

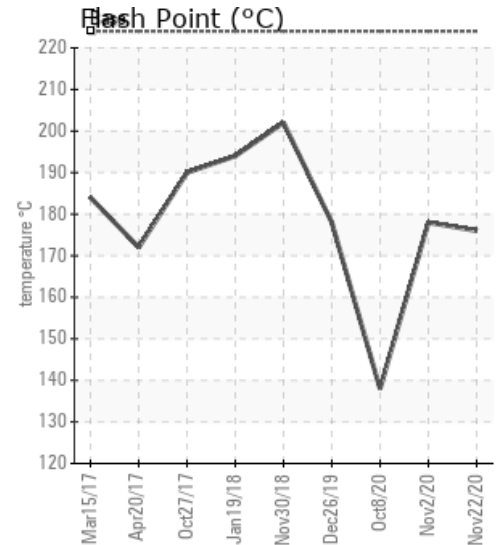
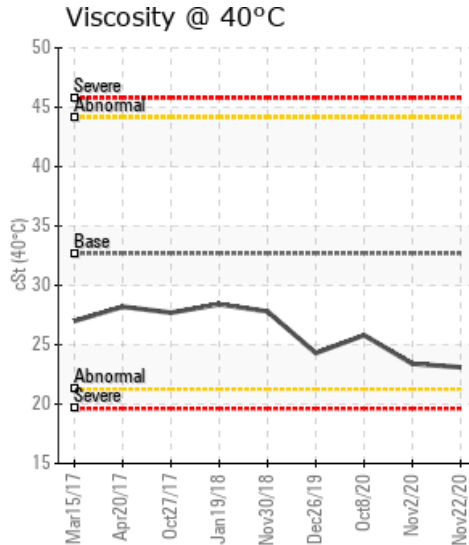
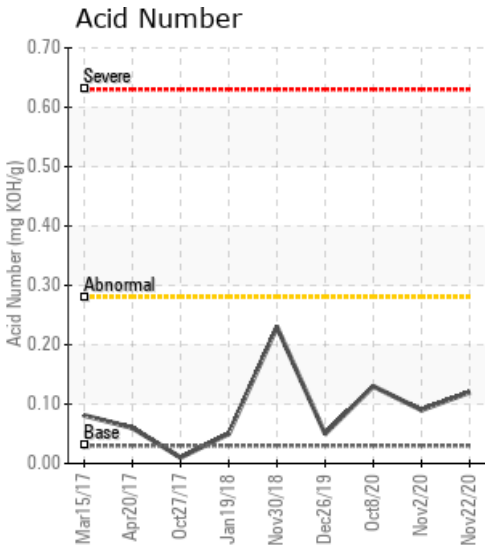
## TFS H/O SYSTEM #1

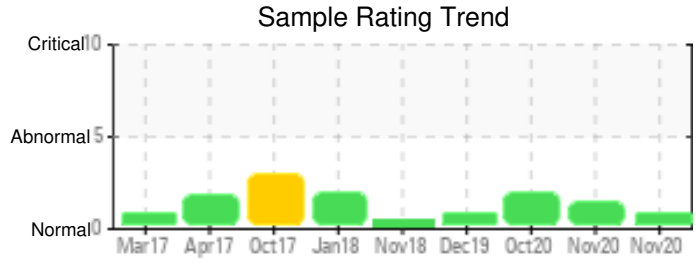
Customer: PTRHTF10176	System Information	Sample Information
CERTAINEED ROOFING 100 CERTAINEED DR JONESBURG, MO 63351 USA Attn: Jeff Montgomery Tel: (952)261-9532 E-Mail: jeffrey.d.montgomery@saint-gobain.com	System Volume: 4462 gal Bulk Operating Temp: 553F / 289C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make: FSE	Lab No: 02395381 Analyst: Joe Goecke Sample Date: 11/22/20 Received Date: 01/04/21 Completed: 01/06/21 Joe Goecke joe.goecke@petrocanadalsp.com

Recommendation: Sample date needs to be corrected to 12/22/20 from 11/22/20. Sample shows no significant change from last sample. A very slight increase in light ends and minor changes in viscosity and flash point. Continue to operate as normal and look to plan a venting of light ends in next quarter. Resample as scheduled.

Comments: COC Flash Point is abnormally low.

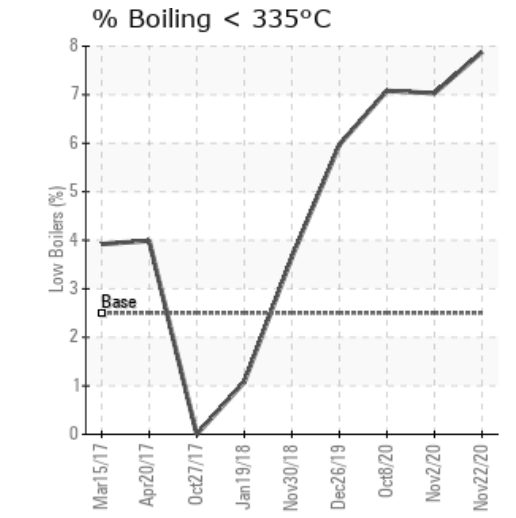
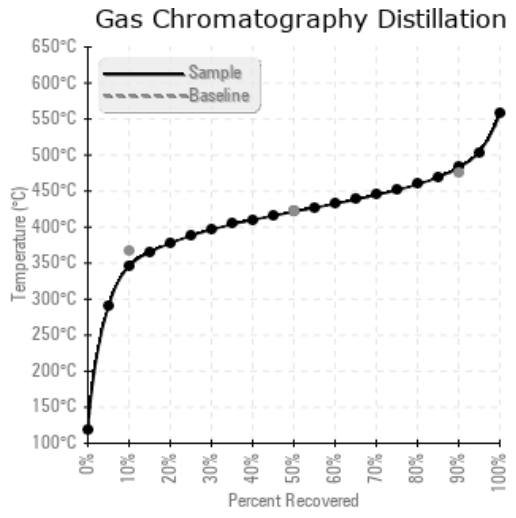
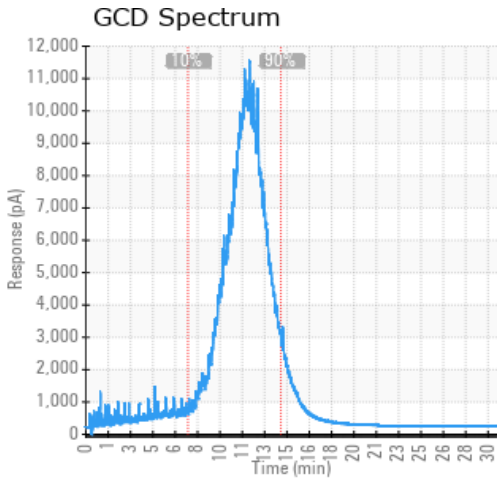
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
11/22/20	01/04/21	0y	Strainer	349 / 176	30.2	23.1	0.12	0.044	655 / 346	790 / 421	900 / 482	7.88
11/02/20	11/06/20	0y	Side Stream	352 / 178	11.0	23.4	0.09	0.090	665 / 352	792 / 422	901 / 483	7.03
10/08/20	10/15/20	4y	SIDE STREAM	280 / 138	17.5	25.8	0.13	0.092	664 / 351	792 / 422	901 / 483	7.08
12/26/19	09/17/20	4y	Filter	352 / 178	14.9	24.3	0.05	0.089	674 / 357	793 / 423	897 / 481	5.97
11/30/18	12/18/18	0y		396 / 202	13.8	27.8	0.23	0.054	683 / 362	791 / 422	897 / 480	3.65
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
11/22/20	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	0
11/02/20	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0
10/08/20	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86	0
12/26/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	0
11/30/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	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	
11/02/20	Not much change in the light ends, but we did see a significant increase in flash point of 40 deg C. Viscosity dropped another 2 centistokes. Since the flash point has increased and we had a slight change in low boilers, I suggest continuing to run and resample next quarter with plans to change in next 90-180 days depending on next results. COC Flash Point is abnormally low.
10/08/20	Flash point is very low at 138C, as well and the light ends have continued to increase. we suggest venting this system if it has not already been done to remove light ends and increase the flash point. If not possible then a partial exchange will help. Suggest resampling after maintenance performed. COC Flash Point is severely low.
12/26/19	Sample received 9 months after taken. Low boilers on the rise and suggest venting the system if not already done flash point also slightly lower than normal. All other parameters are within spec. Timely sample submissions yield more relevant results. COC Flash Point is abnormally low.
11/30/18	This system seems to create a bit more low boilers, so it's important to vent that system more frequently so that the viscosity and flash point remain closer to fresh oil. Otherwise the oil is in great condition. The oil is within acceptable parameters.

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