

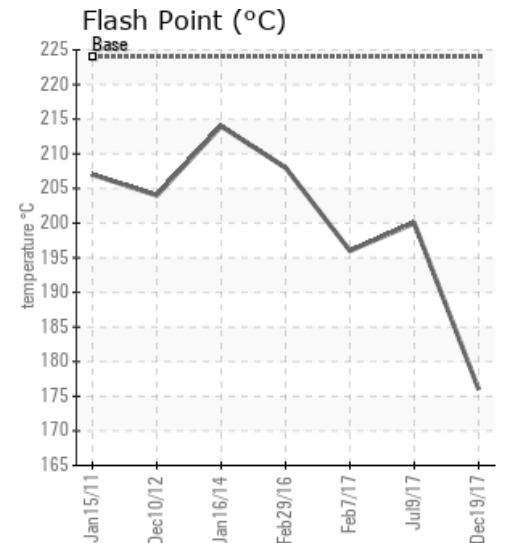
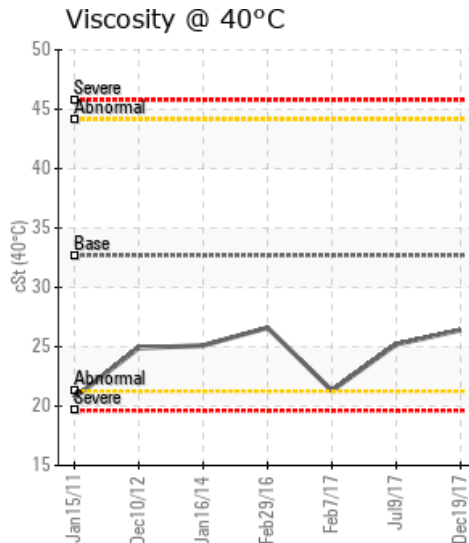
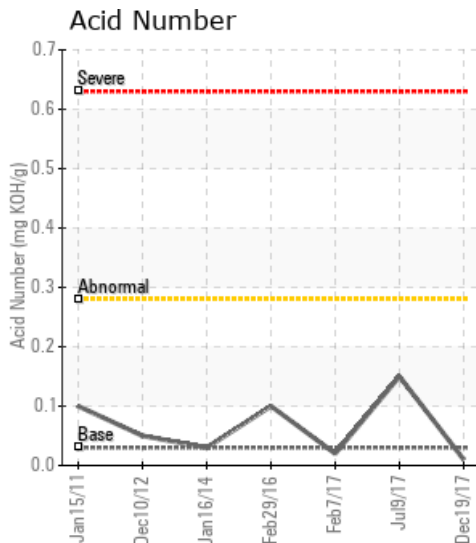
## MODIFIED ROOM

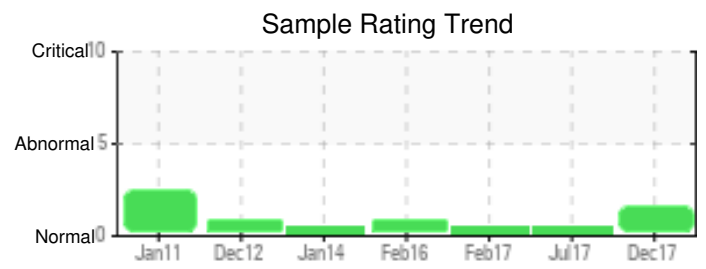
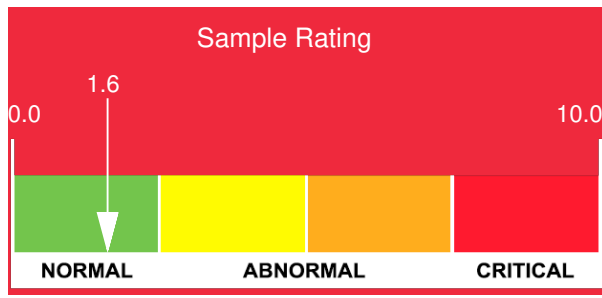
Customer: PTRHTF10059	System Information	Sample Information
CERTAINTEED - SAINT GOBAIN 11519 US RT 250 N MILAN, OH 44846 USA Attn: DAVE BLAKELY Tel: (419)541-0843 E-Mail: dave.l.blakely@saint-gobain.com	System Volume: 320 gal Bulk Operating Temp: 520F / 271C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make: FIRST THERMOL	Lab No: 02192162 Analyst: Yvette Trzcinski Sample Date: 12/19/17 Received Date: 01/11/18 Completed: 01/29/18 To discuss this report contact Yvette Trzcinski at (262)933-0718

Recommendation: The flash point is low and the Simulated distillation indicates the presence of low boilers or molecules boiling before the boiling point of fresh oil which are the results you will see if there is thermal degradation of the fluid. Recommendation is to try and remove the low boilers by venting of the expansion tank if it is safe to do so and add new oil to the system to help raise the flash point about 15% - 20 % resample in 3 - 6 months to see how the system responded.

Comments:

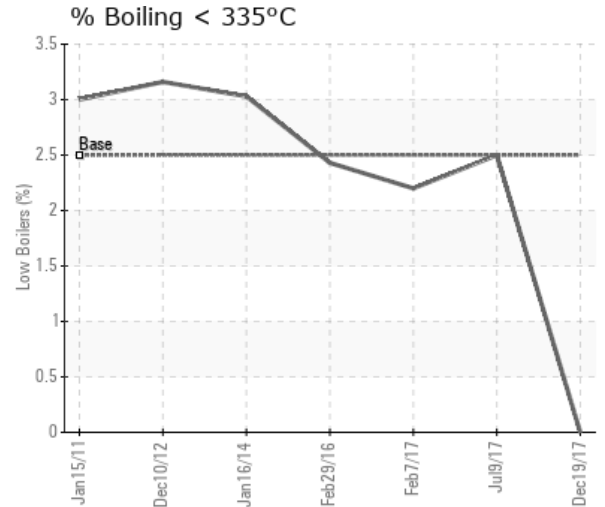
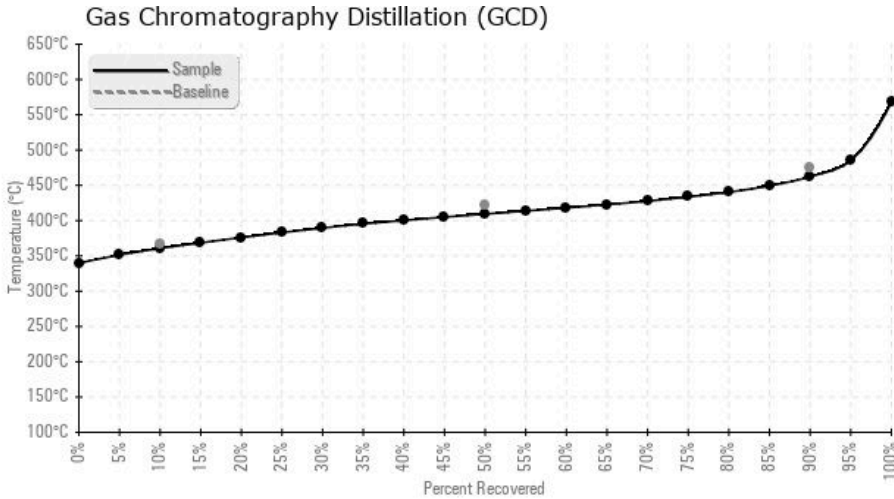
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
12/19/17	01/11/18	0h		349 / 176	12.5	26.4	0.01	0.010	681 / 361	769 / 409	864 / 462	0.00
07/09/17	07/28/17	0h		392 / 200	19.7	25.2	0.15	0.032	678 / 359	780 / 416	881 / 472	2.50
02/07/17	02/15/17	0h	SIDE STREAM FLTR PRT	385 / 196	11.7	21.3	0.02	0.030	678 / 359	779 / 415	883 / 473	2.20
02/29/16	03/10/16	0h	BY HEADER	406 / 208	6.0	26.6	0.10	0.314	680 / 360	787 / 420	908 / 487	2.43
01/16/14	01/23/14	0h	DRIP LEG BY PUMP	417 / 214	11.9	25.1	0.03	0.014	672 / 355	776 / 413	870 / 466	3.03
12/10/12	01/17/13	0h	123516	399 / 204	11.3	24.9	0.05	0.017	668 / 354	769 / 410	861 / 460	3.16
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	
12/19/17	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	33	0	
07/09/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	34	0	
02/07/17	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	34	0	
02/29/16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	0	
01/16/14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	
12/10/12	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	14	0	
<b>Baseline Data</b>			0	0						0			0	0					0					270	

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



### Historical Comments

07/09/17	Viscosity has stabilized from last sample flash point in acceptable ranges, fluid appears to be free of contamination and does not appear to have degraded from last samples. Re sample in 6 months to verify fluid condition.
02/07/17	The viscosity of the fluid has dropped by 20% from the last sample a year ago. The flash point remains strong however. The overall condition looks good and there is no apparent contamination, therefore we can speculate that the drop in viscosity comes from operating the fluid in a way that promotes thermal degradation. We suggest more frequent sampling on this system, next quarter and every 6 months after that.
02/29/16	Oil is in good condition. We are beginning to see some slight oxidation but it is not an issue at this time. Re-sample at next scheduled interval. (GCD) 90% Distillation Point is marginally high.
01/16/14	The fluid has not changed much since the last test in June 2013. It is still a mixture of Therminol 55 and Calflo AF. Everything looks normal. Re-sample as part of your PM in another 6 months or so.
12/10/12	The oil is in good condition as it appear to have received a little Calflo AF since the last sample. Please submit a sample annually. (GCD) 90% Distillation Point is marginally low.

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