

[Tourmaline / 3-16-60-02W6] HEAT MEDIUM

Customer: PTRHTF20175
 QUADRA CHEMICALS
 7802 98 STREET
 CLAIRMONT, AB T0H 0W0 Canada
 Attn: Quadra Samples
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 E-Mail: quadra_samples@quadra.ca

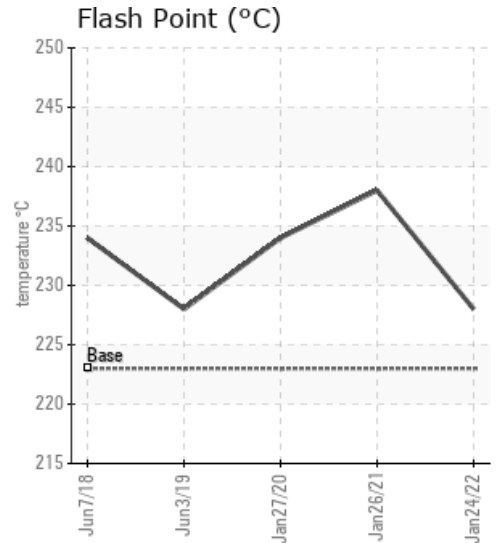
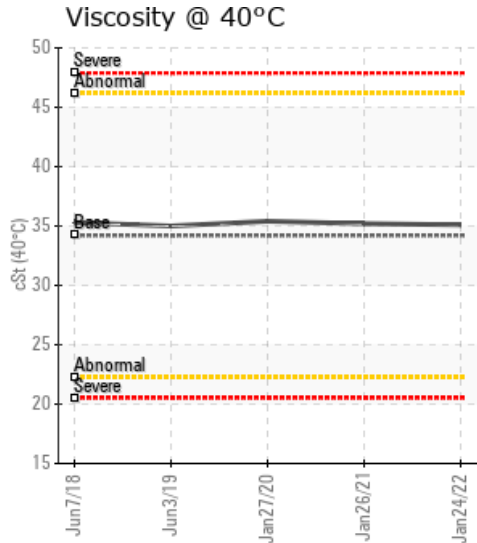
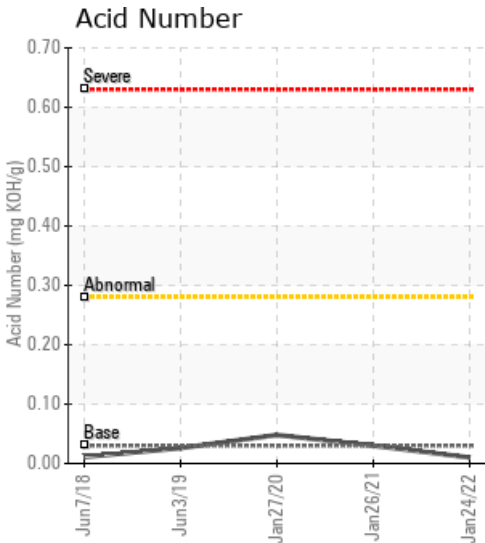
System Information
 System Volume: 23000 ltr
 Bulk Operating Temp: 374F / 190C
 Heating Source:
 Blanket:
 Fluid: PETRO CANADA PETRO-THERM
 Make: HTH HEATECH INC

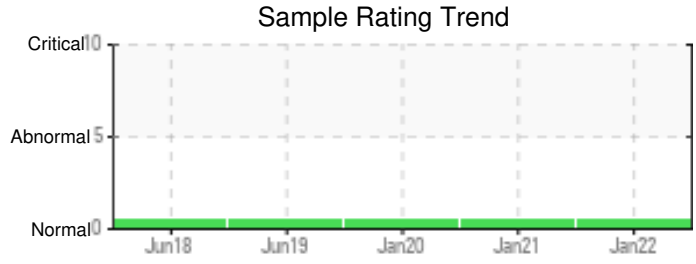
Sample Information
 Lab No: 02473254
 Analyst: Clinton Buhler
 Sample Date: 01/24/22
 Received Date: 02/22/22
 Completed: 02/23/22
 Clinton Buhler
 Clinton.Buhler@hollyfrontier.com

Recommendation: Sample results indicate that the fluid is in suitable condition for continued service. Please re-sample in 12 months.

Comments:

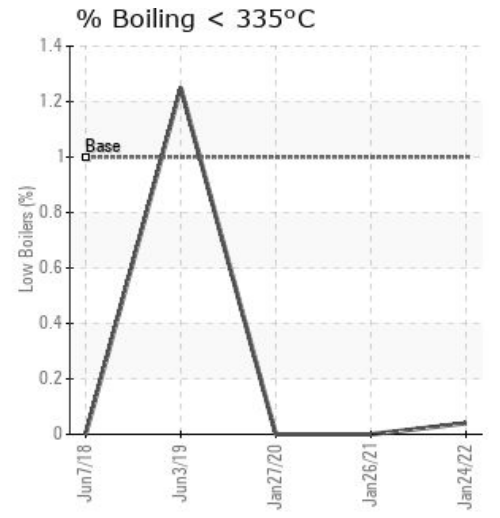
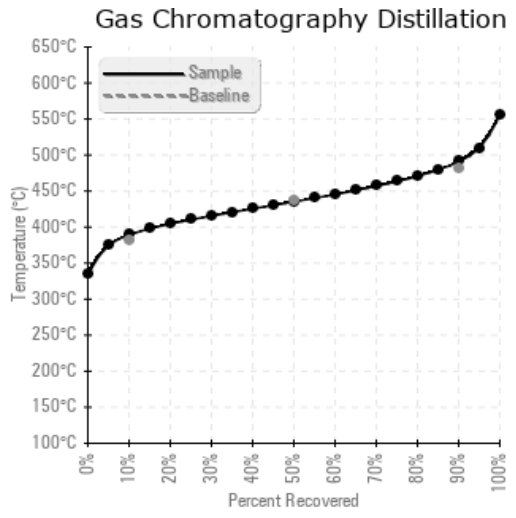
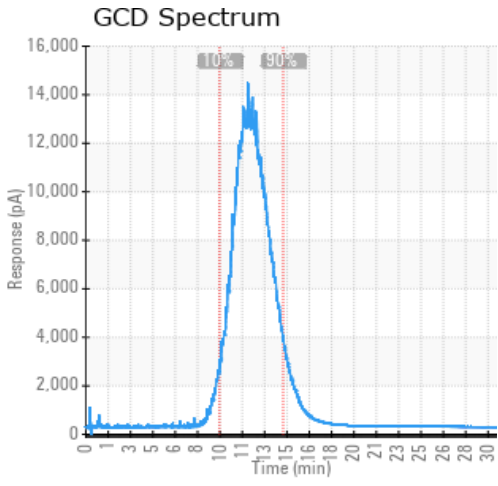
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/24/22	02/22/22	45.0m	Pump bleed	442 / 228	97.5	35.1	0.01	0.030	732 / 389	816 / 435	916 / 491	0.04
01/26/21	02/04/21	34.0m	Pump bleed	460 / 238	88.8	35.2	0.03	0.062	732 / 389	815 / 435	917 / 492	0.00
01/27/20	02/24/20	21.0m	PUMP BLEED	453 / 234	18.1	35.4	0.048	0.057	701 / 372	783 / 417	882 / 472	0.00
06/03/19	07/02/19	15.0m	PUMP BLEED	442 / 228	7.0	35.0	0.026	0.052	715 / 380	802 / 428	910 / 488	1.25
06/07/18	06/25/18	3.0m	PUMP BLEED	453 / 234	1.2	35.3	0.011	0.075	723 / 384	786 / 419	888 / 476	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
01/24/22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01/26/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
01/27/20	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/03/19	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
06/07/18	1	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

01/26/21	Sample results indicate that the heat transfer fluid is in suitable condition for continued service; fluid is in very healthy condition. Please re-sample in one year.
01/27/20	Sample results indicate that the fluid is suitable for continued service. Please re-sample in 12 months
06/03/19	Sample results indicate that the heat transfer fluid is suitable for continued service. Please re-sample in 12 months
06/07/18	Sample results indicate that the heat transfer fluid is suitable for continued service. To build a trend for this unit, and to monitor fluid performance, please re-sample in 6 months.

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