

[PLATEAU] ENERGY PLANT FURNACE

Customer: PTRHTF20249
 Canfor - Plateau
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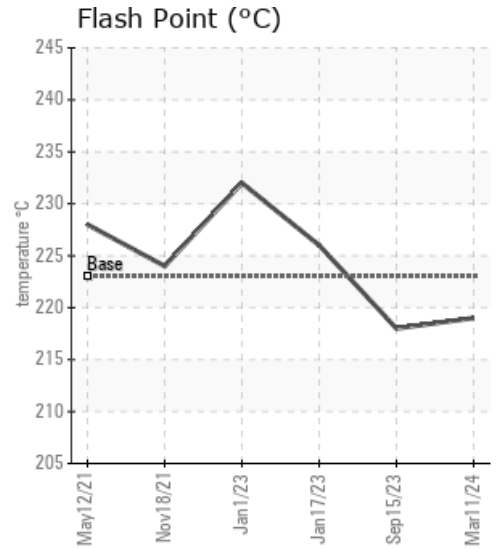
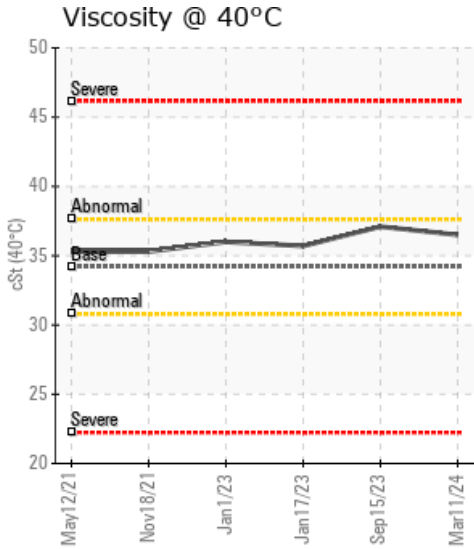
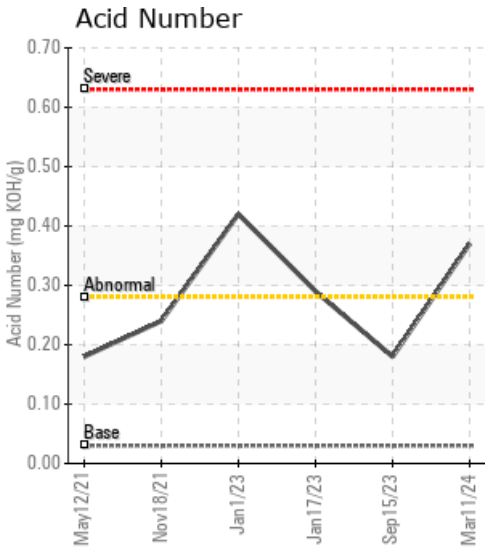
System Information
 System Volume: 190000 ltr
 Bulk Operating Temp: 455F / 235C
 Heating Source:
 Blanket:
 Fluid: PETRO CANADA PETRO-THERM
 Make: DELTECH

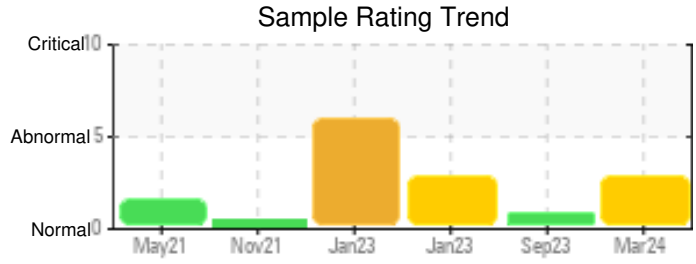
Sample Information
 Lab No: 02623180
 Analyst: Ray Rolston
 Sample Date: 03/11/24
 Received Date: 03/19/24
 Completed: 03/22/24
 Ray Rolston
 Ray.Rolston@HFSinclair.com

Recommendation: Iron wear continues its increasing trend; it is currently 116 ppm approaching the warning guideline of 200 ppm. Water content is low at 39 ppm. Acid Number (AN) has increased to 0.37 mg KOH/g but it remains below the guideline of 1.0. Viscosity is normal. COC Flash Point is typical at 223 C. Gas Chromatography Distillation (GCD) Initial Boiling Point (IBP) result of 98 deg C indicates the presence of thermally cracked light ends. The Final Boiling Point (FBP) of 559.9 deg C is higher than the typical of 542 deg C. Pentane Insolubles (solids) content is flagged at 0.654 wt% which exceeds the warning guideline of 0.5 wt%. Filtration is recommended. Recommend submitting another sample in 6 months to monitor.

Comments: Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high.

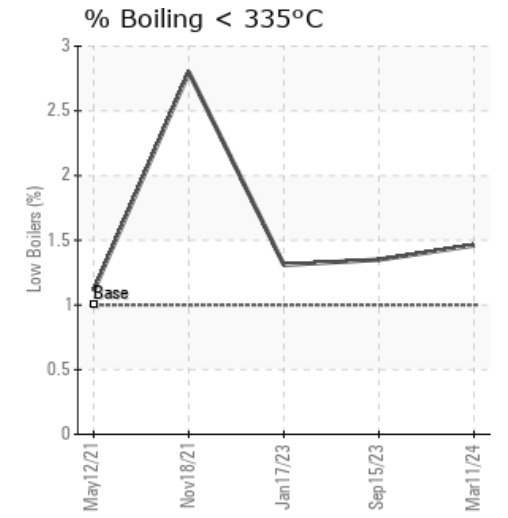
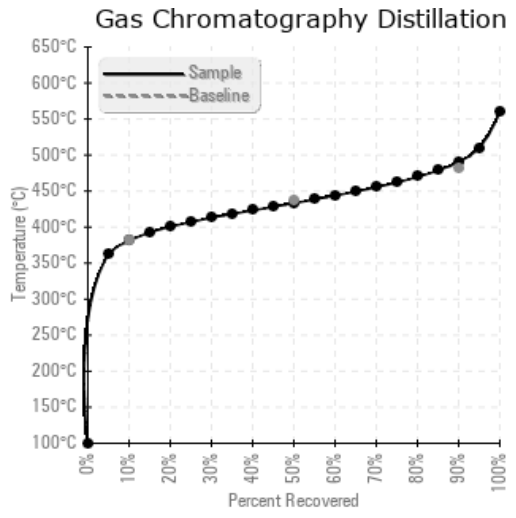
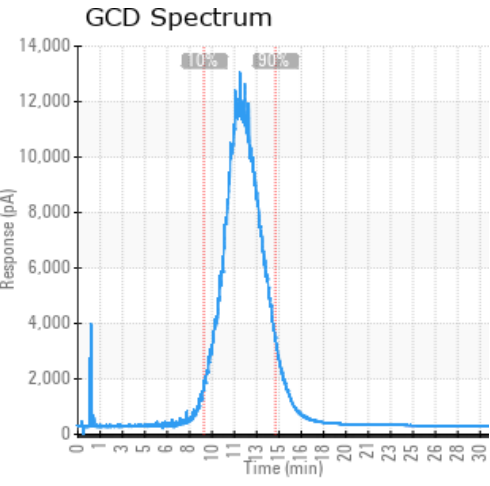
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
03/11/24	03/19/24	14.0y		426 / 219	39	36.5	0.37	0.654	717 / 381	812 / 433	915 / 490	1.46
09/15/23	09/28/23	13.0y		424 / 218	36.9	37.1	0.18	0.484	719 / 382	812 / 433	914 / 490	1.35
01/17/23	01/26/23	13.0y	PRIMARY PIPE	439 / 226	114.0	35.7	0.29	0.397	727 / 386	820 / 438	919 / 493	1.31
01/01/23	01/09/23	13.0y		450 / 232	6112.2	36.0	0.42	0.211				
11/18/21	12/03/21	11.0y	pipe before stack	435 / 224	32.0	35.3	0.24	0.092	711 / 377	811 / 433	911 / 489	2.80
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
03/11/24	116	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	3	0	0	0
09/15/23	109	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	2	0	0	0	3	0	0	1
01/17/23	76	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0
01/01/23	79	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	2	0	0	3
11/18/21	25	0	0	0	0	0	0	0	0	0	0	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	
09/15/23	The fluid is in a good condition and suitable for further use. The Pentane Insolubles (solids) content has increased and is getting close to the reportable limit of 0.5%. If the system is equipped with filtration it is advised to replace/clean the filter elements more frequently. If no filtration is installed it is recommended to install this or filter the fluid via external filtration. Please re-sample in 6 months. Pentane Insolubles levels are abnormally high.
01/17/23	Thank you for re-sampling. Iron wear is elevated at 76 ppm, though other metals are low. Water content is significantly lower at 114 ppm vs. 6112 ppm on the Jan 1/23 sample. The Acid Number (AN) at 0.29 mg KOH/g is also more in line with previous samples. COC Flash Point and Gas Chromatography Distillation (GCD) results are good. Pentane Insolubles (solids) content is flagged with a caution warning at 0.397 wt%. Recommend submitting another sample in 6 months to monitor the heat transfer fluid's condition. Pentane Insolubles levels are abnormally high. Acid Number (AN) is abnormally high. (GCD) 90% Distillation Point is marginally high.
01/01/23	The sample was not taken correctly; please submit another heat transfer fluid sample. Iron wear has increased from 25 ppm to 79 ppm likely due to a sampling anomaly. Water content was measured at 0.611% or 6,112 ppm compared with the previous samples of 32 ppm and 20.7 ppm with free water >10%. The Acid Number (AN) has almost doubled from 0.24 to 0.42 mg KOH/g which triggered a warning. Pentane Insolubles (solids) content has also increased from 0.092% on the previous sample to 0.211%. A simulated distillation (GCD) could not be run due to the high water content. Water contamination levels are severely high. Water contamination levels are severely high. ppm Water contamination levels are severely high. *** SimDis (GCD) not run due to high water content present in the sample *** Acid Number (AN) is abnormally high.
11/18/21	The iron content on this sample is 25 ppm compared with 8 ppm on the May 2021 sample. This may be due to differences in the way that the sample was obtained, or perhaps the sample was taken from a different location. Water content at 32 ppm and Acid Number (AN) at 0.24 mg KOH/g are low which is good. Cleveland Open Cup (COC) Flash Point and Gas Chromatograph Distillation (GCD) are good, although the Initial Boiling Point (IBP) is very low at 183 C (fresh = 316 C), and 2.8% GCD % < 335 C is elevated (fresh = 1%) indicating that some low boiler light fractions are present. Pentane Insolubles (solids content) has decreased from 0.564 wt% on the previous sample to 0.092 wt% suggesting that the oil has either been filtered, or a more representative sample was drawn. All other inspections are normal. Re-sample in 12 months to monitor.

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