

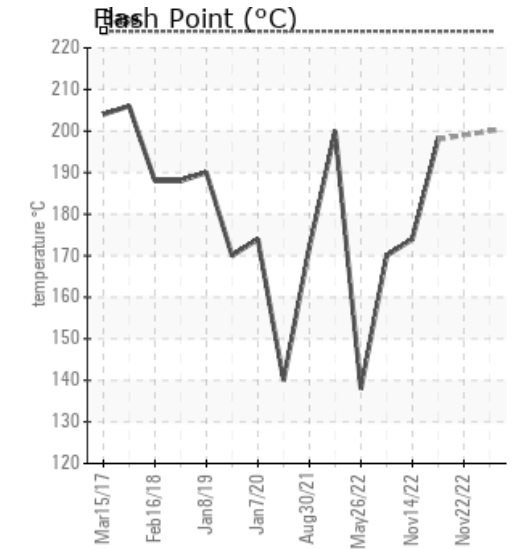
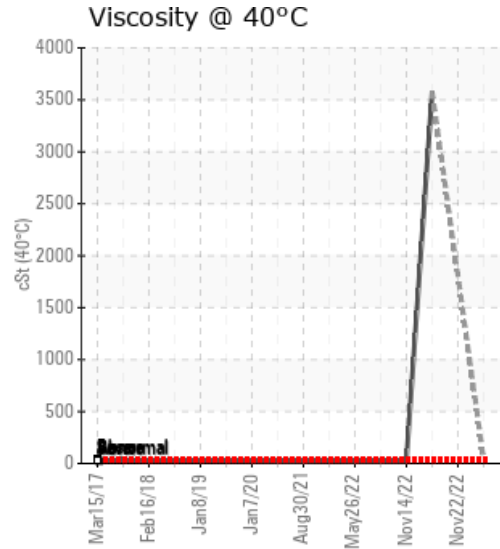
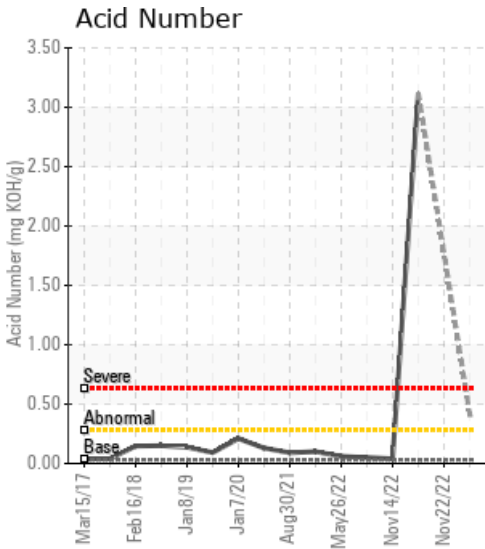
TFS H/O SYSTEM #2

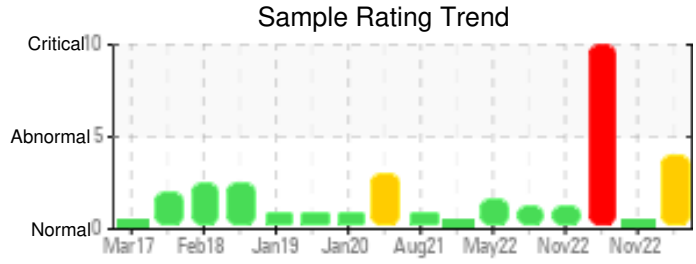
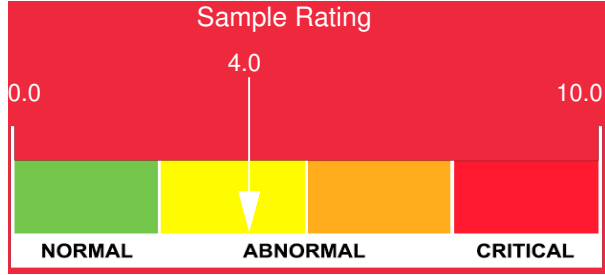
Customer: PTRHTF10176	System Information	Sample Information
CERTAINEED ROOFING 100 CERTAINEED DR JONESBURG, MO 63351 USA Attn: Jeff Montgomery Tel: (952)261-9532 E-Mail: jeffrey.d.montgomery@saint-gobain.com	System Volume: 4244 gal Bulk Operating Temp: 525F / 274C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make: FSE	Lab No: 02535094 Analyst: Neil Buchanan Sample Date: 01/11/23 Received Date: 01/24/23 Completed: 02/07/23 Neil Buchanan neil.buchanan@HFSinclair.com

Recommendation: Sample is in reasonable shape given the history except for the high level of pentane insolubles. Continue to monitor and change filters as required.

Comments: Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high. (GCD) 90% Distillation Point is marginally high. Visc @ 40°C is marginally high.

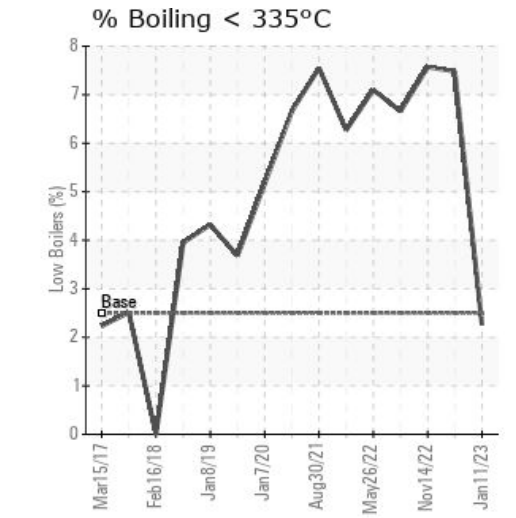
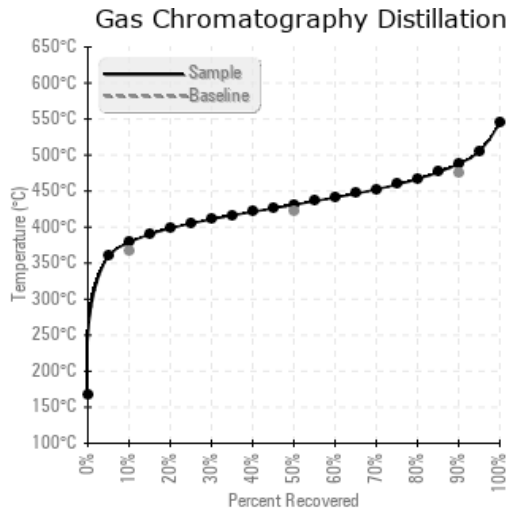
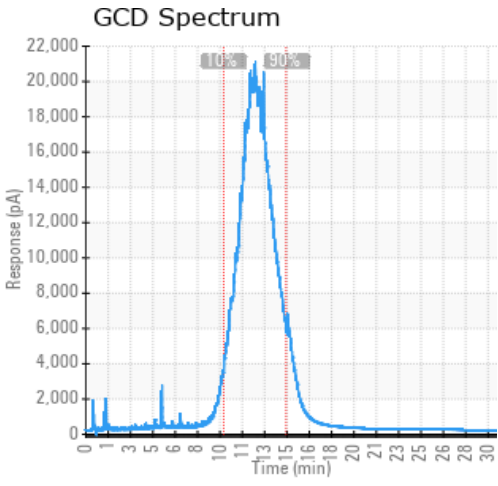
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/11/23	01/24/23	0.0m	sidestream filter	392 / 200	52.7	36.9	0.42	1.05	713 / 379	808 / 431	910 / 488	2.26
11/22/22	11/23/22	0.0m										
11/22/22	11/25/22	0.0m	SIDESTREAM FILTER	388 / 198	116.5	3578	3.12	7.53	661 / 349	795 / 424	925 / 496	7.48
11/14/22	11/22/22	0.0m		345 / 174	6.1	24.6	0.04	0.134	658 / 348	789 / 421	899 / 482	7.57
07/15/22	07/26/22	0.0m		338 / 170	27.7	24.5	0.05	0.074	666 / 352	789 / 421	897 / 481	6.66
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	35	0	3	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	83	2
11/22/22	117	0	17	1	0	0	1	0	0	36	1	5	0	0	2		0	0	0	0	0	0	91	18
11/22/22	200	0	30	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	80	2
11/14/22	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	135	0
07/15/22	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	131	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	
11/22/22	We recommend that you drain the fluid from the component if this has not already been done. We recommend an early resample to monitor this condition. Please note that the fluid was too thick to perform some of the normal laboratory tests.(not applicable) There is no indication of any contamination in the fluid. The fluid viscosity is higher than normal. The fluid is no longer serviceable.
11/22/22	* Heavy asphalt contamination as indicated by all parameters*. Viscosity too high to measure, high levels of nickel and vanadium, very high pentane insolubles. Immediate system restoration work required.Iron and nickel ppm levels are abnormal. Vanadium ppm levels are marginal. Pentane Insolubles levels are severely high. Acid Number (AN) is severely high. (GCD) 90% Distillation Point is severely high. Visc @ 40°C is severely high.
11/14/22	Sample does not show any signs of asphalt contamination based on the lack of Vanadium and normal viscosity and GCD. Fit for further surface and resample next interval to monitor. COC Flash Point is abnormally low. Visc @ 40°C is marginally low.
07/15/22	Flash Point is very low and GCD % <335C is elevated showing the formation of low boilers. COC Flash Point is abnormally low. Visc @ 40°C is abnormally low.

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