

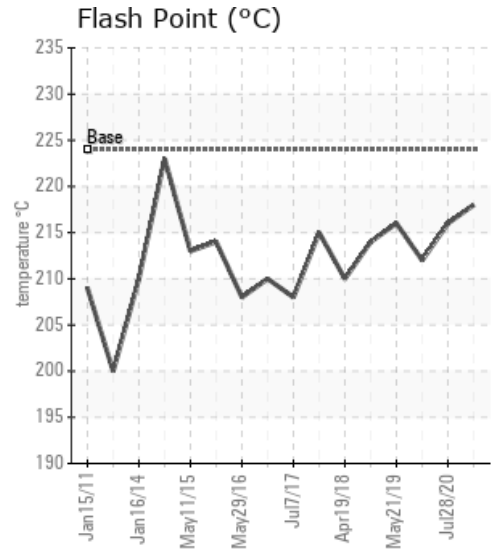
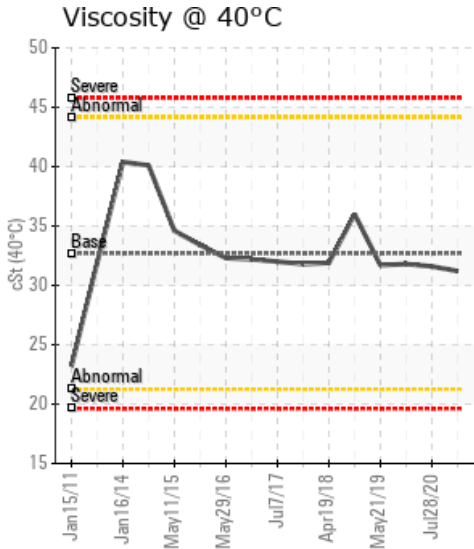
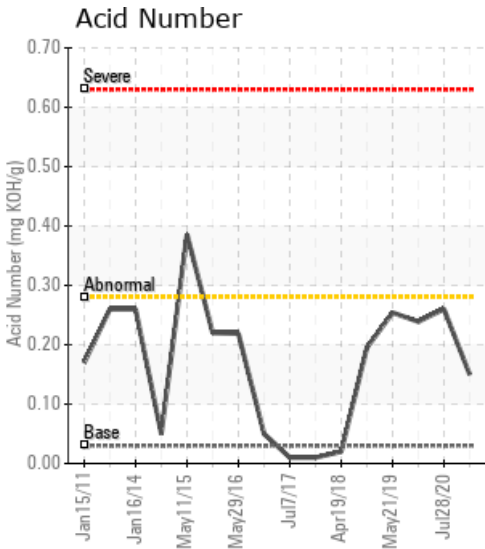
LINE 2 HOT OIL SYSTEM

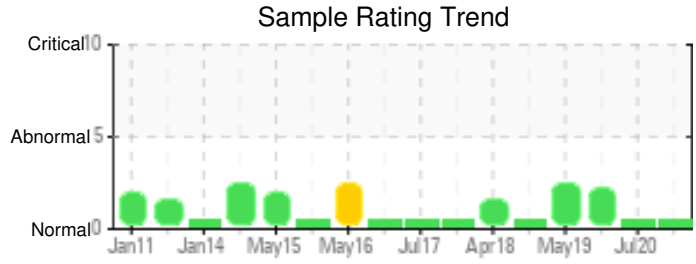
Customer: PTRHTF10059	System Information	Sample Information
CERTAINTEED - SAINT GOBAIN 11519 US RT 250 N MILAN, OH 44846 USA Attn: DAVE BLAKELY Tel: (419)541-0843 E-Mail: dave.l.blakely@saint-gobain.com	System Volume: 1265 gal Bulk Operating Temp: 480F / 249C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make: FIRST THERMOL	Lab No: 02398423 Analyst: Yvette Trzcinski Sample Date: 01/04/21 Received Date: 01/19/21 Completed: 01/22/21 Yvette Trzcinski yvette.trzcinski@hollyfrontier.com

Recommendation: The fluid does appear to have some degradation occurring, but the acid number has not increased from the last sample and the viscosity has remained consistent and oil specifications are all within acceptable limits. Resample at the next interval

Comments:

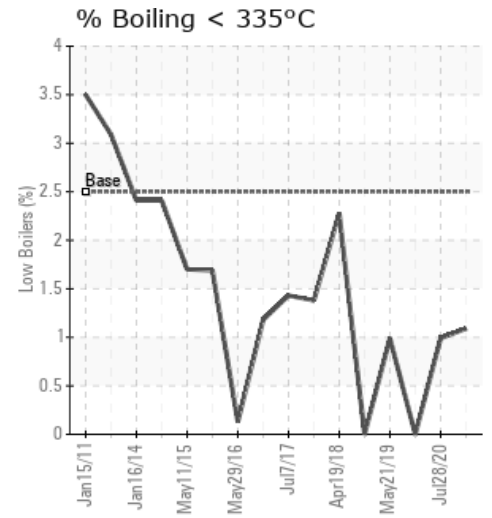
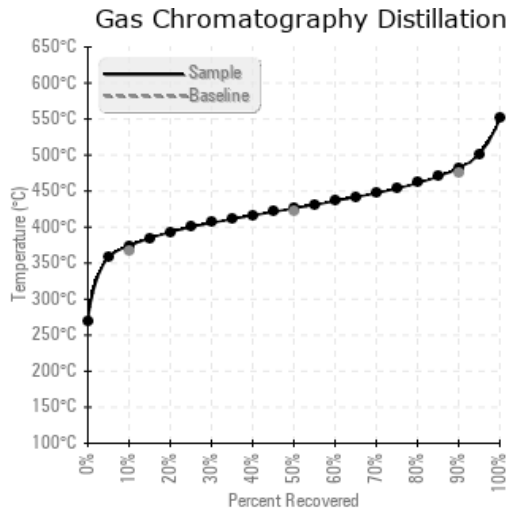
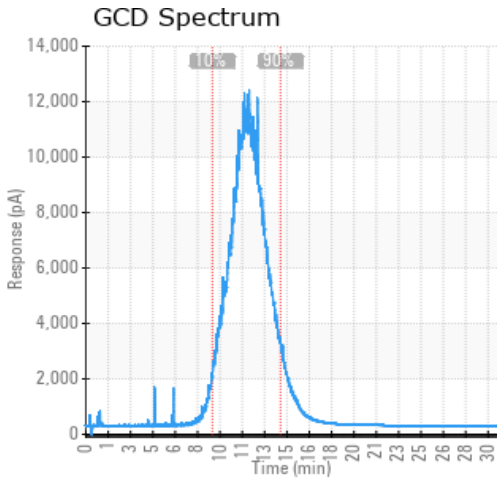
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/04/21	01/19/21	0.0y	Sample Port	424 / 218	11.0	31.2	0.15	0.124	705 / 374	799 / 426	900 / 482	1.09
07/28/20	08/05/20	24.0y	FILTER DRAIN	421 / 216	20.7	31.6	0.26	0.090	707 / 375	800 / 426	898 / 481	0.99
01/09/20	01/17/20	0.0y		414 / 212	5.9	31.8	0.239	0.130	707 / 375	787 / 420	881 / 471	0.00
05/21/19	05/31/19	0.0y		421 / 216	10.3	31.7	0.254	0.013	686 / 363	780 / 416	888 / 476	0.99
10/11/18	10/24/18	0.0y		417 / 214	14.3	36.0	0.195	0.207	694 / 368	786 / 419	880 / 471	0.00
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	
01/04/21	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	0	
07/28/20	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0
01/09/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0
05/21/19	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53	0
10/11/18	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	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

07/28/20	The oil looks very good the viscosity, acid number and flash point are all looking very good and similar to the sample at the beginning of the year - very low solids - resample at the next interval
01/09/20	The condition of the oil is virtually unchanged since May 2019. all properties are normal. Keep up the good work and sample at next scheduled interval
05/21/19	Everything looks good but we are noticing a steady increase in the acid number since last year which may mean the fluid is undergoing oxidation. This will result in a shortened fluid life. Oxidation is when the fluid gets oxidized due to contact with oxygen from air. First, we suggest to check the nitrogen blanket to make sure oxygen is kept out of the expansion tank and the fluid temperature in the expansion tank is hotter than 125F, this means the fluid will oxidize rapidly because the oxidation rate doubles for every 18F increase. Let's discuss what may be happening
10/11/18	The Acid Number test jumped to 0.2. While this is still a very low value and the test itself carries a certain uncertainty when measuring low values, the jump from 0.02 to 0.2 is noticeable in that perhaps oxidation has begun. We will monitor this property and if the trend of increasing Acid Number continues we will recommend to take action. Resample in 6 months.

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