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Honeywell

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TEST REPORT
ALTERNATIVE FUELS PROPULSION
DURABILITY EVALUATION

CONTRACT DTRT57-11-C-10053

FINAL REPORT

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REVISION HISTORY

Rev	By	Approved	Date	Revision Summary
—	TRE	M. Keeton M. Easley	August 28, 2012	Initial issue.

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1.0 INTRODUCTION

This document, prepared by Honeywell Aerospace, Phoenix, AZ (Honeywell), contains the final test report (public version) for the U.S. Department of Transportation/Federal Aviation Administration (USDOT/FAA) Alternative Fuels Propulsion Engine Durability Evaluation and is submitted in accordance with contract data requirements list (CDRL) of USDOT contract DTRT57-11-C-10053.

This program addresses the aviation industry's need to evaluate the impact of alternative aviation fuel [synthetic paraffinic kerosene (SPK)] blends on engine durability. The particular SPK being evaluated during this effort was made from Hydroprocessed Esters and Fatty Acids (HEFA) made from animal fats, however, other potential alternative SPK fuels include HEFA fuels made from vegetable oils and fuel derived by Fischer-Tropsch (F-T) synthesis from unconventional sources (such as coal, natural gas, biomass, or combinations thereof).

The evaluations performed as part of this effort included assessing the impact of a 50/50 blend of HEFA SPK fuel mixed with conventional petroleum-derived Jet A fuel on the major combustion system components of a HTF7000 turbofan propulsion engine over the course of a 500-cycle endurance test. The design of the HTF7000 fuel system and hot section are similar to much larger propulsion engines in commercial and military aircraft. The similarity of the HTF7000 to larger main engines allowed for a complete endurance test that was directly representative to larger engines but only required the limited amount of fuel that was available for testing.

2.0 OBJECTIVES AND SUCCESS CRITERIA

The HTF7000 Engine, shown in Figure 1, is Honeywell's state-of-the-art turbofan propulsion system, producing 7,000 lbs of thrust at takeoff at an Overall Pressure Ratio (OPR) of 22. This propulsion system entered into service in 2004.

Today the HTF7000 powers the Bombardier Challenger 300 super-mid-sized BGA aircraft. Two new applications are currently in development: the HTF7250G for the Gulfstream G280 aircraft and the HTF7500E for the new Embraer Legacy 450 and 500 aircraft. Over 500 HTF7000 engines are in the world-wide fleet today. With the additional two applications above, the fleet is projected to grow to more than 3,500 engines, accumulating nearly two million flying hours per year by 2020.

The HTF7000 engine is a 4.2 bypass ratio, two-spool, co-rotating turbofan engine. It features a single-stage, high-efficiency fan rotor that is driven directly by an un-cooled, three-stage LP (low pressure) turbine. The engine compressor core consists of four axial compressor stages with two stages of variable and three stages of non-variable vanes; and a single stage centrifugal compressor. The axial and centrifugal compressors are driven by a two-stage, cooled HP (high pressure) turbine. The combustor is an annular through-flow, effusion-cooled low-emissions configuration similar to those used on larger engines. To reduce noise and improve propulsive efficiency, a forced mixer is used to merge the fan bypass and core flows together prior to their exiting the engine. The engine includes a full-authority digital control (FADEC) system, which features dual-channel electronic control units.

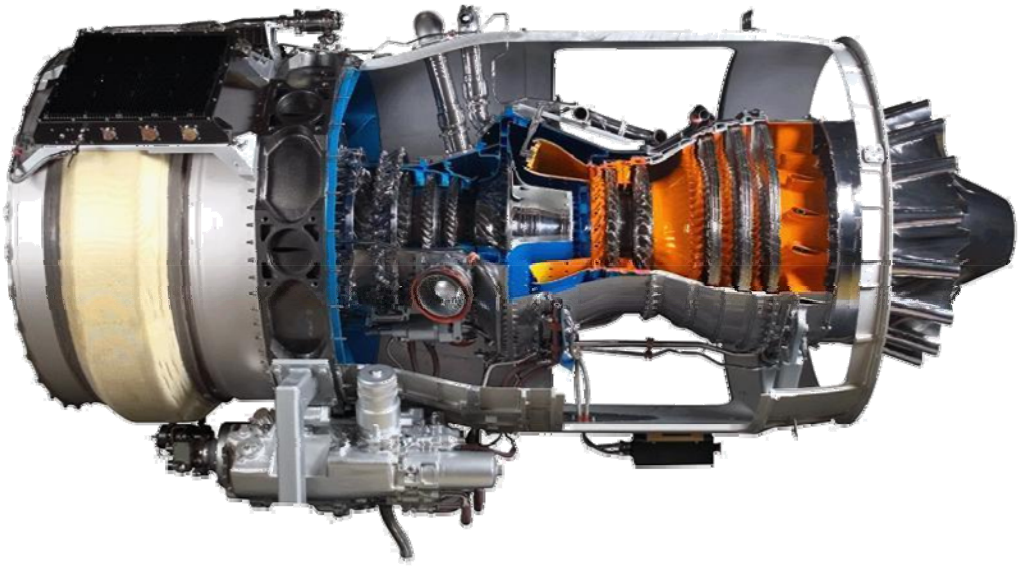


Figure 1. HTF7000 Engine Cutout.

The Service-Life Demonstration (SLD) endurance cycle shown in Figure 2 was used for the fuel evaluation and reflects that of an executive jet application. This SLD cycle has been used extensively in the past with Jet A fuel and is very similar to the endurance cycles used by Pratt & Whitney (P&W) to evaluate the Sasol FSJF and by General Electric (GE) to evaluate FAME-contaminated jet fuel. After start and a three-minute pause at ground idle (GI), the engine performs a typical two-minute takeoff (TO) sequence followed by 11.5-minutes at a simulated flight condition. Landing and deceleration is then simulated followed by a three-minute pause at ground idle and shut down. The total SLD cycle time is 24 minutes resulting in 200 hours accumulated for a 500-cycle test. The HEFA-SPK fuel evaluation was part of a planned 1,227 SLD cycle endurance test with the HEFA-SPK fuel blend being used until the fuel was completely consumed. The endurance test was then continued with conventional Jet A until the 1,227 SLD cycles were completed.

Each 1,227 SLD cycle endurance test accumulates approximately 500 hours of actual engine run time. The SLD cycle is designed to simulate flight conditions so that one SLD cycle provides the hot-section (combustor, turbine nozzles and blades, etc.) thermal cycling that would be experienced over the course of a typical business aviation flight. The thermal cycling that is experienced over the course of a 1,227 SLD cycle endurance test is equivalent to 2,000 engine hours; with 4,000 engine hours being the designed engine overhaul minimum. With respect to the fuel system components (HMU, EFDV, etc.), the more appropriate time for evaluation is the actual engine test hours due to the lack of thermal cycling experienced in the fuel system components.

The hot section components, the combustor and turbine sections, were borescope inspected on regular intervals to document any degradation. The engine fuel wetted components such as the fuel flow divider valve (EFDV), the hydro-mechanical unit (HMU), and the fuel nozzles received pretest and posttest inspections and functional checks. The EFDV and HMU were disassembled for visual inspection of internal components.

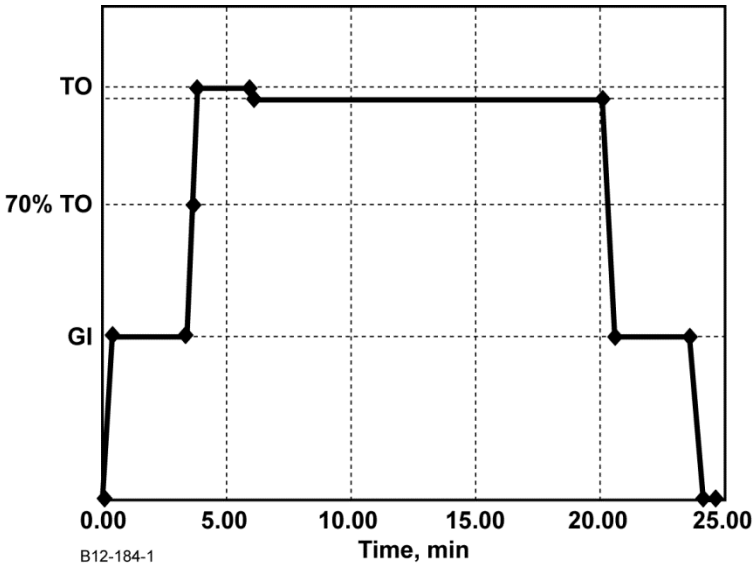


Figure 2. Service-Life Demonstration Cycle.

3.0 TEST EQUIPMENT

The test asset identified for this 500 SLD cycle endurance test with the HEFA-SPK blended fuel was Build 3 of AS907-3-1E Engine S/N 940B (designated 940B-3). The combustor and much of the hot-section related hardware in 940B-3 was used previously on a 1,228 SLD cycle test (Engine 930B-3) and even more hardware was carried over from the 1,242 SLD cycle test (Engine 940B Builds 1 and 2) run between 930B-3 and 940B-3. The combustor test history is shown in Table 1.

Table 1. Combustor Test Asset History.

Model	Cycles	Actual Hours	Equivalent Hours
930B-3	1,228	447:53	~2,000
940B-1 & 2	1,242	544:29	~2,000
Total	2,470	992:22	~4,000

Several heat shields used in the combustor showed significant deterioration during the 930B-3 portion of the testing due to atomizer misalignment with the combustor and swirlers; the combustor dome was out of tolerance. The misalignment issues were remedied between 930B-3 and 940B-1 testing. As a result of the deterioration, 14 of the 16 swirlers were replaced with new hardware and only two of the most deteriorated swirlers were allowed to continue onto the 940B-1 build and subsequently 940B-3 specifically to observe the deterioration progression.

Most of the heat shields from 930B-3 were carried over to 940B-1 and have accumulated 4,000 equivalent hours prior to 940B-3. Four of the heat shields for 940B-3 were new and were part of a development evaluation. Table 2 provides details as to which swirlers and heat shields were carried over from the previous engine builds by showing the equivalent time accumulated on each individual piece of hardware.

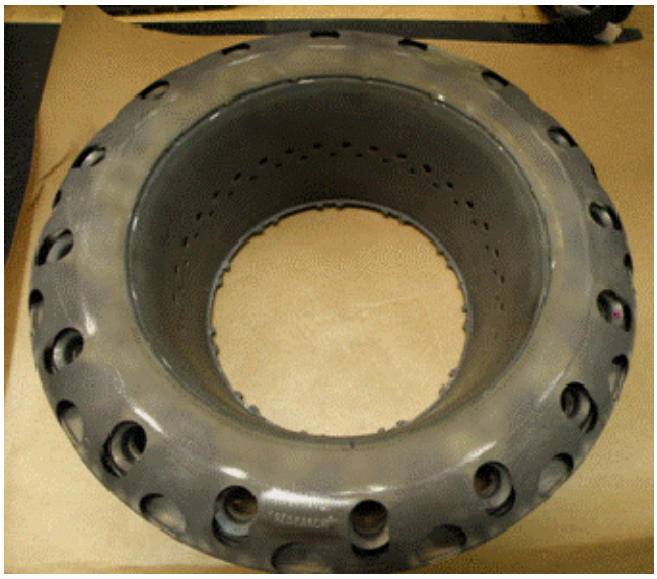
The combustor liners for the 940B-3 engine have accumulated 4,000 equivalent engine hours prior to this HEFA-SPK fuel blend evaluation.

Table 2. Swirler and Heat Shield History Prior to 940B-3.

Location	Swirler Hours (Equivalent)	Heat Shield Hours (Equivalent)
1	2000	4000
2	2000	0
3	2000	4000
4	2000	0
5	4000	4000
6	2000	0
7	2000	0
8	2000	4000
9	4000	4000
10	2000	4000
11	2000	4000
12	2000	4000
13	2000	4000
14	2000	4000
15	2000	4000
16	2000	4000

Pretest Inspections and Component Functional Tests

Fuel system components, including the fuel nozzles, EFDV, and HMU, were functionally tested prior to assembling the engine ensuring that the components were functioning correctly prior to testing. These functional checks also provided a baseline for the posttest functional checks that were performed at the conclusion of the HEFA-SPK portion of the endurance test. Pretest inspections of all engine hardware were completed with a photo of the combustor shown in Figure 3.



(a)

Figure 3. Pretest Photo of Combustor.

Engine Assembly and Test Cell Installation

The assembly of Engine 940B-3 was completed on November 29, 2011 at the Honeywell-Phoenix facility. The assembled engine was then shipped to the San Tan remote test facility for staging, installation into Turbofan Test Cell 968 (Figure 4), and initial engine performance checks.

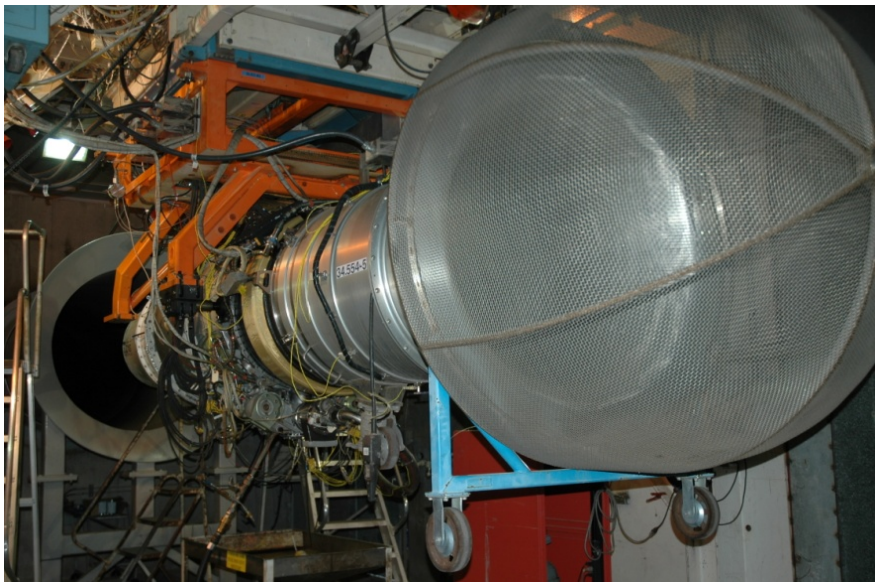


Figure 4. 940B-3 Installed in Test Cell 968 at San Tan Remote Test Facility.

Fuel Delivery and Quality Assurance

Over 60,000 gallons of neat HEFA-SPK fuel was supplied by the U.S. Air Force as part of this USDOT-FAA contract. The fuel was delivered to the San Tan test facility as neat unblended fuel. Upon arrival at the San Tan test facility, delivery tankers off-loaded approximately 6,400 gallons of HEFA-SPK fuel into 15,000 gallon fuel storage Tanks 1 or 2, shown in Figure 5. The tanks were then filled with Honeywell Jet A in order to achieve a 50/50 blend in each tank.

Figure 5. Fuel Tanks at the San Tan Test Facility.

Fuel samples were obtained of the neat HEFA-SPK, the Honeywell Jet A, and the 50/50 blends from each tank of blended fuel that was prepared. Every fuel sample collected was analyzed for specific gravity (SG), viscosity, and lower heating value (LHV) in order to calculate the exact blend ratio within each tank. The measured SG for each blending component and the 50/50 blend are shown in Figure 6 with the predicted SG value calculated from the averages of the blending components. Each blend had a blending error of less than 0.5 percent, which is well within the acceptable blending error tolerance of 3 percent.

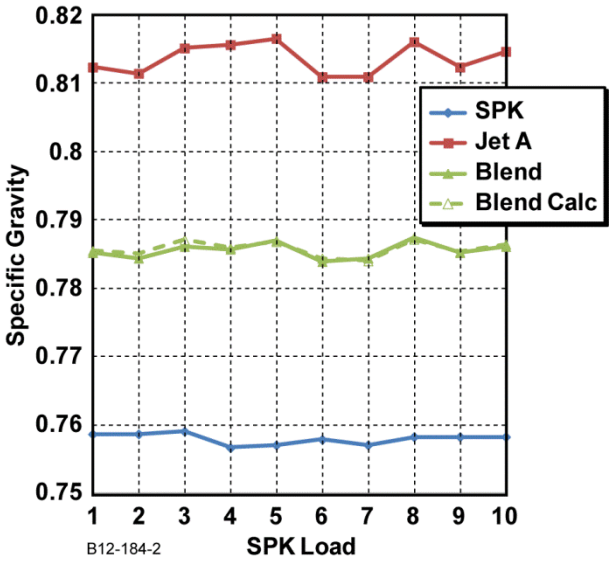


Figure 6. Specific Gravity of Blending Components and 50/50 Blend.

Additional chemical analyses were performed on select fuel samples. Three of the HEFA-SPK tanker samples, as well as the Jet A blending component and the subsequent 50/50 blend samples, were sent out for full ASTM D-7566 specification analysis. Results from the first HEFA-SPK tanker, the Jet A blend component, and the blend from the first mix are shown in Table 3.

Table 3. Fuel Properties.

		Neat HEFA SPK	Jet A	HEFA/Jet A Blend
LHV	MJ/kg	44.0	43.1	43.5
Specific Gravity		0.7587	0.8118	0.7852
Viscosity @ 77ºF	cSt	1.79	1.71	1.74
Viscosity @ 104ºF	cSt	1.41	1.37	1.38
Aromatics	vol %	0.0	16.5	9.0
Freeze Point	ºC	-54.5	-46.5	-50.0
Smoke Point	mm	45.5	25.5	31.0
Flash Point	ºC	40.0	42.2	40.6
Water Content	ppm	26.56	23.71	24.98

Temporary Fuel Storage

Due to delays in engine assembly and the need for the USAF to quickly purge their fuel inventory, Honeywell coordinated with Glendale Aero Services in order to temporarily store up to 20,000 gallons of the HEFA-SPK fuel. Glendale Aero Services leased one of their two dedicated Jet A tanks (Tank 2, middle tank shown in Figure 7) located at the Glendale Municipal Airport fuel farm for this effort. The fuel farm was recently built and contained standard water filtration

and pumping equipment. Honeywell representatives visited the fuel farm prior to it receiving any fuel to ensure that the fuel farm was capable of meeting the program needs.

Figure 7. Fuel Tanks at Glendale Aero Services.

As fuel was required for testing, Desert Refined Products Transport (DRPT), a Honeywell-Phoenix fuel subcontractor, transported the HEFA-SPK in their Jet A dedicated tankers from the Glendale fuel facility to the San Tan Remote Test Facility. The San Tan tanks were then filled with the HEFA-SPK and Honeywell Jet A.

4.0 TEST RESULTS

The engine was installed in Test Cell 968 at the Honeywell-San Tan testing facility and was released for testing on December 7, 2011.

Back-to-Back Fuel Performance Comparison

Before initiating SLD cycles, a back-to-back engine performance comparison was completed with conventional petroleum-derived Jet A and the HEFA-SPK/Jet A blend. There was no noticeable performance difference between the two fuels other than the expected 1 percent decrease in fuel consumption with the HEFA-SPK fuel blend, due to its higher energy content. Typical performance parameters are shown in Table 4. The engine was healthy at the start of testing with margin for specific fuel consumption, inter-turbine temperatures, and engine speed.

Pretest Borescope Inspection

After the engine was installed and prior to initiating endurance test cycles, the hot section was visually inspected via borescope inspection. The pretest borescope inspection was used as a baseline for subsequent inspections slated for every 100 SLD cycles. The inspection included detailed visual checks of the combustion system hardware, including photographs of fuel atomizers, swirl cups, heat shields, combustor liners, turbine nozzles, and turbine blades.

Table 4. Pretest Engine Performance Parameters.

Vs TI-8382 Criteria 940B-3	Jet A 12/5/11 Pretest	HEFA Blend 12/6/11 Pretest
TSFC Margin @ Take-off Thrust	+0.82%	+0.93%
ITT Margin @ Take-Off	+2ºC	+4ºC
N2 Margin @ Take-Off	+212 rpm	+204 rpm
ITT Margin @ MCT	0ºC	+1ºC
N2 Margin @ MCT	+178 rpm	+170 rpm
Thrust @ NTO N1	7754 lbs	7745 lbs
Ground Idle FN (340 lb Max)	325.0 lbs	330.4 lbs
Fuel LHV, Btu/lb	18499	18732
Specific Gravity	0.8104	0.7852

Endurance Cycle Initiation

Endurance testing commenced on December 8, 2011. The alternative fuel blend was used during the first 345 hours and 851 SLD cycles of the test with interim borescope inspections at approximately 100 SLD cycle intervals. The HEFA-SPK blend portion of the testing was completed on January 20, 2012 at which time the fuel atomizers, HMU, flow divider, and fuel filter were removed and sent for post-test inspections and functional checks. The components, with the exception of the atomizers which were reinstalled after functional testing, were replaced with other development assets for completion of the endurance test.

Endurance testing continued January 26, 2012 with standard Jet A fuel and the endurance test was finished with 1,229 SLD cycles completed on February 8, 2012. The engine was removed from the test cell on February 9, 2012 and returned to Phoenix for teardown and posttest analyses.

Periodic Borescope Inspections

Borescope inspections were completed after 109, 231, 322, 417, 478, 634, 771 and 851 SLD cycles. No unusual deterioration was observed during any of the inspections. At the end of the alternative fuel blend portion of the endurance test, the engine had completed 851 SLD cycles and a posttest borescope inspection was performed

After each borescope inspection, additional engine performance calibration checks were completed to ensure proper engine operation. The engine performance results showed no signs of engine deterioration.

Posttest Engine Performance Comparisons

After completion of the 851 SLD cycles, a posttest engine performance evaluation was performed with the HEFA-SPK blend. The SLD cycles were ceased with enough blended fuel remaining in the tanks in order to complete the posttest performance evaluation.

Upon completing the 1,229 SLD cycles with the conventional petroleum-derived Jet A, a posttest engine performance evaluation was performed with conventional petroleum-derived Jet A. There was no significant performance difference between the posttest performance checks with the two fuels other than the previously observed 1 percent decrease in fuel consumption with the HEFA-SPK fuel blend. Results from the posttest performance checks are shown in Table 5.

The margins for thrust specific fuel consumption (TSFC), interstage turbine temperature (ITT), and engine speed did decrease over the course of the test but that is expected for this type of endurance test. There were no significant deviations from what is normally observed for a 1,227 SLD cycle test so as to require additional or unplanned posttest inspections or activities.

Table 5. Posttest Engine Performance Parameters.

Vs TI-8382 Criteria 940B-3	Jet A 12/5/11 Pretest	HEFA Blend 1/20/12 851 Cycles	Jet A 2/9/12 1,229 Cycles
TSFC Margin @ Take-off Thrust	+0.82%	+0.68%	+0.48%
ITT Margin @ Take-Off Comp N1	+2ºC	+6ºC	+2ºC
N2 Margin @ Take-Off Comp N1	+212 rpm	+173 rpm	+154 rpm
ITT Margin @ MCT Comp N1	0ºC	+2ºC	-1ºC
N2 Margin @ MCT Comp N1	+178 rpm	+151 rpm	+129 rpm
Thrust @ NTO N1	7754 lbs	7707 lbs	7715 lbs
Ground Idle FN (340 lb Max)	325.0 lbs	319.3 lbs	325.0 lbs
Fuel LHV, Btu/lb	18499	18720	18535
Specific Gravity	0.8104	0.7861	0.8128

Posttest Functional Check Of Fuel Atomizers

After the alternative fuels portion of the endurance test was completed, the fuel atomizers were removed from the engine and transported to the Honeywell-Phoenix facility for visual inspection and posttest functional testing. The piloted airblast atomizers (start) were tested to Honeywell Document 24-PSC-3034073A, Table 9, and the pure airblast atomizers were tested to Honeywell Document 24-PSC-3034056C, Table 9, and the atomizers were determined to be acceptable for re-installation and continued use in order to finish the final 378 SLD cycles of the endurance test with standard conventional petroleum-derived Jet A fuel. Figure 8 shows the comparison between pretest and posttest atomizer flows at 509 psig relative to the average atomizer flows at 509 psig. There was little variation between the pretest and posttest atomizer flow deviations from average flows with exception of Atomizer 12 which appears to have decreased in flow relative to the average atomizer flows. Atomizer 12 still remained within the 3 percent tolerance band and was deemed acceptable for reassembly onto 940B-3 to finish the 1,227 SLD cycle test with Jet A. No visible anomalies were observed upon inspection on any of the atomizers, including Atomizer 12.

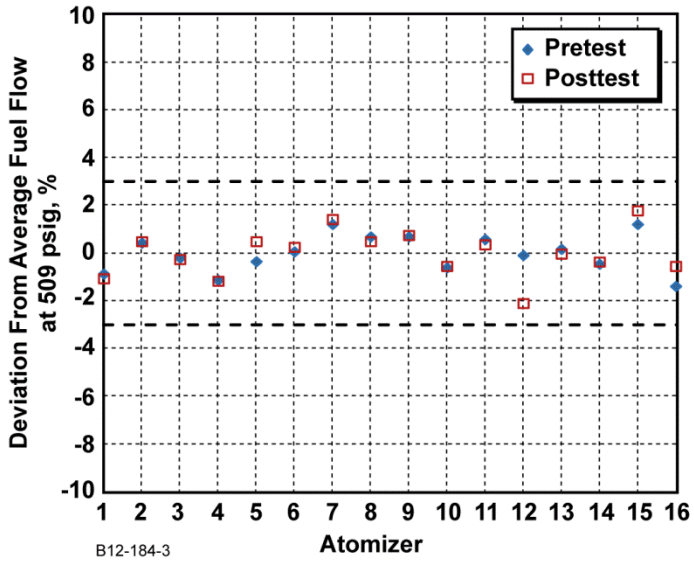
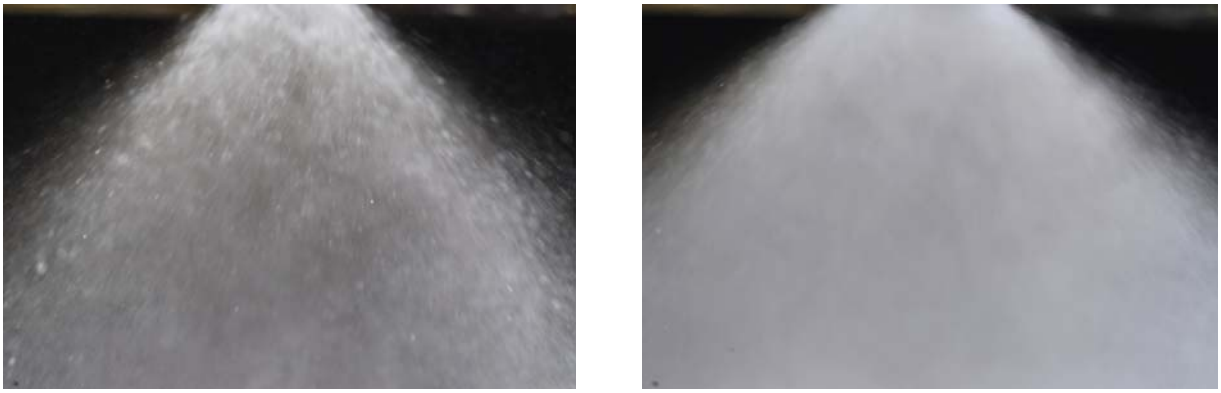


Figure 8. Pretest and Posttest Atomizer Flow Evaluation.

Photos that were taken of the atomizer sprays during the posttest functional check are shown in Figures 9 and 10. The sprays for the two atomizers are typical and do not appear to have been impacted by the HEFA-SPK fuel blend.



(a) **(b)**

Figure 9. Posttest Spray of Atomizer No. 2 at (a) 87 lb/hr and (b) 194 lb/hr.

(a) **(b)**

Figure 10. Posttest Spray of Pilot Atomizer No. 3 at (a) 87 lb/hr and (b) 194 lb/hr.

Photos were also taken of the atomizer tips before and after the endurance test. No material degradation or additional carbon build up appeared evident from the post-test inspections.

Component Posttest Evaluations

The Hydro-Mechanical Unit (HMU), the flow divider valve (EFDV), and the engine fuel filter were removed from the engine (they were replaced with germane hardware in order to finish the endurance test with conventional Jet A fuel) after the HEFA-SPK blend portion of the testing was completed. The EFDV was functionally tested at the Honeywell-Phoenix facility prior to shipment to Honeywell-South Bend for a detailed teardown inspection. The results of the pretest and posttest functional check of the EFDV are shown in Figure 11. The pretest and posttest results are nearly identical and indicate that there was no functional impact of the alternative fuel blend on the flow divider valve.

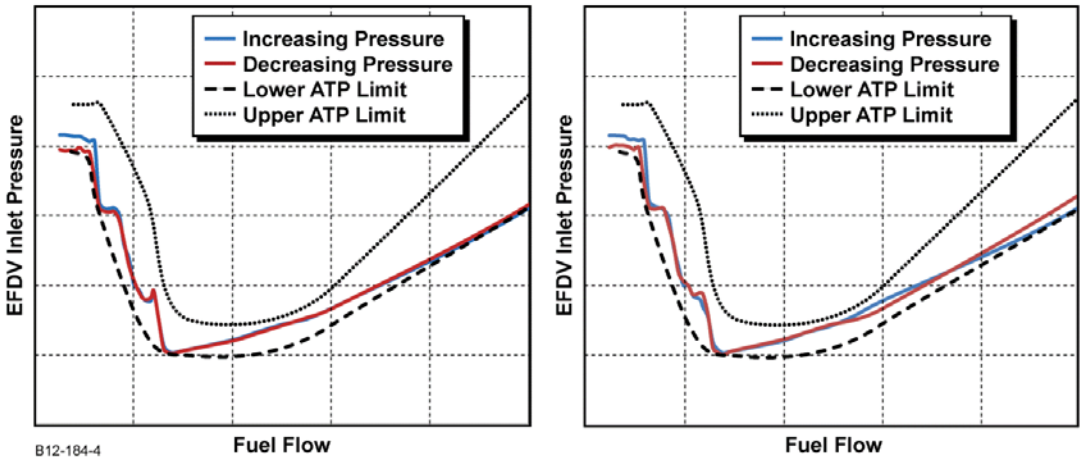
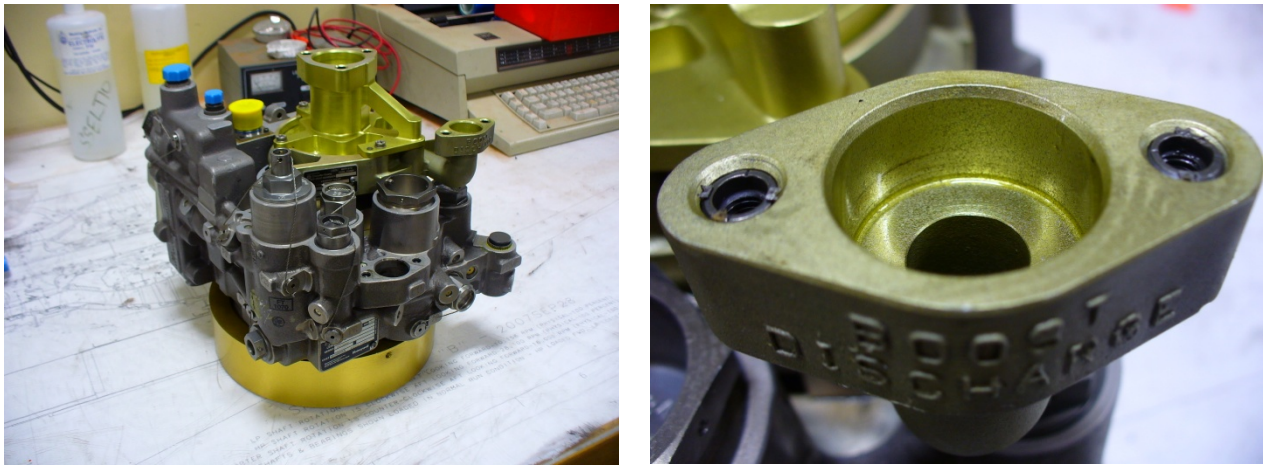


Figure 11. EFDV Functional Test Results (a) Pretest and (b) Posttest.

A limited teardown of the EFDV was also performed prior to shipping the hardware to South Bend in order to get an idea of elastomer conditions and to observe any wear on readily accessible surfaces. Figure 12a shows the EFDV inlet fitting including fluorocarbon and fluorosilicone o-rings that appear to be in pristine condition. Figure 12b shows the groove that houses an internal valve. The surface also appeared to be in pristine condition.

Figure 12. EFDV Inspection Photos (a) Inlet Fitting and (b) Valve Groove.

Unlike the EFDV, which was able to have parts removed without impacting its performance and inspection at South Bend, the HMU was only photographed at the Phoenix facility. Figure 13a shows an overall photo of the HMU and Figure 13b shows an outlet port. No unusual findings were observed at the Phoenix facility.



(a) **(b)**

Figure 13. HMU Inspection Photos (a) Overall Unit and (b) Discharge Port.

Upon arrival at the Honeywell-South Bend facility, both the EFDV and HMU completed run-as-received (RAR) tests and were disassembled. There were no significant findings related to the HEFA-SPK fuel blend exposure. The EFDV teardown was completed March 29, 2012 while the HMU teardown was completed April 20, 2012.

The HMU and EFDV posttest evaluations and teardowns were completed with no significant findings related to the HEFA-SPK fuel blend exposure.

Posttest Teardown Inspection of Fuel Filter

The fuel filter used during the 851 SLD cycles with the HEFA-SPK fuel blend was sent to the manufacturer for a detailed inspection. The evaluation completed by the supplier found no fluid compatibility issues with the design, construction, or medium of the filter. Typical particulate contaminants were found with no presence of bacteria.

Visual inspection of the “as received” condition of the serviced fuel filter element showed the filter element to be intact, with no visible abnormalities or damage.

Typical filter contamination was extracted from the filter element and was comprised, primarily, of significant amounts of fine and coarse particulate contamination. The amount of metallic contamination was estimated to be 30 percent.

Visual examination of the removed filtration medium pack, the component layers of the filtration medium pack, and the filter element core showed no signs of incompatibility with the exposure to the HEFA-SPK fuel blend.

Posttest Teardown and Inspections

Detailed photos were taken of the combustor during the posttest engine teardown. No unusual deterioration was observed during the inspections. Photos were taken of the outer and inner panels of the combustor from pretest and posttest.

Pretest and posttest photos were also taken of the heat shields. Only a mild change in color of the heat shield is noticeable, which is typical of a 1,227 SLD cycle endurance test. No major issues with the heat shields were identified from the use of the HEFA-SPK blend.

Pretest and posttest photos were taken of the first-stage high-pressure turbine blades. The blades were new at the beginning of the endurance test and a noticeable discoloration was observed and could be seen in the photos. This discoloration is due to sand and is typical for a 1,227 SLD cycle endurance test performed at the San Tan Remote Test Facility, where sand ingestion is a common occurrence. No major issues with the first-stage high-pressure turbine blades were identified from the use of the HEFA-SPK blend.

Pretest and posttest photos were taken of the second-stage high-pressure turbine blades. The second-stage blades were used in previous endurance tests and no major color difference is noticeable from pretest to posttest. No major issues with the second-stage high-pressure turbine blades were identified from the use of the HEFA-SPK blend.

5.0 TEST SUMMARY

This engine test program aimed to address the aviation industry's need to evaluate the impact of alternative aviation fuel blends on engine durability. HEFA-SPK (tallow feedstock) was blended 50/50 with conventional petroleum-derived Jet A fuel and used to fuel an HTF7000 turbofan propulsion engine for 851 SLD cycles (345 hours). The evaluations performed as part of this effort included assessing the impact of the HEFA-SPK fuel blend on major combustion and fuel system components. The HTF7000 940B-3 engine performed normally with the use of the HEFA-SPK and Jet A blend. There was no unusual deterioration noticed on any of the hardware during the posttest inspections, functional tests, or other evaluations. The HEFA-SPK blend did not appear to negatively impact the durability of the HTF7000 turbofan propulsion engine.

Appendix I

Periodic Engine Performance Check Results

(3 Pages)

Honeywell

AS907-3 S/N 940B3 Margins and Sensor Checks

vs TI-8382 Criteria	S/N 940B2 [1]	S/N 940B3 [1]			
	Post Cyc Perf #2	SS Break-Ins	22PTCAL1	22PTCAL2	Post161A [4]
AS900PG V1.23	7/26/11	12/3/11	12/5/11	12/6/11	12/15/11
SLD Cycles Completed	-----	-----	0	0	161
Fuel Type	Jet A	Jet A	Jet A	Bio-Fuel	Jet A
Performance Margins @ Takeoff					
TSFC Margin @ Take-Off Thrust	+1.58%		+0.82%	+0.93%	-0.95%
Comp w/Fn Margin @ Take-Off N1	-4 Comp w/+15 lbs		-3 Comp w/+29 lbs	-3 Comp w/+21 lbs	-3 Comp w/+13 lbs
ITT Margin @ Take-off Comp N1	+11C		+2C	+4C	-9C
N2 Margin @ Take-Off Comp N1	+226 rpm		+212 rpm	+204 rpm	+127 rpm
Performance Margins @ MCT					
Comp w/Fn Margin @ MCT N1	-4 Comp w/+7 lbs		-3 Comp w/+21 lbs	-3 Comp w/+16 lbs	-3 Comp w/+3 lbs
ITT Margin @ MCT Comp N1	+8C		0C	+1C	-13C
N2 Margin @ MCT Comp N1	+194 rpm		+178 rpm	+170 rpm	+109 rpm
		Thrust measurement issues cause failure of sale page program			
Thrust @ NTO N1	7783 lbs		7754 lbs	7745 lbs	7739 lbs
Ground Idle FN (vs 340 lb Max)	334.0 lbs		325 lbs	330.4 lbs	n/a [2]
Embraer DSC Sensor Checks					
ECTT2 - Lab T1_avg (@ T-O Power)	n/a [2]		n/a [2]	n/a [2]	n/a [2]
ECVIB - ZVFWDASA (@ T-O Power)	n/a [2]		n/a [2]	n/a [2]	n/a [2]
ECWF / Lab WF_avg (@ 900 pph)	0.997		n/a [2]	n/a [2]	1.000
Other Perf Sensor Checks @ T/O					
ECEGT - Lab TT60_avg	n/a [3]		n/a [3]	n/a [3]	n/a [3]
Left vs Right EGT Split	n/a [2]		n/a [2]	n/a [2]	n/a [2]
N1 Powerset Verification	n/a [2]		n/a [2]	n/a [2]	n/a [2]
Exhaust Nozzle	Reference 907-1	Reference 907-1	Reference 907-1	Reference 907-1	Reference 907-1
Extrapolated Points	None	None	None	None	None
Inlet Condens Correction	No	Unknown	Yes (+0.3% Fn)	No	Yes (+0.4% Fn)
Average Tamb	88.8F	50.7F	48.8F	49.6F	54.6F
Test Cell	967	968	968	968	968

Notes:

[1] MLE Fan Stator Installed

[2] Powerset definition for 22 Point Cal is not compatible with sale page program requirements or NTO Power was not set properly

[3] Station 5.5 rakes are installed

[4] IP Bleed was ON

[5] Engine Powerset definitions is correct. Sale Page program needs updated from interim curves

[6] T1 anomalies during this data set: 1) 4F T1 split for top 2 powersets, and 2) 5F T1/OAT/ECT2 change between 2nd & 3rd data points (in 5 minutes

[7] This data set also had large T1 splits at various powersets. Also had 50 lbs thrust split at high power and 95 lbs thrust split at idle power (wrong

[8] Adjusted to correct Jet A fuel properties (Tfile had Bio-Fuel props as Jet A fuel sample was not tested yet)

Honeywell

AS907-3 S/N 940B3 Margins and Sensor Checks

vs TI-8382 Criteria	S/N 940B2 [1]	S/N 940B3 [1]			
	Post Cyc Perf #2	Post161B	Post417	Post478	Post635A
AS900PG V1.23	7/26/11	12/16/11	1/3/12	1/5/12	1/9/12
SLD Cycles Completed	-----	161	417	478	635
Fuel Type	Jet A	Jet A	Jet A	Jet A	Jet A
Performance Margins @ Takeoff					
TSFC Margin @ Take-Off Thrust	+1.58%	+0.56%	+0.45%	+0.26%	+0.44%
Comp w/Fn Margin @ Take-Off N1	-4 Comp w/+15 lbs	-3 Comp w/+21 lbs	-3 Comp w/+7 lbs	-2 Comp w/+41 lbs	-2 Comp w/+29 lbs
ITT Margin @ Take-off Comp N1	+11C	+2C	+2C	+2C	+2C
N2 Margin @ Take-Off Comp N1	+226 rpm	+168 rpm	+160 rpm	+146 rpm	+150 rpm
Performance Margins @ MCT					
Comp w/Fn Margin @ MCT N1	-4 Comp w/+7 lbs	-3 Comp w/+14 lbs	-3 Comp w/+0 lbs	-2 Comp w/+30 lbs	-2 Comp w/+23 lbs
ITT Margin @ MCT Comp N1	+8C	-2C	-1C	-2C	-1C
N2 Margin @ MCT Comp N1	+194 rpm	+144 rpm	+134 rpm	+122 rpm	+125 rpm
Thrust @ NTO N1	7783 lbs	7745 lbs	7732 lbs	7723 lbs	7710 lbs
Ground Idle FN (vs 340 lb Max)	334.0 lbs	321.3 lbs	325.7 lbs	322.3 lbs	328.9 lbs
Embraer DSC Sensor Checks					
ECTT2 - Lab T1_avg (@ T-O Power)	n/a [2]	n/a [2]	+9,7F	n/a [2]	+0.8F
ECVIB - ZVFWDASA (@ T-O Power)	n/a [2]	n/a [2]	-0.045 ips	n/a [2]	-0.051 ips
ECWF / Lab WF_avg (@ 900 pph)	0.997	0.997	0.995	0.991	0.994
Other Perf Sensor Checks @ T/O					
ECEGT - Lab TT60_avg	n/a [3]	n/a [3]	n/a [3]	n/a [3]	n/a [3]
Left vs Right EGT Split	n/a [2]	n/a [2]	-14.5F	n/a [2]	-22.5F
N1 Powerset Verification	n/a [2]	n/a [2]	n/a [5]	n/a [2]	n/a [5]
Exhaust Nozzle	Reference 907-1	Reference 907-1	Reference 907-1	Reference 907-1	Reference 907-1
Extrapolated Points	None	None	None	None	None
Inlet Condens Correction	No	No	No	No	No
Average Tamb	88.8F	65.4F	65.1F	72.6F	53.5F
Test Cell	967	968	968	968	968

Notes:

[1] MLE Fan Stator Installed

[2] Powerset definition for 22 Point Cal is not compatible with sale page program requirements or NTO Power was not set properly

[3] Station 5.5 rakes are installed

[4] IP Bleed was ON

[5] Engine Powerset definitions is correct. Sale Page program needs updated from interim curves

[6] T1 anomalies during this data set: 1) 4F T1 split for top 2 powersets, and 2) 5F T1/OAT/ECT2 change between 2nd & 3rd data points (in 5 minutes)

[7] This data set also had large T1 splits at various powersets. Also had 50 lbs thrust split at high power and 95 lbs thrust split at idle power (wrong one

[8] Adjusted to correct Jet A fuel properties (Tfile had Bio-Fuel props as Jet A fuel sample was not tested yet)

Honeywell

AS907-3 S/N 940B3 Margins and Sensor Checks

vs TI-8382 Criteria	S/N 940B2 [1]	S/N 940B3 [1]			
	Post Cyc Perf #2	Post852 [6]	Pre853 [7]	Post1229	Post Fan Wash
AS900PG V1.23	7/26/11	1/20/12	1/25/12	2/8/12	2/9/12
SLD Cycles Completed	-----	852	852	1229	1229
Fuel Type	Jet A	Bio-Fuel	Jet A	Jet A	Jet A
Performance Margins @ Takeoff					
TSFC Margin @ Take-Off Thrust	+1.58%	+0.68%	+0.00% (8)	+0.50%	+0.48%
Comp w/Fn Margin @ Take-Off N1	-4 Comp w/+15 lbs	-2 Comp w/+25 lbs	-3 Comp w/+6 lbs	-2 Comp w/+28 lbs	-2 Comp w/+34 lbs
ITT Margin @ Take-off Comp N1	+11C	+6C	+5C	+3C	+2C
N2 Margin @ Take-Off Comp N1	+226 rpm	+173 rpm	+171 rpm	+162 rpm	+154 rpm
Performance Margins @ MCT					
Comp w/Fn Margin @ MCT N1	-4 Comp w/+7 lbs	-2 Comp w/+17 lbs	-3 Comp w/+5 lbs	-2 Comp w/+23 lbs	-2 Comp w/+28 lbs
ITT Margin @ MCT Comp N1	+8C	+2C	+1C	-1C	-1C
N2 Margin @ MCT Comp N1	+194 rpm	+151 rpm	+145 rpm	+127 rpm	+129 rpm
Thrust @ NTO N1	7783 lbs	7707 lbs	7729 lbs	7708 lbs	7715 lbs
Ground Idle FN (vs 340 lb Max)	334.0 lbs	319.3 lbs	235.6 lbs	336.0 lbs	325.0 lbs
Embraer DSC Sensor Checks					
ECTT2 - Lab T1_avg (@ T-O Power)	n/a [2]	+1.9F	n/a [2]	+0.8F	n/a [2]
ECVIB - ZVFWDASA (@ T-O Power)	n/a [2]	-0.053 ips	n/a [2]	-0.048 ips	n/a [2]
ECWF / Lab WF_avg (@ 900 pph)	0.997	0.994	1.015 [8]	n/a [2]	0.996
Other Perf Sensor Checks @ T/O					
ECEGT - Lab TT60_avg	n/a [3]	n/a [3]	n/a [3]	n/a [3]	n/a [3]
Left vs Right EGT Split	n/a [2]	-9.2F	n/a [2]	-22.0F	n/a [2]
N1 Powerset Verification	n/a [2]	n/a [5]	n/a [2]	n/a [5]	n/a [2]
Exhaust Nozzle	Reference 907-1	Reference 907-1	Reference 907-1	Reference 907-1	Reference 907-1
Extrapolated Points	None	None	None	None	None
Inlet Condens Correction	No	Yes (+0.4% Fn)	No	No	No
Average Tamb	88.8F	44.1F	57.7F	68.2F	68.2F
Test Cell	967	968	968	968	968

Notes:

[1] MLE Fan Stator Installed

[2] Powerset definition for 22 Point Cal is not compatible with sale page program requirements or NTO Power was not set properly

[3] Station 5.5 rakes are installed

[4] IP Bleed was ON

[5] Engine Powerset definitions is correct. Sale Page program needs updated from interim curves

[6] T1 anomalies during this data set: 1) 4F T1 split for top 2 powersets, and 2) 5F T1/OAT/ECT2 change between 2nd & 3rd data points (in 5 minutes)

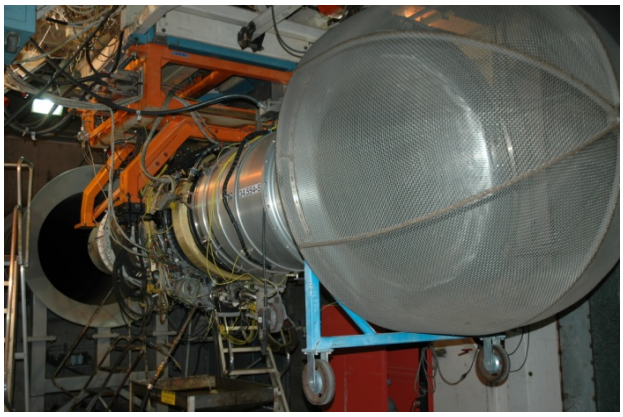
[7] This data set also had large T1 splits at various powersets. Also had 50 lbs thrust split at high power and 95 lbs thrust split at idle power (wrong one

[8] Adjusted to correct Jet A fuel properties (Tfile had Bio-Fuel props as Jet A fuel sample was not tested yet)

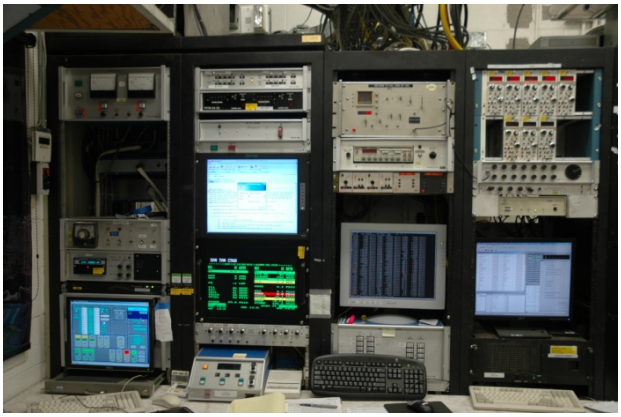
Appendix II

Test Facility Photos

(1 Page)



(a)



(b)

Figure II-1. San Tan Facility (a) Engine Installation and (b) Test Cell Control Room.

(a)

(b)

Figure II-2. Fuel Farms at (a) San Tan and (b) Glendale Aero Services.

Honeywell

Appendix III

Chemical Analysis Results

(118 Pages)

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)
Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	546288	Submission Date	10/20/2011 09:49 AM
Status	Completed	Desired Date	10/24/2011
Disposition	**Conforms**	Commit Date	10/24/2011
Released By	Baker, Susan	Completion Date	10/21/2011 09:41 PM
		Project / Type	Certify
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T1		
Oil / Fuel Type	Jet A	Material Spec	ASTM-D-1655
Detailed Instructions	Gallon container is for Randy Williams who will supply dispo. Extension #7229		
Distribution List	Ciero, Robert | Williams, Randy		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: FIMS (API) Date: 10/21/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.0326527					WI1414	Bautista, Karla
B Coefficient	(c) 3.8290374					WI1414	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Bautista, Karla
Calorimeter constant	2411.0576					WI1411	Bautista, Karla
Sample Weight	0.5680	g				WI1411	Bautista, Karla
Tape Weight	0	g				WI1411	Bautista, Karla
Temperature change	2.5974	°C				WI1411	Bautista, Karla
Fuse Correction	17	cal				WI1411	Bautista, Karla
Nitric Acid	12	ml				WI1411	Bautista, Karla
LHV-FIMS	(c) 18523	BTU/lb				WI1411	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	43.9	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	74	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 42.697					ASTM-D-1298	Bautista, Karla
Density	(c) 812	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.8123					ASTM-D-1298	Bautista, Karla
Test: Viscosity @ 104F							
Tube number-104	VIS-2382					WI1414	Bautista, Karla
Run #1	371.17	sec				WI1414	Bautista, Karla
Run #2	371.10	sec				WI1414	Bautista, Karla
Average Time	(c) 371.14	sec				WI1414	Bautista, Karla
CS	(c) 1.36	cst				WI1414	Bautista, Karla
Test: Viscosity @ 77F							
Other tube constant	0.003653					WI1414	Bautista, Karla
Run #1	466.51	sec				WI1414	Bautista, Karla
Run #2	466.53	sec				WI1414	Bautista, Karla
Average Time	(c) 466.52	sec				WI1414	Bautista, Karla
CS	(c) 1.70	cst				WI1414	Bautista, Karla

Specimen: ~Text Results — Date: 10/20/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Text Results							
Text Result	(see below)					ASTM-D-240	Neal, Terry 10/20/2011
Lower Heating Value (Net Heat of Combustion) was tested per ASTM-D-240							

CMR Hours

Budgeted Hours	Estimated Hours	Actual Hours
-	-	0.5

Test Locations of CMR

Location	Commit Date	Status	Charge Number	Logged By	Last Logged
Oil/Fuel Analysis: FIMS Analysis	10/24/2011	Released	7002368937-0050	Baker, Susan	10/21/2011

CMR Metrics

Location	Commit Date Compliance (%)	Baseline CDC (%)	Commit Date OTTR (days)	Desired Date Compliance (%)	Desired Date OTTR (days)	SPI	CPI	Transit Time (days)	Queue Time (days)	Cycle Time (days)	Thru Time (days)	Desired Time (days)	Total Time (days)
Oil/Fuel Analysis: FIMS Analysis	100.00	100.00	3.00	100.00	3.00	2.68	0.00	1.05	0.00	0.45	0.45	4.00	1.49

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)
Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	546289	Submission Date	10/20/2011 09:52 AM
Status	Completed	Desired Date	10/24/2011
Disposition	**Conforms**	Commit Date	10/24/2011
Released By	Baker, Susan	Completion Date	10/21/2011 09:35 PM
		Project / Type	Certify
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T2		
Oil / Fuel Type	Jet A	Material Spec	ASTM-D-1655
Detailed Instructions	Gallon container is for Randy Williams who will supply dispo. Extension #7229		
Distribution List	Ciero, Robert | Williams, Randy		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: FIMS (API) Date: 10/21/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.3961948					WI1414	Baker, Susan
B Coefficient	(c) 3.9622173					WI1414	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Baker, Susan
Calorimeter constant	2411.0576					WI1411	Baker, Susan
Sample Weight	0.5615	g				WI1411	Baker, Susan
Tape Weight	0	g				WI1411	Baker, Susan
Temperature change	2.5665	°C				WI1411	Baker, Susan
Fuse Correction	13	cal				WI1411	Baker, Susan
Nitric Acid	12	ml				WI1411	Baker, Susan
LHV-FIMS	(c) 18525	BTU/lb				WI1411	Baker, Susan
Test: Specific Gravity (A)							
Observed API Gravity	44.1	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	73	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 42.890					ASTM-D-1298	Bautista, Karla
Density	(c) 811	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.8114					ASTM-D-1298	Bautista, Karla
Test: Viscosity @ 104F							
Tube number-104	VIS-2383					WI1414	Bautista, Karla
Run #1	367.63	sec				WI1414	Bautista, Karla
Run #2	367.63	sec				WI1414	Bautista, Karla
Average Time	(c) 367.63	sec				WI1414	Bautista, Karla
CS	(c) 1.35	cst				WI1414	Bautista, Karla
Test: Viscosity @ 77F							
Other tube constant	0.003676					WI1414	Bautista, Karla
Run #1	462.07	sec				WI1414	Bautista, Karla
Run #2	462.18	sec				WI1414	Bautista, Karla
Average Time	(c) 462.13	sec				WI1414	Bautista, Karla
CS	(c) 1.70	cst				WI1414	Bautista, Karla

Specimen: ~Text Results							Date: 10/20/2011
Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Text Results							
Text Result	(see below)					ASTM-D-240	Neal, Terry 10/20/2011
Lower Heating Value (Net Heat of Combustion) was tested per ASTM-D-240							
Text Result	(see below)					per CMR inst.	Baker, Susan 10/21/2011
re-test not needed							

CMR Re-Test Log Entries						
Date	Re-Test Type	Sample Id	Test	Disp Chg	Reason	Logged By
10/21/2011	Re-test	1061330132	LHV	No	Show Reason	Baker, Susan

CMR Hours		
Budgeted Hours	Estimated Hours	Actual Hours
-	-	0.5

Test Locations of CMR					
Location	Commit Date	Status	Charge Number	Logged By	Last Logged
Oil/Fuel Analysis: FIMS Analysis	10/24/2011	Released	7002368937-0050	Baker, Susan	10/21/2011

CMR Metrics													
Location	Commit Date Compliance (%)	Baseline CDC (%)	Commit Date OTTR (days)	Desired Date Compliance (%)	Desired Date OTTR (days)	SPI	CPI	Transit Time (days)	Queue Time (days)	Cycle Time (days)	Thru Time (days)	Desired Time (days)	Total Time (days)
Oil/Fuel Analysis: FIMS Analysis	100.00	100.00	3.00	100.00	3.00	2.69	0.00	1.04	0.00	0.44	0.44	4.00	1.49

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	547553	Submission Date	10/28/2011 10:42 AM
Status	Completed	Desired Date	10/31/2011
Disposition	**Info Only**	Commit Date	10/31/2011
Released By	Rexroad, Perry	Completion Date	10/31/2011 10:19 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T1		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	ASTM-D-1655
Detailed Instructions	This is Straight Bio-fuel. Not a mix. Taken from first truck before off load.		
Distribution List	Ciero, Robert | Williams, Randy		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: FIMS (API) — Date: 10/31/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.6581499					WI1414	Rexroad, Perry
B Coefficient	(c) 4.0523844					WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2411.06					WI1411	Rexroad, Perry
Sample Weight	0.5679	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.6689	°C				WI1411	Rexroad, Perry
Fuse Correction	7	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18941	BTU/lb				WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	56.5	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	74	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 55.003					ASTM-D-1298	Bautista, Karla
Density	(c) 759	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.7587					ASTM-D-1298	Bautista, Karla
Test: Viscosity @ 104F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	381.21	sec				WI1414	Rexroad, Perry
Run #2	381.11	sec				WI1414	Rexroad, Perry
Average Time	(c) 381.16	sec				WI1414	Rexroad, Perry
CS	(c) 1.40	cst				WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	485.03	sec				WI1414	Rexroad, Perry
Run #2	484.99	sec				WI1414	Rexroad, Perry
Average Time	(c) 485.01	sec				WI1414	Rexroad, Perry
CS	(c) 1.78	cst				WI1414	Rexroad, Perry

Specimen: ~Text Results							Date: 10/28/2011
Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Text Results							
Text Result	(see below)					ASTM-D-240	Neal, Terry 10/28/2011
Lower Heating Value (Net Heat of Combustion) was tested per ASTM-D-240							

CMR Hours		
Budgeted Hours	Estimated Hours	Actual Hours
-	-	0.8

Test Locations of CMR					
Location	Commit Date	Status	Charge Number	Logged By	Last Logged
Oil/Fuel Analysis: FIMS Analysis	10/31/2011	Released	7002368937-0050	Rexroad, Perry	10/31/2011

CMR Metrics													
Location	Commit Date Compliance (%)	Baseline CDC (%)	Commit Date OTTR (days)	Desired Date Compliance (%)	Desired Date OTTR (days)	SPI	CPI	Transit Time (days)	Queue Time (days)	Cycle Time (days)	Thru Time (days)	Desired Time (days)	Total Time (days)
Oil/Fuel Analysis: FIMS Analysis	100.00	100.00	0.00	100.00	0.00	1.01	0.00	0.18	0.00	2.80	2.80	3.00	2.98

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	547554	Submission Date	10/28/2011 10:46 AM
Status	Completed	Desired Date	10/31/2011
Disposition	**Info Only**	Commit Date	10/31/2011
Released By	Rexroad, Perry	Completion Date	10/31/2011 10:25 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	547553
Detailed Instructions	This is Straight Bio-fuel. Not a mix. Taken from second truck before off load.		
Distribution List	Ciero, Robert | Williams, Randy		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: FIMS (API) — Date: 10/31/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.4102498					WI1414	Rexroad, Perry
B Coefficient	(c) 3.9622725					WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2411.06					WI1411	Rexroad, Perry
Sample Weight	0.5633	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.6490	°C				WI1411	Rexroad, Perry
Fuse Correction	12	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18939	BTU/lb				WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	56.5	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	74	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 55.003					ASTM-D-1298	Rexroad, Perry
Density	(c) 759	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.7587					ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003939					WI1414	Rexroad, Perry
Run #1	355.80	sec				WI1414	Rexroad, Perry
Run #2	355.84	sec				WI1414	Rexroad, Perry
Average Time	(c) 355.82	sec				WI1414	Rexroad, Perry
CS	(c) 1.40	cst				WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003939					WI1414	Rexroad, Perry
Run #1	449.82	sec				WI1414	Rexroad, Perry
Run #2	449.89	sec				WI1414	Rexroad, Perry
Average Time	(c) 449.86	sec				WI1414	Rexroad, Perry
CS	(c) 1.77	cst				WI1414	Rexroad, Perry

CMR Hours		
Budgeted Hours	Estimated Hours	Actual Hours
-	-	0.0

Test Locations of CMR					
Location	Commit Date	Status	Charge Number	Logged By	Last Logged
Oil/Fuel Analysis: FIMS Analysis	10/31/2011	Released	7002368937-0050	Rexroad, Perry	10/31/2011

CMR Metrics

Location	Commit Date Compliance (%)	Baseline CDC (%)	Commit Date OTTR (days)	Desired Date Compliance (%)	Desired Date OTTR (days)	SPI	CPI	Transit Time (days)	Queue Time (days)	Cycle Time (days)	Thru Time (days)	Desired Time (days)	Total Time (days)
Oil/Fuel Analysis: FIMS Analysis	100.00	100.00	0.00	100.00	0.00	1.00	0.00	0.18	0.00	2.81	2.81	3.00	2.98

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	547577 rev A	Submission Date	10/28/2011 01:25 PM
Status	Completed	Desired Date	11/11/2011
Disposition	**Info Only**	Commit Date	11/14/2011
Released By	Bautista, Karla	Completion Date	11/11/2011 01:05 PM
Custom Id / Title	San Tan Tank #1	Project / Type	Info Only
Labor Charge Number	7002368937-0050	Material Charge Number	7002368937-0180
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	San Tan Tank #1 Jet A		
Oil / Fuel Type	Jet A	Material Spec	ASTM-D-1655
Tests Required	Water Content (ppm) LHV (BTU/lb) Viscosity Flash Point (F) Distillation Specific Gravity Anti-ice Additive Aromatics Low Temp Viscosity Freeze Point Smoke Point		
Detailed Instructions	Full ASTM D1655 specification analysis required. Sample from San Tan Tank #1 prior to blending in HEFA SPK. Run as many analysis in-house as possible - including specific gravity, LHV, viscosity (D445), flash point, freeze point (D2386), FSII, and distilaltion (D86). Other properties such as acidity (D3242), aromatics (D1319 or D6379), sulfur (any method per spec), low temp visc (D445 at -20C), mercaptan sulfur (D3227), smoke point (D1322), copper strip corrosion (D130), thermal stability at 260C (D3241), existent gum (D381, report washed and unwashed), and MSEP (D3948) may need to be sent to an accredited outside laboratory (recommend Dixie Services). Please also run simulated distillation (D2887) at OP laboratory.		
Distribution List	Culbertson, Brad		

Customer	Williams, Randy	Submitted By	Williams, Randy
Phone	+1 602/231-7229	Phone	+1 602/231-7229
Department	BA--60035	Department	BA--60035
Requesting Site	Phoenix		

Test Results

Specimen: 1061333113 — Date: 11/11/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 9.9357872					WI1414	Bautista, Karla
B Coefficient	(c) 3.7928055					WI1414	Bautista, Karla
Test: Aromatics							
Distance to Blue 1	11.5	cm				ASTM-D-1319	Baker, Susan
Distance to Front 1	69.5	cm				ASTM-D-1319	Baker, Susan
Distance to Blue 2	11.4	cm				ASTM-D-1319	Baker, Susan
Distance to Front 2	70.5	cm				ASTM-D-1319	Baker, Susan
Aromatics Ratio 1	(c) 0.17					ASTM-D-1319	Baker, Susan
Aromatics Ratio 2	(c) 0.16					ASTM-D-1319	Baker, Susan
% Volume Aromatics	(c) 16.5	%				ASTM-D-1319	Baker, Susan

Test: Distillation							
Initial B.P.	312	°F				ASTM-D-86	Bautista, Karla
5% Distilled	336	°F				ASTM-D-86	Bautista, Karla
10% Distilled	346	°F				ASTM-D-86	Bautista, Karla
20% Distilled	360	°F				ASTM-D-86	Bautista, Karla
30% Distilled	376	°F				ASTM-D-86	Bautista, Karla
40% Distilled	388	°F				ASTM-D-86	Bautista, Karla
50% Distilled	402	°F				ASTM-D-86	Bautista, Karla
60% Distilled	418	°F				ASTM-D-86	Bautista, Karla
70% Distilled	436	°F				ASTM-D-86	Bautista, Karla
80% Distilled	458	°F				ASTM-D-86	Bautista, Karla
90% Distilled	488	°F				ASTM-D-86	Bautista, Karla
95% Distilled	512	°F				ASTM-D-86	Bautista, Karla
End Point	544	°F				ASTM-D-86	Bautista, Karla
% Distilled	98.5	%				ASTM-D-86	Bautista, Karla
% Residue	1.2	%				ASTM-D-86	Bautista, Karla
% Loss	(c) 0.3	%				ASTM-D-86	Bautista, Karla
Test: Flash Point - c.c.							
Flash Point	106	°F				ASTM-D-56	Bautista, Karla
Barometric Pressure	28.681	inHg				ASTM-D-56	Bautista, Karla
Corrected Flash Point	(c) 108	°F				ASTM-D-56	Bautista, Karla
Test: Freeze Point							
Freeze Point	-51.7	°F				ASTM-D-2386	Bautista, Karla
Test: H/C ratio							
API Gravity @ 60 degF	(c) 42.804					ASTM-D-1298	Bautista, Karla
Avg Dist Temp	(c) 412	°F				ASTM-D-86	Bautista, Karla
% H	(c) 13.728					ASTM-D-3343-95	Bautista, Karla
H/C Ratio by weight	(c) 0.159					ASTM-D-1298	Bautista, Karla
H/C Ratio by mole	(c) 1.896					ASTM-D-1298	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Bautista, Karla
Calorimeter constant	2411.0576					WI1411	Bautista, Karla
Sample Weight	0.5626	g				WI1411	Bautista, Karla
Tape Weight	0	g				WI1411	Bautista, Karla
Temperature change	2.5778	°C				WI1411	Bautista, Karla
Fuse Correction	19	cal				WI1411	Bautista, Karla
Nitric Acid	12	ml				WI1411	Bautista, Karla
LHV-FIMS	(c) 18546	BTU/lb				WI1411	Bautista, Karla
Test: Smoke Point							
Smoke Point	25.5	mm				ASTM-D-1322	Bautista, Karla
Test: Smoke Point-1 Reference Standard 1							
Toluene	20	%				ASTM-D-1322	Bautista, Karla
Iso-Octane	80	%				ASTM-D-1322	Bautista, Karla
Result 1	23	mm				ASTM-D-1322	Bautista, Karla
Result 2	20	mm				ASTM-D-1322	Bautista, Karla
Result 3	24	mm				ASTM-D-1322	Bautista, Karla
Result Avg	(c) 22	mm				ASTM-D-1322	Bautista, Karla
Expected Value	22.7	mm				ASTM-D-1322	Bautista, Karla
Test: Smoke Point-2 Reference Standard 2							
Toluene	10	%				ASTM-D-1322	Bautista, Karla
Iso-Octane	90	%				ASTM-D-1322	Bautista, Karla
Result 1	31	mm				ASTM-D-1322	Bautista, Karla
Result 2	30	mm				ASTM-D-1322	Bautista, Karla
Result 3	32	mm				ASTM-D-1322	Bautista, Karla

Result Avg	(c) 31	mm				ASTM-D-1322	Bautista, Karla
Expected Value	30.2	mm				ASTM-D-1322	Bautista, Karla
Test: Smoke Point-3 Analysis							
Result 1	26	mm				ASTM-D-1322	Bautista, Karla
Result 2	25	mm				ASTM-D-1322	Bautista, Karla
Result 3	26	mm				ASTM-D-1322	Bautista, Karla
Result Avg	(c) 26	mm				ASTM-D-1322	Bautista, Karla
Corrected Avg	(c) 26.1	mm				ASTM-D-1322	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	44.0	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	74	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 42.804					ASTM-D-1298	Bautista, Karla
Density	(c) 812	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.8118					ASTM-D-1298	Bautista, Karla
Test: Text Results							
Text Result	(see below)					WI1416	Baker, Susan 11/08/2011

Olefins and saturates calculated per ASTM D 1319

Jet A

Olefins, % volume: 2.4
Saturates, % volume: 81.1

Test: Text Results (2)							
Text Result	(see below)					per CMR inst.	Bautista, Karla 11/08/2011

D381
Gum content, mg/100 mL
Unwashed = 1
Washed = 1

D5453
Sulfur, mg/kg = 983

D3227
Mercaptan sulfur, mass % = 0.0014

D445
Viscosity, - 20 °C, mm2/s = 4.710

D1840
Napthalenes, volume % = 1.78

D3242
Acid number, mg KOH/g = 0.014

D130
Corrosion copper strip (2 h/100 °C) = 1a

D3241
Thermal oxidation stability, (2.5 h/260 °C)
Heater tube deposit rating, visual = 3
Filter pressure drop, mm Hg = 2.4

D3948
Water separation, MSEP-A rating = 94

D2887
Boiling range distribution, % recovered, °C

IBP	100.5
5	140.0
10	155.0
20	171.0
30	183.5
40	196.5
50	209.0
60	220.0
70	234.0
80	249.0
90	268.5
95	284.0
FBP	333.0

Analyses were completed by Dixie Services. Please see attached results.

Test: Viscosity @ 104F						
Tube number-104	VIS-2383				WI1414	Bautista, Karla
Run #1	371.30	sec			WI1414	Bautista, Karla
Run #2	371.79	sec			WI1414	Bautista, Karla
Average Time	(c) 371.55	sec			WI1414	Bautista, Karla
CS	(c) 1.37	cst			WI1414	Bautista, Karla
Test: Viscosity @ 77F						
Other tube constant	0.003676				WI1414	Bautista, Karla
Run #1	464.74	sec			WI1414	Bautista, Karla
Run #2	465.23	sec			WI1414	Bautista, Karla
Average Time	(c) 464.99	sec			WI1414	Bautista, Karla
CS	(c) 1.71	cst			WI1414	Bautista, Karla
Test: Water Content (ppm)						
Run #1	24.05	ppm			ASTM-E-1064	Bautista, Karla
Run #2	23.36	ppm			ASTM-E-1064	Bautista, Karla
Water Content	(c) 23.71	ppm			ASTM-E-1064	Bautista, Karla
Water Content Standard	This sample was checked against a 1000 ppm QC standard				ASTM-E-1064	Bautista, Karla

Specimen: 1061333324 Date: 10/30/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Anti-Icing Additive							
DiEGMME	0	% v/v				WI1412	Russell, Danielle Marie

Specimen: ~Attached Results Date: 11/08/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Attached Results							
Attached Result	547577.pdf					per CMR inst.	Bautista, Karla 11/08/2011

Specimen: ~Text Results Date: 11/08/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Text Results							
Text Result	(see below)					per CMR inst.	Cooper, Terry W. 11/08/2011

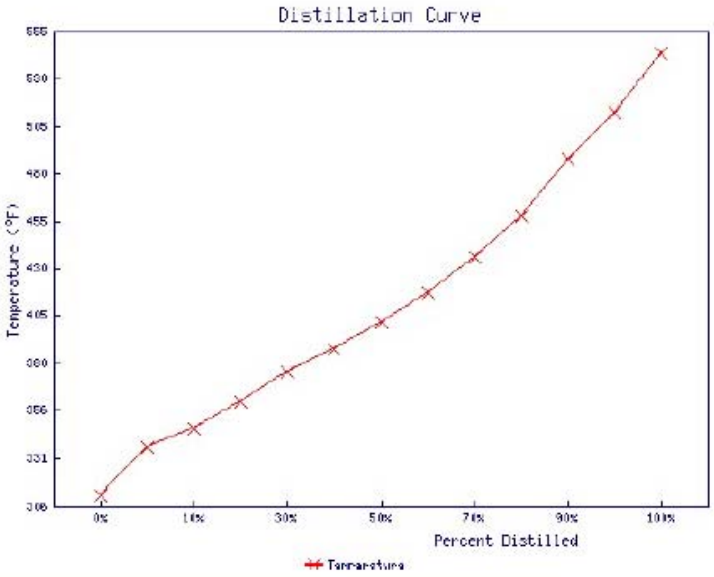
Po 6400124336 has been placed to Dixie

Distillation Test for Specimen 1061333113

Oil and Fuel CMR #	547577
Material	Jet A
Material Specification	ASTM-D-1655
Test Method	ASTM-D-86

		Material Spec Limits	
		Minimum	Maximum
Percent Distilled	98.5		
Percent Residue	1.2		
Percent Loss	0.3		

Percent Distilled	Temperature (°F)	Material Spec Limits	
		Minimum	Maximum
0%	312		
5%	336		
10%	346		
20%	360		
30%	376		
40%	388		
50%	402		
60%	418		
70%	436		
80%	458		
90%	488		
95%	512		
100%	544		



CMR Hours		
Budgeted Hours	Estimated Hours	Actual Hours
8	-	2.3

Test Locations of CMR					
Location	Commit Date	Status	Charge Number	Logged By	Last Logged
Oil/Fuel Analysis: Oils and Fuels	11/14/2011	Released	7002368937-0050	Bautista, Karla	11/11/2011
Purchasing	11/14/2011	Released	7002368937-0050	Cooper, Terry W.	11/08/2011

CMR Metrics

Location	Commit Date Compliance (%)	Baseline CDC (%)	Commit Date OTTR (days)	Desired Date Compliance (%)	Desired Date OTTR (days)	SPI	CPI	Transit Time (days)	Queue Time (days)	Cycle Time (days)	Thru Time (days)	Desired Time (days)	Total Time (days)
Oil/Fuel Analysis: Oils and Fuels	100.00	100.00	3.00	100.00	0.00	1.22	0.00	0.07	0.00	13.92	13.92	13.98	13.99
Purchasing	100.00	100.00	6.00	100.00	6.00	1.86	0.00	0.14	6.86	-0.00	6.86	13.00	6.99

DIXIE SERVICES INCORPORATED

POST OFFICE BOX 451
1706 FIRST STREET

GALENA PARK, TEXAS 77547
www.dixieservices.com

VOICE 713 672 1619
FACSIMILE 713 672 1634

CERTIFICATE OF ANALYSIS

Number: 139519

Client: Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, Arizona 85034

Date: November 8, 2011

Attention: Terry Cooper

Sample: Jet A, submitted 02 Nov 11
Marks: CMR 547577
Origin: Tank #1
Date: 20 Oct 11

D381	Gum content, mg/100 mL	
	Unwashed	1
	Washed	1
D5453	Sulfur, mg/kg	983
D3227	Mercaptan sulfur, mass %	0.0014
D445	Viscosity, - 20 °C, mm^2/s	4.710
D1840	Napthalenes, volume %	1.78
D3242	Acid number, mg KOH/g	0.014
D130	Corrosion copper strip (2 h/100 °C)	1a
D3241	Thermal oxidation stability, (2.5 h/260 °C)	
	Heater tube deposit rating, visual	3
	Filter pressure drop, mm Hg	2.4
D3948	Water separation, MSEP-A rating	94
D2887	Boiling range distribution, % recovered, °C	
	IBP	100.5
	5	140.0
	10	155.0
	20	171.0
	30	183.5
	40	196.5
	50	209.0
	60	220.0
	70	234.0
	80	249.0
	90	268.5
	95	284.0
	FBP	333.0

Dixie Services Incorporated,

Zachary Holland

ZBH/lm
Email Recipients: richard.gadberry@honeywell.com; terry.cooper@honeywell.com; steven.sosa@honeywell.com

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	547579 rev A	Submission Date	10/28/2011 01:29 PM
Status	Completed	Desired Date	11/11/2011
Disposition	**Info Only**	Commit Date	11/14/2011
Released By	Bautista, Karla	Completion Date	11/11/2011 03:58 PM
Custom Id / Title	San Tan Tank #2	Project / Type	Info Only
Labor Charge Number	7002368937-0050	Material Charge Number	7002368937-0180
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	San Tan Tank #2 Jet A		
Oil / Fuel Type	Jet A	Material Spec	ASTM-D-1655
Tests Required	Water Content (ppm) LHV (BTU/lb) Viscosity Flash Point (F) Distillation Specific Gravity Anti-ice Additive Aromatics Low Temp Viscosity Freeze Point Smoke Point		
Detailed Instructions	Full ASTM D1655 specification analysis required. Sample from San Tan Tank #2 prior to blending in HEFA SPK. Run as many analysis in-house as possible - including specific gravity, LHV, viscosity (D445), flash point, freeze point (D2386), and distilaltion (D86). Other properties such as acidity (D3242), aromatics (D1319 or D6379), sulfur (any method per spec), mercaptan sulfur (D3227), low temp viscosity (D445 at -20C), smoke point (D1322), copper strip corrosion (D130), thermal stability at 260C (D3241), existent gum (D381, report washed and unwashed), and MSEP (D3948) may need to be sent to an accredited outside laboratory (recommend Dixie Services). Please also run simulated distillation (D2887) at OP laboratory.		
Distribution List	Culbertson, Brad		

Customer	Williams, Randy	Submitted By	Williams, Randy
Phone	+1 602/231-7229	Phone	+1 602/231-7229
Department	BA--60035	Department	BA--60035
Requesting Site	Phoenix		

Test Results

Specimen: 1061333115 — Date: 11/11/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.3961948					WI1414	Bautista, Karla
B Coefficient	(c) 3.9622173					WI1414	Bautista, Karla
Test: Aromatics							
Distance to Blue 1	10.5	cm				ASTM-D-1319	Baker, Susan
Distance to Front 1	64	cm				ASTM-D-1319	Baker, Susan
Distance to Blue 2	10.5	cm				ASTM-D-1319	Baker, Susan
Distance to Front 2	64	cm				ASTM-D-1319	Baker, Susan
Aromatics Ratio 1	(c) 0.16					ASTM-D-1319	Baker, Susan
Aromatics Ratio 2	(c) 0.16					ASTM-D-1319	Baker, Susan
% Volume Aromatics	(c) 16.0	%				ASTM-D-1319	Baker, Susan

Test: Distillation							
Initial B.P.		308	°F			ASTM-D-86	Bautista, Karla
5% Distilled		336	°F			ASTM-D-86	Bautista, Karla
10% Distilled		346	°F			ASTM-D-86	Bautista, Karla
20% Distilled		358	°F			ASTM-D-86	Bautista, Karla
30% Distilled		376	°F			ASTM-D-86	Bautista, Karla
40% Distilled		388	°F			ASTM-D-86	Bautista, Karla
50% Distilled		404	°F			ASTM-D-86	Bautista, Karla
60% Distilled		420	°F			ASTM-D-86	Bautista, Karla
70% Distilled		436	°F			ASTM-D-86	Bautista, Karla
80% Distilled		458	°F			ASTM-D-86	Bautista, Karla
90% Distilled		488	°F			ASTM-D-86	Bautista, Karla
95% Distilled		514	°F			ASTM-D-86	Bautista, Karla
End Point		544	°F			ASTM-D-86	Bautista, Karla
% Distilled		98	%			ASTM-D-86	Bautista, Karla
% Residue		1.2	%			ASTM-D-86	Bautista, Karla
% Loss		(c) 0.8	%			ASTM-D-86	Bautista, Karla
Test: Flash Point - c.c.							
Flash Point		103	°F			ASTM-D-56	Bautista, Karla
Barometric Pressure		28.678	inHg			ASTM-D-56	Bautista, Karla
Corrected Flash Point		(c) 105	°F			ASTM-D-56	Bautista, Karla
Test: Freeze Point							
Freeze Point		-50.8	°F			ASTM-D-2386	Bautista, Karla
Test: H/C ratio							
API Gravity @ 60 degF		(c) 42.997				ASTM-D-1298	Bautista, Karla
Avg Dist Temp		(c) 413	°F			ASTM-D-86	Bautista, Karla
% H		(c) 13.763				ASTM-D-3343-95	Bautista, Karla
H/C Ratio by weight		(c) 0.160				ASTM-D-1298	Bautista, Karla
H/C Ratio by mole		(c) 1.902				ASTM-D-1298	Bautista, Karla
Test: LHV							
Calorimeter		Parr 1266				WI1411	Bautista, Karla
Calorimeter constant		2411.0576				WI1411	Bautista, Karla
Sample Weight		0.5607	g			WI1411	Bautista, Karla
Tape Weight		0	g			WI1411	Bautista, Karla
Temperature change		2.5617	°C			WI1411	Bautista, Karla
Fuse Correction		6	cal			WI1411	Bautista, Karla
Nitric Acid		12	ml			WI1411	Bautista, Karla
LHV-FIMS		(c) 18535	BTU/lb			WI1411	Bautista, Karla
Test: Smoke Point							
Smoke Point		24.5	mm			ASTM-D-1322	Bautista, Karla
Test: Smoke Point-1 Reference Standard 1							
Toluene		20	%			ASTM-D-1322	Bautista, Karla
Iso-Octane		80	%			ASTM-D-1322	Bautista, Karla
Result 1		23	mm			ASTM-D-1322	Bautista, Karla
Result 2		20	mm			ASTM-D-1322	Bautista, Karla
Result 3		24	mm			ASTM-D-1322	Bautista, Karla
Result Avg		(c) 22	mm			ASTM-D-1322	Bautista, Karla
Expected Value		22.7	mm			ASTM-D-1322	Bautista, Karla
Test: Smoke Point-2 Reference Standard 2							
Toluene		10	%			ASTM-D-1322	Bautista, Karla
Iso-Octane		90	%			ASTM-D-1322	Bautista, Karla
Result 1		31	mm			ASTM-D-1322	Bautista, Karla
Result 2		30	mm			ASTM-D-1322	Bautista, Karla
Result 3		32	mm			ASTM-D-1322	Bautista, Karla

Result Avg	(c) 31	mm				ASTM-D-1322	Bautista, Karla
Expected Value	30.2	mm				ASTM-D-1322	Bautista, Karla
Test: Smoke Point-3 Analysis							
Result 1	25	mm				ASTM-D-1322	Bautista, Karla
Result 2	24	mm				ASTM-D-1322	Bautista, Karla
Result 3	25	mm				ASTM-D-1322	Bautista, Karla
Result Avg	(c) 25	mm				ASTM-D-1322	Bautista, Karla
Corrected Avg	(c) 25.1	mm				ASTM-D-1322	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	44.2	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	74	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 42.997					ASTM-D-1298	Bautista, Karla
Density	(c) 811	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.8109					ASTM-D-1298	Bautista, Karla
Test: Text Results							
Text Result	(see below)					WI1416	Baker, Susan 11/08/2011

Olefins and saturates calculated per ASTM D 1319

Jet A

Olefins, % volume: 2.3
Saturates, % volume: 81.7

Test: Text Results (2)							
Text Result	(see below)					per CMR inst.	Bautista, Karla 11/08/2011

D381
Gum content, mg/100 mL
Unwashed = < 1
Washed = < 1

D5453
Sulfur, mg/kg = 1033

D3227
Mercaptan sulfur, mass % = 0.0016

D445
Viscosity, - 20 °C, mm2/s = 4.683

D1840
Napthalenes, volume % = 1.81

D3242
Acid number, mg KOH/g = 0.014

D130
Corrosion copper strip (2 h/100 °C) = 1a

D3241
Thermal oxidation stability, (2.5 h/260 °C)
Heater tube deposit rating, visual = 1
Filter pressure drop, mm Hg = 0.2

D3948
Water separation, MSEP-A rating = 98

D2887
Boiling range distribution, % recovered, °C

IBP	100.0
5	139.0
10	153.0
20	170.0
30	182.5
40	196.5
50	208.5
60	219.5
70	233.5
80	249.0
90	268.0
95	283.0
FBP	330.0

Analyses were completed by Dixie Services. Please see attached results.

Test: Viscosity @ 104F									
Tube number-104		VIS-2384					WI1414	Bautista, Karla
Run #1		343.34	sec				WI1414	Bautista, Karla
Run #2		343.58	sec				WI1414	Bautista, Karla
Average Time	(c)	343.46	sec				WI1414	Bautista, Karla
CS	(c)	1.35	cst				WI1414	Bautista, Karla
Test: Viscosity @ 77F									
Other tube constant		0.003939					WI1414	Bautista, Karla
Run #1		431.88	sec				WI1414	Bautista, Karla
Run #2		432.21	sec				WI1414	Bautista, Karla
Average Time	(c)	432.04	sec				WI1414	Bautista, Karla
CS	(c)	1.70	cst				WI1414	Bautista, Karla
Test: Water Content (ppm)									
Run #1		29.13	ppm				ASTM-E-1064	Bautista, Karla
Run #2		27.46	ppm				ASTM-E-1064	Bautista, Karla
Water Content	(c)	28.30	ppm				ASTM-E-1064	Bautista, Karla
Water Content Standard	This sample was checked against a 1000 ppm QC standard						ASTM-E-1064	Bautista, Karla

Specimen: 1061333325 Date: 10/30/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Anti-Icing Additive							
DiEGMME	0	% v/v				WI1412	Russell, Danielle Marie

Specimen: ~Attached Results Date: 11/08/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Attached Results							
Attached Result	547579.pdf					per CMR inst.	Bautista, Karla 11/08/2011

Specimen: ~Text Results Date: 11/08/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Text Results							
Text Result	(see below)					per CMR inst.	Cooper, Terry W. 11/08/2011

PO 6400124338 has been placed to Dixie

Distillation Test for Specimen 1061333115

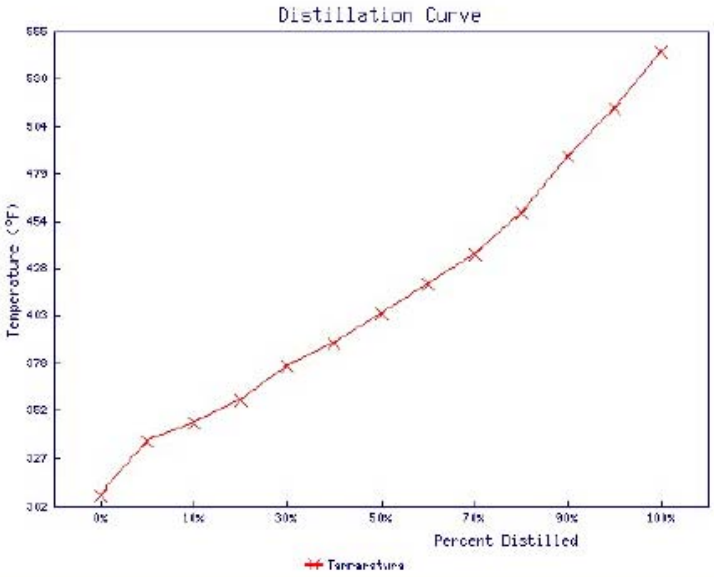
Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)

Oil and Fuel CMR #	547579
Material	Jet A
Material Specification	ASTM-D-1655
Test Method	ASTM-D-86

		Material Spec Limits	
		Minimum	Maximum
Percent Distilled	98		
Percent Residue	1.2		
Percent Loss	0.8		

Percent Distilled	Temperature (°F)	Material Spec Limits	
		Minimum	Maximum
0%	308		
5%	336		
10%	346		
20%	358		
30%	376		
40%	388		
50%	404		
60%	420		
70%	436		
80%	458		
90%	488		
95%	514		
100%	544		



CMR Re-Test Log Entries						
Date	Re-Test Type	Sample Id	Test	Disp Chg	Reason	Logged By
11/04/2011	Re-test	1061333115	LHV	No	Show Reason	Bautista, Karla

DIXIE SERVICES INCORPORATED

POST OFFICE BOX 451
1706 FIRST STREET

GALENA PARK, TEXAS 77547
www.dixieservices.com

VOICE 713 672 1619
FACSIMILE 713 672 1634

CERTIFICATE OF ANALYSIS

Number: 139520

Date: November 8, 2011

Client: Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, Arizona 85034

Attention: Terry Cooper

Sample: Jet A, submitted 02 Nov 11
Marks: CMR 547579
Origin: Tank #2
Date: 20 Oct 11

D381	Gum content, mg/100 mL	
	Unwashed	< 1
	Washed	< 1
D5453	Sulfur, mg/kg	1033
D3227	Mercaptan sulfur, mass %	0.0016
D445	Viscosity, - 20 °C, mm^2/s	4.683
D1840	Napthalenes, volume %	1.81
D3242	Acid number, mg KOH/g	0.014
D130	Corrosion copper strip (2 h/100 °C)	1a
D3241	Thermal oxidation stability, (2.5 h/260 °C)	
	Heater tube deposit rating, visual	1
	Filter pressure drop, mm Hg	0.2
D3948	Water separation, MSEP-A rating	98
D2887	Boiling range distribution, % recovered, °C	
	IBP	100.0
	5	139.0
	10	153.0
	20	170.0
	30	182.5
	40	196.5
	50	208.5
	60	219.5
	70	233.5
	80	249.0
	90	268.0
	95	283.0
	FBP	330.0

Dixie Services Incorporated,

Zachary Holland

ZBH/lm

Email Recipients: richard.gadberry@honeywell.com; terry.cooper@honeywell.com; steven.sosa@honeywell.com

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	547581	Submission Date	10/28/2011 01:58 PM
Status	Completed	Desired Date	11/04/2011
Disposition	**Info Only**	Commit Date	11/18/2011
Released By	Bautista, Karla	Completion Date	11/08/2011 03:51 PM
Custom Id / Title	HEFA SPK Tanker 1	Project / Type	Info Only
Labor Charge Number	7002368937-0050	Material Charge Number	7002368937-0180
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	Delivery Tanker		
Oil / Fuel Type	HEFA SPK	Material Spec	D7566 Table 1 and A1.1
Operating Time	n/a	Engine Serial #	n/a
Tests Required	Water Content (ppm) LHV (BTU/lb) Viscosity Flash Point (F) Distillation Specific Gravity Anti-ice Additive Aromatics Low Temp Viscosity Freeze Point Smoke Point		
Detailed Instructions	Full ASTM D1655/D7566 specification analysis required. Sample from 1st tanker (Tanker 1) delivering HEFA SPK to San Tan. Run as many analysis in-house as possible - including specific gravity, LHV, viscosity (D445), flash point, freeze point (D2386), and distilaltion (D86). Other properties such as acidity (D3242), aromatics (D1319 or D6379), low temp viscosity (D445 at -20C), sulfur (D5453 or D2622), mercaptan sulfur (D3227), smoke point (D1322), copper strip corrosion (D130), thermal stability at 325C (D3241), existent gum (D381, report washed and unwashed), and MSEP (D3948) may need to be sent to an accredited outside laboratory (recommend Dixie Services). Please also run simulated distillation (D2887) at OP laboratory. Also check hydrocarbon concentration (D2425 and D5291), nitrogen (D4629), halogens (D7359), and trace metals (ICP, prefer UOP 389)		
Distribution List	Culbertson, Brad		

Customer	Williams, Randy	Submitted By	Williams, Randy
Phone	+1 602/231-7229	Phone	+1 602/231-7229
Department	BA--60035	Department	BA--60035
Requesting Site	Phoenix		

Test Results

Specimen: FIMS (API) — Date: 11/08/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.5588793					WI1414	Bautista, Karla
B Coefficient	(c) 4.0153196					WI1414	Bautista, Karla
Test: Anti-Icing Additive							
DiEGMME	0	% v/v				WI1412	Bautista, Karla
Test: Distillation							
Initial B.P.	296	°F				ASTM-D-86	Bautista, Karla
5% Distilled	326	°F				ASTM-D-86	Bautista, Karla
10% Distilled	338	°F				ASTM-D-86	Bautista, Karla

20% Distilled		356	°F			ASTM-D-86	Bautista, Karla
30% Distilled		376	°F			ASTM-D-86	Bautista, Karla
40% Distilled		400	°F			ASTM-D-86	Bautista, Karla
50% Distilled		424	°F			ASTM-D-86	Bautista, Karla
60% Distilled		446	°F			ASTM-D-86	Bautista, Karla
70% Distilled		466	°F			ASTM-D-86	Bautista, Karla
80% Distilled		482	°F			ASTM-D-86	Bautista, Karla
90% Distilled		498	°F			ASTM-D-86	Bautista, Karla
95% Distilled		506	°F			ASTM-D-86	Bautista, Karla
End Point		530	°F			ASTM-D-86	Bautista, Karla
% Distilled		99	%			ASTM-D-86	Bautista, Karla
% Residue		0.9	%			ASTM-D-86	Bautista, Karla
% Loss		(c) 0.1	%			ASTM-D-86	Bautista, Karla
Test: Flash Point - c.c.							
Flash Point		102	°F			ASTM-D-56	Bautista, Karla
Barometric Pressure		28.674	inHg			ASTM-D-56	Bautista, Karla
Corrected Flash Point		(c) 104	°F			ASTM-D-56	Bautista, Karla
Test: Freeze Point							
Freeze Point		-66.1	°F			ASTM-D-2386	Bautista, Karla
Test: LHV							
Calorimeter		Parr 1266				WI1411	Rexroad, Perry
Calorimeter constant		2411.06				WI1411	Rexroad, Perry
Sample Weight		0.5460	g			WI1411	Rexroad, Perry
Tape Weight		0	g			WI1411	Rexroad, Perry
Temperature change		2.5670	°C			WI1411	Rexroad, Perry
Fuse Correction		10	cal			WI1411	Rexroad, Perry
Nitric Acid		12	ml			WI1411	Rexroad, Perry
LHV-FIMS		(c) 18938	BTU/lb			WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity		56.4	°API			ASTM-D-1298	Rexroad, Perry
Fuel Temperature		73	°F			ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF		(c) 55.003				ASTM-D-1298	Rexroad, Perry
Density		(c) 759	kg/m^3			ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF		0.7587				ASTM-D-1298	Rexroad, Perry
Test: Text Results							
Text Result		(see below)				WI6360	Bautista, Karla 11/03/2011
Smoke Point = 46mm 45mm 46mm Corrected average = 45.5 mm Results are estimate only do to limitation of standards at 42.88mm maximum.							
Test: Text Results (2)							
Text Result		(see below)				WI1416	Bautista, Karla 11/08/2011
No detectable volume of aromatic content. Aromatics % volume = 0%							
Test: Text Results (3)							
Text Result		(see below)				per CMR inst.	Bautista, Karla 11/08/2011

D381
Gum content, mg/100 mL
Unwashed = < 1
Washed = < 1

D5453
Sulfur, mg/kg = 0.15

D3227
Mercaptan sulfur, mass % = < 0.0001

D445
Viscosity, - 20 °C, mm2/s = 5.255

D1840
Napthalenes, volume % = < 0.01

D3242
Acid number, mg KOH/g = 0.002

D130
Corrosion copper strip (2 h/100 °C) = 1b

D3241
Thermal oxidation stability, (2.5 h/325 °C):
Heater tube deposit rating, visual = 1
Filter pressure drop, mm Hg = 0

D3948
Water separation, MSEP-A rating = 93

D2887
Boiling range distribution, % recovered, °C

IBP	113.5
5	132.5
10	142.0
20	165.0
30	185.5
40	202.5
50	219.5
60	238.0
70	255.5
80	266.5
90	276.0
95	280.0
FBP	287.5

D4629
Nitrogen, mg/kg = 0.44

D5291
Carbon, mass % = 85.4
Hydrogen, mass % = 14.6

UOP389
Trace Metals, mg/kg
Aluminum < 0.02

Calcium	0.06
Cobalt	< 0.02
Chromium	< 0.02
Copper	< 0.02
Iron	0.05
Potassium	< 0.02
Magnesium	< 0.02
Manganese	< 0.02
Molybdenum	< 0.02
Sodium	< 0.02
Nickel	< 0.02
Phosphorus	< 0.02
Lead	< 0.02
Strontium	< 0.02
Palladium	< 0.02
Platinum	< 0.02
Tin	< 0.02
Titanium	< 0.02
Vanadium	< 0.02
Zinc	0.13

Analyses were completed by Dixie Services. Please see attached results.

Test: Viscosity @ 104F							
Other tube constant	0.003653					WI1414	Rexroad, Perry
Run #1	386.05	sec				WI1414	Rexroad, Perry
Run #2	386.00	sec				WI1414	Rexroad, Perry
Average Time	(c) 386.03	sec				WI1414	Rexroad, Perry
CS	(c) 1.41	cst				WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003653					WI1414	Rexroad, Perry
Run #1	488.71	sec				WI1414	Rexroad, Perry
Run #2	488.66	sec				WI1414	Rexroad, Perry
Average Time	(c) 488.69	sec				WI1414	Rexroad, Perry
CS	(c) 1.79	cst				WI1414	Rexroad, Perry
Test: Water Content (ppm)							
Run #1	27.21	ppm				ASTM-E-1064	Bautista, Karla
Run #2	25.91	ppm				ASTM-E-1064	Bautista, Karla
Water Content	(c) 26.56	ppm				ASTM-E-1064	Bautista, Karla
Water Content Standard	This sample was checked against a 1000 ppm QC standard					ASTM-E-1064	Bautista, Karla

Specimen: ~Attached Results — Date: 11/08/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Attached Results							
Attached Result	547581.pdf					per CMR inst.	Bautista, Karla 11/08/2011

Specimen: ~Text Results — Date: 11/08/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Text Results							
Text Result	(see below)					per CMR inst.	Cooper, Terry W. 11/08/2011
PO 6400124339 has been placed to Dixie							

Distillation Test for Specimen FIMS (API)

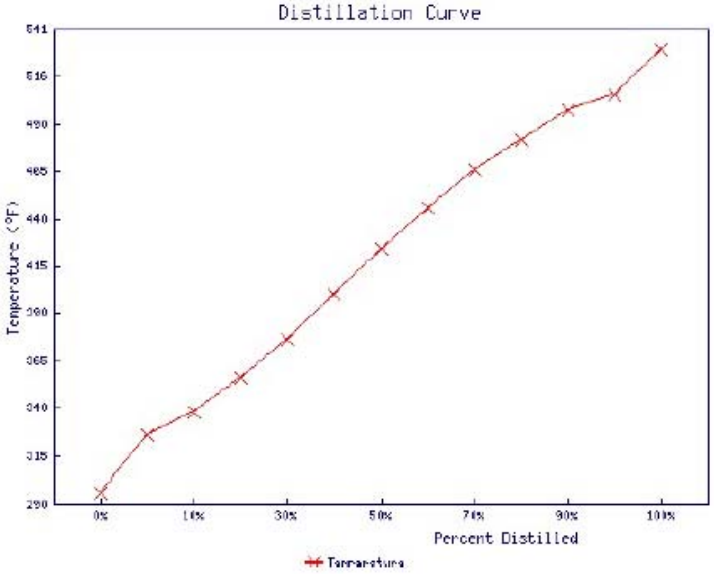
Oil and Fuel CMR # 547581

Percent	Temperature	Material Spec Limits

Material	HEFA SPK
Material Specification	D7566 Table 1 and A1.1
Test Method	ASTM-D-86

		Material Spec Limits	
		Minimum	Maximum
Percent Distilled	99		
Percent Residue	0.9		
Percent Loss	0.1		

Percent Distilled	Temperature (°F)	Material Spec Limits Minimum	Material Spec Limits Maximum
0%	296		
5%	326		
10%	338		
20%	356		
30%	376		
40%	400		
50%	424		
60%	446		
70%	466		
80%	482		
90%	498		
95%	506		
100%	530		



CMR Hours		
Budgeted Hours	Estimated Hours	Actual Hours
8	-	1.5

Test Locations of CMR					
Location	Commit Date	Status	Charge Number	Logged By	Last Logged
Oil/Fuel Analysis: Oils and Fuels	11/18/2011	Released	7002368937-0050	Bautista, Karla	11/08/2011
Purchasing	11/18/2011	Released	7002368937-0050	Cooper, Terry W.	11/08/2011

CMR Metrics

Location	Commit Date Compliance (%)	Baseline CDC (%)	Commit Date OTTR (days)	Desired Date Compliance (%)	Desired Date OTTR (days)	SPI	CPI	Transit Time (days)	Queue Time (days)	Cycle Time (days)	Thru Time (days)	Desired Time (days)	Total Time (days)
Oil/Fuel Analysis: Oils and Fuels	100.00	100.00	10.00	0.00	-4.00	1.87	0.00	3.70	0.00	7.38	7.38	7.00	11.08
Purchasing	100.00	100.00	10.00	100.00	10.00	2.43	0.00	0.13	6.86	-0.00	6.86	17.00	6.99

Honeywell

DIXIE SERVICES INCORPORATED

POST OFFICE BOX 451
1706 FIRST STREET

GALENA PARK, TEXAS 77547
www.dixieservices.com

VOICE 713 672 1619
FACSIMILE 713 672 1634

CERTIFICATE OF ANALYSIS

Number: 139516

Client: Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, Arizona 85034

Date: November 8, 2011

Attention: Terry Cooper

Sample: HEFA SPK, submitted 02 Nov 11
Marks: CMR 547581, Truck 1
Date: 28 Oct 11

D381	Gum content, mg/100 mL	
	Unwashed	< 1
	Washed	< 1
D5453	Sulfur, mg/kg	0.15
D3227	Mercaptan sulfur, mass %	< 0.0001
D445	Viscosity, - 20 °C, mm^2/s	5.255
D1840	Napthalenes, volume %	< 0.01
D3242	Acid number, mg KOH/g	0.002
D130	Corrosion copper strip (2 h/100 °C)	1b
D3241	Thermal oxidation stability, (2.5 h/325 °C)	
	Heater tube deposit rating, visual	1
	Filter pressure drop, mm Hg	0
D3948	Water separation, MSEP-A rating	93
D2887	Boiling range distribution, % recovered, °C	
	IBP	113.5
	5	132.5
	10	142.0
	20	165.0
	30	185.5
	40	202.5
	50	219.5
	60	238.0
	70	255.5
	80	266.5
	90	276.0
	95	280.0
	FBP	287.5
D4629	Nitrogen, mg/kg	0.44
D5291	Carbon, mass %	85.4
	Hydrogen, mass %	14.6

UOP389 Trace Metals, mg/kg	
Aluminum	< 0.02
Calcium	0.06
Cobalt	< 0.02
Chromium	< 0.02
Copper	< 0.02
Iron	0.05
Potassium	< 0.02
Magnesium	< 0.02
Manganese	< 0.02
Molybdenum	< 0.02
Sodium	< 0.02
Nickel	< 0.02
Phosphorus	< 0.02
Lead	< 0.02
Strontium	< 0.02
Palladium	< 0.02
Platinum	< 0.02
Tin	< 0.02
Titanium	< 0.02
Vanadium	< 0.02
Zinc	0.13

Dixie Services Incorporated,

Zachary Holland

ZBH/cb

Email Recipients: richard.gadberry@honeywell.com; terry.cooper@honeywell.com
steven.sosa@honeywell.com

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)
Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	547597 rev A	Submission Date	10/28/2011 03:59 PM
Status	Completed	Desired Date	11/11/2011
Disposition	**Info Only**	Commit Date	11/18/2011
Released By	Bautista, Karla	Completion Date	11/11/2011 04:07 PM
Custom Id / Title	HEFA SPK Tanker 2	Project / Type	Info Only
Labor Charge Number	7002368937-0050	Material Charge Number	7002368937-0180
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	Delivery Tanker 2		
Oil / Fuel Type	HEFA SPK	Material Spec	D7566 Table 1 and A1.1
Operating Time	n/a	Engine Serial #	n/a
Tests Required	Water Content (ppm) LHV (BTU/lb) Viscosity Flash Point (F) Distillation Specific Gravity Anti-ice Additive Aromatics Freeze Point		
Detailed Instructions	Sample from 2nd tanker (Tanker 2) delivering HEFA SPK to San Tan. Run only those D1655/D7566 analysis that can be completed in-house - including specific gravity, LHV, viscosity (D445), flash point, freeze point (D2386), and distilaltion (D86). Please also run simulated distillation (D2887) and existent gum (D381, report washed and unwashed) at OP laboratory (Dixie Services). Hold any remaining sample for possible future analysis.		
Distribution List	Culbertson, Brad		

Customer	Williams, Randy	Submitted By	Williams, Randy
Phone	+1 602/231-7229	Phone	+1 602/231-7229
Department	BA--60035	Department	BA--60035
Requesting Site	Phoenix		

Test Results

Specimen: FIMS (API) Date: 11/11/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.6581499					WI1414	Bautista, Karla
B Coefficient	(c) 4.0523844					WI1414	Bautista, Karla
Test: Anti-Icing Additive							
DiEGMME	0	% v/v				WI1412	Bautista, Karla
Test: Aromatics							
Distance to Blue 1	0	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 1	68	cm				ASTM-D-1319	Bautista, Karla
Distance to Blue 2	0	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 2	68	cm				ASTM-D-1319	Bautista, Karla
Aromatics Ratio 1	(c) 0.00					ASTM-D-1319	Bautista, Karla
Aromatics Ratio 2	(c) 0.00					ASTM-D-1319	Bautista, Karla
% Volume Aromatics	(c) 0.0	%				ASTM-D-1319	Bautista, Karla
Test: Distillation							
Initial B.P.	300	°F				ASTM-D-86	Bautista, Karla

5% Distilled	322	°F				ASTM-D-86	Bautista, Karla
10% Distilled	334	°F				ASTM-D-86	Bautista, Karla
20% Distilled	354	°F				ASTM-D-86	Bautista, Karla
30% Distilled	374	°F				ASTM-D-86	Bautista, Karla
40% Distilled	398	°F				ASTM-D-86	Bautista, Karla
50% Distilled	422	°F				ASTM-D-86	Bautista, Karla
60% Distilled	444	°F				ASTM-D-86	Bautista, Karla
70% Distilled	466	°F				ASTM-D-86	Bautista, Karla
80% Distilled	482	°F				ASTM-D-86	Bautista, Karla
90% Distilled	496	°F				ASTM-D-86	Bautista, Karla
95% Distilled	506	°F				ASTM-D-86	Bautista, Karla
End Point	524	°F				ASTM-D-86	Bautista, Karla
% Distilled	98.0	%				ASTM-D-86	Bautista, Karla
% Residue	1.3	%				ASTM-D-86	Bautista, Karla
% Loss	(c) 0.7	%				ASTM-D-86	Bautista, Karla
Test: Flash Point - c.c.							
Flash Point	104	°F				ASTM-D-56	Bautista, Karla
Barometric Pressure	28.671	inHg				ASTM-D-56	Bautista, Karla
Corrected Flash Point	(c) 106	°F				ASTM-D-56	Bautista, Karla
Test: Freeze Point							
Freeze Point	-66.1	°F				ASTM-D-2386	Bautista, Karla
Test: H/C ratio							
API Gravity @ 60 degF	(c) 55.102					ASTM-D-1298	Bautista, Karla
Avg Dist Temp	(c) 417	°F				ASTM-D-86	Bautista, Karla
% H	(c) 15.347					ASTM-D-3343-95	Bautista, Karla
H/C Ratio by weight	(c) 0.181					ASTM-D-1298	Bautista, Karla
H/C Ratio by mole	(c) 2.160					ASTM-D-1298	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2411.06					WI1411	Rexroad, Perry
Sample Weight	0.5564	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.6152	°C				WI1411	Rexroad, Perry
Fuse Correction	10	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18936	BTU/lb				WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	56.5	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	73	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 55.102					ASTM-D-1298	Rexroad, Perry
Density	(c) 758	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.7583					ASTM-D-1298	Rexroad, Perry
Test: Text Results							
Text Result	(see below)					per CMR inst.	Bautista, Karla 11/04/2011

D381

Gum content, steam, mg/100 mL:
Unwashed = < 1
Washed = < 1

D2887

Boiling range distribution, % recovered, °C:

IBP	113.5
05	132.5
10	142.0
20	164.5
30	183.5
40	201.5
50	219.0
60	237.0
70	254.5
80	265.5
90	275.5
95	280.0
FBP	288.0

Analyses were completed by Dixie Services. Please see attached results.

Test: Text Results (2)						
Text Result	(see below)				WI1416	Bautista, Karla 11/08/2011
No detectable volume of aromatic content.						
Aromatics % volume = 0%						
Test: Viscosity @ 104F						
Other tube constant	0.003676				WI1414	Rexroad, Perry
Run #1	380.57	sec			WI1414	Rexroad, Perry
Run #2	380.50	sec			WI1414	Rexroad, Perry
Average Time	(c) 380.53	sec			WI1414	Rexroad, Perry
CS	(c) 1.40	cst			WI1414	Rexroad, Perry
Test: Viscosity @ 77F						
Other tube constant	0.003676				WI1414	Rexroad, Perry
Run #1	484.80	sec			WI1414	Rexroad, Perry
Run #2	484.71	sec			WI1414	Rexroad, Perry
Average Time	(c) 484.76	sec			WI1414	Rexroad, Perry
CS	(c) 1.78	cst			WI1414	Rexroad, Perry
Test: Water Content (ppm)						
Run #1	17.76	ppm			ASTM-E-1064	Bautista, Karla
Run #2	16.68	ppm			ASTM-E-1064	Bautista, Karla
Water Content	(c) 17.22	ppm			ASTM-E-1064	Bautista, Karla
Water Content Standard	This sample was checked against a 1000 ppm QC standard				ASTM-E-1064	Bautista, Karla

Specimen: ~Attached Results — Date: 11/04/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Attached Results							
Attached Result	547597.pdf					per CMR inst.	Bautista, Karla 11/04/2011

Specimen: ~Text Results — Date: 11/08/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Text Results							
Text Result	(see below)					per CMR inst.	Cooper, Terry W. 11/08/2011
PO 6400124342 has been palced to Dixie.							

Distillation Test for Specimen FIMS (API)

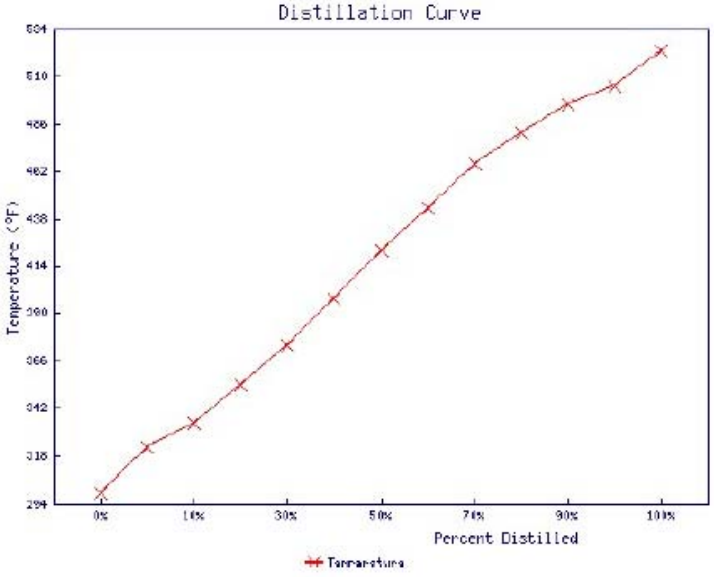
Oil and Fuel CMR # 547597

Percent	Temperature	Material Spec Limits

Material HEFA SPK
Material Specification D7566 Table 1 and A1.1
Test Method ASTM-D-86

		Material Spec Limits	
		Minimum	Maximum
Percent Distilled	98.0		
Percent Residue	1.3		
Percent Loss	0.7		

Percent Distilled	Temperature (°F)	Material Spec Limits Minimum	Material Spec Limits Maximum
0%	300		
5%	322		
10%	334		
20%	354		
30%	374		
40%	398		
50%	422		
60%	444		
70%	466		
80%	482		
90%	496		
95%	506		
100%	524		



DIXIE SERVICES INCORPORATED

POST OFFICE BOX 451
1706 FIRST STREET

GALENA PARK, TEXAS 77547
www.dixieservices.com

VOICE 713 672 1619
FACSIMILE 713 672 1634

CERTIFICATE OF ANALYSIS

Number: 139515

Client: Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, Arizona 85034

Date: November 4, 2011

Attention: Terry Cooper

Sample: HEFA SPK, submitted 02 Nov 11
Marks: CMR 547597

D381	Gum content, steam, mg/100 mL	
	Unwashed	< 1
	Washed	< 1
D2887	Boiling range distribution, % recovered, °C	
	IBP	113.5
	5	132.5
	10	142.0
	20	164.5
	30	183.5
	40	201.5
	50	219.0
	60	237.0
	70	254.5
	80	265.5
	90	275.5
	95	280.0
	FBP	288.0

Dixie Services Incorporated,

Zachary Holland

ZBH/cb

Email Recipients: richard.gadberry@honeywell.com; terry.cooper@honeywell.com
steven.sosa@honeywell.com

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)
Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	548678	Submission Date	11/03/2011 10:34 AM
Status	Completed	Desired Date	11/07/2011
Disposition	**Info Only**	Commit Date	11/07/2011
Released By	Bautista, Karla	Completion Date	11/04/2011 11:11 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T1		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	ASTM-D-1655
Detailed Instructions	fuel mixed for 15 hrs.		
Distribution List	Ciero, Robert | Williams, Randy		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: FIMS (API) Date: 11/04/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.3551532					WI1414	Bautista, Karla
B Coefficient	(c) 3.9442348					WI1414	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Bautista, Karla
Calorimeter constant	2411.0576					WI1411	Bautista, Karla
Sample Weight	0.5632	g				WI1411	Bautista, Karla
Tape Weight	0	g				WI1411	Bautista, Karla
Temperature change	2.6058	°C				WI1411	Bautista, Karla
Fuse Correction	19	cal				WI1411	Bautista, Karla
Nitric Acid	12	ml				WI1411	Bautista, Karla
LHV-FIMS	(c) 18686	BTU/lb				WI1411	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	49.9	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	72	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 48.709					ASTM-D-1298	Bautista, Karla
Density	(c) 785	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.7852					ASTM-D-1298	Bautista, Karla
Test: Viscosity @ 104F							
Tube number-104	VIS-2382					WI1414	Bautista, Karla
Run #1	378.09	sec				WI1414	Bautista, Karla
Run #2	377.94	sec				WI1414	Bautista, Karla
Average Time	(c) 378.02	sec				WI1414	Bautista, Karla
CS	(c) 1.38	cst				WI1414	Bautista, Karla
Test: Viscosity @ 77F							
Other tube constant	0.003653					WI1414	Bautista, Karla
Run #1	477.50	sec				WI1414	Bautista, Karla
Run #2	477.56	sec				WI1414	Bautista, Karla
Average Time	(c) 477.53	sec				WI1414	Bautista, Karla
CS	(c) 1.74	cst				WI1414	Bautista, Karla

Specimen: ~Text Results							Date: 11/03/2011
Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Text Results							
Text Result	(see below)					ASTM-D-240	Neal, Terry 11/03/2011
Lower Heating Value (Net Heat of Combustion) was tested per ASTM-D-240							

CMR Hours		
Budgeted Hours	Estimated Hours	Actual Hours
-	-	1.5

Test Locations of CMR					
Location	Commit Date	Status	Charge Number	Logged By	Last Logged
Oil/Fuel Analysis: FIMS Analysis	11/07/2011	Released	7002368937-0050	Bautista, Karla	11/04/2011

CMR Metrics													
Location	Commit Date Compliance (%)	Baseline CDC (%)	Commit Date OTTR (days)	Desired Date Compliance (%)	Desired Date OTTR (days)	SPI	CPI	Transit Time (days)	Queue Time (days)	Cycle Time (days)	Thru Time (days)	Desired Time (days)	Total Time (days)
Oil/Fuel Analysis: FIMS Analysis	100.00	100.00	3.00	100.00	3.00	3.90	0.00	0.94	0.00	0.09	0.09	4.00	1.03

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

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CMR Number	548679	Submission Date	11/03/2011 10:36 AM
Status	Completed	Desired Date	11/07/2011
Disposition	**Info Only**	Commit Date	11/07/2011
Released By	Bautista, Karla	Completion Date	11/04/2011 11:15 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	ASTM-D-1655
Detailed Instructions	fuel mixed for 15 hrs.		
Distribution List	Ciero, Robert | Williams, Randy		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: FIMS (API) — Date: 11/04/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.4548741					WI1414	Bautista, Karla
B Coefficient	(c) 3.9814940					WI1414	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Bautista, Karla
Calorimeter constant	2411.0576					WI1411	Bautista, Karla
Sample Weight	0.5622	g				WI1411	Bautista, Karla
Tape Weight	0	g				WI1411	Bautista, Karla
Temperature change	2.6046	°C				WI1411	Bautista, Karla
Fuse Correction	21	cal				WI1411	Bautista, Karla
Nitric Acid	12	ml				WI1411	Bautista, Karla
LHV-FIMS	(c) 18700	BTU/lb				WI1411	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	50.0	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	71	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 48.893					ASTM-D-1298	Bautista, Karla
Density	(c) 784	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.7844					ASTM-D-1298	Bautista, Karla
Test: Viscosity @ 104F							
Tube number-104	VIS-2383					WI1414	Bautista, Karla
Run #1	373.82	sec				WI1414	Bautista, Karla
Run #2	373.93	sec				WI1414	Bautista, Karla
Average Time	(c) 373.88	sec				WI1414	Bautista, Karla
CS	(c) 1.37	cst				WI1414	Bautista, Karla
Test: Viscosity @ 77F							
Other tube constant	0.003676					WI1414	Bautista, Karla
Run #1	471.92	sec				WI1414	Bautista, Karla
Run #2	471.97	sec				WI1414	Bautista, Karla
Average Time	(c) 471.95	sec				WI1414	Bautista, Karla
CS	(c) 1.73	cst				WI1414	Bautista, Karla

Specimen: ~Text Results							Date: 11/03/2011
Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Text Results							
Text Result	(see below)					ASTM-D-240	Neal, Terry 11/03/2011
Lower Heating Value (Net Heat of Combustion) was tested per ASTM-D-240							

CMR Hours		
Budgeted Hours	Estimated Hours	Actual Hours
-	-	1.5

Test Locations of CMR					
Location	Commit Date	Status	Charge Number	Logged By	Last Logged
Oil/Fuel Analysis: FIMS Analysis	11/07/2011	Released	7002368937-0050	Bautista, Karla	11/04/2011

CMR Metrics													
Location	Commit Date Compliance (%)	Baseline CDC (%)	Commit Date OTTR (days)	Desired Date Compliance (%)	Desired Date OTTR (days)	SPI	CPI	Transit Time (days)	Queue Time (days)	Cycle Time (days)	Thru Time (days)	Desired Time (days)	Total Time (days)
Oil/Fuel Analysis: FIMS Analysis	100.00	100.00	3.00	100.00	3.00	3.90	0.00	0.94	0.00	0.09	0.09	4.00	1.03

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	549771	Submission Date	11/10/2011 07:22 AM
Status	Completed	Desired Date	11/14/2011
Disposition	**Info Only**	Commit Date	11/14/2011
Released By	Bautista, Karla	Completion Date	11/14/2011 05:07 PM
Custom Id / Title	Biofuel Blend T1 Retest	Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T1		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	ASTM-D-1655
Detailed Instructions	Retest retains from CMR18686 (biofuel blend from San Tan tank T1 fuel mixed for 15 hrs) - check specific gravity, aromatics, LHV (using sulfur content of 0.049 wt%). Rush, need today if possible..		
Distribution List	Ciero, Robert | Williams, Randy		

Customer	Williams, Randy	Submitted By	Williams, Randy
Phone	+1 602/231-7229	Phone	+1 602/231-7229
Department	BA--60035	Department	BA--60035
Requesting Site	Phoenix		

Test Results

Specimen: 1061409714 — Date: 11/14/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.6092919					WI1414	Bautista, Karla
B Coefficient	(c) 4.0366145					WI1414	Bautista, Karla
Test: Aromatics							
Distance to Blue 1	6.4	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 1	69	cm				ASTM-D-1319	Bautista, Karla
Distance to Blue 2	6.2	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 2	68.7	cm				ASTM-D-1319	Bautista, Karla
Aromatics Ratio 1	(c) 0.09					ASTM-D-1319	Bautista, Karla
Aromatics Ratio 2	(c) 0.09					ASTM-D-1319	Bautista, Karla
% Volume Aromatics	(c) 9.0	%				ASTM-D-1319	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Bautista, Karla
Calorimeter constant	2411.0576					WI1411	Bautista, Karla
Sample Weight	0.5684	g				WI1411	Bautista, Karla
Tape Weight	0	g				WI1411	Bautista, Karla
Temperature change	2.6306	°C				WI1411	Bautista, Karla
Fuse Correction	15	cal				WI1411	Bautista, Karla
Nitric Acid	12	ml				WI1411	Bautista, Karla
LHV-FIMS	(c) 18700	BTU/lb				WI1411	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	50.1	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	74	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 48.709					ASTM-D-1298	Bautista, Karla
Density	(c) 785	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.7852					ASTM-D-1298	Bautista, Karla
Test: Text Results							
Text Result	(see below)					WI1416	Bautista, Karla 11/10/2011

Olefins and saturates calculated per ASTM D 1319

Jet A / Biofuel

Olefins, % volume: 0.7
Saturates, % volume: 90.3

Test: Text Results (2)						
Text Result	(see below)				WI1411	Bautista, Karla 11/14/2011
LHV using sulfur content of 0.049 %m and hydrogen content of 14.164 %m is equal to 18706 BTU/lb.						
Test: Viscosity @ 104F						
Tube number-104	VIS-2382				WI1414	Bautista, Karla
Run #1	378.37	sec			WI1414	Bautista, Karla
Run #2	378.36	sec			WI1414	Bautista, Karla
Average Time	(c) 378.37	sec			WI1414	Bautista, Karla
CS	(c) 1.38	cst			WI1414	Bautista, Karla
Test: Viscosity @ 77F						
Other tube constant	0.003653				WI1414	Bautista, Karla
Run #1	477.75	sec			WI1414	Bautista, Karla
Run #2	477.83	sec			WI1414	Bautista, Karla
Average Time	(c) 477.79	sec			WI1414	Bautista, Karla
CS	(c) 1.75	cst			WI1414	Bautista, Karla

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)
Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	549773	Submission Date	11/10/2011 07:26 AM
Status	Completed	Desired Date	11/14/2011
Disposition	**Info Only**	Commit Date	11/14/2011
Released By	Bautista, Karla	Completion Date	11/14/2011 05:07 PM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	D7566
Detailed Instructions	Retest retains from CMR548679 (biofuel blend from San Tan tank T2 mixed for 15 hrs) - check specific gravity, aromatics, LHV (use sulfur of 0.052 wt%). Rush - need today if possible.		
Distribution List	Ciero, Robert | Williams, Randy		

Customer	Williams, Randy	Submitted By	Williams, Randy
Phone	+1 602/231-7229	Phone	+1 602/231-7229
Department	BA--60035	Department	BA--60035
Requesting Site	Phoenix		

Test Results

Specimen: 1061409715 Date: 11/14/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.0988767					WI1414	Bautista, Karla
B Coefficient	(c) 3.8510781					WI1414	Bautista, Karla
Test: Aromatics							
Distance to Blue 1	6.0	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 1	67.5	cm				ASTM-D-1319	Bautista, Karla
Distance to Blue 2	6.2	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 2	67.7	cm				ASTM-D-1319	Bautista, Karla
Aromatics Ratio 1	(c) 0.09					ASTM-D-1319	Bautista, Karla
Aromatics Ratio 2	(c) 0.09					ASTM-D-1319	Bautista, Karla
% Volume Aromatics	(c) 9.0	%				ASTM-D-1319	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Bautista, Karla
Calorimeter constant	2411.0576					WI1411	Bautista, Karla
Sample Weight	0.5600	g				WI1411	Bautista, Karla
Tape Weight	0	g				WI1411	Bautista, Karla
Temperature change	2.5947	°C				WI1411	Bautista, Karla
Fuse Correction	13	cal				WI1411	Bautista, Karla
Nitric Acid	12	ml				WI1411	Bautista, Karla
LHV-FIMS	(c) 18720	BTU/lb				WI1411	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	50.3	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	74	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 48.893					ASTM-D-1298	Bautista, Karla
Density	(c) 784	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.7844					ASTM-D-1298	Bautista, Karla
Test: Text Results							

Text Result	(see below)				WI1416	Bautista, Karla 11/10/2011
Olefins and saturates calculated per ASTM D 1319 Jet A / Biofuel Olefins, % volume: 0.7 Saturates, % volume: 90.3						
Test: Text Results (2)						
Text Result	(see below)				WI1411	Bautista, Karla 11/14/2011
LHV using sulfur content of 0.052 %m and hydrogen content of 14.1815 %m is equal to 18733 BTU/lb.						
Test: Viscosity @ 104F						
Tube number-104	VIS-2383				WI1414	Bautista, Karla
Run #1	374.39	sec			WI1414	Bautista, Karla
Run #2	374.65	sec			WI1414	Bautista, Karla
Average Time	(c) 374.52	sec			WI1414	Bautista, Karla
CS	(c) 1.38	cst			WI1414	Bautista, Karla
Test: Viscosity @ 77F						
Other tube constant	0.003676				WI1414	Bautista, Karla
Run #1	471.96	sec			WI1414	Bautista, Karla
Run #2	471.95	sec			WI1414	Bautista, Karla
Average Time	(c) 471.96	sec			WI1414	Bautista, Karla
CS	(c) 1.73	cst			WI1414	Bautista, Karla

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

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CMR Number	549845	Submission Date	11/10/2011 11:54 AM
Status	Completed	Desired Date	11/14/2011
Disposition	**Info Only**	Commit Date	11/14/2011
Released By	Bautista, Karla	Completion Date	11/14/2011 05:07 PM
Custom Id / Title	T1 Biofuel Blend	Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T1		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	D7566
Detailed Instructions	Sample from San Tan tank T1, biofuel blend mixed for 4 hrs today - sample date 11/10/11. Analyze specific gravity, aromatics, LHV (assume sulfur content of 0.041%m), and viscosity.		
Distribution List	Ciero, Robert | Williams, Randy		

Customer	Williams, Randy	Submitted By	Neal, Terry
Phone	+1 602/231-7229	Phone	+1 480/592-7931
Department	BA--60035	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: 1061409713 — Date: 11/14/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.3551532					WI1414	Bautista, Karla
B Coefficient	(c) 3.9442348					WI1414	Bautista, Karla
Test: Aromatics							
Distance to Blue 1	6	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 1	67.3	cm				ASTM-D-1319	Bautista, Karla
Distance to Blue 2	6	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 2	67.0	cm				ASTM-D-1319	Bautista, Karla
Aromatics Ratio 1	(c) 0.09					ASTM-D-1319	Bautista, Karla
Aromatics Ratio 2	(c) 0.09					ASTM-D-1319	Bautista, Karla
% Volume Aromatics	(c) 9.0	%				ASTM-D-1319	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Bautista, Karla
Calorimeter constant	2411.0576					WI1411	Bautista, Karla
Sample Weight	0.5548	g				WI1411	Bautista, Karla
Tape Weight	0	g				WI1411	Bautista, Karla
Temperature change	2.5686	°C				WI1411	Bautista, Karla
Fuse Correction	17	cal				WI1411	Bautista, Karla
Nitric Acid	12	ml				WI1411	Bautista, Karla
LHV-FIMS	(c) 18699	BTU/lb				WI1411	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	50.1	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	74	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 48.709					ASTM-D-1298	Bautista, Karla
Density	(c) 785	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.7852					ASTM-D-1298	Bautista, Karla
Test: Text Results							
Text Result	(see below)					WI1416	Bautista, Karla 11/14/2011

Olefins and saturates calculated per ASTM D 1319

Jet A/Biofuel

Olefins, % volume: 0.7

Saturates, % volume: 90.3

Test: Text Results (2)							
Text Result	(see below)					WI1411	Bautista, Karla 11/14/2011
LHV using sulfur content of 0.041 %m and hydrogen content of 14.164 %m is equal to 18705 BTU/lb.							
Test: Viscosity @ 104F							
Tube number-104	VIS-2384					WI1414	Bautista, Karla
Run #1	350.69	sec				WI1414	Bautista, Karla
Run #2	350.67	sec				WI1414	Bautista, Karla
Average Time	(c) 350.68	sec				WI1414	Bautista, Karla
CS	(c) 1.38	cst				WI1414	Bautista, Karla
Test: Viscosity @ 77F							
Other tube constant	0.003939					WI1414	Bautista, Karla
Run #1	442.77	sec				WI1414	Bautista, Karla
Run #2	442.85	sec				WI1414	Bautista, Karla
Average Time	(c) 442.81	sec				WI1414	Bautista, Karla
CS	(c) 1.74	cst				WI1414	Bautista, Karla

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	549846	Submission Date	11/10/2011 11:55 AM
Status	Completed	Desired Date	11/14/2011
Disposition	**Info Only**	Commit Date	11/14/2011
Released By	Bautista, Karla	Completion Date	11/14/2011 05:06 PM
Custom Id / Title	T2 Biofuel Blend	Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	D7566
Detailed Instructions	Sample fro San Tan tank T2, biofuel blend mixed for 4 hrs today, sample data 11/10/11. Analyze specific gravity, aromatics, LHV (assume sulfur content of 0.052%m), viscosity.		
Distribution List	Ciero, Robert | Williams, Randy | Culbertson, Brad		

Customer	Williams, Randy	Submitted By	Neal, Terry
Phone	+1 602/231-7229	Phone	+1 480/592-7931
Department	BA--60035	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: 1061409712 — Date: 11/14/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.3551532					WI1414	Bautista, Karla
B Coefficient	(c) 3.9442348					WI1414	Bautista, Karla
Test: Aromatics							
Distance to Blue 1	6	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 1	67.2	cm				ASTM-D-1319	Bautista, Karla
Distance to Blue 2	6	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 2	67.0	cm				ASTM-D-1319	Bautista, Karla
Aromatics Ratio 1	(c) 0.09					ASTM-D-1319	Bautista, Karla
Aromatics Ratio 2	(c) 0.09					ASTM-D-1319	Bautista, Karla
% Volume Aromatics	(c) 9.0	%				ASTM-D-1319	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Bautista, Karla
Calorimeter constant	2411.0576					WI1411	Bautista, Karla
Sample Weight	0.5598	g				WI1411	Bautista, Karla
Tape Weight	0	g				WI1411	Bautista, Karla
Temperature change	2.5961	°C				WI1411	Bautista, Karla
Fuse Correction	19	cal				WI1411	Bautista, Karla
Nitric Acid	12	ml				WI1411	Bautista, Karla
LHV-FIMS	(c) 18719	BTU/lb				WI1411	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	50.3	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	74	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 48.893					ASTM-D-1298	Bautista, Karla
Density	(c) 784	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.7844					ASTM-D-1298	Bautista, Karla
Test: Text Results							
Text Result	(see below)					WI1416	Bautista, Karla 11/14/2011

Olefins and saturates calculated per ASTM D 1319

Jet A/Biofuel

Olefins, % volume: 0.7

Saturates, % volume: 90.3

Test: Text Results (2)						
Text Result	(see below)				WI1411	Bautista, Karla 11/14/2011
LHV using sulfur content of 0.052 %m and hydrogen content of 14.1815 %m is equal to 18732 BTU/lb.						
Test: Viscosity @ 104F						
Tube number-104	VIS-2384				WI1414	Bautista, Karla
Run #1	349.10	sec			WI1414	Bautista, Karla
Run #2	349.23	sec			WI1414	Bautista, Karla
Average Time	(c) 349.17	sec			WI1414	Bautista, Karla
CS	(c) 1.38	cst			WI1414	Bautista, Karla
Test: Viscosity @ 77F						
Other tube constant	0.003939				WI1414	Bautista, Karla
Run #1	440.85	sec			WI1414	Bautista, Karla
Run #2	440.80	sec			WI1414	Bautista, Karla
Average Time	(c) 440.83	sec			WI1414	Bautista, Karla
CS	(c) 1.74	cst			WI1414	Bautista, Karla

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	552845	Submission Date	12/05/2011 09:51 AM
Status	Completed	Desired Date	12/09/2011
Disposition	**Info Only**	Commit Date	12/20/2011
Released By	Bautista, Karla	Completion Date	12/15/2011 10:37 AM
Custom Id / Title	HEFA SPKJet A Blend Tank 1	Project / Type	Info Only
Labor Charge Number	7002368937-0050	Material Charge Number	7002368937-0180
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	Tank 1 (San Tan)		
Oil / Fuel Type	HEFA SPK	Material Spec	D7566 Table 1 and A1.1
Operating Time	n/a	Engine Serial #	n/a
Tests Required	Water Content (ppm) LHV (BTU/lb) Viscosity Flash Point (F) Distillation Specific Gravity Anti-ice Additive Aromatics Low Temp Viscosity Freeze Point Smoke Point		
Detailed Instructions	Full ASTM D1655/D7566 specification analysis required. Sample from Tank 1 (San Tan) of HEFA SPK/Jet A blend. Run as many analysis in-house as possible - including specific gravity, LHV, viscosity (D445), flash point, freeze point (D2386), and distilaltion (D86). Other properties such as acidity (D3242), aromatics (D1319 or D6379), low temp viscosity (D445 at -20C), sulfur (D5453 or D2622), mercaptan sulfur (D3227), smoke point (D1322), copper strip corrosion (D130), thermal stability at 325C (D3241), existent gum (D381, report washed and unwashed), and MSEP (D3948) may need to be sent to an accredited outside laboratory (recommend Dixie Services). Please also run simulated distillation (D2887) at OP laboratory. Also check hydrocarbon concentration (D2425 and D5291), nitrogen (D4629), and trace metals (ICP, prefer UOP 389)		
Distribution List	Williams, Randy		

Customer	Culbertson, Brad	Submitted By	Culbertson, Brad
Phone	+1 602/231-2423	Phone	+1 602/231-2423
Department	BA--60035	Department	BA--60035
Requesting Site	Phoenix		

Test Results

Specimen: 1061418025 — Date: 12/15/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.3551532					WI1414	Bautista, Karla
B Coefficient	(c) 3.9442348					WI1414	Bautista, Karla
Test: Anti-Icing Additive							
DiEGMME	0	% v/v				WI1412	Bautista, Karla
Test: Aromatics							
Distance to Blue 1	6.0	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 1	67.0	cm				ASTM-D-1319	Bautista, Karla
Distance to Blue 2	6.2	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 2	67.3	cm				ASTM-D-1319	Bautista, Karla

Aromatics Ratio 1	(c) 0.09					ASTM-D-1319	Bautista, Karla
Aromatics Ratio 2	(c) 0.09					ASTM-D-1319	Bautista, Karla
% Volume Aromatics	(c) 9.0	%				ASTM-D-1319	Bautista, Karla
Test: Distillation							
Initial B.P.	308	°F				ASTM-D-86	Bautista, Karla
5% Distilled	330	°F				ASTM-D-86	Bautista, Karla
10% Distilled	340	°F				ASTM-D-86	Bautista, Karla
20% Distilled	358	°F				ASTM-D-86	Bautista, Karla
30% Distilled	376	°F				ASTM-D-86	Bautista, Karla
40% Distilled	392	°F				ASTM-D-86	Bautista, Karla
50% Distilled	410	°F				ASTM-D-86	Bautista, Karla
60% Distilled	430	°F				ASTM-D-86	Bautista, Karla
70% Distilled	450	°F				ASTM-D-86	Bautista, Karla
80% Distilled	470	°F				ASTM-D-86	Bautista, Karla
90% Distilled	494	°F				ASTM-D-86	Bautista, Karla
95% Distilled	510	°F				ASTM-D-86	Bautista, Karla
End Point	532	°F				ASTM-D-86	Bautista, Karla
% Distilled	98.7	%				ASTM-D-86	Bautista, Karla
% Residue	1.1	%				ASTM-D-86	Bautista, Karla
% Loss	(c) 0.2	%				ASTM-D-86	Bautista, Karla
Test: Flash Point - c.c.							
Flash Point	104	°F				ASTM-D-56	Bautista, Karla
Barometric Pressure	29.208	inHg				ASTM-D-56	Bautista, Karla
Corrected Flash Point	(c) 105	°F				ASTM-D-56	Bautista, Karla
Test: Freeze Point							
Freeze Point	-58	°F				ASTM-D-2386	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Bautista, Karla
Calorimeter constant	2419.3473					WI1411	Bautista, Karla
Sample Weight	0.5680	g				WI1411	Bautista, Karla
Tape Weight	0	g				WI1411	Bautista, Karla
Temperature change	2.6275	°C				WI1411	Bautista, Karla
Fuse Correction	18	cal				WI1411	Bautista, Karla
Nitric Acid	12	ml				WI1411	Bautista, Karla
LHV-FIMS	(c) 18736	BTU/lb				WI1411	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	49.6	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	69	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 48.709					ASTM-D-1298	Bautista, Karla
Density	(c) 785	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.7852					ASTM-D-1298	Bautista, Karla
Test: Text Results							
Text Result	(see below)					WI1416	Bautista, Karla 12/12/2011
Olefins and saturates calculated per ASTM D 1319 HEFA SPK/Jet A Olefins, % volume: 0.6 Saturates, % volume: 90.4							
Test: Text Results (2)							
Text Result	(see below)					per CMR inst.	Bautista, Karla 12/15/2011
D381							

Gum content, mg/100 mL
Unwashed = < 1
Washed = < 1

D5453
Sulfur, mass % = 0.058

D3227
Mercaptan sulfur, mass % = 0.0007

D445
Viscosity, - 20 °C, mm2/s = 4.951

D1840
Napthalenes, volume % = 0.80

D3242
Acid number, mg KOH/g = 0.008

D130
Corrosion copper strip (2 h/100 °C) = 1A

D3241
Thermal oxidation stability, (2.5 h/325 °C)
Heater tube deposit rating, visual = > 4
Filter pressure drop, mm Hg = > 25 (60 minutes)

D3948
Water separation, MSEP-A rating = 69

D2887
Boiling range distribution, % recovered, °C

IBP	109.5
05	135.0
10	148.0
20	166.0
30	182.5
40	197.5
50	210.0
60	224.0
70	241.0
80	257.5
90	271.5
95	279.0
FBP	314.0

D4629
Nitrogen, mg/kg = 3.0

D5291
Carbon, mass % = 84.9
Hydrogen, mass % = 14.3

D1322
Smoke point, mm = 31.0

UOP389

Trace Metals, mg/kg	
Aluminum	< 0.02
Calcium	0.04
Cobalt	< 0.02
Chromium	< 0.02
Copper	0.25
Iron	< 0.02
Potassium	< 0.02
Lithium	< 0.02
Magnesium	< 0.02
Manganese	< 0.02
Molybdenum	< 0.02
Sodium	0.10
Nickel	< 0.02
Phosphorus	< 0.02
Lead	0.02
Strontium	< 0.02
Palladium	< 0.02
Platinum	< 0.02
Tin	< 0.02
Titanium	< 0.02
Vanadium	< 0.02
Zinc	0.02

Analyses were completed by Dixie Services. Please see attached results.

Test: Viscosity @ 104F							
Tube number-104	VIS-2383					WI1414	Bautista, Karla
Run #1	374.58	sec				WI1414	Bautista, Karla
Run #2	374.60	sec				WI1414	Bautista, Karla
Average Time	(c) 374.59	sec				WI1414	Bautista, Karla
CS	(c) 1.38	cst				WI1414	Bautista, Karla
Test: Viscosity @ 77F							
Other tube constant	0.003676					WI1414	Bautista, Karla
Run #1	473.78	sec				WI1414	Bautista, Karla
Run #2	473.62	sec				WI1414	Bautista, Karla
Average Time	(c) 473.70	sec				WI1414	Bautista, Karla
CS	(c) 1.74	cst				WI1414	Bautista, Karla
Test: Water Content (ppm)							
Run #1	25.13	ppm				ASTM-E-1064	Bautista, Karla
Run #2	24.83	ppm				ASTM-E-1064	Bautista, Karla
Water Content	(c) 24.98	ppm				ASTM-E-1064	Bautista, Karla
Water Content Standard	This sample was checked against a 50 ppm QC standard					ASTM-E-1064	Bautista, Karla

Specimen: ~Attached Results — Date: 12/15/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Attached Results							
Attached Result	552845.pdf					per CMR inst.	Bautista, Karla 12/15/2011

Specimen: ~Text Results — Date: 12/07/2011

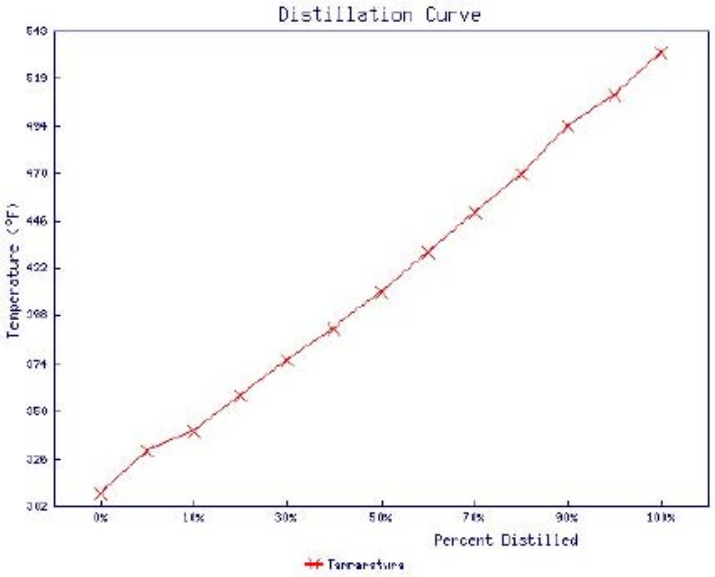
Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Text Results							
Text Result	(see below)					per CMR inst.	Cooper, Terry W. 12/07/2011
po 6500145455 Placed and sample shipped to Dixe per request.							

Distillation Test for Specimen 1061418025

Oil and Fuel CMR # 552845
Material HEFA SPK
Material Specification D7566 Table 1 and A1.1
Test Method ASTM-D-86

		Material Spec Limits	
		Minimum	Maximum
Percent Distilled	98.7		
Percent Residue	1.1		
Percent Loss	0.2		

Percent Distilled	Temperature (°F)	Material Spec Limits	
		Minimum	Maximum
0%	308		
5%	330		
10%	340		
20%	358		
30%	376		
40%	392		
50%	410		
60%	430		
70%	450		
80%	470		
90%	494		
95%	510		
100%	532		



Honeywell

DIXIE SERVICES INCORPORATED

POST OFFICE BOX 451
1706 FIRST STREET

GALENA PARK, TEXAS 77547
www.dixieservices.com

VOICE 713 672 1619
FACSIMILE 713 672 1634

CERTIFICATE OF ANALYSIS

Number: 139790

Date: December 14, 2011

Client: Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, Arizona 85034

Attention: Terry Cooper

Sample: SPK / Jet A Blend, submitted 09 Dec 11
Origin: Tank #1
Marks: CMR 552845, 50/50 Biofuel
P.O. Number 6500145455

D381	Gum content, mg/100 mL	
	Unwashed	< 1
	Washed	< 1
D5453	Sulfur, mass %	0.058
D3227	Mercaptan sulfur, mass %	0.0007
D445	Viscosity, - 20 °C, mm^2/s	4.951
D1840	Napthalenes, volume %	0.80
D3242	Acid number, mg KOH/g	0.008
D130	Corrosion copper strip (2 h/100 °C)	1A
D3241	Thermal oxidation stability, (2.5 h/325 °C)	
	Heater tube deposit rating, visual	> 4
	Filter pressure drop, mm Hg	> 25 (60 minutes)
D3948	Water separation, MSEP-A rating	69
D2887	Boiling range distribution, % recovered, °C	
	IBP	109.5
	5	135.0
	10	148.0
	20	166.0
	30	182.5
	40	197.5
	50	210.0
	60	224.0
	70	241.0
	80	257.5
	90	271.5
	95	279.0
	FBP	314.0
D4629	Nitrogen, mg/kg	3.0
D5291	Carbon, mass %	84.9
	Hydrogen, mass %	14.3
D1322	Smoke point, mm	31.0

UOP389	Trace Metals, mg/kg	
	Aluminum	< 0.02
	Calcium	0.04
	Cobalt	< 0.02
	Chromium	< 0.02
	Copper	0.25
	Iron	< 0.02
	Potassium	< 0.02
	Lithium	< 0.02
	Magnesium	< 0.02
	Manganese	< 0.02
	Molybdenum	< 0.02
	Sodium	0.10
	Nickel	< 0.02
	Phosphorus	< 0.02
	Lead	0.02
	Strontium	< 0.02
	Palladium	< 0.02
	Platinum	< 0.02
	Tin	< 0.02
	Titanium	< 0.02
	Vanadium	< 0.02
	Zinc	0.02

Dixie Services Incorporated,

Zachary Holland

ZBH/lm

Email Recipients: richard.gadberry@honeywell.com; terry.cooper@honeywell.com
steven.sosa@honeywell.com

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	552846	Submission Date	12/05/2011 09:51 AM
Status	Completed	Desired Date	12/09/2011
Disposition	**Info Only**	Commit Date	12/23/2011
Released By	Bautista, Karla	Completion Date	12/15/2011 10:48 AM
Custom Id / Title	HEFA SPKJet A Blend Tank 2	Project / Type	Info Only
Labor Charge Number	7002368937-0050	Material Charge Number	7002368937-0180
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	Tank 2 (San Tan)		
Oil / Fuel Type	HEFA SPK	Material Spec	D7566 Table 1 and A1.1
Operating Time	n/a	Engine Serial #	n/a
Tests Required	Water Content (ppm) LHV (BTU/lb) Viscosity Flash Point (F) Distillation Specific Gravity Anti-ice Additive Aromatics Low Temp Viscosity Freeze Point Smoke Point		
Detailed Instructions	Full ASTM D1655/D7566 specification analysis required. Sample from Tank 2 (San Tan) of HEFA SPK/Jet A blend. Run as many analysis in-house as possible - including specific gravity, LHV, viscosity (D445), flash point, freeze point (D2386), and distilaltion (D86). Other properties such as acidity (D3242), aromatics (D1319 or D6379), low temp viscosity (D445 at -20C), sulfur (D5453 or D2622), mercaptan sulfur (D3227), smoke point (D1322), copper strip corrosion (D130), thermal stability at 325C (D3241), existent gum (D381, report washed and unwashed), and MSEP (D3948) may need to be sent to an accredited outside laboratory (recommend Dixie Services). Please also run simulated distillation (D2887) at OP laboratory. Also check hydrocarbon concentration (D2425 and D5291), nitrogen (D4629), and trace metals (ICP, prefer UOP 389)		
Distribution List	Williams, Randy		

Customer	Culbertson, Brad	Submitted By	Culbertson, Brad
Phone	+1 602/231-2423	Phone	+1 602/231-2423
Department	BA--60035	Department	BA--60035
Requesting Site	Phoenix		

Test Results

Specimen: 1061418034 — Date: 12/15/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.4548741					WI1414	Bautista, Karla
B Coefficient	(c) 3.9814940					WI1414	Bautista, Karla
Test: Anti-Icing Additive							
DiEGMME	0	% v/v				WI1412	Bautista, Karla
Test: Aromatics							
Distance to Blue 1	6.0					WI1416	Bautista, Karla
Distance to Front 1	66.9					WI1416	Bautista, Karla
Distance to Blue 2	6.0					WI1416	Bautista, Karla
Distance to Front 2	66.8					WI1416	Bautista, Karla

Aromatics Ratio 1	(c) 0.09					WI1416	Bautista, Karla
Aromatics Ratio 2	(c) 0.09					WI1416	Bautista, Karla
% Volume Aromatics	(c) 9.0					WI1416	Bautista, Karla
Test: Distillation							
Initial B.P.	308	°F				ASTM-D-86	Bautista, Karla
5% Distilled	326	°F				ASTM-D-86	Bautista, Karla
10% Distilled	338	°F				ASTM-D-86	Bautista, Karla
20% Distilled	356	°F				ASTM-D-86	Bautista, Karla
30% Distilled	376	°F				ASTM-D-86	Bautista, Karla
40% Distilled	392	°F				ASTM-D-86	Bautista, Karla
50% Distilled	410	°F				ASTM-D-86	Bautista, Karla
60% Distilled	430	°F				ASTM-D-86	Bautista, Karla
70% Distilled	450	°F				ASTM-D-86	Bautista, Karla
80% Distilled	472	°F				ASTM-D-86	Bautista, Karla
90% Distilled	494	°F				ASTM-D-86	Bautista, Karla
95% Distilled	510	°F				ASTM-D-86	Bautista, Karla
End Point	532	°F				ASTM-D-86	Bautista, Karla
% Distilled	98.5	%				ASTM-D-86	Bautista, Karla
% Residue	1.2	%				ASTM-D-86	Bautista, Karla
% Loss	(c) 0.3	%				ASTM-D-86	Bautista, Karla
Test: Flash Point - c.c.							
Flash Point	104	°F				ASTM-D-56	Bautista, Karla
Barometric Pressure	29.204	inHg				ASTM-D-56	Bautista, Karla
Corrected Flash Point	(c) 105	°F				ASTM-D-56	Bautista, Karla
Test: Freeze Point							
Freeze Point	-58	°F				ASTM-D-2386	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Bautista, Karla
Calorimeter constant	2419.3473					WI1411	Bautista, Karla
Sample Weight	0.5648	g				WI1411	Bautista, Karla
Tape Weight	0	g				WI1411	Bautista, Karla
Temperature change	2.6121	°C				WI1411	Bautista, Karla
Fuse Correction	16	cal				WI1411	Bautista, Karla
Nitric Acid	12	ml				WI1411	Bautista, Karla
LHV-FIMS	(c) 18737	BTU/lb				WI1411	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	49.8	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	69	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 48.893					ASTM-D-1298	Bautista, Karla
Density	(c) 784	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.7844					ASTM-D-1298	Bautista, Karla
Test: Text Results							
Text Result	(see below)					WI1416	Bautista, Karla 12/12/2011
Olefins and saturates calculated per ASTM D 1319 HEFA SPK/Jet A Olefins, % volume: 0.6 Saturates, % volume: 90.4							
Test: Text Results (2)							
Text Result	(see below)					per CMR inst.	Bautista, Karla 12/15/2011
D381							

Gum content, mg/100 mL
Unwashed = < 1
Washed = < 1

D5453
Sulfur, mass % = 0.054

D3227
Mercaptan sulfur, mass % = 0.0009

D445
Viscosity, - 20 °C, mm2/s = 4.892

D1840
Napthalenes, volume % = 0.80

D3242
Acid number, mg KOH/g = 0.009

D130
Corrosion copper strip (2 h/100 °C) = 1A

D3241
Thermal oxidation stability, (2.5 h/325 °C)
Heater tube deposit rating, visual = > 4
Filter pressure drop, mm Hg = 9.6

D3948
Water separation, MSEP-A rating = 83

D2887
Boiling range distribution, % recovered, °C

IBP	108.5
05	134.0
10	147.5
20	165.5
30	182.0
40	197.5
50	210.0
60	224.0
70	241.5
80	257.5
90	271.5
95	279.0
FBP	316.5

D4629
Nitrogen, mg/kg = 3.1

D5291
Carbon, mass % = 85.1
Hydrogen, mass % = 14.6

D1322
Smoke point, mm = 31.0

UOP389

Trace Metals, mg/kg	
Aluminum	< 0.02
Calcium	0.04
Cobalt	< 0.02
Chromium	< 0.02
Copper	0.02
Iron	< 0.02
Potassium	< 0.02
Lithium	< 0.02
Magnesium	< 0.02
Manganese	< 0.02
Molybdenum	< 0.02
Sodium	< 0.02
Nickel	< 0.02
Phosphorus	< 0.02
Lead	< 0.02
Strontium	< 0.02
Palladium	< 0.02
Platinum	< 0.02
Tin	< 0.02
Titanium	< 0.02
Vanadium	< 0.02
Zinc	0.02

Analyses were completed by Dixie Services. Please see attached results.

Test: Viscosity @ 104F							
Tube number-104	VIS-2382					WI1414	Bautista, Karla
Run #1	375.64	sec				WI1414	Bautista, Karla
Run #2	375.57	sec				WI1414	Bautista, Karla
Average Time	(c) 375.61	sec				WI1414	Bautista, Karla
CS	(c) 1.37					WI1414	Bautista, Karla
Test: Viscosity @ 77F							
Other tube constant	0.003653					WI1414	Bautista, Karla
Run #1	474.40	sec				WI1414	Bautista, Karla
Run #2	474.26	sec				WI1414	Bautista, Karla
Average Time	(c) 474.33	sec				WI1414	Bautista, Karla
CS	(c) 1.73	cst				WI1414	Bautista, Karla
Test: Water Content (ppm)							
Run #1	27.36	ppm				ASTM-E-1064	Bautista, Karla
Run #2	29.33	ppm				ASTM-E-1064	Bautista, Karla
Water Content	(c) 28.35	ppm				ASTM-E-1064	Bautista, Karla
Water Content Standard	This sample was checked against a 50 ppm QC standard					ASTM-E-1064	Bautista, Karla

Specimen: ~Attached Results — Date: 12/15/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Attached Results							
Attached Result	552846.pdf					per CMR inst.	Bautista, Karla 12/15/2011

Specimen: ~Text Results — Date: 12/07/2011

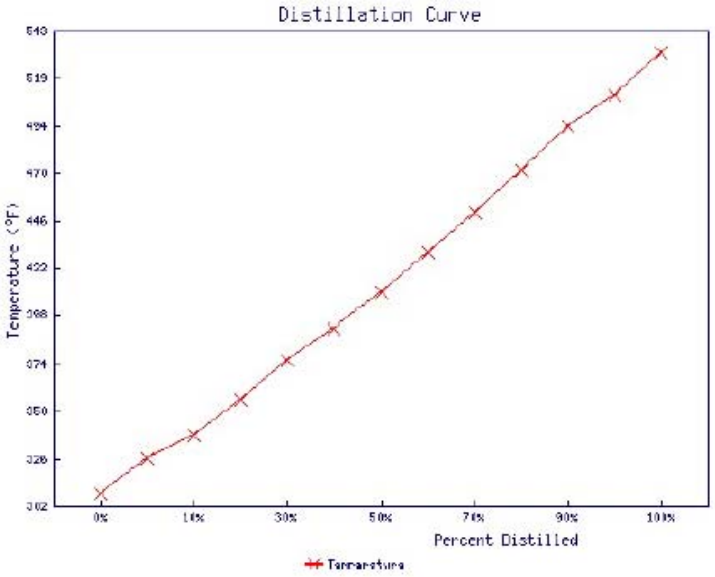
Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Text Results							
Text Result	(see below)					per CMR inst.	Cooper, Terry W. 12/07/2011
PO 6500145452 has been placed and sample shipped to Dixie per request							

Distillation Test for Specimen 1061418034

Oil and Fuel CMR # 552846
Material HEFA SPK
Material Specification D7566 Table 1 and A1.1
Test Method ASTM-D-86

		Material Spec Limits	
		Minimum	Maximum
Percent Distilled	98.5		
Percent Residue	1.2		
Percent Loss	0.3		

Percent Distilled	Temperature (°F)	Material Spec Limits	
		Minimum	Maximum
0%	308		
5%	326		
10%	338		
20%	356		
30%	376		
40%	392		
50%	410		
60%	430		
70%	450		
80%	472		
90%	494		
95%	510		
100%	532		



CMR Re-Test Log Entries

Date	Re-Test Type	Sample Id	Test	Disp Chg	Reason	Logged By
12/13/2011	Re-test	1061418034	LHV	Yes	Show Reason	Bautista, Karla

DIXIE SERVICES INCORPORATED

POST OFFICE BOX 451
1706 FIRST STREET

GALENA PARK, TEXAS 77547
www.dixieservices.com

VOICE 713 672 1619
FACSIMILE 713 672 1634

CERTIFICATE OF ANALYSIS

Number: 139791

Client: Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, Arizona 85034

Date: December 14, 2011

Attention: Terry Cooper

Sample: SPK / Jet A Blend, submitted 09 Dec 11
Origin: Tank #2
Marks: CMR 552846, 50/50 Biofuel
P.O. Number 6500145452

D381	Gum content, mg/100 mL	
	Unwashed	< 1
	Washed	< 1
D5453	Sulfur, mass %	0.054
D3227	Mercaptan sulfur, mass %	0.0009
D445	Viscosity, - 20 °C, mm^2/s	4.892
D1840	Napthalenes, volume %	0.80
D3242	Acid number, mg KOH/g	0.009
D130	Corrosion copper strip (2 h/100 °C)	1A
D3241	Thermal oxidation stability, (2.5 h/325 °C)	
	Heater tube deposit rating, visual	> 4
	Filter pressure drop, mm Hg	9.6
D3948	Water separation, MSEP-A rating	83
D2887	Boiling range distribution, % recovered, °C	
	IBP	108.5
	5	134.0
	10	147.5
	20	165.5
	30	182.0
	40	197.5
	50	210.0
	60	224.0
	70	241.5
	80	257.5
	90	271.5
	95	279.0
	FBP	316.5
D4629	Nitrogen, mg/kg	3.1
D5291	Carbon, mass %	85.1
	Hydrogen, mass %	14.6
D1322	Smoke point, mm	31.0

UOP389	Trace Metals, mg/kg	
	Aluminum	< 0.02
	Calcium	0.04
	Cobalt	< 0.02
	Chromium	< 0.02
	Copper	0.02
	Iron	< 0.02
	Potassium	< 0.02
	Lithium	< 0.02
	Magnesium	< 0.02
	Manganese	< 0.02
	Molybdenum	< 0.02
	Sodium	< 0.02
	Nickel	< 0.02
	Phosphorus	< 0.02
	Lead	< 0.02
	Strontium	< 0.02
	Palladium	< 0.02
	Platinum	< 0.02
	Tin	< 0.02
	Titanium	< 0.02
	Vanadium	< 0.02
	Zinc	0.02

Dixie Services Incorporated,

Zachary Holland

ZBH/lm

Email Recipients: richard.gadberry@honeywell.com; terry.cooper@honeywell.com
steven.sosa@honeywell.com

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)
Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	553039	Submission Date	12/06/2011 10:04 AM
Status	Completed	Desired Date	12/09/2011
Disposition	**Info Only**	Commit Date	12/09/2011
Released By	Baker, Susan	Completion Date	12/06/2011 10:47 PM
		Project / Type	Info Only
Labor Charge Number	7000840121-0170		
SAP Project	EC-001649	SAP Work Center	1015-EEMAZZML
Sample Origin	T4		
Oil / Fuel Type	Jet A	Material Spec	ASTM-D-1655
Detailed Instructions	Fuel sample for First performance cal.		
Distribution List	Coons, Eric | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A — Date: 12/06/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.4984738		9.1000000		10.9000000	WI1414	Baker, Susan
B Coefficient	(c) 4.0004388		3.4000000		4.2000000	WI1414	Baker, Susan
Test: LHV							
Calorimeter	Parr 1266					WI1411	Baker, Susan
Calorimeter constant	2411.0576					WI1411	Baker, Susan
Sample Weight	0.5468	g				WI1411	Baker, Susan
Tape Weight	0	g				WI1411	Baker, Susan
Temperature change	2.4930	°C				WI1411	Baker, Susan
Fuse Correction	8	cal				WI1411	Baker, Susan
Nitric Acid	12	ml				WI1411	Baker, Susan
LHV-FIMS	(c) 18499	BTU/lb	18420		18625	WI1411	Baker, Susan
Test: Specific Gravity (A)							
Observed API Gravity	44	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	70	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 43.105					ASTM-D-1298	Bautista, Karla
Density	(c) 810	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.8104		0.799		0.825	ASTM-D-1298	Bautista, Karla
Test: Viscosity @ 104F							
Tube number-104	VIS-2384					WI1414	Bautista, Karla
Run #1	340.99	sec				WI1414	Bautista, Karla
Run #2	341.12	sec				WI1414	Bautista, Karla
Average Time	(c) 341.06	sec				WI1414	Bautista, Karla
CS	(c) 1.34	cst	1.08		1.49	WI1414	Bautista, Karla
Test: Viscosity @ 77F							
Other tube constant	0.003939					WI1414	Bautista, Karla
Run #1	428.76	sec				WI1414	Bautista, Karla
Run #2	428.52	sec				WI1414	Bautista, Karla
Average Time	(c) 428.64	sec				WI1414	Bautista, Karla
CS	(c) 1.69	cst	0.32		1.90	WI1414	Bautista, Karla

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	553104 rev A	Submission Date	12/06/2011 02:04 PM
Status	Completed	Desired Date	12/09/2011
Disposition	**Info Only**	Commit Date	12/09/2011
Released By	Rexroad, Perry	Completion Date	12/09/2011 09:33 AM
		Project / Type	Info Only
Labor Charge Number	7000840121-0170		
SAP Project	EC-001649	SAP Work Center	1015-EEMAZZML
Sample Origin	T1		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	ASTM-D-1655
Detailed Instructions	Performance cal with bio-fuel		
Distribution List	Coons, Eric | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A/Biofuel — Date: 12/09/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.8146117		9.0000000		11.0000000	WI1414	Rexroad, Perry
B Coefficient	(c) 4.1132802		3.0000000		4.4000000	WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2419.35					WI1411	Rexroad, Perry
Sample Weight	0.5779	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.6745	°C				WI1411	Rexroad, Perry
Fuse Correction	23	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18732	BTU/lb	18420		18800	WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	49.6	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	68	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 48.801					ASTM-D-1298	Rexroad, Perry
Density	(c) 785	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.7848		0.770		0.825	ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	369.80	sec				WI1414	Rexroad, Perry
Run #2	369.61	sec				WI1414	Rexroad, Perry
Average Time	(c) 369.71	sec				WI1414	Rexroad, Perry
CS	(c) 1.36	cst	1.00		1.50	WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	469.42	sec				WI1414	Rexroad, Perry
Run #2	469.48	sec				WI1414	Rexroad, Perry
Average Time	(c) 469.45	sec				WI1414	Rexroad, Perry
CS	(c) 1.73	cst	1.30		1.90	WI1414	Rexroad, Perry

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	554339	Submission Date	12/13/2011 11:13 AM
Status	Completed	Desired Date	12/16/2011
Disposition	**Info Only**	Commit Date	12/16/2011
Released By	Baker, Susan	Completion Date	12/13/2011 11:39 PM
		Project / Type	Info Only
Labor Charge Number	7000840121-0170		
SAP Project	EC-001649	SAP Work Center	1015-EEMAZZML
Sample Origin	T5		
Oil / Fuel Type	Jet A	Material Spec	ASTM-D-1655
Distribution List	Williams, Randy | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A — Date: 12/13/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.0988767		9.1000000		10.9000000	WI1414	Baker, Susan
B Coefficient	(c) 3.8510781		3.4000000		4.2000000	WI1414	Baker, Susan
Test: LHV							
Calorimeter	Parr 1266					WI1411	Baker, Susan
Calorimeter constant	2419.3473					WI1411	Baker, Susan
Sample Weight	0.6645	g				WI1411	Baker, Susan
Tape Weight	0	g				WI1411	Baker, Susan
Temperature change	3.0288	°C				WI1411	Baker, Susan
Fuse Correction	20	cal				WI1411	Baker, Susan
Nitric Acid	12	ml				WI1411	Baker, Susan
LHV-FIMS	(c) 18529	BTU/lb	18420		18625	WI1411	Baker, Susan
Test: Specific Gravity (A)							
Observed API Gravity	43	°API				ASTM-D-1298	Baker, Susan
Fuel Temperature	70	°F				ASTM-D-1298	Baker, Susan
API Gravity @ 60 degF	(c) 42.098					ASTM-D-1298	Baker, Susan
Density	(c) 815	kg/m^3				ASTM-D-1298	Baker, Susan
Specific Gravity 60/60 degF	0.8151		0.799		0.825	ASTM-D-1298	Baker, Susan
Test: Viscosity @ 104F							
Tube number-104	VIS-2384					WI1414	Baker, Susan
Run #1	349.65	sec				WI1414	Baker, Susan
Run #2	349.68	sec				WI1414	Baker, Susan
Average Time	(c) 349.66	sec				WI1414	Baker, Susan
CS	(c) 1.38	cst	1.08		1.49	WI1414	Baker, Susan
Test: Viscosity @ 77F							
Other tube constant	0.003923					WI1414	Baker, Susan
Run #1	441.25	sec				WI1414	Baker, Susan
Run #2	441.20	sec				WI1414	Baker, Susan
Average Time	(c) 441.23	sec				WI1414	Baker, Susan
CS	(c) 1.73	cst	0.32		1.90	WI1414	Baker, Susan

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)
Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	554591	Submission Date	12/14/2011 11:59 AM
Status	Completed	Desired Date	12/15/2011
Disposition	**Info Only**	Commit Date	12/15/2011
Released By	Bautista, Karla	Completion Date	12/15/2011 05:29 PM
Custom Id / Title	Glendale Aero Tank #2 Samples	Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	Glendale Aero Tank #2		
Oil / Fuel Type	Jet A	Material Spec	ASTM-D-1655
Tests Required	Water Content (ppm) LHV (BTU/lb) Viscosity Flash Point (F) Distillation Specific Gravity Aromatics Freeze Point		
Detailed Instructions	Fuel samples were taken from Glendale Aero Services fuel tank #2. This tank will temporarily store neat HEFA fuel being shipped from WPAFB for use at San Tan. These samples will provide additional confidence in the fuel system integrity at the Glendale Aero Services fuel farm. Please expedite analyses. Please perform the following analyses on the fuel samples provided. Two samples were taken from the fuel tank filter and one sample was taken from the tank sump.		
Distribution List	Ciero, Robert | Williams, Randy | Keeton, Tony J		

Customer	Culbertson, Brad	Submitted By	Culbertson, Brad
Phone	+1 602/231-2423	Phone	+1 602/231-2423
Department	BA--60035	Department	BA--60035
Requesting Site	Phoenix		

Test Results

Specimen: Fuel Tank Filter — Date: 12/15/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.4548741					WI1414	Bautista, Karla
B Coefficient	(c) 3.9814940					WI1414	Bautista, Karla
Test: Aromatics							
Distance to Blue 1	12.9	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 1	67.9	cm				ASTM-D-1319	Bautista, Karla
Distance to Blue 2	13.0	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 2	68.0	cm				ASTM-D-1319	Bautista, Karla
Aromatics Ratio 1	(c) 0.19					ASTM-D-1319	Bautista, Karla
Aromatics Ratio 2	(c) 0.19					ASTM-D-1319	Bautista, Karla
% Volume Aromatics	(c) 19.0	%				ASTM-D-1319	Bautista, Karla
Test: Distillation							
Initial B.P.	312	°F				ASTM-D-86	Bautista, Karla
5% Distilled	334	°F				ASTM-D-86	Bautista, Karla
10% Distilled	344	°F				ASTM-D-86	Bautista, Karla
20% Distilled	360	°F				ASTM-D-86	Bautista, Karla

30% Distilled	376	°F				ASTM-D-86	Bautista, Karla
40% Distilled	390	°F				ASTM-D-86	Bautista, Karla
50% Distilled	404	°F				ASTM-D-86	Bautista, Karla
60% Distilled	424	°F				ASTM-D-86	Bautista, Karla
70% Distilled	442	°F				ASTM-D-86	Bautista, Karla
80% Distilled	464	°F				ASTM-D-86	Bautista, Karla
90% Distilled	494	°F				ASTM-D-86	Bautista, Karla
95% Distilled	518	°F				ASTM-D-86	Bautista, Karla
End Point	544	°F				ASTM-D-86	Bautista, Karla
% Distilled	98.6	%				ASTM-D-86	Bautista, Karla
% Residue	1.1	%				ASTM-D-86	Bautista, Karla
% Loss	(c) 0.3	%				ASTM-D-86	Bautista, Karla
Test: Flash Point - c.c.							
Flash Point	107	°F				ASTM-D-56	Bautista, Karla
Barometric Pressure	28.984	inHg				ASTM-D-56	Bautista, Karla
Corrected Flash Point	(c) 108	°F				ASTM-D-56	Bautista, Karla
Test: Freeze Point							
Freeze Point	-50.8	°F				ASTM-D-2386	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Bautista, Karla
Calorimeter constant	2419.3473					WI1411	Bautista, Karla
Sample Weight	0.5500	g				WI1411	Bautista, Karla
Tape Weight	0	g				WI1411	Bautista, Karla
Temperature change	2.5050	°C				WI1411	Bautista, Karla
Fuse Correction	19	cal				WI1411	Bautista, Karla
Nitric Acid	12	ml				WI1411	Bautista, Karla
LHV-FIMS	(c) 18508	BTU/lb				WI1411	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	42.8	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	69	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 41.992					ASTM-D-1298	Bautista, Karla
Density	(c) 816	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.8156					ASTM-D-1298	Bautista, Karla
Test: Text Results							
Text Result	(see below)					WI1416	Bautista, Karla 12/15/2011
Olefins and saturates calculated per ASTM D 1319 Jet A Olefins, % volume: 1.4 Saturates, % volume: 79.6							
Test: Viscosity @ 104F							
Tube number-104	VIS-2383					WI1414	Bautista, Karla
Run #1	373.13	sec				WI1414	Bautista, Karla
Run #2	373.20	sec				WI1414	Bautista, Karla
Average Time	(c) 373.16	sec				WI1414	Bautista, Karla
CS	(c) 1.37	cst				WI1414	Bautista, Karla
Test: Viscosity @ 77F							
Other tube constant	0.003676					WI1414	Bautista, Karla
Run #1	470.13	sec				WI1414	Bautista, Karla
Run #2	470.34	sec				WI1414	Bautista, Karla
Average Time	(c) 470.24	sec				WI1414	Bautista, Karla

CS	(c) 1.73	cst				WI1414	Bautista, Karla
Test: Water Content (ppm)							
Run #1	39.11	ppm				ASTM-E-1064	Bautista, Karla
Run #2	40.86	ppm				ASTM-E-1064	Bautista, Karla
Water Content	(c) 39.99	ppm				ASTM-E-1064	Bautista, Karla
Water Content Standard	This sample was checked against a 100 ppm QC standard					ASTM-E-1064	Bautista, Karla

Specimen: Tank Sump. Date: 12/15/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.1310614					WI1414	Bautista, Karla
B Coefficient	(c) 3.8658411					WI1414	Bautista, Karla
Test: Aromatics							
Distance to Blue 1	12.8	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 1	66.9	cm				ASTM-D-1319	Bautista, Karla
Distance to Blue 2	12.8	cm				ASTM-D-1319	Bautista, Karla
Distance to Front 2	66.9	cm				ASTM-D-1319	Bautista, Karla
Aromatics Ratio 1	(c) 0.19					ASTM-D-1319	Bautista, Karla
Aromatics Ratio 2	(c) 0.19					ASTM-D-1319	Bautista, Karla
% Volume Aromatics	(c) 19.0	%				ASTM-D-1319	Bautista, Karla
Test: Distillation							
Initial B.P.	310	°F				ASTM-D-86	Bautista, Karla
5% Distilled	330	°F				ASTM-D-86	Bautista, Karla
10% Distilled	342	°F				ASTM-D-86	Bautista, Karla
20% Distilled	358	°F				ASTM-D-86	Bautista, Karla
30% Distilled	374	°F				ASTM-D-86	Bautista, Karla
40% Distilled	388	°F				ASTM-D-86	Bautista, Karla
50% Distilled	402	°F				ASTM-D-86	Bautista, Karla
60% Distilled	420	°F				ASTM-D-86	Bautista, Karla
70% Distilled	438	°F				ASTM-D-86	Bautista, Karla
80% Distilled	460	°F				ASTM-D-86	Bautista, Karla
90% Distilled	490	°F				ASTM-D-86	Bautista, Karla
95% Distilled	518	°F				ASTM-D-86	Bautista, Karla
End Point	540	°F				ASTM-D-86	Bautista, Karla
% Distilled	98.3	%				ASTM-D-86	Bautista, Karla
% Residue	1.2	%				ASTM-D-86	Bautista, Karla
% Loss	(c) 0.5	%				ASTM-D-86	Bautista, Karla
Test: Flash Point - c.c.							
Flash Point	104	°F				ASTM-D-56	Bautista, Karla
Barometric Pressure	28.981	inHg				ASTM-D-56	Bautista, Karla
Corrected Flash Point	(c) 105	°F				ASTM-D-56	Bautista, Karla
Test: Freeze Point							
Freeze Point	-52.6	°F				ASTM-D-2386	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Bautista, Karla
Calorimeter constant	2419.3473					WI1411	Bautista, Karla
Sample Weight	0.5543	g				WI1411	Bautista, Karla
Tape Weight	0	g				WI1411	Bautista, Karla
Temperature change	2.5302	°C				WI1411	Bautista, Karla
Fuse Correction	20	cal				WI1411	Bautista, Karla
Nitric Acid	12	ml				WI1411	Bautista, Karla
LHV-FIMS	(c) 18538	BTU/lb				WI1411	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	43.4	°API				ASTM-D-1298	Bautista, Karla

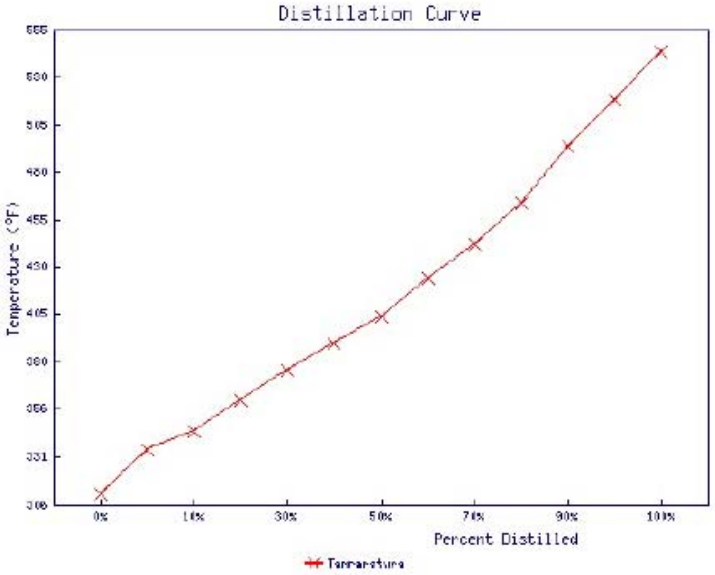
Fuel Temperature	70	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 42.504					ASTM-D-1298	Bautista, Karla
Density	(c) 813	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.8132					ASTM-D-1298	Bautista, Karla
Test: Text Results							
Text Result	(see below)					WI1416	Bautista, Karla 12/15/2011
Olefins and saturates calculated per ASTM D 1319 Jet A Olefins, % volume: 1.3 Saturates, % volume: 79.7							
Test: Viscosity @ 104F							
Tube number-104	VIS-2382					WI1414	Bautista, Karla
Run #1	368.50	sec				WI1414	Bautista, Karla
Run #2	368.42	sec				WI1414	Bautista, Karla
Average Time	(c) 368.46	sec				WI1414	Bautista, Karla
CS	(c) 1.35	cst				WI1414	Bautista, Karla
Test: Viscosity @ 77F							
Other tube constant	0.003653					WI1414	Bautista, Karla
Run #1	463.36	sec				WI1414	Bautista, Karla
Run #2	463.64	sec				WI1414	Bautista, Karla
Average Time	(c) 463.50	sec				WI1414	Bautista, Karla
CS	(c) 1.69	cst				WI1414	Bautista, Karla
Test: Water Content (ppm)							
Run #1	76.54	ppm				ASTM-E-1064	Bautista, Karla
Run #2	83.92	ppm				ASTM-E-1064	Bautista, Karla
Water Content	(c) 80.23	ppm				ASTM-E-1064	Bautista, Karla
Water Content Standard	This sample was checked against a 100 ppm QC standard					ASTM-E-1064	Bautista, Karla

Distillation Test for Specimen Fuel Tank Filter

Oil and Fuel CMR # 554591
Material Jet A
Material Specification ASTM-D-1655
Test Method ASTM-D-86

		Material Spec Limits	
		Minimum	Maximum
Percent Distilled	98.6		
Percent Residue	1.1		
Percent Loss	0.3		

Percent Distilled	Temperature (°F)	Material Spec Limits	
		Minimum	Maximum
0%	312		
5%	334		
10%	344		
20%	360		
30%	376		
40%	390		
50%	404		
60%	424		
70%	442		
80%	464		
90%	494		
95%	518		
100%	544		

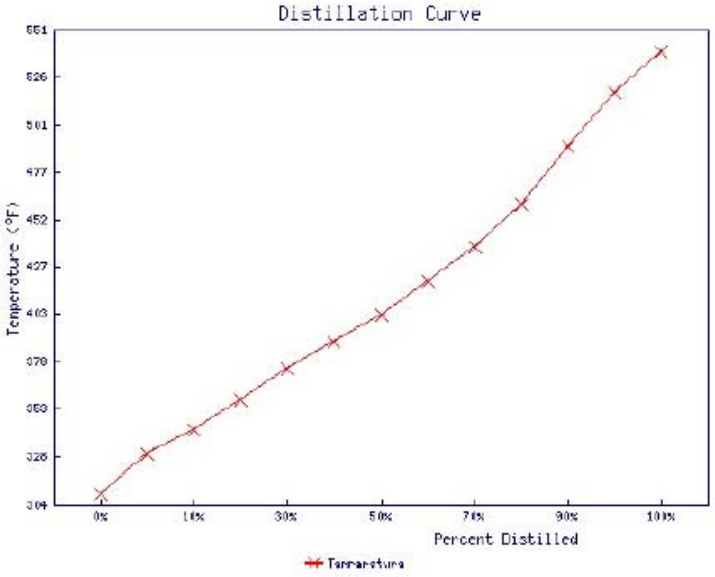


Distillation Test for Specimen Tank Sump.

Oil and Fuel CMR # 554591
Material Jet A
Material Specification ASTM-D-1655
Test Method ASTM-D-86

		Material Spec Limits	
		Minimum	Maximum
Percent Distilled	98.3		
Percent Residue	1.2		
Percent Loss	0.5		

Percent Distilled	Temperature (°F)	Material Spec Limits	
		Minimum	Maximum
0%	310		
5%	330		
10%	342		
20%	358		
30%	374		
40%	388		
50%	402		
60%	420		
70%	438		
80%	460		
90%	490		
95%	518		
100%	540		



Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)
Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	554928	Submission Date	12/16/2011 12:25 PM
Status	Completed	Desired Date	12/19/2011
Disposition	**Info Only**	Commit Date	12/19/2011
Released By	Baker, Susan	Completion Date	12/16/2011 10:08 PM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	T1		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	ASTM-D-1655
Detailed Instructions	This is Straight Bio-fuel. Not a mix. Taken from third truck before off load.		
Distribution List	Ciero, Robert | Williams, Randy | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A/Biofuel — Date: 12/16/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.6590670					WI1414	Baker, Susan
B Coefficient	(c) 4.0577716					WI1414	Baker, Susan
Test: LHV							
Calorimeter	Parr 1266					WI1411	Baker, Susan
Calorimeter constant	2419.3473					WI1411	Baker, Susan
Sample Weight	0.5631	g				WI1411	Baker, Susan
Tape Weight	0	g				WI1411	Baker, Susan
Temperature change	2.6505	°C				WI1411	Baker, Susan
Fuse Correction	18	cal				WI1411	Baker, Susan
Nitric Acid	12	ml				WI1411	Baker, Susan
LHV-FIMS	(c) 18989	BTU/lb				WI1411	Baker, Susan
Test: Specific Gravity (A)							
Observed API Gravity	56.2	°API				ASTM-D-1298	Baker, Susan
Fuel Temperature	72	°F				ASTM-D-1298	Baker, Susan
API Gravity @ 60 degF	(c) 54.905					ASTM-D-1298	Baker, Susan
Density	(c) 759	kg/m^3				ASTM-D-1298	Baker, Susan
Specific Gravity 60/60 degF	0.7591					ASTM-D-1298	Baker, Susan
Test: Viscosity @ 104F							
Tube number-104	VIS-2384					WI1414	Baker, Susan
Run #1	343.03	sec				WI1414	Baker, Susan
Run #2	343.05	sec				WI1414	Baker, Susan
Average Time	(c) 343.04	sec				WI1414	Baker, Susan
CS	(c) 1.35	cst				WI1414	Baker, Susan
Test: Viscosity @ 77F							
Other tube constant	0.003939					WI1414	Baker, Susan
Run #1	433.03	sec				WI1414	Baker, Susan
Run #2	433.09	sec				WI1414	Baker, Susan

Average Time	(c) 433.06	sec				WI1414	Baker, Susan
CS	(c) 1.71	cst				WI1414	Baker, Susan

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)

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CMR Number	554972	Submission Date	12/16/2011 04:44 PM
Status	Completed	Desired Date	12/19/2011
Disposition	**Info Only**	Commit Date	12/19/2011
Released By	Baker, Susan	Completion Date	12/16/2011 10:30 PM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	547553
Detailed Instructions	This is Straight Bio-fuel. Not a mix. Taken from fourth truck before off load.		
Distribution List	Ciero, Robert | Williams, Randy | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A/Biofuel — Date: 12/16/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.4984738					WI1414	Baker, Susan
B Coefficient	(c) 4.0004388					WI1414	Baker, Susan
Test: LHV							
Calorimeter	Parr 1266					WI1411	Baker, Susan
Calorimeter constant	2419.3473					WI1411	Baker, Susan
Sample Weight	0.5728	g				WI1411	Baker, Susan
Tape Weight	0	g				WI1411	Baker, Susan
Temperature change	2.6968	°C				WI1411	Baker, Susan
Fuse Correction	20	cal				WI1411	Baker, Susan
Nitric Acid	12	ml				WI1411	Baker, Susan
LHV-FIMS	(c) 18990	BTU/lb				WI1411	Baker, Susan
Test: Specific Gravity (A)							
Observed API Gravity	56.8	°API				ASTM-D-1298	Baker, Susan
Fuel Temperature	72	°F				ASTM-D-1298	Baker, Susan
API Gravity @ 60 degF	(c) 55.496					ASTM-D-1298	Baker, Susan
Density	(c) 757	kg/m^3				ASTM-D-1298	Baker, Susan
Specific Gravity 60/60 degF	0.7567					ASTM-D-1298	Baker, Susan
Test: Viscosity @ 104F							
Tube number-104	VIS-2383					WI1414	Baker, Susan
Run #1	364.76	sec				WI1414	Baker, Susan
Run #2	364.79	sec				WI1414	Baker, Susan
Average Time	(c) 364.78	sec				WI1414	Baker, Susan
CS	(c) 1.34	cst				WI1414	Baker, Susan
Test: Viscosity @ 77F							
Other tube constant	0.003676					WI1414	Baker, Susan
Run #1	460.43	sec				WI1414	Baker, Susan
Run #2	460.41	sec				WI1414	Baker, Susan

Average Time	(c) 460.42	sec				WI1414	Baker, Susan
CS	(c) 1.69	cst				WI1414	Baker, Susan

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

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CMR Number	554973	Submission Date	12/16/2011 04:51 PM
Status	Completed	Desired Date	12/19/2011
Disposition	**Info Only**	Commit Date	12/19/2011
Released By	Baker, Susan	Completion Date	12/16/2011 10:33 PM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T1		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	ASTM-D-1655
Distribution List	Ciero, Robert | Williams, Randy | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A/Biofuel — Date: 12/16/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.1964298		9.0000000		11.0000000	WI1414	Baker, Susan
B Coefficient	(c) 3.8875493		3.0000000		4.4000000	WI1414	Baker, Susan
Test: LHV							
Calorimeter	Parr 1266					WI1411	Baker, Susan
Calorimeter constant	2419.3473					WI1411	Baker, Susan
Sample Weight	0.5560	g				WI1411	Baker, Susan
Tape Weight	0	g				WI1411	Baker, Susan
Temperature change	2.5724	°C				WI1411	Baker, Susan
Fuse Correction	15	cal				WI1411	Baker, Susan
Nitric Acid	12	ml				WI1411	Baker, Susan
LHV-FIMS	(c) 18744	BTU/lb	18420		18800	WI1411	Baker, Susan
Test: Specific Gravity (A)							
Observed API Gravity	49.8	°API				ASTM-D-1298	Baker, Susan
Fuel Temperature	73	°F				ASTM-D-1298	Baker, Susan
API Gravity @ 60 degF	(c) 48.503					ASTM-D-1298	Baker, Susan
Density	(c) 786	kg/m^3				ASTM-D-1298	Baker, Susan
Specific Gravity 60/60 degF	0.7861		0.770		0.825	ASTM-D-1298	Baker, Susan
Test: Viscosity @ 104F							
Tube number-104	VIS-2382					WI1414	Baker, Susan
Run #1	374.25	sec				WI1414	Baker, Susan
Run #2	374.29	sec				WI1414	Baker, Susan
Average Time	(c) 374.27	sec				WI1414	Baker, Susan
CS	(c) 1.37	cst	1.00		1.50	WI1414	Baker, Susan
Test: Viscosity @ 77F							
Other tube constant	0.003653					WI1414	Baker, Susan
Run #1	470.60	sec				WI1414	Baker, Susan
Run #2	470.56	sec				WI1414	Baker, Susan
Average Time	(c) 470.58	sec				WI1414	Baker, Susan
CS	(c) 1.72	cst	1.30		1.90	WI1414	Baker, Susan

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)
Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	555010	Submission Date	12/17/2011 08:27 AM
Status	Completed	Desired Date	12/20/2011
Disposition	**Info Only**	Commit Date	12/21/2011
Released By	Rexroad, Perry	Completion Date	12/21/2011 06:05 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	ASTM-D-1655
Distribution List	Ciero, Robert | Williams, Randy | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A/Biofuel — Date: 12/21/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.6590670		9.0000000		11.0000000	WI1414	Rexroad, Perry
B Coefficient	(c) 4.0577716		3.0000000		4.4000000	WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2419.35					WI1411	Rexroad, Perry
Sample Weight	0.5555	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.5620	°C				WI1411	Rexroad, Perry
Fuse Correction	12	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18705	BTU/lb	18420		18800	WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	49.4	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	68	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 48.594					ASTM-D-1298	Rexroad, Perry
Density	(c) 786	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.7857		0.770		0.825	ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	366.88	sec				WI1414	Rexroad, Perry
Run #2	366.99	sec				WI1414	Rexroad, Perry
Average Time	(c) 366.94	sec				WI1414	Rexroad, Perry
CS	(c) 1.35	cst	1.00		1.50	WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	464.30	sec				WI1414	Rexroad, Perry
Run #2	464.32	sec				WI1414	Rexroad, Perry
Average Time	(c) 464.31	sec				WI1414	Rexroad, Perry
CS	(c) 1.71	cst	1.30		1.90	WI1414	Rexroad, Perry

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	555180	Submission Date	12/19/2011 12:27 PM
Status	Completed	Desired Date	12/21/2011
Disposition	**Info Only**	Commit Date	12/21/2011
Released By	Rexroad, Perry	Completion Date	12/21/2011 07:52 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	547553
Detailed Instructions	This is Straight Bio-fuel. Not a mix. Taken from fifth truck before off load.		
Distribution List	Ciero, Robert | Williams, Randy | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: 1061424943 — Date: 12/21/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.5561674					WI1414	Rexroad, Perry
B Coefficient	(c) 4.0193355					WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2419.35					WI1411	Rexroad, Perry
Sample Weight	0.5678	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.6641	°C				WI1411	Rexroad, Perry
Fuse Correction	22	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18934	BTU/lb				WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	56.1	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	66	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 55.397					ASTM-D-1298	Rexroad, Perry
Density	(c) 757	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.7571					ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003939					WI1414	Rexroad, Perry
Run #1	345.42	sec				WI1414	Rexroad, Perry
Run #2	345.49	sec				WI1414	Rexroad, Perry
Average Time	(c) 345.46	sec				WI1414	Rexroad, Perry
CS	(c) 1.36	cst				WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003939					WI1414	Rexroad, Perry
Run #1	437.06	sec				WI1414	Rexroad, Perry
Run #2	437.17	sec				WI1414	Rexroad, Perry

Average Time	(c) 437.12	sec				WI1414	Rexroad, Perry
CS	(c) 1.72	cst				WI1414	Rexroad, Perry

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

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CMR Number	555309	Submission Date	12/20/2011 07:14 AM
Status	Completed	Desired Date	12/23/2011
Disposition	**Info Only**	Commit Date	12/23/2011
Released By	Rexroad, Perry	Completion Date	12/21/2011 07:47 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T5		
Oil / Fuel Type	Jet A	Material Spec	ASTM-D-1655
Detailed Instructions	Sample was taken from truck before off load into tank 2		
Distribution List	Ciero, Robert | Williams, Randy | Culbertson, Brad | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A — Date: 12/21/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.1964298		9.1000000		10.9000000	WI1414	Rexroad, Perry
B Coefficient	(c) 3.8875493		3.4000000		4.2000000	WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2419.35					WI1411	Rexroad, Perry
Sample Weight	0.5795	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.6391	°C				WI1411	Rexroad, Perry
Fuse Correction	21	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18506	BTU/lb	18420		18625	WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	42.6	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	69	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 41.801					ASTM-D-1298	Rexroad, Perry
Density	(c) 817	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.8165		0.799		0.825	ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	372.49	sec				WI1414	Rexroad, Perry
Run #2	372.41	sec				WI1414	Rexroad, Perry
Average Time	(c) 372.45	sec				WI1414	Rexroad, Perry
CS	(c) 1.37	cst	1.08		1.49	WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	469.07	sec				WI1414	Rexroad, Perry
Run #2	469.00	sec				WI1414	Rexroad, Perry
Average Time	(c) 469.03	sec				WI1414	Rexroad, Perry
CS	(c) 1.72	cst	0.32		1.90	WI1414	Rexroad, Perry

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

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CMR Number	555407 rev A	Submission Date	12/20/2011 02:00 PM
Status	Completed	Desired Date	12/23/2011
Disposition	**Info Only**	Commit Date	12/23/2011
Released By	Rexroad, Perry	Completion Date	12/21/2011 09:24 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	ASTM-D-1655
Distribution List	Ciero, Robert | Williams, Randy | Culbertson, Brad | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A/Biofuel — Date: 12/21/2011

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.5561674		9.0000000		11.0000000	WI1414	Rexroad, Perry
B Coefficient	(c) 4.0193355		3.0000000		4.4000000	WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Morton, Jeremy
Calorimeter constant	2419.3473					WI1411	Morton, Jeremy
Sample Weight	0.5690	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Morton, Jeremy
Temperature change	2.6301	°C				WI1411	Rexroad, Perry
Fuse Correction	22	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Morton, Jeremy
LHV-FIMS	(c) 18716	BTU/lb	18420		18800	WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	49.5	°API				ASTM-D-1298	Morton, Jeremy
Fuel Temperature	72	°F				ASTM-D-1298	Morton, Jeremy
API Gravity @ 60 degF	(c) 48.297					ASTM-D-1298	Morton, Jeremy
Density	(c) 787	kg/m^3				ASTM-D-1298	Morton, Jeremy
Specific Gravity 60/60 degF	0.7870		0.770		0.825	ASTM-D-1298	Morton, Jeremy
Test: Viscosity @ 104F							
Tube number-104	VIS-2382					WI1414	Morton, Jeremy
Run #1	371.8	sec				WI1414	Morton, Jeremy
Run #2	371.7	sec				WI1414	Morton, Jeremy
Average Time	(c) 371.8	sec				WI1414	Morton, Jeremy
CS	(c) 1.36	cst	1.00		1.50	WI1414	Morton, Jeremy
Test: Viscosity @ 77F							
Other tube constant	0.003653					WI1414	Morton, Jeremy
Run #1	470.6	sec				WI1414	Morton, Jeremy
Run #2	470.3	sec				WI1414	Morton, Jeremy
Average Time	(c) 470.5	sec				WI1414	Morton, Jeremy
CS	(c) 1.72	cst	1.30		1.90	WI1414	Morton, Jeremy

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

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CMR Number	556685	Submission Date	01/03/2012 07:44 AM
Status	Completed	Desired Date	01/06/2012
Disposition	**Info Only**	Commit Date	01/06/2012
Released By	Rexroad, Perry	Completion Date	01/03/2012 10:23 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T5		
Oil / Fuel Type	Jet A	Material Spec	ASTM-D-1655
Detailed Instructions	Sample was taken from truck before off load into tank 2		
Distribution List	Ciero, Robert | Williams, Randy | Culbertson, Brad | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A — Date: 01/03/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.0605290		9.1000000		10.9000000	WI1414	Rexroad, Perry
B Coefficient	(c) 3.8422996		3.4000000		4.2000000	WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2419.35					WI1411	Rexroad, Perry
Sample Weight	0.5534	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.5252	°C				WI1411	Rexroad, Perry
Fuse Correction	17	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18540	BTU/lb	18420		18625	WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	44.0	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	71	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 42.997					ASTM-D-1298	Rexroad, Perry
Density	(c) 811	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.8109		0.799		0.825	ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003653					WI1414	Rexroad, Perry
Run #1	364.04	sec				WI1414	Rexroad, Perry
Run #2	363.97	sec				WI1414	Rexroad, Perry
Average Time	(c) 364.01	sec				WI1414	Rexroad, Perry
CS	(c) 1.33	cst	1.08		1.49	WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003653					WI1414	Rexroad, Perry
Run #1	453.41	sec				WI1414	Rexroad, Perry
Run #2	453.47	sec				WI1414	Rexroad, Perry
Average Time	(c) 453.44	sec				WI1414	Rexroad, Perry
CS	(c) 1.66	cst	0.32		1.90	WI1414	Rexroad, Perry

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)
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CMR Number	556749	Submission Date	01/03/2012 01:05 PM
Status	Completed	Desired Date	01/04/2012
Disposition	**Info Only**	Commit Date	01/04/2012
Released By	Rexroad, Perry	Completion Date	01/04/2012 10:23 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	547553
Detailed Instructions	This is Straight Bio-fuel. Not a mix. Taken from sixth truck before off load.		
Distribution List	Ciero, Robert | Williams, Randy | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: FIMS — Date: 01/04/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.2955248					WI1414	Rexroad, Perry
B Coefficient	(c) 3.9245917					WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2419.35					WI1411	Rexroad, Perry
Sample Weight	0.5624	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.6438	°C				WI1411	Rexroad, Perry
Fuse Correction	23	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18959	BTU/lb				WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	56.1	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	68	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 55.200					ASTM-D-1298	Rexroad, Perry
Density	(c) 758	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.7579					ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	370.25	sec				WI1414	Rexroad, Perry
Run #2	370.21	sec				WI1414	Rexroad, Perry
Average Time	(c) 370.23	sec				WI1414	Rexroad, Perry
CS	(c) 1.36	cst				WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	465.51	sec				WI1414	Rexroad, Perry
Run #2	465.50	sec				WI1414	Rexroad, Perry

Average Time	(c) 465.51	sec				WI1414	Rexroad, Perry
CS	(c) 1.71	cst				WI1414	Rexroad, Perry

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

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CMR Number	556826	Submission Date	01/04/2012 06:31 AM
Status	Completed	Desired Date	01/09/2012
Disposition	**Info Only**	Commit Date	01/09/2012
Released By	Rexroad, Perry	Completion Date	01/04/2012 09:55 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T5		
Oil / Fuel Type	Jet A	Material Spec	ASTM-D-1655
Distribution List	Ciero, Robert | Williams, Randy | Culbertson, Brad | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A — Date: 01/04/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.1613768		9.1000000		10.9000000	WI1414	Rexroad, Perry
B Coefficient	(c) 3.8800235		3.4000000		4.2000000	WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2419.35					WI1411	Rexroad, Perry
Sample Weight	0.5555	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.5348	°C				WI1411	Rexroad, Perry
Fuse Correction	16	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18542	BTU/lb	18420		18625	WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	43.6	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	67	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 42.997					ASTM-D-1298	Rexroad, Perry
Density	(c) 811	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.8109		0.799		0.825	ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003653					WI1414	Rexroad, Perry
Run #1	362.06	sec				WI1414	Rexroad, Perry
Run #2	362.11	sec				WI1414	Rexroad, Perry
Average Time	(c) 362.09	sec				WI1414	Rexroad, Perry
CS	(c) 1.32	cst	1.08		1.49	WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003653					WI1414	Rexroad, Perry
Run #1	450.77	sec				WI1414	Rexroad, Perry
Run #2	450.84	sec				WI1414	Rexroad, Perry
Average Time	(c) 450.80	sec				WI1414	Rexroad, Perry
CS	(c) 1.65	cst	0.32		1.90	WI1414	Rexroad, Perry

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

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CMR Number	556827	Submission Date	01/04/2012 06:33 AM
Status	Completed	Desired Date	01/09/2012
Disposition	**Info Only**	Commit Date	01/09/2012
Released By	Rexroad, Perry	Completion Date	01/04/2012 11:29 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	ASTM-D-1655
Distribution List	Ciero, Robert | Williams, Randy | Culbertson, Brad | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A/Biofuel — Date: 01/04/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.2955248		9.0000000		11.0000000	WI1414	Rexroad, Perry
B Coefficient	(c) 3.9245917		3.0000000		4.4000000	WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2419.35					WI1411	Rexroad, Perry
Sample Weight	0.5469	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.5336	°C				WI1411	Rexroad, Perry
Fuse Correction	23	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18743	BTU/lb	18420		18800	WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	49.8	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	68	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 49.008					ASTM-D-1298	Rexroad, Perry
Density	(c) 784	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.7839		0.770		0.825	ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003939					WI1414	Rexroad, Perry
Run #1	346.09	sec				WI1414	Rexroad, Perry
Run #2	346.01	sec				WI1414	Rexroad, Perry
Average Time	(c) 346.05	sec				WI1414	Rexroad, Perry
CS	(c) 1.36	cst	1.00		1.50	WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003939					WI1414	Rexroad, Perry
Run #1	434.38	sec				WI1414	Rexroad, Perry
Run #2	434.50	sec				WI1414	Rexroad, Perry
Average Time	(c) 434.44	sec				WI1414	Rexroad, Perry
CS	(c) 1.71	cst	1.30		1.90	WI1414	Rexroad, Perry

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)

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CMR Number	556939	Submission Date	01/04/2012 12:36 PM
Status	Completed	Desired Date	01/05/2012
Disposition	**Info Only**	Commit Date	01/05/2012
Released By	Baker, Susan	Completion Date	01/04/2012 07:11 PM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	547553
Detailed Instructions	This is Straight Bio-fuel. Not a mix. Taken from SEVENTH truck before off load.		
Distribution List	Ciero, Robert | Williams, Randy | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: 1061428406 — Date: 01/04/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.4548741					WI1414	Baker, Susan
B Coefficient	(c) 3.9814940					WI1414	Baker, Susan
Test: LHV							
Calorimeter	Parr 1266					WI1411	Baker, Susan
Calorimeter constant	2419.3473					WI1411	Baker, Susan
Sample Weight	0.5775	g				WI1411	Baker, Susan
Tape Weight	0	g				WI1411	Baker, Susan
Temperature change	2.7196	°C				WI1411	Baker, Susan
Fuse Correction	21	cal				WI1411	Baker, Susan
Nitric Acid	12	ml				WI1411	Baker, Susan
LHV-FIMS	(c) 18992	BTU/lb				WI1411	Baker, Susan
Test: Specific Gravity (A)							
Observed API Gravity	56.6	°API				ASTM-D-1298	Baker, Susan
Fuel Temperature	71	°F				ASTM-D-1298	Baker, Susan
API Gravity @ 60 degF	(c) 55.397					ASTM-D-1298	Baker, Susan
Density	(c) 757	kg/m^3				ASTM-D-1298	Baker, Susan
Specific Gravity 60/60 degF	0.7571					ASTM-D-1298	Baker, Susan
Test: Viscosity @ 104F							
Tube number-104	VIS-2382					WI1414	Baker, Susan
Run #1	374.74	sec				WI1414	Baker, Susan
Run #2	374.76	sec				WI1414	Baker, Susan
Average Time	(c) 374.75	sec				WI1414	Baker, Susan
CS	(c) 1.37	cst				WI1414	Baker, Susan
Test: Viscosity @ 77F							
Other tube constant	0.003653					WI1414	Baker, Susan
Run #1	472.29	sec				WI1414	Baker, Susan
Run #2	472.25	sec				WI1414	Baker, Susan

Average Time	(c) 472.27	sec				WI1414	Baker, Susan
CS	(c) 1.73	cst				WI1414	Baker, Susan

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

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CMR Number	557050	Submission Date	01/05/2012 07:45 AM
Status	Completed	Desired Date	01/09/2012
Disposition	**Info Only**	Commit Date	01/09/2012
Released By	Bautista, Karla	Completion Date	01/05/2012 02:14 PM
Custom Id / Title	BioFuel/Jet A 50/50 Mix	Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	ASTM-D-1655
Detailed Instructions	This is a 50/50 blend of BioFuel and Jet A taken from Tank 2 at 7:30 am on 1/5/12.		
Distribution List	Neal, Terry | Williams, Randy | Culbertson, Brad | Eaton, Jason | Patterson, Mike		

Customer	Ciero, Robert	Submitted By	Ciero, Robert
Phone	+1 480/592-7938	Phone	+1 480/592-7938
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A/Biofuel — Date: 01/05/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.4984738		9.0000000		11.0000000	WI1414	Bautista, Karla
B Coefficient	(c) 4.0004388		3.0000000		4.4000000	WI1414	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Bautista, Karla
Calorimeter constant	2419.3473					WI1411	Bautista, Karla
Sample Weight	0.5620	g				WI1411	Bautista, Karla
Tape Weight	0	g				WI1411	Bautista, Karla
Temperature change	2.5972	°C				WI1411	Bautista, Karla
Fuse Correction	15	cal				WI1411	Bautista, Karla
Nitric Acid	12	ml				WI1411	Bautista, Karla
LHV-FIMS	(c) 18728	BTU/lb	18420		18800	WI1411	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	50.0	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	71	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 48.893					ASTM-D-1298	Bautista, Karla
Density	(c) 784	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.7844		0.770		0.825	ASTM-D-1298	Bautista, Karla
Test: Viscosity @ 104F							
Tube number-104	VIS-2384					WI1414	Bautista, Karla
Run #1	340.18	sec				WI1414	Bautista, Karla
Run #2	340.25	sec				WI1414	Bautista, Karla
Average Time	(c) 340.22	sec				WI1414	Bautista, Karla
CS	(c) 1.34	cst	1.00		1.50	WI1414	Bautista, Karla
Test: Viscosity @ 77F							
Other tube constant	0.003939					WI1414	Bautista, Karla
Run #1	428.51	sec				WI1414	Bautista, Karla
Run #2	428.40	sec				WI1414	Bautista, Karla
Average Time	(c) 428.46	sec				WI1414	Bautista, Karla
CS	(c) 1.69	cst	1.30		1.90	WI1414	Bautista, Karla

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

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CMR Number	557695	Submission Date	01/10/2012 11:13 AM
Status	Completed	Desired Date	01/13/2012
Disposition	**Info Only**	Commit Date	01/13/2012
Released By	Bautista, Karla	Completion Date	01/11/2012 04:13 PM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T5		
Oil / Fuel Type	Jet A	Material Spec	ASTM-D-1655
Detailed Instructions	Sample was taken from truck before off load into tank 2		
Distribution List	Ciero, Robert | Williams, Randy | Culbertson, Brad | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A — Date: 01/11/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 9.9612930		9.1000000		10.9000000	WI1414	Bautista, Karla
B Coefficient	(c) 3.8051731		3.4000000		4.2000000	WI1414	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Bautista, Karla
Calorimeter constant	2419.3473					WI1411	Bautista, Karla
Sample Weight	0.5595	g				WI1411	Bautista, Karla
Tape Weight	0	g				WI1411	Bautista, Karla
Temperature change	2.5485	°C				WI1411	Bautista, Karla
Fuse Correction	16	cal				WI1411	Bautista, Karla
Nitric Acid	12	ml				WI1411	Bautista, Karla
LHV-FIMS	(c) 18517	BTU/lb	18420		18625	WI1411	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	43.6	°API				ASTM-D-1298	Bautista, Karla
Fuel Temperature	70	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 42.697					ASTM-D-1298	Bautista, Karla
Density	(c) 812	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.8123		0.799		0.825	ASTM-D-1298	Bautista, Karla
Test: Viscosity @ 104F							
Tube number-104	VIS-2384					WI1414	Bautista, Karla
Run #1	340.05	sec				WI1414	Bautista, Karla
Run #2	339.75	sec				WI1414	Bautista, Karla
Average Time	(c) 339.90	sec				WI1414	Bautista, Karla
CS	(c) 1.34	cst	1.08		1.49	WI1414	Bautista, Karla
Test: Viscosity @ 77F							
Other tube constant	0.003939					WI1414	Bautista, Karla
Run #1	424.99	sec				WI1414	Bautista, Karla
Run #2	424.91	sec				WI1414	Bautista, Karla
Average Time	(c) 424.95	sec				WI1414	Bautista, Karla
CS	(c) 1.67	cst	0.32		1.90	WI1414	Bautista, Karla

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

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CMR Number	558038	Submission Date	01/12/2012 10:45 AM
Status	Completed	Desired Date	01/16/2012
Disposition	**Info Only**	Commit Date	01/16/2012
Released By	Rexroad, Perry	Completion Date	01/13/2012 07:46 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T5		
Oil / Fuel Type	Jet A	Material Spec	ASTM-D-1655
Detailed Instructions	Sample was taken from truck before off load into tank 1		
Distribution List	Ciero, Robert | Williams, Randy | Culbertson, Brad | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A — Date: 01/13/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.3326430		9.1000000		10.9000000	WI1414	Rexroad, Perry
B Coefficient	(c) 3.9412133		3.4000000		4.2000000	WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2419.35					WI1411	Rexroad, Perry
Sample Weight	0.5705	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.5981	°C				WI1411	Rexroad, Perry
Fuse Correction	21	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18504	BTU/lb	18420		18625	WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	42.4	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	65	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 41.907					ASTM-D-1298	Rexroad, Perry
Density	(c) 816	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.8160		0.799		0.825	ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003939					WI1414	Rexroad, Perry
Run #1	338.50	sec				WI1414	Rexroad, Perry
Run #2	338.51	sec				WI1414	Rexroad, Perry
Average Time	(c) 338.51	sec				WI1414	Rexroad, Perry
CS	(c) 1.33	cst	1.08		1.49	WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003939					WI1414	Rexroad, Perry
Run #1	425.11	sec				WI1414	Rexroad, Perry
Run #2	425.16	sec				WI1414	Rexroad, Perry
Average Time	(c) 425.14	sec				WI1414	Rexroad, Perry
CS	(c) 1.67	cst	0.32		1.90	WI1414	Rexroad, Perry

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)

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CMR Number	558070	Submission Date	01/12/2012 01:05 PM
Status	Completed	Desired Date	01/13/2012
Disposition	**Info Only**	Commit Date	01/13/2012
Released By	Rexroad, Perry	Completion Date	01/13/2012 08:32 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	547553
Detailed Instructions	This is Straight Bio-fuel. Not a mix. Taken from Ninth truck before off load.		
Distribution List	Ciero, Robert | Williams, Randy | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: FIMS — Date: 01/13/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.5090025					WI1414	Rexroad, Perry
B Coefficient	(c) 3.9991590					WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2419.35					WI1411	Rexroad, Perry
Sample Weight	0.5720	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.6767	°C				WI1411	Rexroad, Perry
Fuse Correction	20	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18900	BTU/lb				WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	55.4	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	62	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 55.102					ASTM-D-1298	Rexroad, Perry
Density	(c) 758	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.7583					ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003653					WI1414	Rexroad, Perry
Run #1	381.10	sec				WI1414	Rexroad, Perry
Run #2	381.12	sec				WI1414	Rexroad, Perry
Average Time	(c) 381.11	sec				WI1414	Rexroad, Perry
CS	(c) 1.39	cst				WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003653					WI1414	Rexroad, Perry
Run #1	482.29	sec				WI1414	Rexroad, Perry
Run #2	482.20	sec				WI1414	Rexroad, Perry

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)
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CMR Number	558101	Submission Date	01/12/2012 02:34 PM
Status	Completed	Desired Date	01/13/2012
Disposition	**Info Only**	Commit Date	01/13/2012
Released By	Rexroad, Perry	Completion Date	01/13/2012 08:36 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	T1		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	547553
Detailed Instructions	This is Straight Bio-fuel. Not a mix. Taken from Eighth truck before off load.		
Distribution List	Ciero, Robert | Williams, Randy | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: FIMS — Date: 01/13/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.5090025					WI1414	Rexroad, Perry
B Coefficient	(c) 3.9991590					WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2419.25					WI1411	Rexroad, Perry
Sample Weight	0.5701	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.6704	°C				WI1411	Rexroad, Perry
Fuse Correction	22	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18909	BTU/lb				WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	55.5	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	63	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 55.102					ASTM-D-1298	Rexroad, Perry
Density	(c) 758	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.7583					ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	378.62	sec				WI1414	Rexroad, Perry
Run #2	378.59	sec				WI1414	Rexroad, Perry
Average Time	(c) 378.61	sec				WI1414	Rexroad, Perry
CS	(c) 1.39	cst				WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	478.67	sec				WI1414	Rexroad, Perry
Run #2	478.69	sec				WI1414	Rexroad, Perry

Average Time	(c) 478.68	sec				WI1414	Rexroad, Perry
CS	(c) 1.76	cst				WI1414	Rexroad, Perry

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)
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CMR Number	558104	Submission Date	01/12/2012 03:00 PM
Status	Completed	Desired Date	01/16/2012
Disposition	**Info Only**	Commit Date	01/16/2012
Released By	Rexroad, Perry	Completion Date	01/13/2012 11:50 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T1		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	556827
Distribution List	Ciero, Robert | Williams, Randy | Culbertson, Brad | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A/Biofuel — Date: 01/13/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.3961948		9.0000000		11.0000000	WI1414	Rexroad, Perry
B Coefficient	(c) 3.9622173		3.0000000		4.4000000	WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2419.35					WI1411	Rexroad, Perry
Sample Weight	0.5616	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.5910	°C				WI1411	Rexroad, Perry
Fuse Correction	13	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18708	BTU/lb	18420		18800	WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	48.4	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	62	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 48.205					ASTM-D-1298	Rexroad, Perry
Density	(c) 787	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.7874		0.770		0.825	ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003653					WI1414	Rexroad, Perry
Run #1	368.19	sec				WI1414	Rexroad, Perry
Run #2	368.24	sec				WI1414	Rexroad, Perry
Average Time	(c) 368.22	sec				WI1414	Rexroad, Perry
CS	(c) 1.35	cst	1.00		1.50	WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003653					WI1414	Rexroad, Perry
Run #1	466.56	sec				WI1414	Rexroad, Perry
Run #2	466.77	sec				WI1414	Rexroad, Perry
Average Time	(c) 466.66	sec				WI1414	Rexroad, Perry
CS	(c) 1.70	cst	1.30		1.90	WI1414	Rexroad, Perry

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

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CMR Number	558168	Submission Date	01/13/2012 06:05 AM
Status	Completed	Desired Date	01/16/2012
Disposition	**Info Only**	Commit Date	01/16/2012
Released By	Rexroad, Perry	Completion Date	01/13/2012 10:58 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	556827
Distribution List	Ciero, Robert | Williams, Randy | Culbertson, Brad | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A/Biofuel — Date: 01/13/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.5561674		9.0000000		11.0000000	WI1414	Rexroad, Perry
B Coefficient	(c) 4.0193355		3.0000000		4.4000000	WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2419.35					WI1411	Rexroad, Perry
Sample Weight	0.5733	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.6463	°C				WI1411	Rexroad, Perry
Fuse Correction	13	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18717	BTU/lb	18420		18800	WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	48.8	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	61	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 48.709					ASTM-D-1298	Rexroad, Perry
Density	(c) 785	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.7852		0.770		0.825	ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Tube number-104	E896					WI1414	Rexroad, Perry
Run #1	658.95	sec				WI1414	Rexroad, Perry
Run #2	658.99	sec				WI1414	Rexroad, Perry
Average Time	(c) 658.97	sec				WI1414	Rexroad, Perry
CS	(c) 1.36	cst	1.00		1.50	WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Tube number-77	E896					WI1414	Rexroad, Perry
Run #1	830.38	sec				WI1414	Rexroad, Perry
Run #2	830.31	sec				WI1414	Rexroad, Perry
Average Time	(c) 830.35	sec				WI1414	Rexroad, Perry
CS	(c) 1.72	cst	1.30		1.90	WI1414	Rexroad, Perry

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)
Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	558518	Submission Date	01/16/2012 08:12 AM
Status	Completed	Desired Date	01/27/2012
Disposition	**Info Only**	Commit Date	01/27/2012
Released By	Bautista, Karla	Completion Date	01/18/2012 10:36 AM
Custom Id / Title	HEFA SPK Tanker 8	Project / Type	Info Only
Labor Charge Number	7002368937-0050	Material Charge Number	7002368937-0180
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	Delivery Tanker		
Oil / Fuel Type	HEFA SPK	Material Spec	D7566 Table 1 and A1.1
Operating Time	n/a	Engine Serial #	n/a
Tests Required	Water Content (ppm) LHV (BTU/lb) Viscosity Flash Point (F) Distillation Specific Gravity Anti-ice Additive Aromatics Low Temp Viscosity Freeze Point Smoke Point		
Detailed Instructions	Full ASTM D1655/D7566 specification analysis required. Sample from 8th tanker (Tanker 8) delivering HEFA SPK to San Tan. Run as many analysis in-house as possible - including specific gravity, LHV, viscosity (D445), flash point, freeze point (D2386), and distillation (D86). Other properties such as acidity (D3242), aromatics (D1319 or D6379), low temp viscosity (D445 at -20C), sulfur (D5453 or D2622), mercaptan sulfur (D3227), smoke point (D1322), copper strip corrosion (D130), thermal stability at 325C (D3241), existent gum (D381, report washed and unwashed), and MSEP (D3948) may need to be sent to an accredited outside laboratory (recommend Dixie Services). Please also run simulated distillation (D2887) at OP laboratory. Also check hydrocarbon concentration (D2425 and D5291), nitrogen (D4629), halogens (D7359), and trace metals (ICP, prefer UOP 389). Please use samples from CMR 558101 for analyses.		
Distribution List	Williams, Randy		

Customer	Culbertson, Brad	Submitted By	Culbertson, Brad
Phone	+1 602/231-2423	Phone	+1 602/231-2423
Department	BA--60035	Department	BA--60035
Requesting Site	Phoenix		

Test Results

Specimen: 1061432518 — Date: 01/16/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.5588793					WI1414	Bautista, Karla
B Coefficient	(c) 4.0153196					WI1414	Bautista, Karla
Test: Anti-Icing Additive							
DiEGMME	0	% v/v				WI1412	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity	56.1	°API				ASTM-D-1298	Bautista, Karla

Fuel Temperature	70	°F				ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF	(c) 55.003					ASTM-D-1298	Bautista, Karla
Density	(c) 759	kg/m^3				ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF	0.7587					ASTM-D-1298	Bautista, Karla
Test: Viscosity @ 104F							
Tube number-104	VIS-2383					WI1414	Bautista, Karla
Run #1	383.65	sec				WI1414	Bautista, Karla
Run #2	383.47	sec				WI1414	Bautista, Karla
Average Time	(c) 383.56	sec				WI1414	Bautista, Karla
CS	(c) 1.41	cst				WI1414	Bautista, Karla
Test: Viscosity @ 77F							
Other tube constant	0.003676					WI1414	Bautista, Karla
Run #1	486.47	sec				WI1414	Bautista, Karla
Run #2	486.58	sec				WI1414	Bautista, Karla
Average Time	(c) 486.53	sec				WI1414	Bautista, Karla
CS	(c) 1.79	cst				WI1414	Bautista, Karla

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)
Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	558520	Submission Date	01/16/2012 08:13 AM
Status	Completed	Desired Date	01/27/2012
Disposition	**Info Only**	Commit Date	01/27/2012
Released By	Bautista, Karla	Completion Date	01/23/2012 03:50 PM
Custom Id / Title	HEFA SPK Tanker 9	Project / Type	Info Only
Labor Charge Number	7002368937-0050	Material Charge Number	7002368937-0180
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	Delivery Tanker		
Oil / Fuel Type	HEFA SPK	Material Spec	D7566 Table 1 and A1.1
Operating Time	n/a	Engine Serial #	n/a
Tests Required	Water Content (ppm) LHV (BTU/lb) Viscosity Flash Point (F) Distillation Specific Gravity Anti-ice Additive Aromatics Freeze Point Smoke Point		
Detailed Instructions	Full ASTM D1655/D7566 specification analysis (less OP analysis). Sample from 9th tanker (Tanker 9) delivering HEFA SPK to San Tan. Run only analyses that can be performed in-house - including specific gravity, LHV, viscosity (D445), flash point, freeze point (D2386), aromatics (D1319 or D6379), smoke point (D1322), and distillation (D86). Please use samples from CMR 558070 for analyses.		
Distribution List	Williams, Randy		

Customer	Culbertson, Brad	Submitted By	Culbertson, Brad
Phone	+1 602/231-2423	Phone	+1 602/231-2423
Department	BA--60035	Department	BA--60035
Requesting Site	Phoenix		

Test Results

Specimen: 1061432523 Date: 01/23/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.5588793					WI1414	Bautista, Karla
B Coefficient	(c) 4.0153196					WI1414	Bautista, Karla
Test: Anti-Icing Additive							
DiEGMME	0	% v/v				WI1412	Bautista, Karla
Test: Distillation							
Initial B.P.	300	°F				ASTM-D-86	Bautista, Karla
5% Distilled	320	°F				ASTM-D-86	Bautista, Karla
10% Distilled	330	°F				ASTM-D-86	Bautista, Karla
20% Distilled	350	°F				ASTM-D-86	Bautista, Karla
30% Distilled	374	°F				ASTM-D-86	Bautista, Karla
40% Distilled	400	°F				ASTM-D-86	Bautista, Karla
50% Distilled	424	°F				ASTM-D-86	Bautista, Karla

60% Distilled		450	°F			ASTM-D-86	Bautista, Karla
70% Distilled		468	°F			ASTM-D-86	Bautista, Karla
80% Distilled		484	°F			ASTM-D-86	Bautista, Karla
90% Distilled		500	°F			ASTM-D-86	Bautista, Karla
95% Distilled		510	°F			ASTM-D-86	Bautista, Karla
End Point		526	°F			ASTM-D-86	Bautista, Karla
% Distilled		98.0	%			ASTM-D-86	Bautista, Karla
% Residue		1.2	%			ASTM-D-86	Bautista, Karla
% Loss		(c) 0.8	%			ASTM-D-86	Bautista, Karla
Test: Flash Point - c.c.							
Flash Point		103	°F			ASTM-D-56	Bautista, Karla
Barometric Pressure		29.002	inHg			ASTM-D-56	Bautista, Karla
Corrected Flash Point		(c) 104	°F			ASTM-D-56	Bautista, Karla
Test: Freeze Point							
Freeze Point		-61.6	°F			ASTM-D-2386	Bautista, Karla
Test: LHV							
Calorimeter		Parr 1266				WI1411	Rexroad, Perry
Calorimeter constant		2414.60				WI1411	Rexroad, Perry
Sample Weight		0.5690	g			WI1411	Rexroad, Perry
Tape Weight		0	g			WI1411	Rexroad, Perry
Temperature change		2.6622	°C			WI1411	Rexroad, Perry
Fuse Correction		8	cal			WI1411	Rexroad, Perry
Nitric Acid		12	ml			WI1411	Rexroad, Perry
LHV-FIMS		(c) 18896	BTU/lb			WI1411	Rexroad, Perry
Test: Smoke Point-1 Reference Standard 1							
Toluene		5	%			ASTM-D-1322	Bautista, Karla
Iso-Octane		95	%			ASTM-D-1322	Bautista, Karla
Result 1		36	mm			ASTM-D-1322	Bautista, Karla
Result 2		36	mm			ASTM-D-1322	Bautista, Karla
Result 3		36	mm			ASTM-D-1322	Bautista, Karla
Result Avg		(c) 36	mm			ASTM-D-1322	Bautista, Karla
Expected Value		35.4	mm			ASTM-D-1322	Bautista, Karla
Test: Smoke Point-2 Reference Standard 2							
Toluene		0	%			ASTM-D-1322	Bautista, Karla
Iso-Octane		100	%			ASTM-D-1322	Bautista, Karla
Result 1		43	mm			ASTM-D-1322	Bautista, Karla
Result 2		42	mm			ASTM-D-1322	Bautista, Karla
Result 3		43	mm			ASTM-D-1322	Bautista, Karla
Result Avg		(c) 43	mm			ASTM-D-1322	Bautista, Karla
Expected Value		42.8	mm			ASTM-D-1322	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity		56.1	°API			ASTM-D-1298	Bautista, Karla
Fuel Temperature		69	°F			ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF		(c) 55.102				ASTM-D-1298	Bautista, Karla
Density		(c) 758	kg/m^3			ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF		0.7583				ASTM-D-1298	Bautista, Karla
Test: Text Results							
Text Result		(see below)				WI1416	Bautista, Karla 01/20/2012
No detectable volume of aromatic content. Aromatics % volume = 0%							
Test: Text Results (2)							
Text Result		(see below)				WI6260	Bautista, Karla

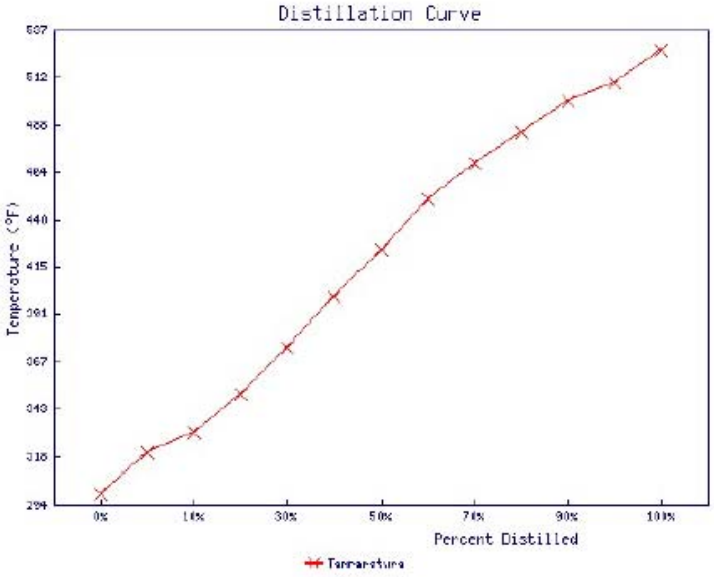
Text Result	(see below)				WI6360	01/23/2012
Smoke Point =						
50 mm						
50 mm						
50 mm						
Corrected average = 49.5 mm						
Results are estimate only due to limitation of standards at 42.8 mm maximum.						
Test: Viscosity @ 104F						
Tube number-104	VIS-2382				WI1414	Bautista, Karla
Run #1	386.05	sec			WI1414	Bautista, Karla
Run #2	386.20	sec			WI1414	Bautista, Karla
Average Time	(c) 386.13	sec			WI1414	Bautista, Karla
CS	(c) 1.41	cst			WI1414	Bautista, Karla
Test: Viscosity @ 77F						
Other tube constant	0.003653				WI1414	Bautista, Karla
Run #1	489.76	sec			WI1414	Bautista, Karla
Run #2	489.82	sec			WI1414	Bautista, Karla
Average Time	(c) 489.79	sec			WI1414	Bautista, Karla
CS	(c) 1.79	cst			WI1414	Bautista, Karla
Test: Water Content (ppm)						
Run #1	20.17	ppm			ASTM-E-1064	Bautista, Karla
Run #2	19.59	ppm			ASTM-E-1064	Bautista, Karla
Water Content	(c) 19.88	ppm			ASTM-E-1064	Bautista, Karla
Water Content Standard	This sample was checked against a 50 ppm QC standard				ASTM-E-1064	Bautista, Karla

Distillation Test for Specimen 1061432523

Oil and Fuel CMR # 558520
Material HEFA SPK
Material Specification D7566 Table 1 and A1.1
Test Method ASTM-D-86

		Material Spec Limits	
		Minimum	Maximum
Percent Distilled	98.0		
Percent Residue	1.2		
Percent Loss	0.8		

Percent Distilled	Temperature (°F)	Material Spec Limits	
		Minimum	Maximum
0%	300		
5%	320		
10%	330		
20%	350		
30%	374		
40%	400		
50%	424		
60%	450		
70%	468		
80%	484		
90%	500		
95%	510		
100%	526		



Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)
Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	558918	Submission Date	01/18/2012 05:19 AM
Status	Completed	Desired Date	01/20/2012
Disposition	**Info Only**	Commit Date	01/23/2012
Released By	Rexroad, Perry	Completion Date	01/20/2012 12:01 PM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	547553
Detailed Instructions	This is Straight Bio-fuel. Not a mix. Taken from Tenth truck before off load.		
Distribution List	Ciero, Robert | Williams, Randy | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: FIMS — Date: 01/20/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.6590670					WI1414	Rexroad, Perry
B Coefficient	(c) 4.0577716					WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2414.60					WI1411	Rexroad, Perry
Sample Weight	0.5556	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.6157	°C				WI1411	Rexroad, Perry
Fuse Correction	23	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18951	BTU/lb	18400			WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	56.1	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	69	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 55.102					ASTM-D-1298	Rexroad, Perry
Density	(c) 758	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.7583					ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	367.04	sec				WI1414	Rexroad, Perry
Run #2	367.19	sec				WI1414	Rexroad, Perry
Average Time	(c) 367.12	sec				WI1414	Rexroad, Perry
CS	(c) 1.35	cst	1.2		1.5	WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	465.19	sec				WI1414	Rexroad, Perry
Run #2	465.09	sec				WI1414	Rexroad, Perry

Average Time	(c) 465.14	sec				WI1414	Rexroad, Perry
CS	(c) 1.71	cst	1.65		1.85	WI1414	Rexroad, Perry

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	558935	Submission Date	01/18/2012 06:48 AM
Status	Completed	Desired Date	01/23/2012
Disposition	**Info Only**	Commit Date	01/23/2012
Released By	Rexroad, Perry	Completion Date	01/20/2012 11:33 AM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T5		
Oil / Fuel Type	Jet A	Material Spec	ASTM-D-1655
Detailed Instructions	Sample was taken from truck before off load into tank 2		
Distribution List	Ciero, Robert | Williams, Randy | Culbertson, Brad | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A — Date: 01/20/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.2310468		9.1000000		10.9000000	WI1414	Rexroad, Perry
B Coefficient	(c) 3.9032288		3.4000000		4.2000000	WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2414.60					WI1411	Rexroad, Perry
Sample Weight	0.5688	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.5958	°C				WI1411	Rexroad, Perry
Fuse Correction	19	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18511	BTU/lb	18420		18625	WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	43.1	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	70	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 42.205					ASTM-D-1298	Rexroad, Perry
Density	(c) 815	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.8146		0.799		0.825	ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003653					WI1414	Rexroad, Perry
Run #1	366.43	sec				WI1414	Rexroad, Perry
Run #2	366.51	sec				WI1414	Rexroad, Perry
Average Time	(c) 366.47	sec				WI1414	Rexroad, Perry
CS	(c) 1.34	cst	1.08		1.49	WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003653					WI1414	Rexroad, Perry
Run #1	460.18	sec				WI1414	Rexroad, Perry
Run #2	460.24	sec				WI1414	Rexroad, Perry
Average Time	(c) 460.21	sec				WI1414	Rexroad, Perry
CS	(c) 1.68	cst	0.32		1.90	WI1414	Rexroad, Perry

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	558982	Submission Date	01/18/2012 10:09 AM
Status	Completed	Desired Date	02/03/2012
Disposition	**Info Only**	Commit Date	02/03/2012
Released By	Bautista, Karla	Completion Date	01/31/2012 06:14 PM
Custom Id / Title	HEFA SPK Tanker 7	Project / Type	Info Only
Labor Charge Number	7002368937-0050	Material Charge Number	7002368937-0180
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	Delivery Tanker		
Oil / Fuel Type	HEFA SPK	Material Spec	D7566 Table 1 and A1.1
Operating Time	n/a	Engine Serial #	n/a
Tests Required	Water Content (ppm) LHV (BTU/lb) Viscosity Flash Point (F) Distillation Specific Gravity Anti-ice Additive Aromatics Low Temp Viscosity Freeze Point Smoke Point		
Detailed Instructions	Full ASTM D1655/D7566 specification analysis required. Sample from 7th tanker (Tanker 7) delivering HEFA SPK to San Tan. Run as many analyses in-house as possible - including specific gravity, LHV, viscosity (D445), flash point, freeze point (D2386), and distillation (D86). Other properties such as acidity (D3242), aromatics (D1319 or D6379), low temp viscosity (D445 at -20C), sulfur (D5453 or D2622), mercaptan sulfur (D3227), smoke point (D1322), copper strip corrosion (D130), thermal stability at 325C (D3241), existent gum (D381, report washed and unwashed), and MSEP (D3948) may need to be sent to an accredited outside laboratory (recommend Dixie Services). Please also run simulated distillation (D2887) at OP laboratory. Also check hydrocarbon concentration (D2425 and D5291), nitrogen (D4629), and trace metals (ICP, prefer UOP 389). Please use sample in 1-gallon epoxy lined can from CMR 556939 for analyses and send can to OP lab when finished with in-house analyses.		
Distribution List	Williams, Randy		

Customer	Culbertson, Brad	Submitted By	Culbertson, Brad
Phone	+1 602/231-2423	Phone	+1 602/231-2423
Department	BA--60035	Department	BA--60035
Requesting Site	Phoenix		

Test Results

Specimen: 1061433789 — Date: 01/31/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.5561674					WI1414	Bautista, Karla
B Coefficient	(c) 4.0193355					WI1414	Bautista, Karla
Test: Anti-Icing Additive							
DiEGMME	0	% v/v				WI1412	Bautista, Karla
Test: Distillation							

Initial B.P.		302	°F			ASTM-D-86	Bautista, Karla
5% Distilled		320	°F			ASTM-D-86	Bautista, Karla
10% Distilled		330	°F			ASTM-D-86	Bautista, Karla
20% Distilled		348	°F			ASTM-D-86	Bautista, Karla
30% Distilled		370	°F			ASTM-D-86	Bautista, Karla
40% Distilled		392	°F			ASTM-D-86	Bautista, Karla
50% Distilled		416	°F			ASTM-D-86	Bautista, Karla
60% Distilled		438	°F			ASTM-D-86	Bautista, Karla
70% Distilled		458	°F			ASTM-D-86	Bautista, Karla
80% Distilled		476	°F			ASTM-D-86	Bautista, Karla
90% Distilled		494	°F			ASTM-D-86	Bautista, Karla
95% Distilled		504	°F			ASTM-D-86	Bautista, Karla
End Point		522	°F			ASTM-D-86	Bautista, Karla
% Distilled		99.0	%			ASTM-D-86	Bautista, Karla
% Residue		0.9	%			ASTM-D-86	Bautista, Karla
% Loss		(c) 0.1	%			ASTM-D-86	Bautista, Karla
Test: Flash Point - c.c.							
Flash Point		104	°F			ASTM-D-56	Bautista, Karla
Barometric Pressure		29.003	inHg			ASTM-D-56	Bautista, Karla
Corrected Flash Point		(c) 105	°F			ASTM-D-56	Bautista, Karla
Test: Freeze Point							
Freeze Point		-65.2	°F			ASTM-D-2386	Bautista, Karla
Test: LHV							
Calorimeter		Parr 1266				WI1411	Rexroad, Perry
Calorimeter constant		2414.60				WI1411	Rexroad, Perry
Sample Weight		0.5739	g			WI1411	Rexroad, Perry
Tape Weight		0	g			WI1411	Rexroad, Perry
Temperature change		2.6943	°C			WI1411	Rexroad, Perry
Fuse Correction		16	cal			WI1411	Rexroad, Perry
Nitric Acid		12	ml			WI1411	Rexroad, Perry
LHV-FIMS		(c) 18928	BTU/lb			WI1411	Rexroad, Perry
Test: Smoke Point-1 Reference Standard 1							
Toluene		5	%			ASTM-D-1322	Bautista, Karla
Iso-Octane		95	%			ASTM-D-1322	Bautista, Karla
Result 1		36	mm			ASTM-D-1322	Bautista, Karla
Result 2		36	mm			ASTM-D-1322	Bautista, Karla
Result 3		36	mm			ASTM-D-1322	Bautista, Karla
Result Avg		(c) 36	mm			ASTM-D-1322	Bautista, Karla
Expected Value		35.4	mm			ASTM-D-1322	Bautista, Karla
Test: Smoke Point-2 Reference Standard 2							
Toluene		0	%			ASTM-D-1322	Bautista, Karla
Iso-Octane		100	%			ASTM-D-1322	Bautista, Karla
Result 1		43	mm			ASTM-D-1322	Bautista, Karla
Result 2		42	mm			ASTM-D-1322	Bautista, Karla
Result 3		43	mm			ASTM-D-1322	Bautista, Karla
Result Avg		(c) 43	mm			ASTM-D-1322	Bautista, Karla
Expected Value		42.8	mm			ASTM-D-1322	Bautista, Karla
Test: Specific Gravity (A)							
Observed API Gravity		56.2	°API			ASTM-D-1298	Bautista, Karla
Fuel Temperature		68	°F			ASTM-D-1298	Bautista, Karla
API Gravity @ 60 degF		(c) 55.299				ASTM-D-1298	Bautista, Karla
Density		(c) 758	kg/m^3			ASTM-D-1298	Bautista, Karla
Specific Gravity 60/60 degF		0.7575				ASTM-D-1298	Bautista, Karla
Test: Text Results							

Text Result	(see below)			WI1416	Bautista, Karla 01/20/2012

No detectable volume of aromatic content.

Aromatics % volume = 0%

Test: Text Results (2)

Text Result	(see below)			WI6360	Bautista, Karla 01/23/2012

Smoke Point =

50 mm
50 mm
50 mm

Corrected average = 49.5 mm

Results are estimate only due to limitation of standards at 42.8 mm maximum.

Test: Text Results (3)

Text Result	(see below)			per CMR inst.	Bautista, Karla 01/31/2012

D381
Gum content, mg/100 mL
Unwashed = < 1
Washed = < 1

D5453
Sulfur, mg/kg = 3.3

D3227
Mercaptan sulfur, mass % = < 0.0001

D445
Kinematic viscosity, - 20 °C, mm2/s = 4.913

D1840
Napthalenes, volume % = 0.01

D3242
Acid number, mg KOH/g = 0.002

D130
Corrosion copper strip (2 h/100 °C) = 1b

D3241
Thermal oxidation stability, (2.5 h/325 °C)
Heater tube deposit rating, visual = 1
Filter pressure drop, mm Hg = 0.0

D3948
Water separation, MSEP-A rating = 86

D2887
Boiling range distribution, % recovered, °C
IBP 115.0
5 132.5
10 142.0
20 163.0

30	180.0
40	198.5
50	215.5
60	231.0
70	250.0
80	262.5
90	273.0
95	279.0
FBP	295.0

D4629
Nitrogen, mg/kg = 0.4

D5291
Carbon and Hydrogen, mass % = 99.9

UOP389
Trace Metals, mg/kg

Aluminum	< 0.02
Calcium	< 0.02
Cobalt	< 0.02
Chromium	< 0.02
Copper	< 0.02
Iron	< 0.02
Potassium	< 0.02
Magnesium	< 0.02
Manganese	< 0.02
Molybdenum	< 0.02
Sodium	< 0.02
Nickel	< 0.02
Phosphorus	< 0.02
Lead	< 0.02
Strontium	< 0.02
Palladium	< 0.02
Platinum	< 0.02
Tin	< 0.02
Titanium	< 0.02
Vanadium	< 0.02
Zinc	< 0.02

Analyses were completed by Dixie Services. Please see attached results.

Test: Viscosity @ 104F					
Tube number-104	VIS-2384		WI1414	Bautista, Karla	
Run #1	345.47	sec	WI1414	Bautista, Karla	
Run #2	345.63	sec	WI1414	Bautista, Karla	
Average Time	(c) 345.55	sec	WI1414	Bautista, Karla	
CS	(c) 1.36	cst	WI1414	Bautista, Karla	
Test: Viscosity @ 77F					
Other tube constant	0.003939		WI1414	Bautista, Karla	
Run #1	436.74	sec	WI1414	Bautista, Karla	
Run #2	436.69	sec	WI1414	Bautista, Karla	
Average Time	(c) 436.72	sec	WI1414	Bautista, Karla	
CS	(c) 1.72	cst	WI1414	Bautista, Karla	
Test: Water Content (ppm)					
Run #1	20.54	ppm	ASTM-E-1064	Bautista, Karla	
Run #2	19.24	ppm	ASTM-E-1064	Bautista, Karla	

Water Content	(c) 19.89	ppm			ASTM-E-1064	Bautista, Karla
Water Content Standard	This sample was checked against a 50 ppm QC standard				ASTM-E-1064	Bautista, Karla

Specimen: ~Attached Results — Date: 01/31/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Attached Results							
Attached Result	558982.pdf					per CMR inst.	Bautista, Karla 01/31/2012

Specimen: ~Text Results — Date: 01/20/2012

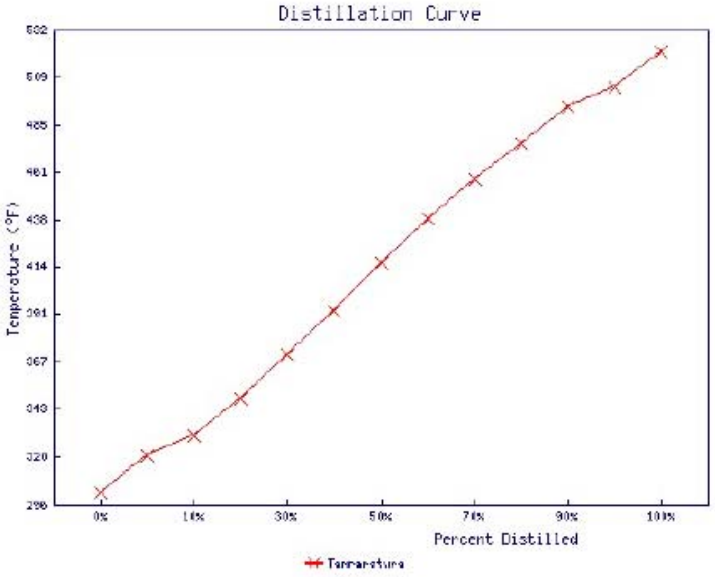
Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Text Results							
Text Result	(see below)					per CMR inst.	Cooper, Terry W. 01/20/2012
PO 6500152174 placed and sampel shipped to Dixie per request							

Distillation Test for Specimen 1061433789

Oil and Fuel CMR # 558982
Material HEFA SPK
Material Specification D7566 Table 1 and A1.1
Test Method ASTM-D-86

		Material Spec Limits	
		Minimum	Maximum
Percent Distilled	99.0		
Percent Residue	0.9		
Percent Loss	0.1		

Percent Distilled	Temperature (°F)	Material Spec Limits	
		Minimum	Maximum
0%	302		
5%	320		
10%	330		
20%	348		
30%	370		
40%	392		
50%	416		
60%	438		
70%	458		
80%	476		
90%	494		
95%	504		
100%	522		



DIXIE SERVICES INCORPORATED

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GALENA PARK, TEXAS 77547
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VOICE 713 672 1619
FACSIMILE 713 672 1634

CERTIFICATE OF ANALYSIS

Number: 140249

Client: Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, Arizona 85034

Date: January 31, 2012

Attention: Terry Cooper

Sample: HEFA SPK, submitted 23 Jan 12
Origin: Truck 7
Marks: CMR 558982

D381	Gum content, mg/100 mL	
	Unwashed	< 1
	Washed	< 1
D5453	Sulfur, mg/kg	3.3
D3227	Mercaptan sulfur, mass %	< 0.0001
D445	Kinematic viscosity, - 20 °C, mm^2/s	4.913
D1840	Napthalenes, volume %	0.01
D3242	Acid number, mg KOH/g	0.002
D130	Corrosion copper strip (2 h/100 °C)	1b
D3241	Thermal oxidation stability, (2.5 h/325 °C)	
	Heater tube deposit rating, visual	1
	Filter pressure drop, mm Hg	0.0
D3948	Water separation, MSEP-A rating	86
D2887	Boiling range distribution, % recovered, °C	
	IBP	115.0
	5	132.5
	10	142.0
	20	163.0
	30	180.0
	40	198.5
	50	215.5
	60	231.0
	70	250.0
	80	262.5
	90	273.0
	95	279.0
	FBP	295.0
D4629	Nitrogen, mg/kg	0.4
D5291	Carbon and Hydrogen, mass %	99.9

UOP389 Trace Metals, mg/kg	
Aluminum	< 0.02
Calcium	< 0.02
Cobalt	< 0.02
Chromium	< 0.02
Copper	< 0.02
Iron	< 0.02
Potassium	< 0.02
Magnesium	< 0.02
Manganese	< 0.02
Molybdenum	< 0.02
Sodium	< 0.02
Nickel	< 0.02
Phosphorus	< 0.02
Lead	< 0.02
Strontium	< 0.02
Palladium	< 0.02
Platinum	< 0.02
Tin	< 0.02
Titanium	< 0.02
Vanadium	< 0.02
Zinc	< 0.02

Dixie Services Incorporated,

Zachary Holland

ZBH/cb

Email Recipients: richard.gadberry@honeywell.com; terry.cooper@honeywell.com
steven.sosa@honeywell.com

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: FIMS Analysis (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	559008	Submission Date	01/18/2012 12:25 PM
Status	Completed	Desired Date	01/23/2012
Disposition	**Info Only**	Commit Date	01/23/2012
Released By	Rexroad, Perry	Completion Date	01/20/2012 12:30 PM
		Project / Type	Info Only
Labor Charge Number	7002368937-0050		
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
Sample Origin	T2		
Oil / Fuel Type	Jet A/Biofuel	Material Spec	ASTM-D-1655
Distribution List	Ciero, Robert | Williams, Randy | Culbertson, Brad | Patterson, Michael		

Customer	Neal, Terry	Submitted By	Neal, Terry
Phone	+1 480/592-7931	Phone	+1 480/592-7931
Department	BA--60122	Department	BA--60122
Requesting Site	Phoenix		

Test Results

Specimen: Jet A/Biofuel — Date: 01/20/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: A&B Coefficients							
A Coefficient	(c) 10.3961948		9.0000000		11.0000000	WI1414	Rexroad, Perry
B Coefficient	(c) 3.9622173		3.0000000		4.4000000	WI1414	Rexroad, Perry
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2414.60					WI1411	Rexroad, Perry
Sample Weight	0.5481	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.5397	°C				WI1411	Rexroad, Perry
Fuse Correction	22	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18720	BTU/lb	18420		18800	WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	49.1	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	66	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 48.503					ASTM-D-1298	Rexroad, Perry
Density	(c) 786	kg/m^3				ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.7861		0.770		0.825	ASTM-D-1298	Rexroad, Perry
Test: Viscosity @ 104F							
Other tube constant	0.003653					WI1414	Rexroad, Perry
Run #1	368.98	sec				WI1414	Rexroad, Perry
Run #2	368.88	sec				WI1414	Rexroad, Perry
Average Time	(c) 368.93	sec				WI1414	Rexroad, Perry
CS	(c) 1.35	cst	1.00		1.50	WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003653					WI1414	Rexroad, Perry
Run #1	465.17	sec				WI1414	Rexroad, Perry
Run #2	465.22	sec				WI1414	Rexroad, Perry
Average Time	(c) 465.20	sec				WI1414	Rexroad, Perry
CS	(c) 1.70	cst	1.30		1.90	WI1414	Rexroad, Perry

DIXIE SERVICES INCORPORATED

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GALENA PARK, TEXAS 77547
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VOICE 713 672 1619
FACSIMILE 713 672 1634

CERTIFICATE OF ANALYSIS

Number: 140535 *Revised 3/15/12*

Date: March 1, 2012

Client: Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, Arizona 85034

Attention: Terry Cooper

Sample: HEFA SPK, submitted 22 Feb 12
Marks: CMR 561373

This certificate is revised to report the individual results for D5291 Carbon and Hydrogen.

D381	Existent gum, mg/100 mL	< 1
D5453	Sulfur, mg/kg	26
D3227	Mercaptan sulfur, mass %	< 0.0001
D445	Kinematic viscosity, - 20 °C, mm^2/s	4.909
D1840	Napthalenes, volume %	0.03
D3242	Acid number, mg KOH/g	0.003
D130	Corrosion copper strip (2 h/100 °C)	1b
D3241	Thermal oxidation stability, (2.5 h/325 °C)	
	Heater tube deposit rating, visual	1
	Filter pressure drop, mm Hg	0.0
D3948	Water separation, MSEP-A rating	92
D2887	Boiling range distribution, % recovered, °C	
	IBP	114.5
	5	132.5
	10	141.5
	20	162.5
	30	179.0
	40	197.5
	50	213.5
	60	229.0
	70	248.5
	80	261.5
	90	272.0
	95	278.0
	FBP	291.0
D4629	Nitrogen, mg/kg	< 0.10
D5291	Carbon, mass %	84.6
	Hydrogen, mass %	15.3
IP 585	Total FAME content, mg/kg	< 4.0
D5452	Particulate contamination, mg/L	0.2
	Volume	1.0

Honeywell

Attn: Terry Cooper
Honeywell International Inc.
3131 Airlane-Engineering
Phoenix, AZ 85034

CMR Result Report
Oil/Fuel Analysis: Oils and Fuels (Phoenix)

Uncontrolled in electronic/hard copy. Verify version in LIMS.

CMR Number	561373 rev B	Submission Date	02/02/2012 04:40 PM
Status	Completed	Desired Date	03/14/2012
Disposition	**NonConforms**	Commit Date	03/14/2012
Released By	Baker, Susan	Completion Date	03/14/2012 10:25 PM
Custom Id / Title	Glendale HEFA SPK	Project / Type	Certify
Labor Charge Number	7002368937-0050	Material Charge Number	7002368937-0180
SAP Project	EG-002166	SAP Work Center	1015-EEMAZZML
TSCA Sample Origin	USA		
Sample Origin	Glendale Storage Tank		
Oil / Fuel Type	HEFA SPK	Material Spec	D7566
Tests Required	Smoke Point		
Detailed Instructions	Analyze can #2 of HEFA SPK from Glendale storage tank to D7566 Annex 2 requirements. Complete as many analysis in house as possible (specific gravity, lower heating value, viscosity, D86 distillation, aromatics, smoke point, water content, etc.) - the balance OP. Will provide OP material charge number later. Hold can #1 for further analysis (or if needed for OP analysis).		
Distribution List	Culbertson, Brad		

Customer	Williams, Randy	Submitted By	Williams, Randy
Phone	+1 602/231-7229	Phone	+1 602/231-7229
Department	BA--60035	Department	BA--60035
Requesting Site	Phoenix		

Test Results

Specimen: ASTM-D-1655&Jet A — Date: 03/14/2012

Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Anti-Icing Additive							
DiEGMME	0.0	% v/v				WI1412	Bautista, Karla
Test: Conductivity							
Conductivity	184	pS/m				WI6400	Bautista, Karla
Temperature	23.7	°C				WI6400	Bautista, Karla
Test: Distillation							
Initial B.P.	302	°F				ASTM-D-86	Bautista, Karla
5% Distilled	320	°F				ASTM-D-86	Bautista, Karla
10% Distilled	330	°F			401	ASTM-D-86	Bautista, Karla
20% Distilled	350	°F				ASTM-D-86	Bautista, Karla
30% Distilled	370	°F				ASTM-D-86	Bautista, Karla
40% Distilled	392	°F				ASTM-D-86	Bautista, Karla
50% Distilled	414	°F				ASTM-D-86	Bautista, Karla
60% Distilled	436	°F				ASTM-D-86	Bautista, Karla
70% Distilled	458	°F				ASTM-D-86	Bautista, Karla
80% Distilled	476	°F				ASTM-D-86	Bautista, Karla
90% Distilled	494	°F				ASTM-D-86	Bautista, Karla
95% Distilled	506	°F				ASTM-D-86	Bautista, Karla
End Point	524	°F			572	ASTM-D-86	Bautista, Karla
% Distilled	98.5	%				ASTM-D-86	Bautista, Karla
% Residue	1.0	%			1.5	ASTM-D-86	Bautista, Karla
% Loss	(c) 0.5	%			1.5	ASTM-D-86	Bautista, Karla
Test: Flash Point - c.c.							
Flash Point	103	°F	100.4			ASTM-D-56	Bautista, Karla

Barometric Pressure	28.842	inHg				ASTM-D-56	Bautista, Karla
Corrected Flash Point	(c) 105	°F				ASTM-D-56	Bautista, Karla
Test: Freeze Point							
Freeze Point	-67	°F			-40	ASTM-D-2386	Bautista, Karla
Test: LHV							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2414.60					WI1411	Rexroad, Perry
Sample Weight	0.5625	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.6485	°C				WI1411	Rexroad, Perry
Fuse Correction	23	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18953	BTU/lb	18400			WI1411	Rexroad, Perry
Test: LHV (MJ/kg)							
Calorimeter	Parr 1266					WI1411	Rexroad, Perry
Calorimeter constant	2414.60					WI1411	Rexroad, Perry
Sample Weight	0.5625	g				WI1411	Rexroad, Perry
Tape Weight	0	g				WI1411	Rexroad, Perry
Temperature change	2.6485	°C				WI1411	Rexroad, Perry
Fuse Correction	23	cal				WI1411	Rexroad, Perry
Nitric Acid	12	ml				WI1411	Rexroad, Perry
LHV-FIMS	(c) 18953	BTU/lb				WI1411	Rexroad, Perry
LHV-converted	(c) 44.09	MJ/kg				WI1411	Rexroad, Perry
Test: Specific Gravity (A)							
Observed API Gravity	55.9	°API				ASTM-D-1298	Rexroad, Perry
Fuel Temperature	69	°F				ASTM-D-1298	Rexroad, Perry
API Gravity @ 60 degF	(c) 54.905					ASTM-D-1298	Rexroad, Perry
Density	(c) 759	kg/m^3	730		770	ASTM-D-1298	Rexroad, Perry
Specific Gravity 60/60 degF	0.7591		0.730		0.770	ASTM-D-1298	Rexroad, Perry
Test: Text Results							
Text Result	(see below)					WI1416	Bautista, Karla 02/06/2012

No detectable volume of aromatic content.

Aromatics % volume = 0%

Test: Text Results (2)							
Text Result	(see below)					WI6360	Bautista, Karla 02/08/2012

Smoke Point =

50 mm
50 mm
50 mm

Corrected average = 50 mm

Results are estimate only due to limitation of standards at 42.8 mm maximum.

Test: Text Results (3)							
Text Result	(see below)					per CMR inst.	Bautista, Karla 03/01/2012

D381
Existent gum, mg/100 mL = < 1

D5453
Sulfur, mg/kg = 26

D3227
Mercaptan sulfur, mass % = < 0.0001

D445
Kinematic viscosity, - 20 °C, mm2/s = 4.909

D1840
Napthalenes, volume % = 0.03

D3242
Acid number, mg KOH/g = 0.003

D130
Corrosion copper strip (2 h/100 °C) = 1b

D3241
Thermal oxidation stability, (2.5 h/325 °C)
Heater tube deposit rating, visual = 1
Filter pressure drop, mm Hg = 0.0

D3948
Water separation, MSEP-A rating = 92

D2887
Boiling range distribution, % recovered, °C

IBP	114.5
05	132.5
10	141.5
20	162.5
30	179.0
40	197.5
50	213.5
60	229.0
70	248.5
80	261.5
90	272.0
95	278.0
FBP	291.0

D4629
Nitrogen, mg/kg = < 0.10

D5291
Carbon and Hydrogen, mass % = 99.9

IP 585
Total FAME content, mg/kg = < 4.0

D5452
Particulate contamination, mg/L = 0.2
Volume = 1.0

UOP389
Trace Metals, mg/kg

Aluminum	< 0.02
Calcium	0.02

Cobalt	< 0.02
Chromium	< 0.02
Copper	< 0.02
Iron	0.02
Potassium	0.04
Magnesium	< 0.02
Manganese	< 0.02
Molybdenum	< 0.02
Sodium	0.02
Nickel	< 0.02
Phosphorus	< 0.02
Lead	< 0.02
Strontium	< 0.02
Palladium	< 0.02
Platinum	< 0.02
Tin	< 0.02
Titanium	< 0.02
Vanadium	< 0.02
Lithium	< 0.02
Zinc	< 0.02

Analyses were completed by Dixie Services. Please see attached results.

Test: Text Results (4)							
Text Result	(see below)					per CMR inst.	Bautista, Karla 03/01/2012

HEFA SPK sample does not conform to ASTM D7566 requirements due to the following analysis:

D5453 - Sulfur (maximum value = 15 mg/kg)
Results = 26 mg/kg

Test: Viscosity @ 104F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	366.73	sec				WI1414	Rexroad, Perry
Run #2	366.64	sec				WI1414	Rexroad, Perry
Average Time	(c) 366.69	sec				WI1414	Rexroad, Perry
CS	(c) 1.35	cst	1.2		1.5	WI1414	Rexroad, Perry
Test: Viscosity @ 77F							
Other tube constant	0.003676					WI1414	Rexroad, Perry
Run #1	464.01	sec				WI1414	Rexroad, Perry
Run #2	464.19	sec				WI1414	Rexroad, Perry
Average Time	(c) 464.10	sec				WI1414	Rexroad, Perry
CS	(c) 1.71	cst	1.65		1.85	WI1414	Rexroad, Perry
Test: Water Content (ppm)							
Run #1	16.43	ppm				ASTM-E-1064	Baker, Susan
Run #2	15.07	ppm				ASTM-E-1064	Baker, Susan
Water Content	(c) 15.75	ppm			90	ASTM-E-1064	Baker, Susan
Water Content Standard	This sample was checked against a 50 ppm QC standard					ASTM-E-1064	Baker, Susan

Specimen: ~Attached Results							Date: 03/01/2012
Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Attached Results							
Attached Result	561373.pdf					per CMR inst.	Bautista, Karla 03/01/2012

Specimen: ~Text Results							Date: 02/21/2012
Property	Result	Units	LL	T	UL	SOP	Analyst
Test: Text Results							

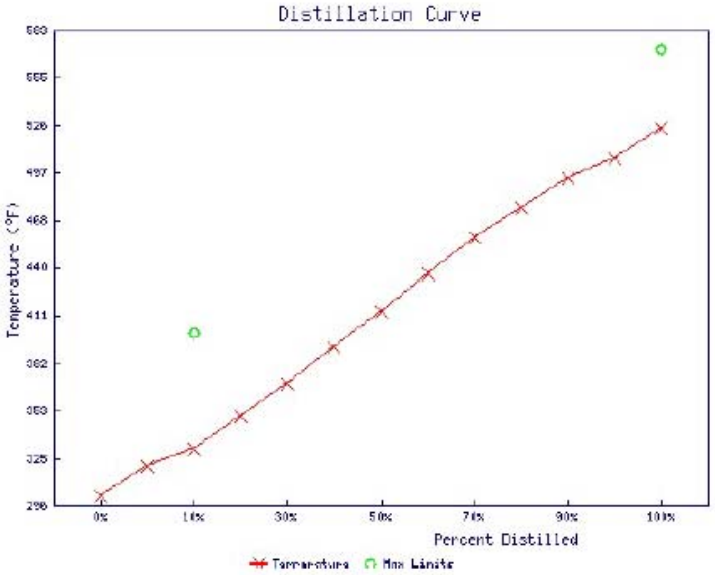
Text Result	(see below)			per CMR inst.	Cooper, Terry W. 02/21/2012
PO 6500156929 has been placed and sample shipped to Dixie per request.					

Distillation Test for Specimen ASTM-D-1655&Jet A

Oil and Fuel CMR # 561373
Material HEFA SPK
Material Specification D7566
Test Method ASTM-D-86

		Material Spec Limits	
		Minimum	Maximum
Percent Distilled	98.5		
Percent Residue	1.0		1.5
Percent Loss	0.5		1.5

Percent Distilled	Temperature (°F)	Material Spec Limits	
		Minimum	Maximum
0%	302		
5%	320		
10%	330		401
20%	350		
30%	370		
40%	392		
50%	414		
60%	436		
70%	458		
80%	476		
90%	494		
95%	506		
100%	524		572



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Appendix IV

EFDV, HMU, and Fuel Filter Posttest Inspection Report

(10 Pages)

HTF7000 FHC0832 Bio-Fuel Evaluation

N. E. Wilson
Engineer II
Hydro-mechanical Fuel Controls
Fuel and Actuation, MCOE

G. E. Kline
Sr. Project Engineer
Hydro-mechanical Fuel Controls
Fuel and Actuation, MCOE

The HTF7000 hydro-mechanical fuel control, ecology flow divider valve and fuel filter element were delivered to Honeywell Aerospace in South Bend, IN for an evaluation of performance after testing with bio-fuel. Substantial testing has been conducted including bypass valve performance, low pump speed performance and simulated engine break-in test. The following will report the testing results including ATP test results, findings during teardown and complete photographs of the valve assemblies.

Keywords: Bio-fuel, HTF7000, FHC0832, ATP, FDAZ0727

Models: FH-C6

1 INTRODUCTION

The hydro-mechanical fuel control (HMU, PN 442599, SN FHC0832), ecology flow divider valve (EFDV, PN 442425, SN FDAZ0727) and fuel filter element (PN 2688211) for the HTF7000 engine were delivered to Honeywell Aerospace in South Bend, IN to evaluate the performance before and after completing 345 hours of accelerated engine cycle testing with a 50/50 blend of stand JET A and HEFA-SPK bio-fuel meeting the requirements of D7566. The ATP was performed in April of 2011 in Rocky Mount, NC and then again as received in March of 2012 in South Bend, IN. Subsequent transient testing was completed per PDARs 953, 973S4 and 746 on test cell 1421 in South Bend for reference. Upon completion of all required tests, a complete teardown and pictorial evaluation was completed with photographs reported in section 3.

2 TEST RESULTS

2.1 HMU

All test points for the as-shipped ATP from Rocky Mount were in-limits. The run-as-received (RAR) ATP yielded several high-flow test points that were low out of limits (LOOL), in particular TP 660, 670 and 675. Repeat testing from paragraph 6 of the ATP was completed for comparitive analysis to the previous test results. As was the case in the original RAR, TP 660, 670 and 675 resulted in LOOL flow and another out of limits test point, TP 640, which was high out of limits (HOOL).

To summarize the results and comparison of the ATP data:

- As-shipped ATP - all points within limits
- As-received ATP - high-flow points LOOL (TP 660, 670, 675)
- Paragraph 6 of ATP after several tests with bio-fuel – high-flow points LOOL (TP 660, 670, 675) and TP 640 HOOL.

2.2 EFDV

An ATP was completed as-shipped and as-received and reported no test points that were out of limits.

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3 TEARDOWN COMPONENT PHOTOGRAPHS

Figure 1

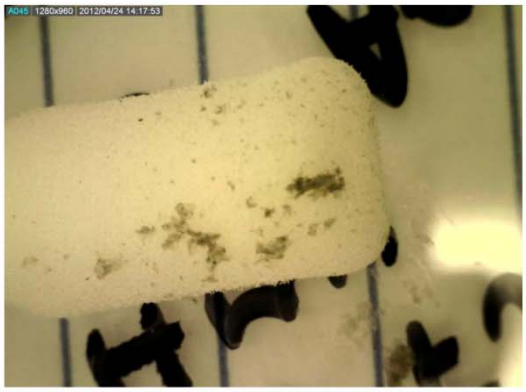

Figure 2

Figure 3

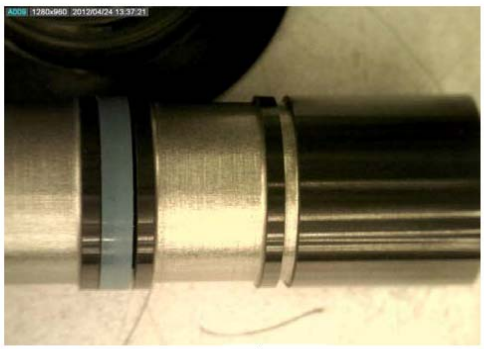

Figure 4

Figure 5

Figure 6

Figure 7

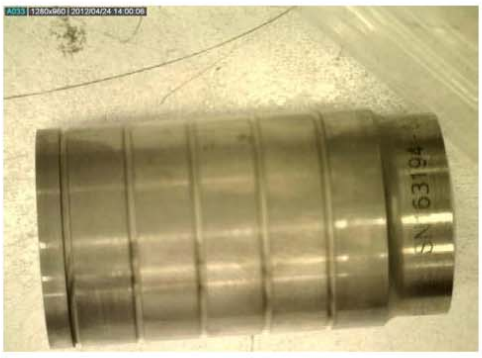

Figure 8

Figure 9

Figure 10

Figure 11

Figure 12

Figure 13

Figure 14

Figure 15

Figure 16

Figure 17

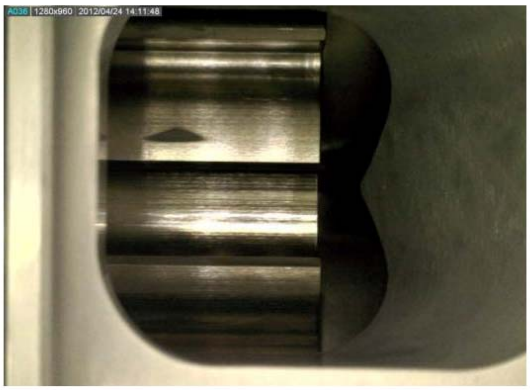

Figure 18

Figure 19

Figure 20

Figure 21

Figure 22

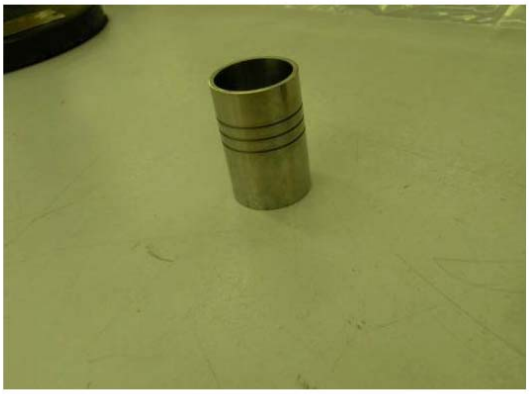

Figure 23

3.3 FUEL FILTER ELEMENT

The fuel filter element was delivered to the supplier and had a post-test analysis performed. No major findings related to biofuel exposure were observed.

4 CONCLUSIONS

Upon completion of the testing and teardown of the HMU, EFDV and fuel filter element, including visual inspection of the valve assemblies, there were no major findings. The component test results and findings are reflective only of the limited exposure to bio-fuel and may not be indicative or long-term use. There was a small amount of particulate collected in the metering valve and P_x channel upon removal of the LVDT and metering valve. This material appeared to be comprised of a gum substance with what appeared to be flecks of dirt. The material has been since collected although no formal material lab analysis was conducted. All valves exhibited signs of normal use and the pump gears and impeller were in good working condition.

The test points that were HOOL and LOOL are thought to be the result of head drop and not to be a consequence of bio-fuel exposure. It is recommended that further investigation of the head drop be evaluated.

Honeywell

Signatures

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