

[1-24-52-20W5] H4010 (H500)-DISCHARGE OF PUMP

Customer: PTRHTF20103
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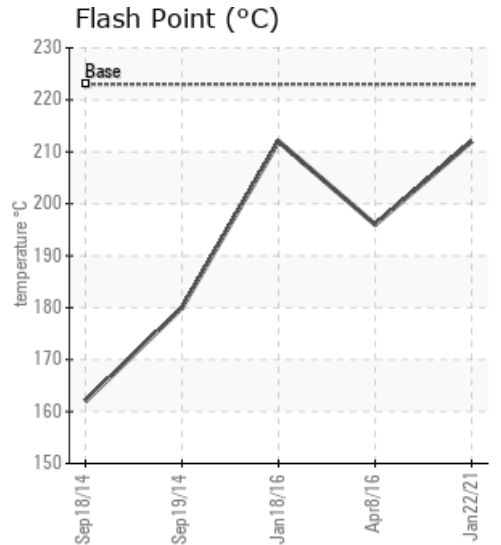
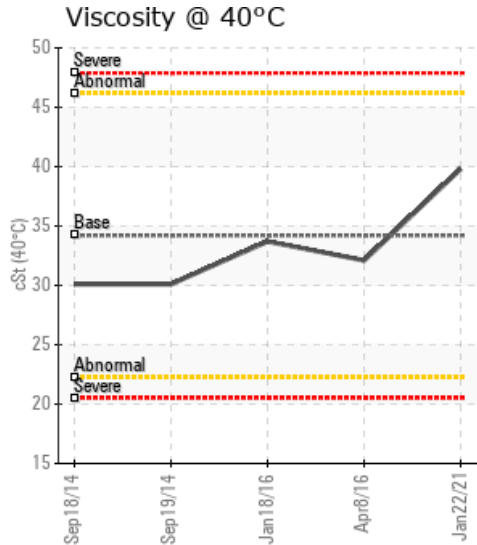
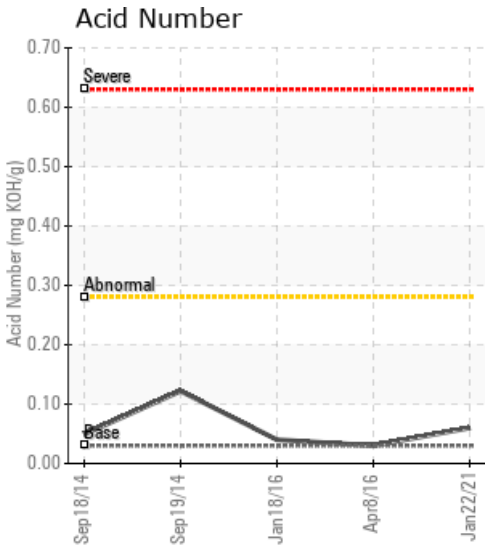
System Information
 System Volume: 17000 ltr
 Bulk Operating Temp: 500F / 260C
 Heating Source:
 Blanket:
 Fluid: PETRO CANADA PETRO-THERM
 Make: ALCO

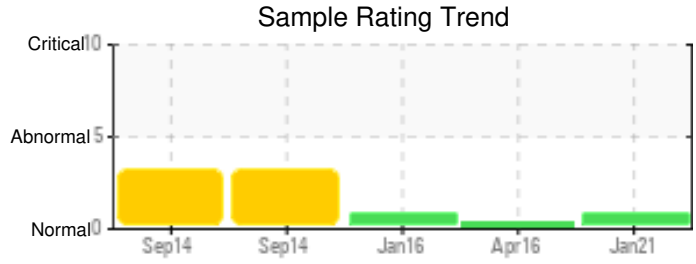
Sample Information
 Lab No: 02400092
 Analyst: Peter Harteveld
 Sample Date: 01/22/21
 Received Date: 01/27/21
 Completed: 02/16/21
 Peter Harteveld
 peter.harteveld@hollyfrontier.com

Recommendation: The fluid is in a good condition but slightly elevated viscosity at 40C combined with a high 90% GCD temperature indicates the onset of oxidation. Please ensure the blanket gas system is in good working order. Pentane Insoluble (solids) content is getting close the reportable limit of 0.5%. Please consider fluid filtration in the near future. Resample in 12 months.

Comments: Pentane Insolubles levels are abnormally high.

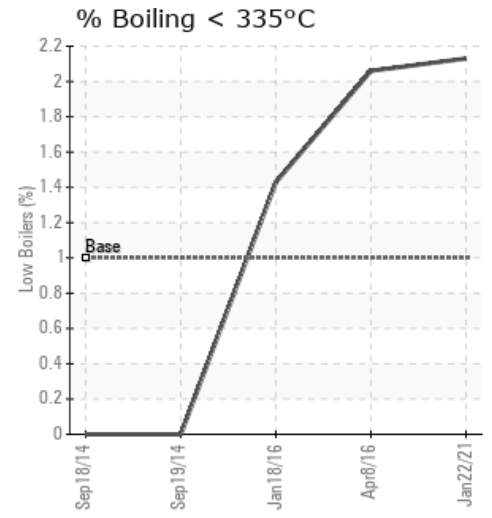
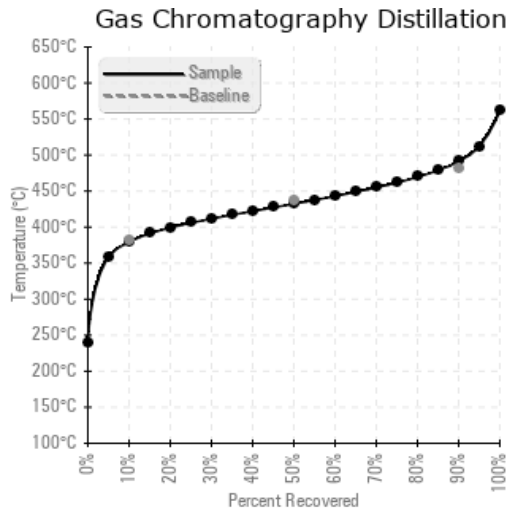
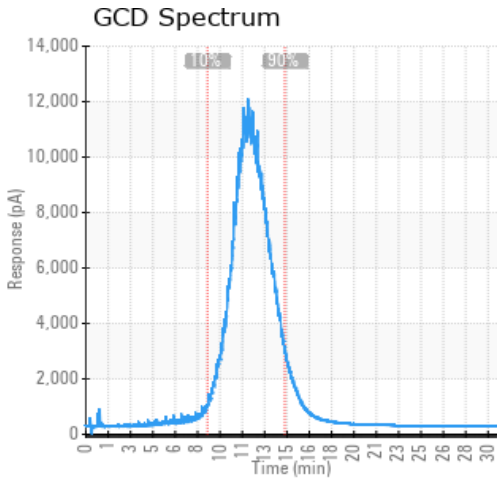
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/22/21	01/27/21	0.0y		414 / 212	9.7	39.8	0.06	0.468	715 / 379	810 / 432	916 / 491	2.13
04/08/16	05/04/16	1.0y	1-24-52-20W5	385 / 196	2.2	32.1	0.03	0.054	711 / 377	808 / 431	916 / 491	2.06
01/18/16	02/19/16	0.0y	SIGHT GLASS	414 / 212	26.1	33.7	0.04	0.065	715 / 380	812 / 434	920 / 493	1.43
09/19/14	10/07/14	0.0y	DISCHARGE OF PUMP	356 / 180	13.5	30.1	0.122	0.671	711 / 377	804 / 429	917 / 492	0.00
09/18/14	10/07/14	0.0y	DISCHARGE OF PUMP	324 / 162	18.5	30.1	0.049	0.604	724 / 385	810 / 432	911 / 488	0.00
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
01/22/21	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
04/08/16	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
01/18/16	2	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
09/19/14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
09/18/14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	
04/08/16	The fluid is in good condition and suitable for further use. Please re-sample in 12 months.
01/18/16	The fluid is in good condition and suitable for further use. Please re-sample in 12 months. Indicate fluid service life at next sample. (GCD) 90% Distillation Point is marginally high.
09/19/14	Flash Point is low. This is an indication of thermal degradation but judging from other parameters like viscosity and the distillation curve, the degradation at this moment is minor. It is however recommended to vent off lower boiler vapors to restore the Flash Point to a higher (safer) temperature. (This comment is based on the use of N2 blanket gas. When natural gas is used as blanket gas, it can be the cause of Flash Point reduction. The Pentane Insoluble (solids) content of the fluid has just exceeded the warning limit of 0.5%. Immediate action is not required at this moment but in the near future filtration of the fluid should be considered to prevent solids from depositing on heat exchanger internals. Pentane Insolubles levels are severely high. COC Flash Point is marginally low.
09/18/14	Flash Point is low. This is an indication of thermal degradation but judging from other parameters like viscosity and the distillation curve, the degradation at this moment is minor. It is however recommended to vent off lower boiler vapors to restore the Flash Point to a higher (safer) temperature. (This comment is based on the use of N2 blanket gas. When natural gas is used as blanket gas, it can be the cause of Flash Point reduction. The Pentane Insoluble (solids) content of the fluid has just exceeded the warning limit of 0.5%. Immediate action is not required at this moment but in the near future filtration of the fluid should be considered to prevent solids from depositing on heat exchanger internals. Pentane Insolubles levels are severely high. COC Flash Point is severely low.

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