

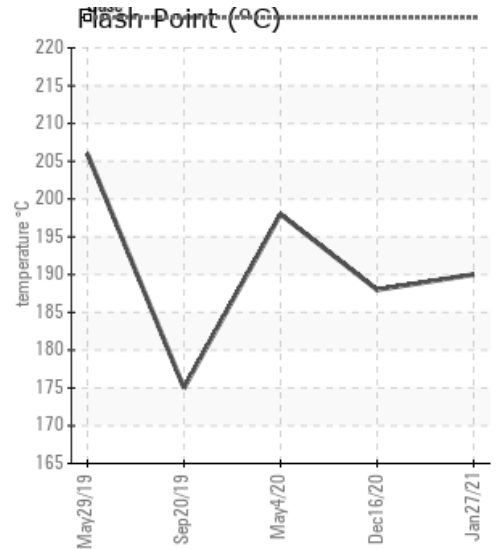
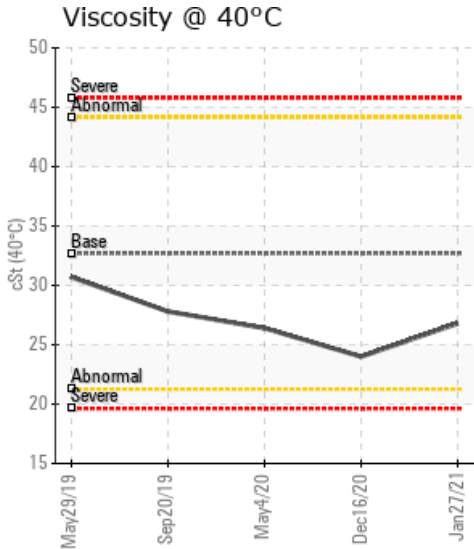
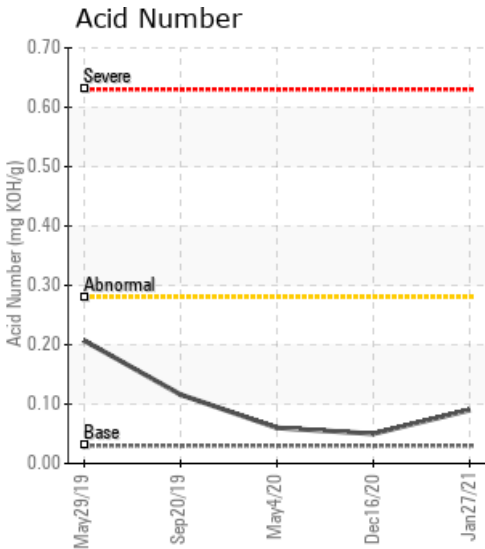
## FILLER HEATER

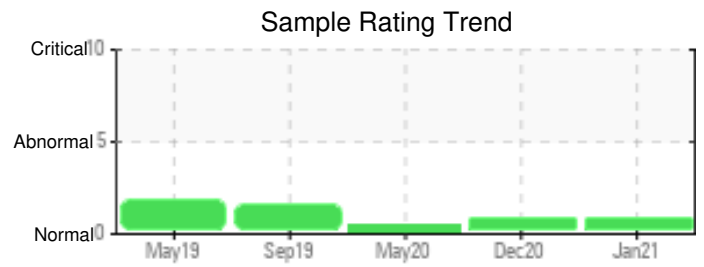
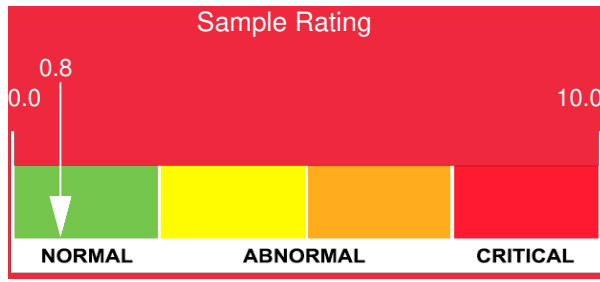
Customer: PTRHTF10068	System Information	Sample Information
Certainteed - Saint Gobain 1077 PLEASANT ST NORWOOD, MA 02062 USA Attn: Carol Turgeon Tel: (781)278-0463 E-Mail: carol.turgeon@saint-gobain.com	System Volume: 2200 gal Bulk Operating Temp: 550F / 288C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make: PERFORMANCE HEATING	Lab No: 02401205 Analyst: Doug Vrooman Sample Date: 01/27/21 Received Date: 02/02/21 Completed: 02/05/21 Doug Vrooman douglas.vrooman@hollyfrontier.com

Recommendation: The sample results for the Filler Heater have shown slight improvements with Flash point from 188 to 190. Low boilers GCD 10% 363.4 have shown a slight increase whereas GCD 90% 483.7 have decrease slightly. Acid number has also increased from .05 to .09. Continue to monitor at planned intervals.

Comments: COC Flash Point is marginally low.

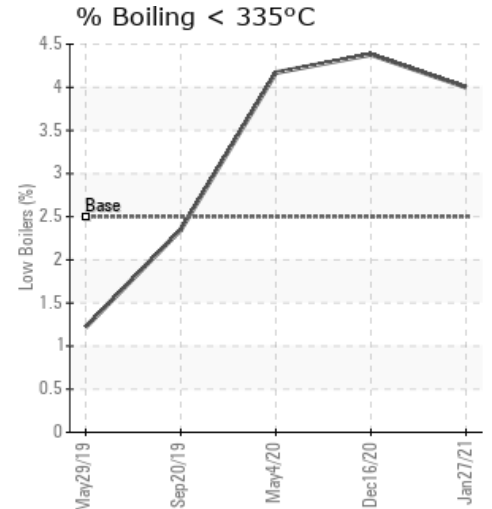
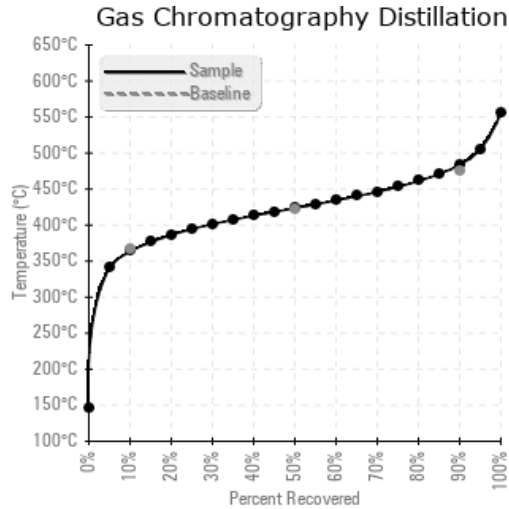
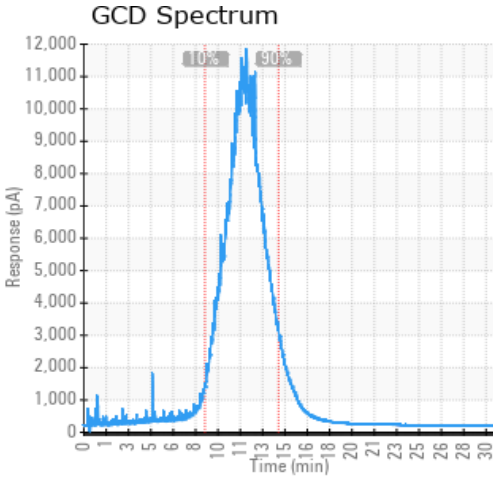
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/27/21	02/02/21	33.0m	Duplex pump	374 / 190	3.5	26.8	0.09	0.052	686 / 363	794 / 424	903 / 484	4.00
12/16/20	01/20/21	19.0m	DUPLEX PUMP	370 / 188	8.1	24.0	0.05	0.066	684 / 362	794 / 423	903 / 484	4.38
05/04/20	05/13/20	12.0m	DUPLEX	388 / 198	19.2	26.4	0.06	0.093	685 / 363	794 / 423	903 / 484	4.17
09/20/19	10/01/19	7.0m	DUPLEX PUMPS	347 / 175	41.2	27.8	0.116	0.069	704 / 373	811 / 433	920 / 493	2.35
05/29/19	06/19/19	0.0m	DUPLEX PUMP	403 / 206	23.8	30.7	0.207	0.155	693 / 367	792 / 422	901 / 483	1.22
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
01/27/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0
12/16/20	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	31	0
05/04/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0
09/20/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0
05/29/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	0
Baseline Data			0	0						0			0	0					0				270	

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



### Historical Comments

12/16/20	This new Higher Temp system continues to effect HTF condition. We are noticing that the viscosity has dropped to 24.0 cSt @ 40C as well as COC Flash point which has dropped to 188. We recommend Venting (boil-off), as soon as possible. We would also recommend venting more frequently and adding fresh (make-up) fluid more frequently to assist with fluid condition. There is no asphalt contamination reported at this time. COC Flash Point is marginally low.
05/04/20	The sample results for the Filler Heater have shown slight improvements with Flash point from 175 to 198. Low boilers GCD 10% 362.9 as well as GCD 90% 483.8 have decrease slightly. Acid number has also decrease from .116 to .06. Continue to monitor at planned intervals.
09/20/19	This new Higher Temp system is effecting HTF condition. We are noticing that the viscosity has dropped to 27.8 cSt @ 40C as well as COC Flash point which has dropped to 175. We recommend Venting (boil-off), as soon as possible. We would also recommend venting more frequently and adding fresh (make-up) fluid more frequently to assist with fluid condition. There is no asphalt contamination reported at this time. (GCD) 90% Distillation Point is abnormally high. COC Flash Point is abnormally low.
05/29/19	We understand there was some issue with the nitrogen blanket on this new system hence the slight rise in Acid Number. Other properties look normal. Re-sample in 6 months to closely monitor this new system.

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