

[LSD 09-27-31-04W5] ALTAGAS HARMATTAN

Customer: PTRHTF20169
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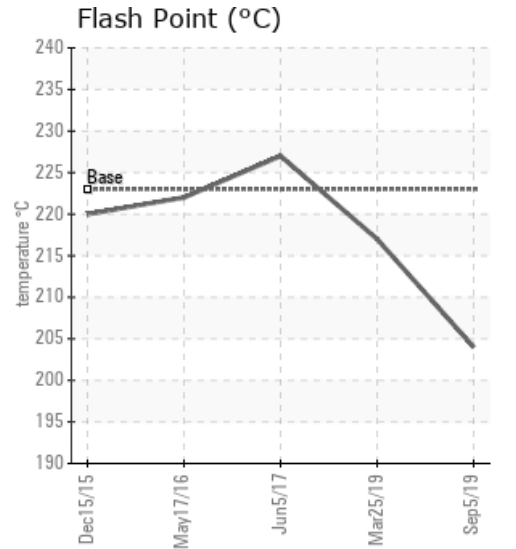
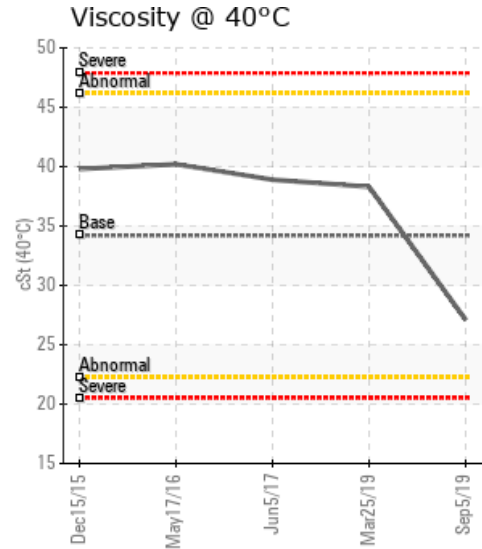
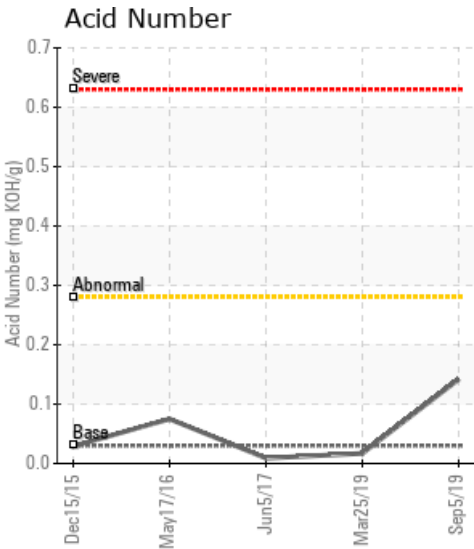
System Information
 System Volume: 90000 ltr
 Bulk Operating Temp: 464F / 240C
 Heating Source:
 Blanket:
 Fluid: PETRO CANADA PETRO-THERM
 Make: DIRECT FIRE HEATER

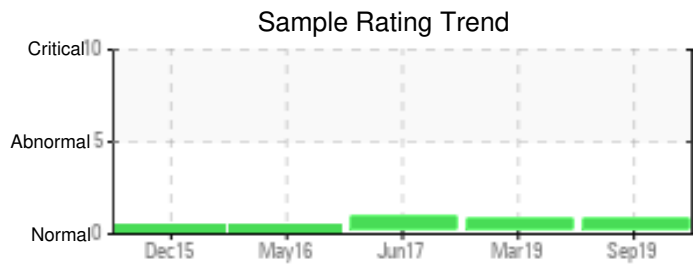
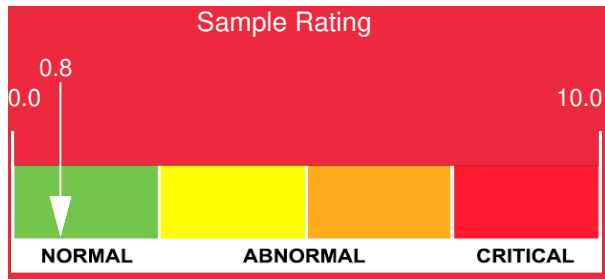
Sample Information
 Lab No: 02308922
 Analyst: Kevin McDermott
 Sample Date: 09/05/19
 Received Date: 09/17/19
 Completed: 09/23/19

Recommendation: Several fluid properties have changed noticeably since the previous sample due to recent exchanger leak however fluid condition remains in good condition for further service and no action needs to be taken. Suggest to continue with annual samples or sooner if there are suspected process conditions that could stress or contaminate the fluid.

Comments:

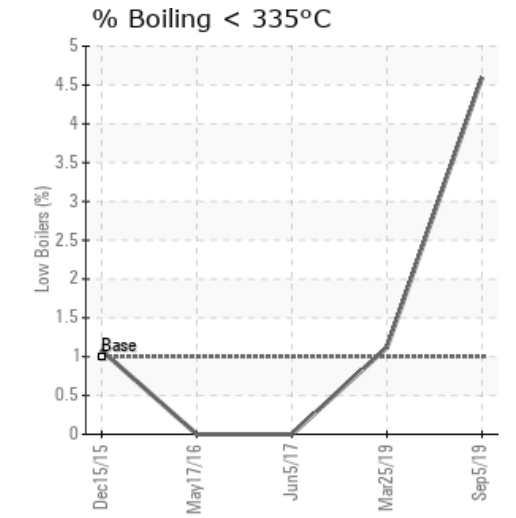
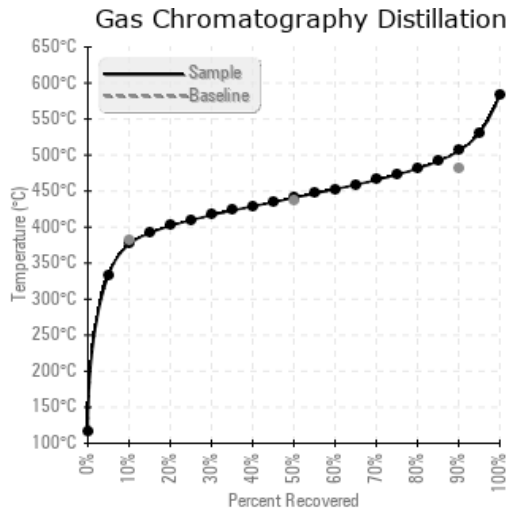
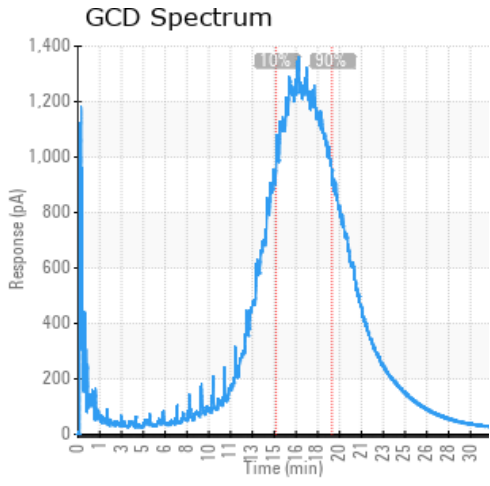
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
09/05/19	09/17/19	20y	DISCHARGE CIRC. PUMP	399 / 204	11.3	27.1	0.142	0.304	710 / 377	825 / 441	942 / 506	4.60
03/25/19	03/26/19	0y	CL1903-0258	423 / 217	11.5	38.3	0.017	0.017	718 / 381	812 / 433	921 / 494	1.12
06/05/17	08/03/17	0y	HOT OIL PUMP SUCTION	441 / 227	5.0	38.9	0.009	0.041	735 / 391	826 / 441	946 / 508	0.00
05/17/16	05/18/16	17y		432 / 222	0.00	40.2	0.075	0.013	730 / 388	823 / 440	932 / 500	0.00
12/15/15	12/21/15	17y	PUMP SUCTION	428 / 220	1.4	39.8	0.029	0.086	721 / 383	813 / 434	917 / 491	1.08
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00





Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc	
09/05/19	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
03/25/19	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/05/17	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/17/16	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	1	
12/15/15	17	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Baseline Data			0	0						0		0	0					0					0		

Elemental analysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]



Historical Comments	
03/25/19	Fluid remains in very good condition. No significant change from the previous sample June 2017. Suggest to continue submitting samples of used fluid annually to proactively monitor the condition. (GCD) 90% Distillation Point is marginally high.
06/05/17	Viscosity @ 40c a little higher than expected as in previous samples. The GCD 90% number is also high. Fluid remains in good condition overall and fit for continued use. Resample in a year or so. Or sooner if the fluid gets exposed to harsh conditions such as overheating, lack of circulation or absence of blanket gas.
05/17/16	Viscosity @ 40c is a little higher than expected but no change since Dec 2015 sample. Otherwise fluid in very good condition. Resample in 12 months to proactively monitor fluid condition.
12/15/15	Viscosity values are higher than expected but fluid is otherwise in very good condition. Re-sample in 12 months or sooner if process conditions become severe. Visc @ 40°C is abnormally high.

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