

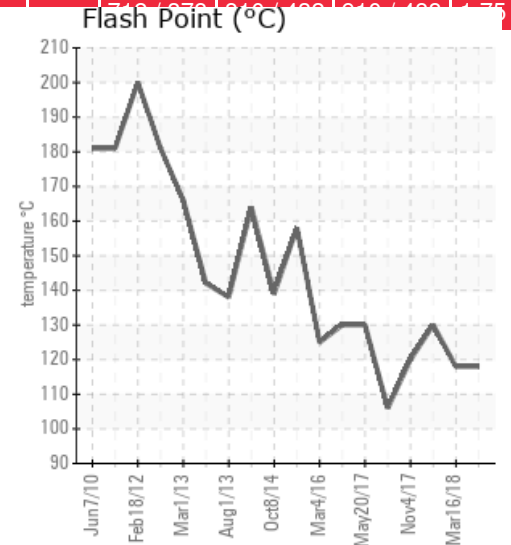
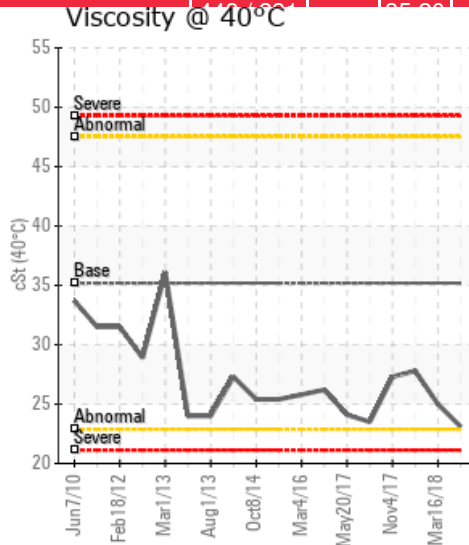
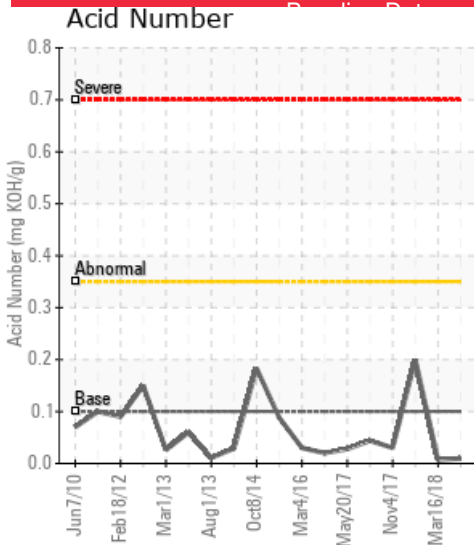
SOUTH HEATER

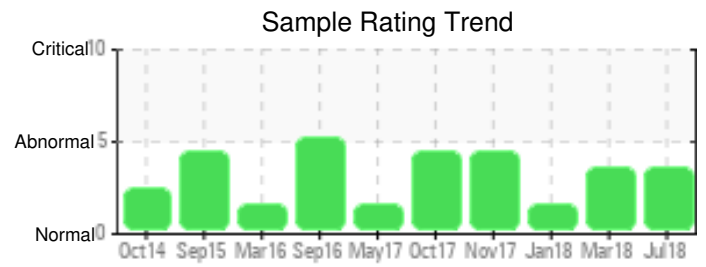
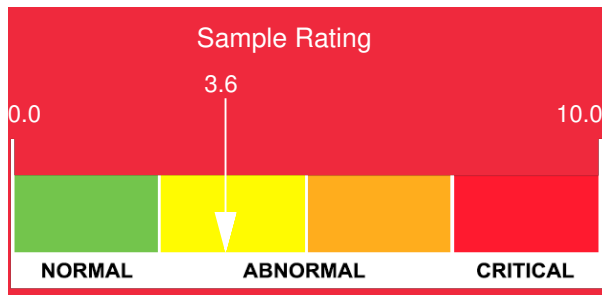
Customer: PTRHTF10043	System Information	Sample Information
MALARKY ROOFING PRODUCTS 3131 N. COLUMBIA BLVD PORTLAND, OR 97217 USA Attn: SCOTT MCDANIEL Tel: (503)283-1191 E-Mail: smcdaniel@malarkeyroofing.com	System Volume: 1200 gal Bulk Operating Temp: 620F / 327C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO HTF Make: AMERICAN HEATING	Lab No: 02232581 Analyst: Ron LeBlanc Sample Date: 07/26/18 Received Date: 08/08/18 Completed: 08/10/18 To discuss this report contact Ron LeBlanc at (541)678-7044

Recommendation: 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.

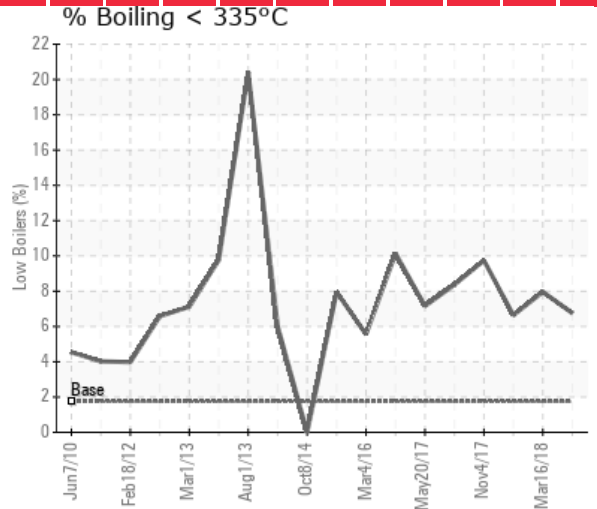
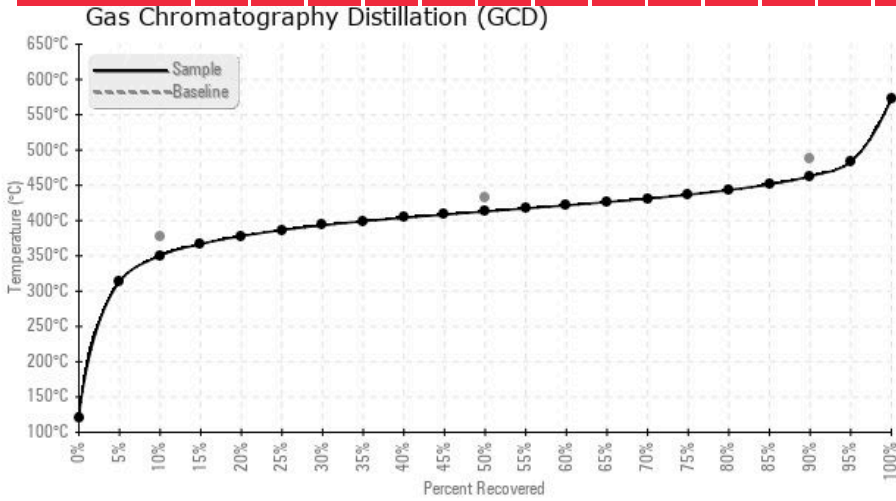
Comments: (GCD) 90% Distillation Point is severely low. COC Flash Point is severely low.

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	%
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
05/20/17	06/05/17	0m	NORTH HEAT EXCHANGER	266 / 130	29.5	24.1	0.028	0.061	666 / 352	802 / 428	915 / 490	7.16
09/22/16	10/04/16	0m	NORTH HEAT EXCHANGER	266 / 130	11.2	26.2	0.02	0.040	625 / 330	785 / 419	886 / 475	10.14





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
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	1	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	1	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
05/20/17	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	0
09/22/16	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	39	0
Elemental analysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	280	0	



Historical Comments

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.
05/20/17	COC Flash Point is severely low. Water has increased. If some new oil can be added to the system it will help increase COC flash point. Make sure to let sufficient amount of oil purge from sample point before collecting sample. COC Flash Point is severely low.
09/22/16	COC Flash Point is severely low. (GCD) 10% Distillation Point is abnormally low. (GCD) % < 335°C is marginally high. (GCD) 90% Distillation Point is marginally low. Resample in 3 months. COC Flash Point is severely low. (GCD) 10% Distillation Point is abnormally low. (GCD) % < 335°C is marginally high. (GCD) 90% Distillation Point is marginally low.

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