

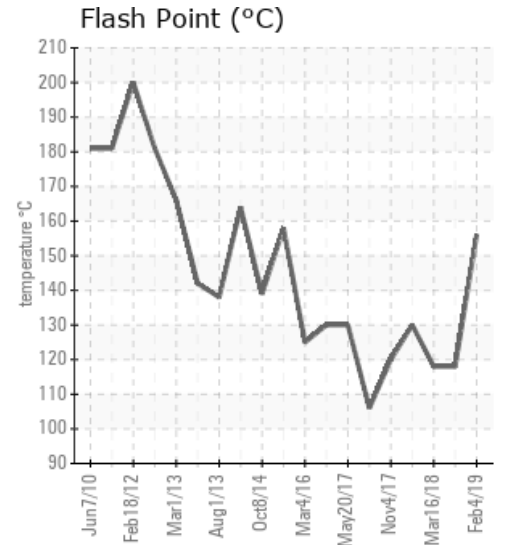
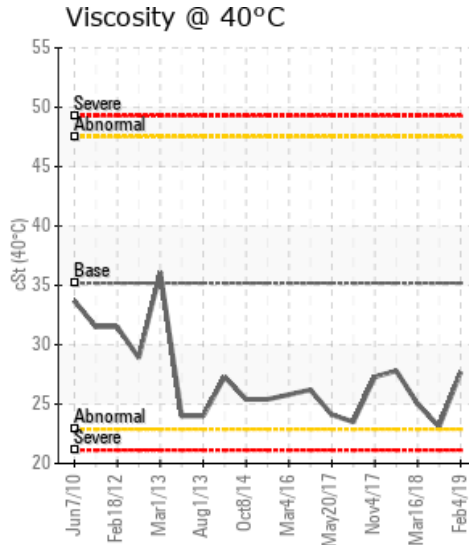
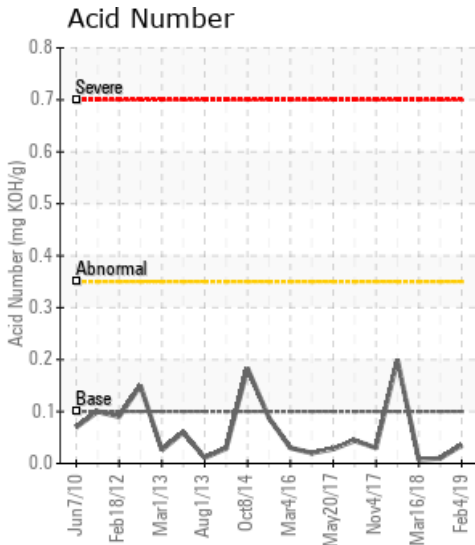
## SOUTH HEATER

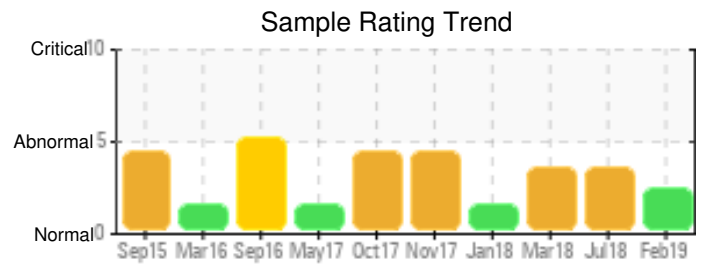
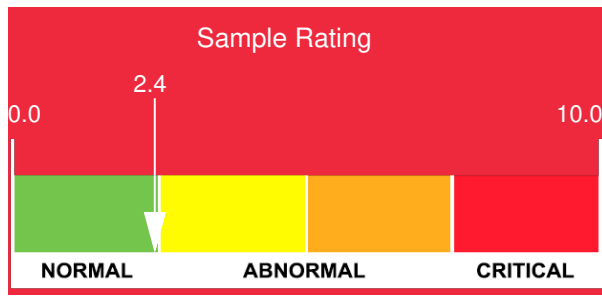
Customer: PTRHTF10043	System Information	Sample Information
MALARKY ROOFING PRODUCTS 3131 N. COLUMBIA BLVD PORTLAND, OR 97217 USA Attn: SCOTT MCDANIEL Tel: (503)283-1191 E-Mail: smcdaniel@malarkeyroofing.com	System Volume: 1200 gal Bulk Operating Temp: 620F / 327C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO HTF Make: AMERICAN HEATING	Lab No: 02268196 Analyst: Ron LeBlanc Sample Date: 02/04/19 Received Date: 02/15/19 Completed: 02/20/19

Recommendation: COC Flash Point is elevated. Re-sample in 3 months to check results again. Purge 1/2 gallon of oil before sample is drawn.

Comments: COC Flash Point is severely low. (GCD) 90% Distillation Point is marginally low.

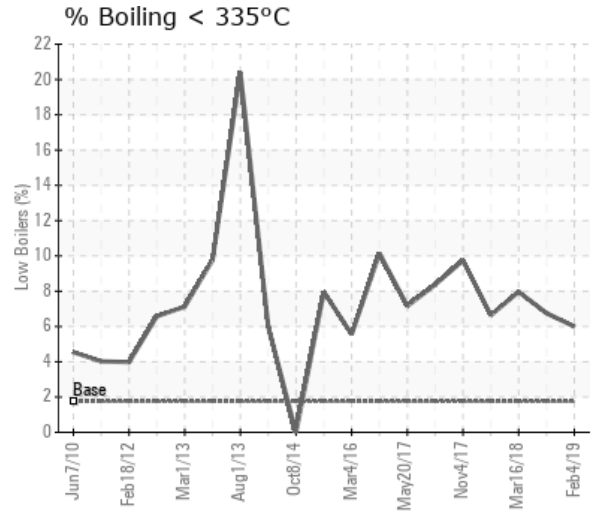
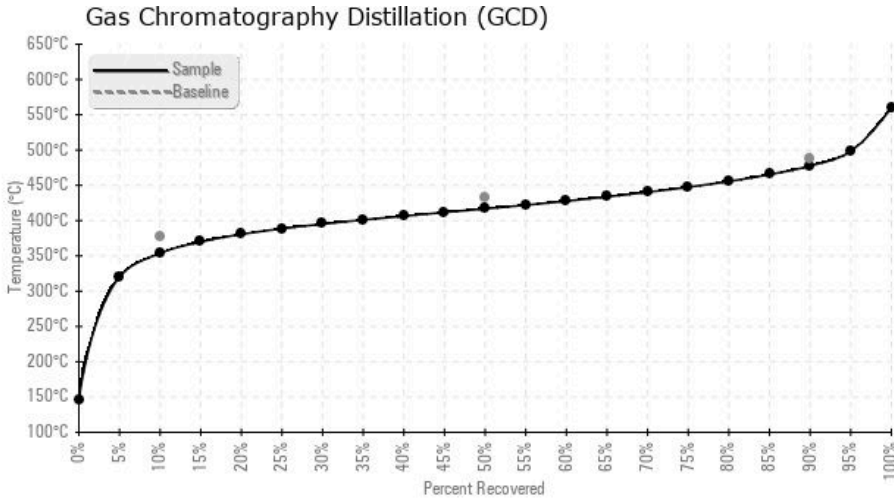
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
02/04/19	02/15/19	0m	SOUTH HEAT EXCHANGE	313 / 156	16.9	27.7	0.035	0.016	669 / 354	782 / 417	892 / 478	5.99
07/26/18	08/08/18	0m	NORTH HEAT EXCHANGE	244 / 118	4.9	23.1	0.01	0.098	662 / 350	775 / 413	865 / 463	6.76
03/16/18	04/02/18	0m		244 / 118	7.3	25.0	0.007	0.031	660 / 349	803 / 428	917 / 491	7.96
01/12/18	01/26/18	0m		266 / 130	0.00	27.8	0.2	0.018	671 / 355	797 / 425	906 / 486	6.64
11/04/17	11/22/17	0m		248 / 120	9.1	27.3	0.03	0.031	632 / 333	796 / 424	893 / 478	9.74
10/04/17	10/17/17	0m		223 / 106	15.1	23.5	0.044	0.036	652 / 344	798 / 426	911 / 488	8.37
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
02/04/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0
07/26/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0
03/16/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0
01/12/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0
11/04/17	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
10/04/17	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0
<b>Baseline Data</b>			0	0						0			0	0					0				280	

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



Historical Comments	
07/26/18	Viscosity has dropped from ISO 32 to ISO 22. COC flash point has lowered significantly to a point that should be corrected. Determine what is affecting viscosity. Has there been a heater issue of late causing oil to overheat severely. New oil might need to be added to bring COC flash point up if no other issue is found. (GCD) 90% Distillation Point is severely low. COC Flash Point is severely low.
03/16/18	Flash point has decreased. System might need to be sweetened with new oil to raise flash point. Purge more oil at sample point and submit a new sample to check results. COC Flash Point is severely low. (GCD) % < 335°C is marginally high.
01/12/18	COC IS IMPROVING. It looks like new oil was added as GCD IS IMPROVING. (GCD) 10% Distillation Point improved. Resample in 2 months. COC Flash Point is severely low.
11/04/17	Adding new oil could bring flash point up significantly. Check for heating consistency. COC Flash Point is severely low. (GCD) 10% Distillation Point is abnormally low. (GCD) % < 335°C is marginally high.
10/04/17	Resample to confirm results. Let about 1 gallon of oil purge before taking sample. COC Flash Point is severely low. (GCD) % < 335°C is marginally high. (GCD) 10% Distillation Point is marginally low.

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