

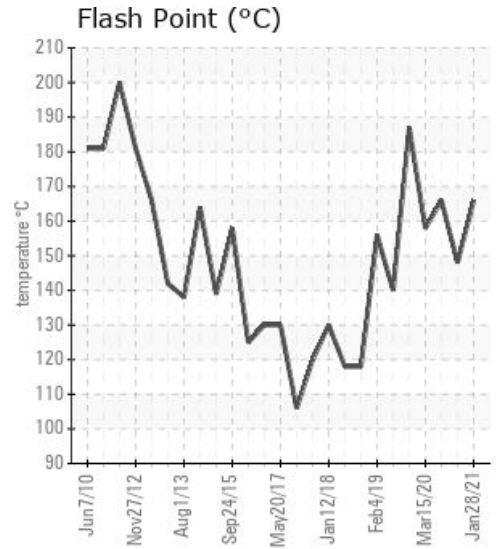
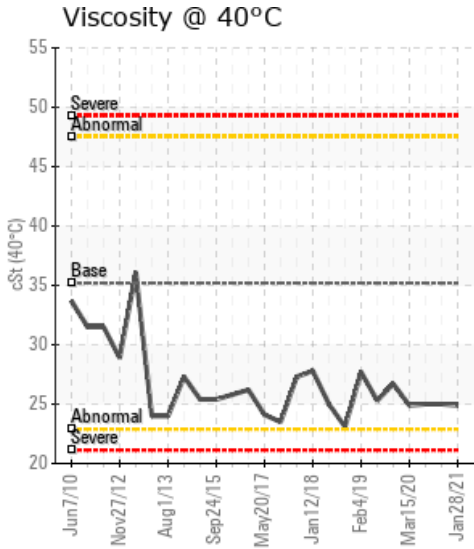
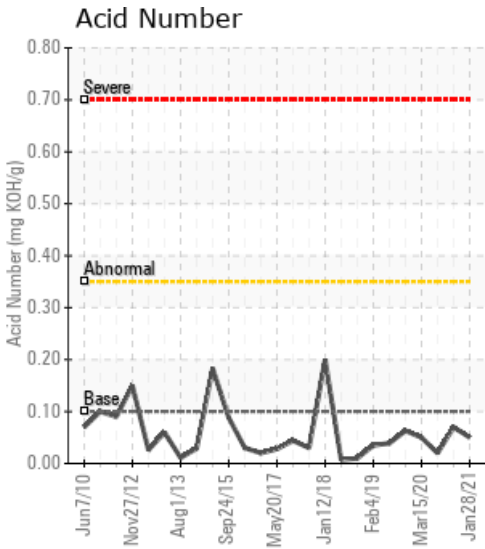
SOUTH HEATER

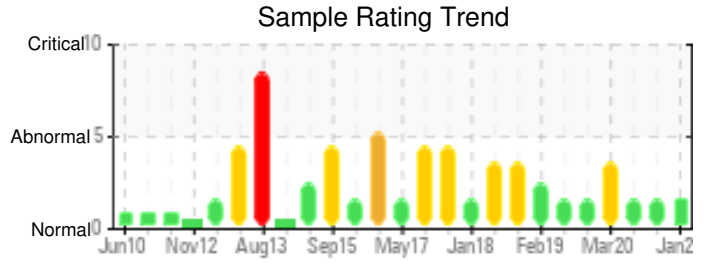
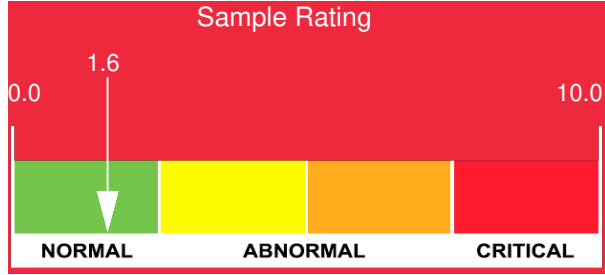
Customer: PTRHTF10043	System Information	Sample Information
MALARKY ROOFING PRODUCTS 3131 N. COLUMBIA BLVD PORTLAND, OR 97217 USA Attn: Jeff Tonn Tel: E-Mail: jtonn@malarkeyroofing.com	System Volume: 1200 gal Bulk Operating Temp: 620F / 327C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO HTF Make: AMERICAN HEATING	Lab No: 02404157 Analyst: Ron LeBlanc Sample Date: 01/28/21 Received Date: 02/17/21 Completed: 02/22/21 Ron LeBlanc Ronald.LeBlancSr@hollyfrontier.com

Recommendation: (GCD) 10% is low which can cause the flash point to lower significantly indicating low boilers. The low boilers can be removed via the expansion tank. Re-sample in 6 months.

Comments: COC Flash Point is severely low.

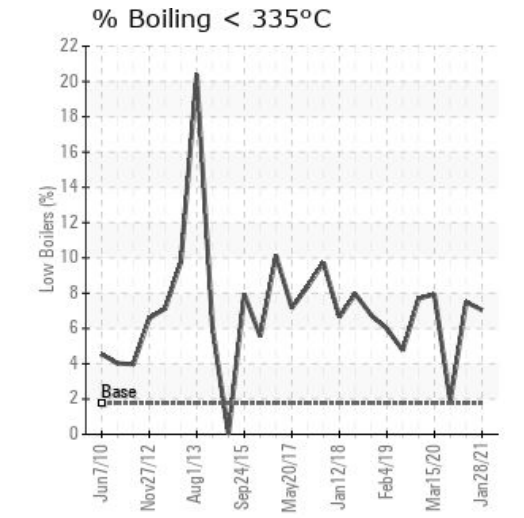
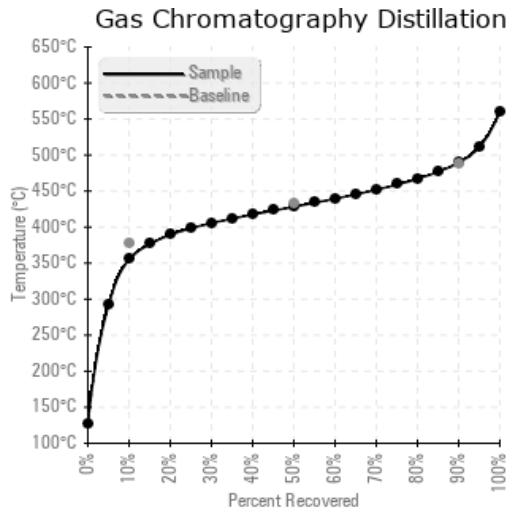
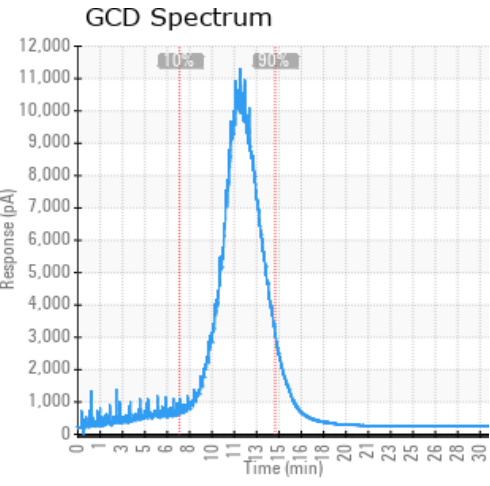
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/28/21	02/17/21	36.0m	North heat exchanger	331 / 166	2.8	24.9	0.05	0.039	672 / 355	803 / 428	913 / 490	7.05
07/10/20	07/23/20	0.0m	DRAINED 200G MAY 10	298 / 148	13.9	25.0	0.07	0.019	666 / 352	801 / 427	909 / 487	7.49
03/18/20	03/27/20	15.0m	NORTH HEAT EXCHANGE	331 / 166	8.9	25.0	0.02	0.045	728 / 387	815 / 435	920 / 493	1.90
03/15/20	05/29/20	24.0m	north heat exchange	316 / 158	26.6	24.9	0.05	0.165	660 / 349	800 / 427	908 / 487	7.94
08/09/19	09/06/19	8.0m	NORTH HEAT EXC	369 / 187	20.2	26.7	0.063	0.094	661 / 349	790 / 421	886 / 475	7.69
Baseline Data				448 / 231		35.20	.1		712 / 378	810 / 432	910 / 488	1.75





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
01/28/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0
07/10/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0
03/18/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
03/15/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
08/09/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0
Baseline Data			0	0						0			0	0				0	0				280	

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



Historical Comments	
07/10/20	COC Flash point is low which indicates thermal degradation or possible contamination. Be sure the sample port was purged sufficiently before capturing sample oil. COC Flash Point is severely low.
03/18/20	The COC flash point is low again compared to the previous sample. All other typicals remain normal. Could the reported sample have been pulled without proper purging? Adding some new oil would bring up the flash point. Resample in 30 days and purge at least 2 gallons from sample point to evaluate the results. COC Flash Point is severely low.
03/15/20	COC Flash Point is very low. A low flash point can indicate thermal degradation. Add new oil to bring up Flash Point. (GCD) % < 335°C is marginally high. Make sure the oil was purged before collection into the sample container to get the best sample. COC Flash Point is severely low. (GCD) % < 335°C is marginally high.
08/09/19	COC Flash point came up from the previous sample. (GCD) 90% point is marginally low. Resample in 3 months. COC Flash Point is marginally low. (GCD) 90% Distillation Point is marginally low.

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