

HEAT TRANSFER FLUID POWER FLAME

Customer: PTRHTF10116
 CERTAINTEED - SAINT GOBAIN
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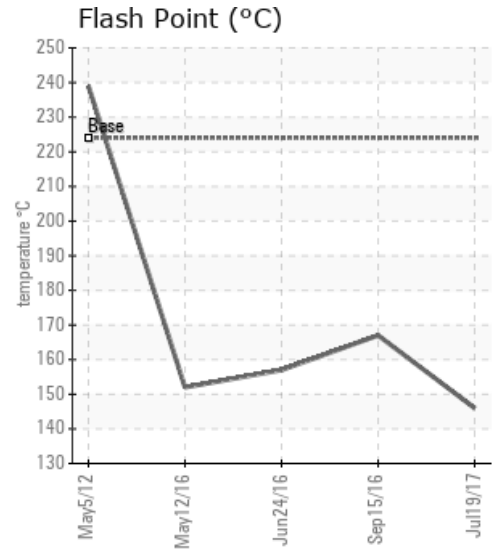
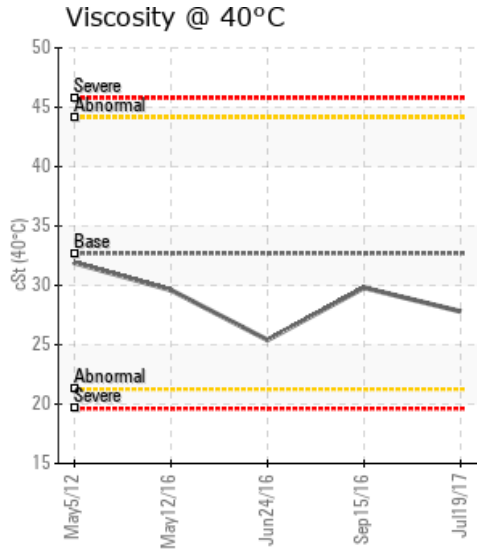
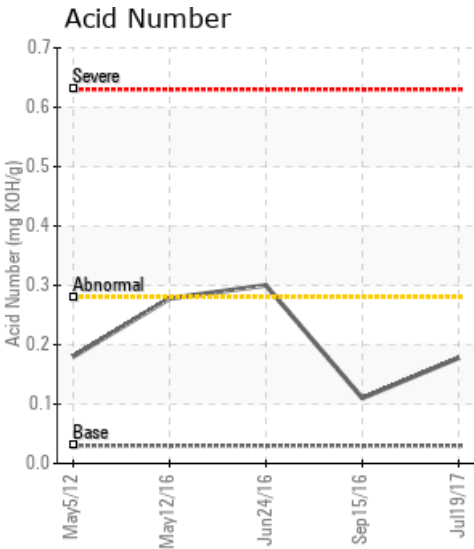
System Information
 System Volume: 1500 gal
 Bulk Operating Temp: 550F / 288C
 Heating Source:
 Blanket:
 Fluid: PETRO CANADA CALFLO AF
 Make: POWER FLAME

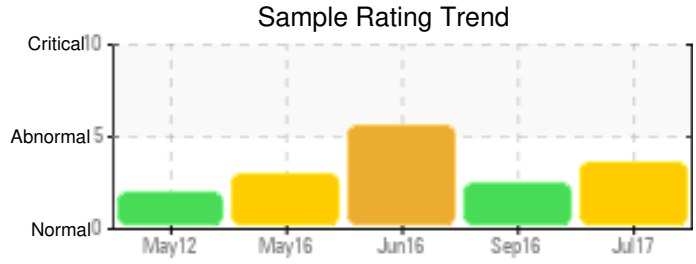
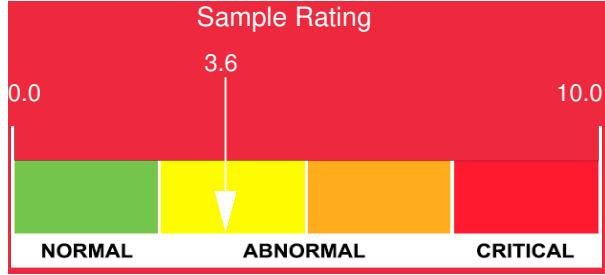
Sample Information
 Lab No: 02159936
 Analyst: Gaston Arseneault
 Sample Date: 07/19/17
 Received Date: 07/27/17
 Completed: 08/08/17

Recommendation: Fluid flash point has been low since intense monitoring that began in May 2016. The viscosity has also been low and solids increased. We recommend looking at heater output to do the same job compared to a few years ago. Meanwhile, venting low boilers should be done to remove low boiling material from the system. A partial fluid replacement (~30%) would also go a long way to improving the fluid condition, but the root cause of why this system works harder than the others may need to be investigated.

Comments: (GCD) 90% Distillation Point is severely high. COC Flash Point is severely low.

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	%
07/19/17	07/27/17	1h	LAMINATE SUPPLY VALV	295 / 146	15.9	27.8	0.178	0.199	686 / 364	804 / 429	929 / 498	4.37
09/15/16	09/22/16	0h	LAMINATE VALVE	333 / 167	41.8	29.8	0.11	0.078	679 / 360	801 / 427	919 / 493	4.83
06/24/16	07/05/16	0h	LAMINATE VALVE	315 / 157	18.0	25.4	0.300	0.091	672 / 356	795 / 424	917 / 492	5.45
05/12/16	05/24/16	0h	DOMINATE VALVE	306 / 152	31.8	29.6	0.278	0.091	677 / 358	798 / 426	909 / 487	5.15
05/05/12	05/14/12	4h	HOT OIL RETURN TO HE	462 / 239	44	31.9	0.18	0.027	701 / 371	812 / 434	924 / 495	3.272
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5

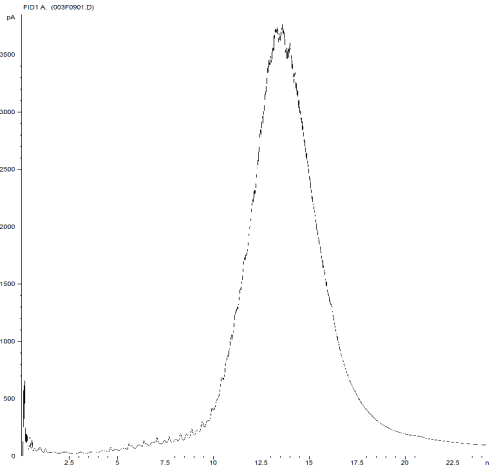




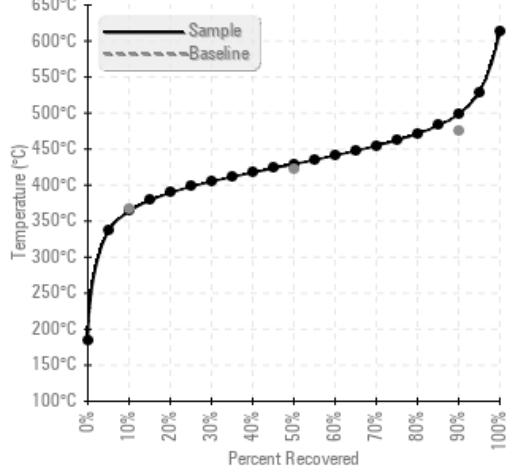
Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
07/19/17	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83	5
09/15/16	22	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	4	0	0	0	70	1
06/24/16	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	66	1
05/12/16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	1
05/05/12	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	92	0
Baseline Data			0	0						0		0	0						0				270	

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

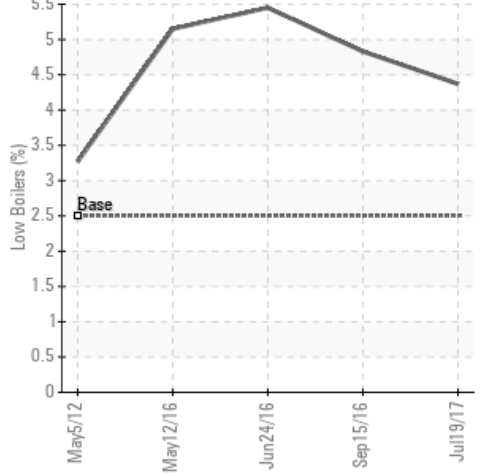
GCD Spectrum



Gas Chromatography Distillation



% Boiling < 335°C



Historical Comments	
09/15/16	The oil condition improved modestly with the viscosity and flash point slightly closer to fresh oil. We suggest to re-sample in 6 months to keep monitoring the fluid condition. (GCD) 90% Distillation Point is abnormally high. COC Flash Point is abnormally low.
06/24/16	The fluid is still low viscosity and low flash point. That combined with the high GCD 90% temperature indicate thermal cracking. We suggest to perform venting of low boilers on this system and replace the volume lost by adding fresh oil. Fresh oil level in the expansion tank should be 75% full when the system is operating (and 25% level when the system is cold). COC Flash Point is severely low. Acid Number (AN) is abnormally high. (GCD) 90% Distillation Point is abnormally high.
05/12/16	The low boilers need to be vented off to increase the flash point and reduce any fire hazard. Also check the thermostat and monitor the heating temperature to make sure it isn't causing thermal cracking, low boilers and deposits. COC Flash Point is severely low. (GCD) 90% Distillation Point is marginally high.
05/05/12	We shall keep monitoring this fluid. More than 1 test suggest that the oil has started to oxidize and is not slightly heavier than normal. The elevated flash point, the high 90% distillation temperature, the 0.18 Total Acid Number. Let's keep an eye on future samples. We will send reminders for sampling every 6 months just so we can build a data set in an accelerated way so we can observe trends.

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