

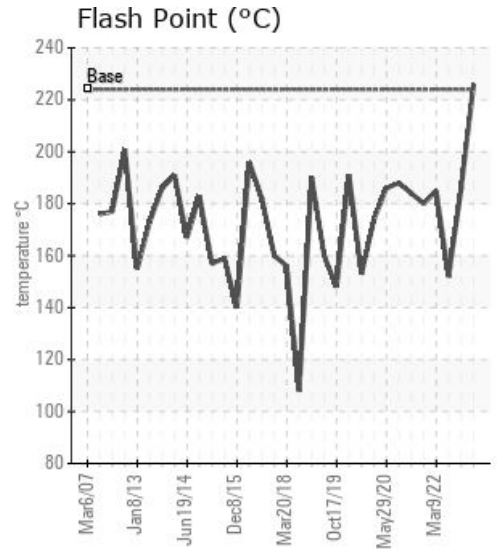
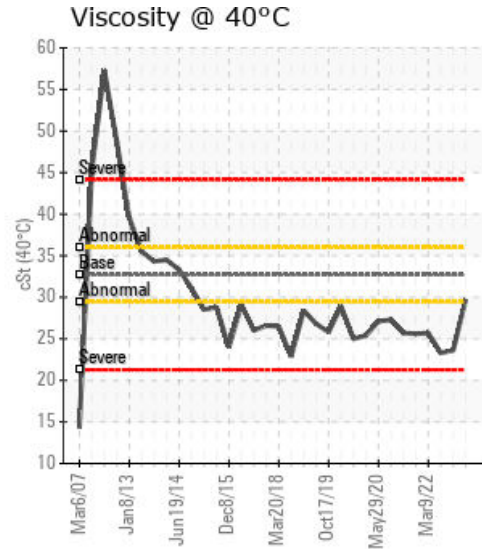
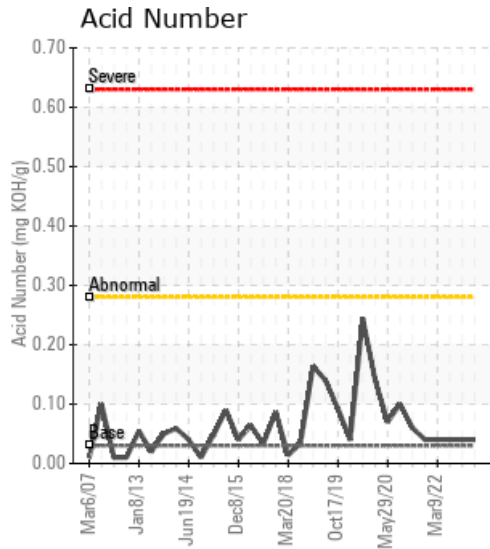
MAIN HOT OIL SYSTEM

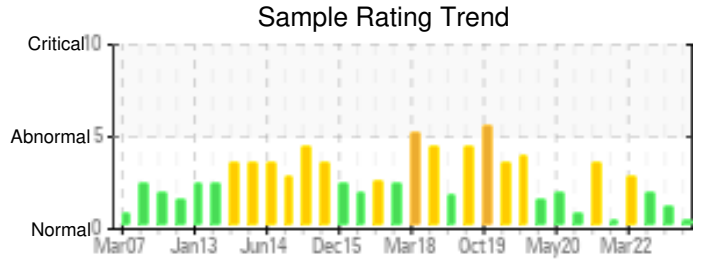
Customer: PTRHTF10068	System Information	Sample Information
Certainteed - Saint Gobain 1077 PLEASANT ST NORWOOD, MA 02062 US Attn: Robert Jaruse Tel: E-Mail: robert.jaruse@saint-gobain.com	System Volume: 5000 gal Bulk Operating Temp: 560F / 293C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make: A.M.KINNEY	Lab No: 02535093 Analyst: Greg Fernandez Sample Date: 01/11/23 Received Date: 01/24/23 Completed: 04/25/23 Greg Fernandez gregory.fernandez@hfsinclair.com

Recommendation: Fluid sample shows the Calflo AF in suitable condition for continued service. Re-sample at next scheduled interval.

Comments: No elevated wear metals reported. All fluid parameters, including Viscosity, AN, GCD determined Boiling Points, and Flash are well within typical range and indicative of a fluid in good condition.

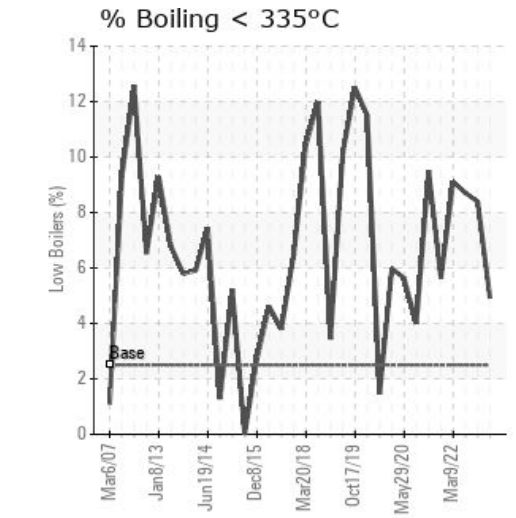
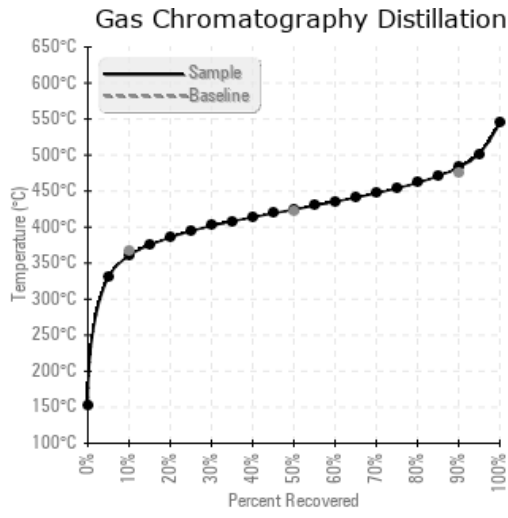
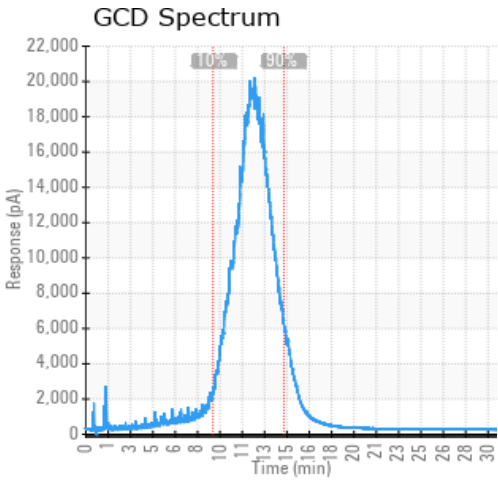
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/11/23	01/24/23	0.0y		439 / 226	13.2	29.7	0.04	0.046	681 / 361	796 / 424	901 / 483	4.92
09/01/22	09/09/22	0.0y	heat exchanger	367 / 186	8.2	23.6	0.04	0.072	650 / 343	788 / 420	901 / 483	8.39
07/28/22	08/04/22	0.0y	heat exchanger	306 / 152	22.0	23.3	0.04	0.225	646 / 341	787 / 419	900 / 482	8.71
03/09/22	03/25/22	3.0y	heat exchanger	365 / 185	13.6	25.7	0.04	0.037	640 / 338	766 / 408	905 / 485	9.11
01/06/22	01/18/22	0.0y	heat exchange	356 / 180	29.5	25.6	0.04	0.047	673 / 356	792 / 422	897 / 481	5.64
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
01/11/23	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0
09/01/22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0
07/28/22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0
03/09/22	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0
01/06/22	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	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	
09/01/22	In July, this system underwent a boil-off and subsequently at 100 gallons of make-up oil was added to the system. The current sample results show good results for Flash (an improved value from the prior sample report), Acid Number, and low boilers. Viscosity has trended lower over the past few samples and is still low, but not at an alarming level. Continued monitoring of this value is in order. In general, this sample shows improved product performance values over the prior sample and is suitable to continue until the next sample interval. Visc @ 40°C continues to trend lower and is now abnormally low. COC Flash Point is marginally low.
07/28/22	The sample continues to exhibit indicators of thermal cracking and the development of low boilers. Typically these systems should be vented when the level approaches 9% of GCD <335C, and this sample now is below 9%. COC Flash Point also continues to fall and now reports at another low. Venting the system and topping off the fluid level with fresh fluid should be planned in the near future as corrective measures. The low Flash point is a potential concern, but plant personnel should determine at what level the Flash Point becomes a concern or alarm.
03/09/22	This sample continues to show some signs of cracking oil and development of low boilers. Typically these systems should be vented when the level approached 9% as this has. The system can continue to be used but should plan for some maintenance in the near future. The flash point and viscosity are trending lower but steady. (GCD) % < 335°C is marginally high. COC Flash Point is marginally low.
01/06/22	Flash point and viscosity are both slightly lower than normal, and low boilers starting to creep higher. continue to use as normal and resample in 6-8 months. COC Flash Point is marginally low.

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