

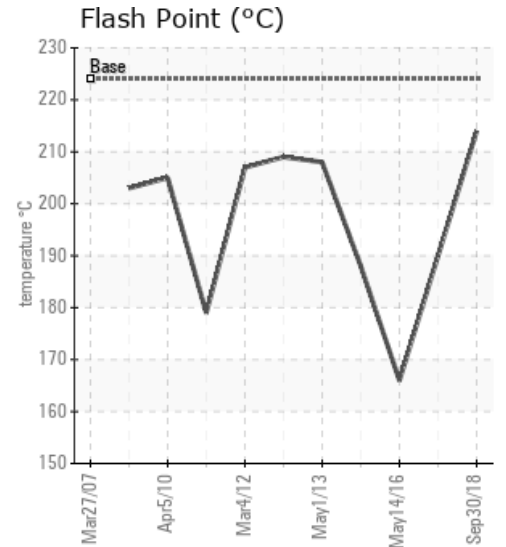
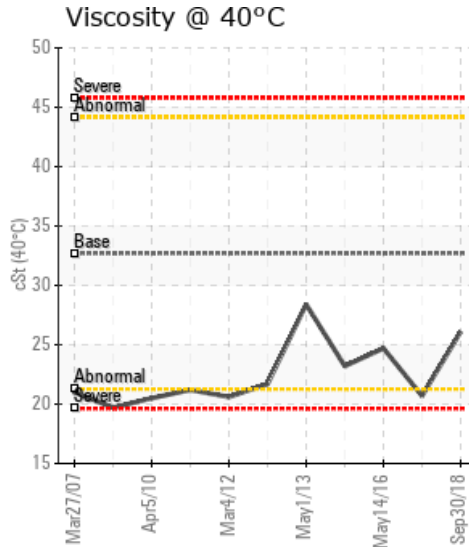
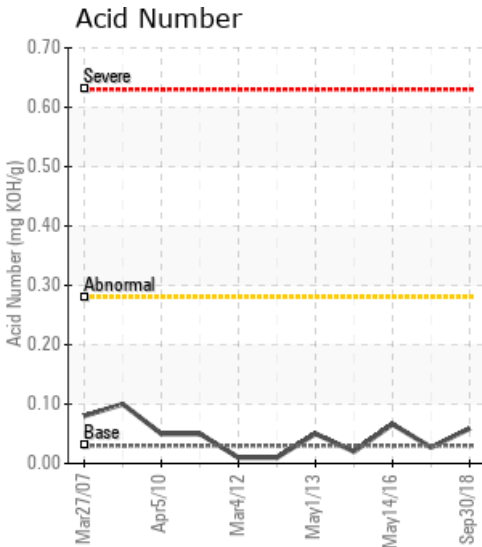
## LINE 2 FILLER HEATER SYSTEM

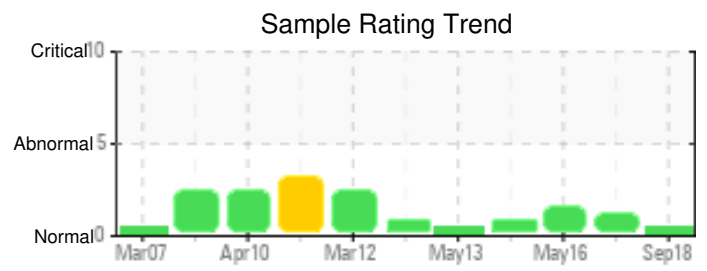
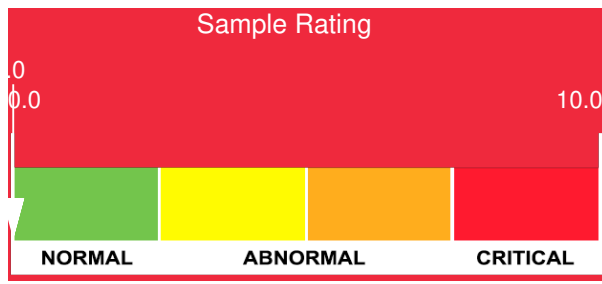
Customer: PTRHTF10069	System Information	Sample Information
CERTAINEED - SAINT GOBAIN 3303 EAST 4TH AVENUE SHAKOPEE, MN 55379 USA Attn: Patrick Wallace Tel: E-Mail: patrick.wallace@saint-gobain.com	System Volume: 5670 gal Bulk Operating Temp: 428F / 220C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make:	Lab No: 02244125 Analyst: Gaston Arseneault Sample Date: 09/30/18 Received Date: 10/10/18 Completed: 10/23/18 Gaston Arseneault gaston.arseneault@hollyfrontier.com

Recommendation: Flash point remains strong even if the viscosity hovers around 15% lower than fresh oil. Results appear to remain stable from year to year. Re-sample at next scheduled interval. No trace of contamination by asphalt or the elements or fluid degradation.

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	%
09/30/18	10/10/18	0.0y		417 / 214	0.00	26.1	0.059	0.027	687 / 364	778 / 415	874 / 468	1.90
09/03/17	09/12/17	4.0y	MAIN SYSTEM FLOW	374 / 190	0.00	20.7	0.027	0.042	682 / 361	785 / 419	891 / 477	3.93
05/14/16	05/24/16	0.0y	MAIN SYSTEM FLOW	331 / 166	2.3	24.7	0.066	0.080	665 / 352	773 / 411	866 / 463	6.19
06/06/14	06/17/14	0.0y	MAIN FLOW NEAR PUMP	370 / 188	3.2	23.2	0.02	0.034	669 / 354	783 / 417	888 / 475	6.18
05/01/13	05/15/13	0.0y	MAIN SYSTEM FLOW	406 / 208	54.3	28.4	0.05	0.112	688 / 365	774 / 412	874 / 468	1.07
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5

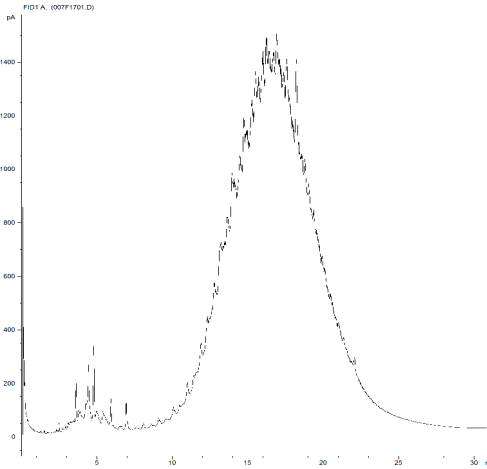




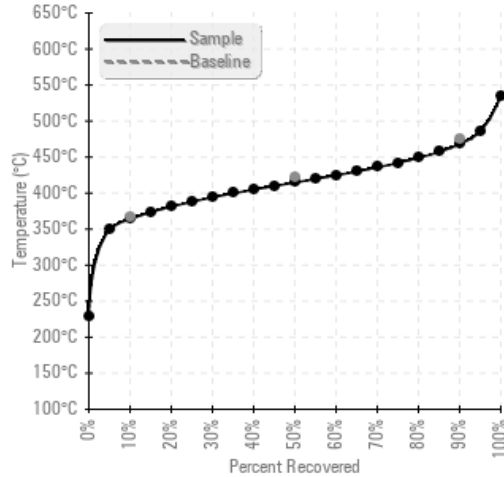
Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
09/30/18	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	48	0
09/03/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49	0
05/14/16	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0
06/06/14	6	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	14	0	69	0
05/01/13	28	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0	0	0	0	0	6	0	163	1
Baseline Data			0	0						0		0	0						0				270	

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

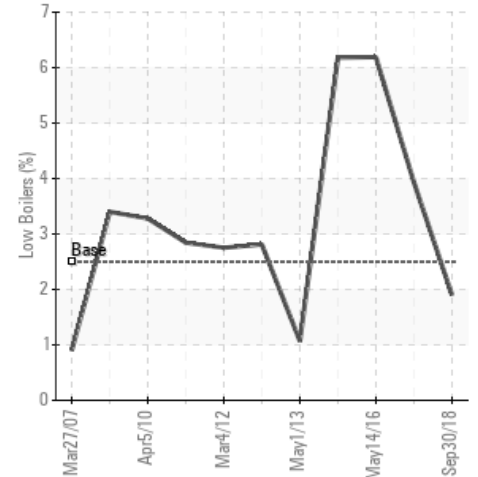
GCD Spectrum



Gas Chromatography Distillation



% Boiling < 335°C



Historical Comments

09/03/17	We can not explain why the oil viscosity dropped 20% yet the flash point increased by dozens of degrees. Anywho, no immediate action seems required at this time. Re-sample at next normal interval. Visc @ 40°C is abnormally low. COC Flash Point is marginally low.
05/14/16	COC Flash Point is abnormally low. GCD % at 335C is marginally high at 6.19% and should consider venting. Other properties look good. Resample next interval to monitor.
06/06/14	The oil carries a certain amount of low boilers. We recommend to vent them out and replace lost volume with fresh oil addition. COC Flash Point is marginally low.
05/01/13	Overall the fluid is in excellent condition. We see a jump in viscosity, but also an increase in the additive concentration that is likely due to an addition of fresh Calflo AF. Please continue to sample at the regular interval (9-12 months).

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