

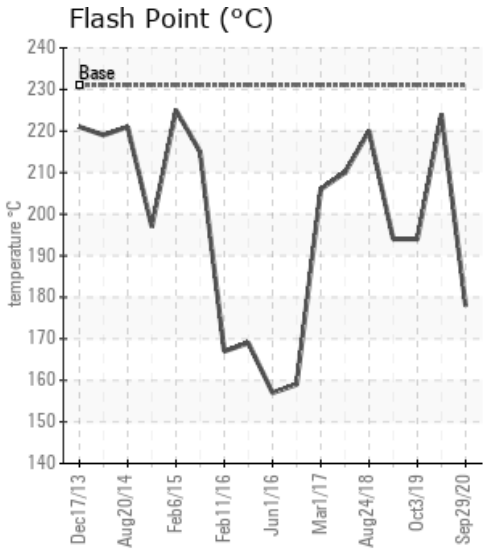
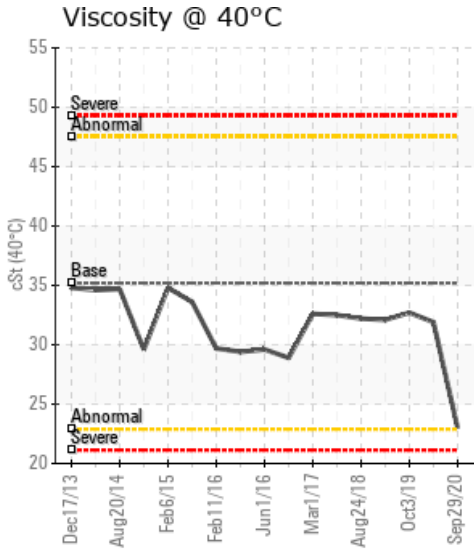
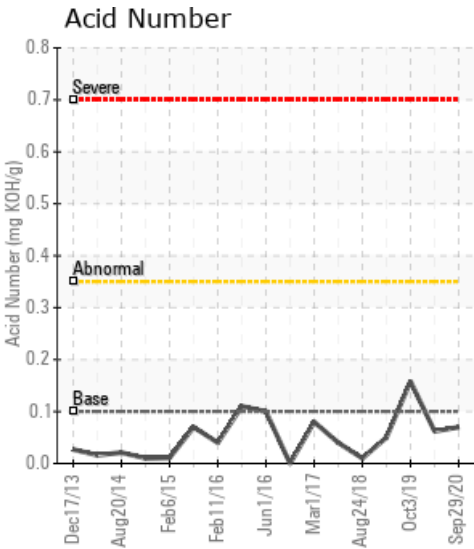
LN02 Laminator Hot Oil System

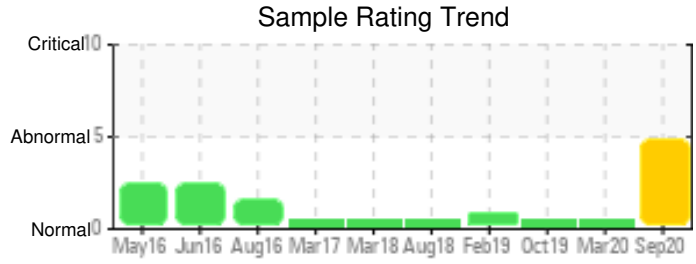
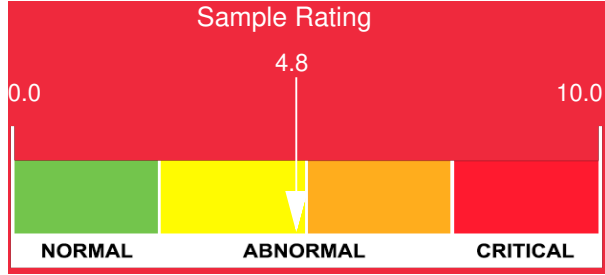
Customer: PTRHTF10141	System Information	Sample Information
TAMKO BUILDING PRODUCTS 2300 35TH ST TUSCALOOSA, AL 35401 USA Attn: Greg Colburn Tel: (205)752-3555 E-Mail: gregory_colburn@tamko.com	System Volume: 110 gal Bulk Operating Temp: 350F / 177C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO HTF Make: Heat Exchanger And T	Lab No: 02379939 Analyst: Jake Finn Sample Date: 09/29/20 Received Date: 10/07/20 Completed: 10/16/20 Jake Finn jake.finn@petrocanadalsp.com

Recommendation: This sample is showing signs of severe thermal degradation. GCD 10% distillation is severely low, COC flash point is 53°C below normal, and viscosity grade has dropped from an ISO 32 to ISO 22. Our system information shows that the capacity for this system is 110 gallons which is not large enough to consider 'sweetening' or venting to improve fluid condition. There are no signs of system wear or contamination in this sample, but the current fluid condition requires this fluid be replaced with new Calflo HTF as soon as possible.

Comments: (GCD) 10% Distillation Point is severely low. (GCD) % < 335°C is abnormally high. COC Flash Point is abnormally low.

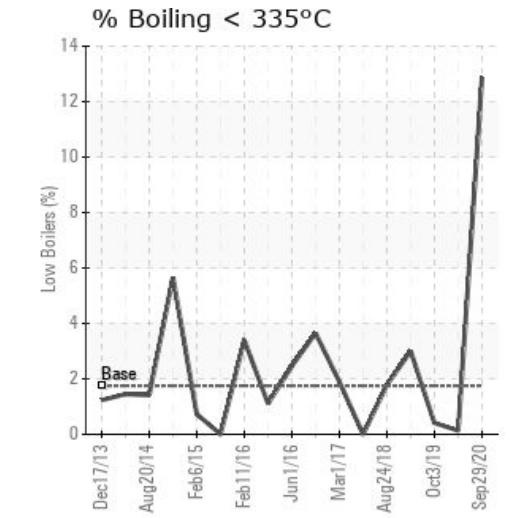
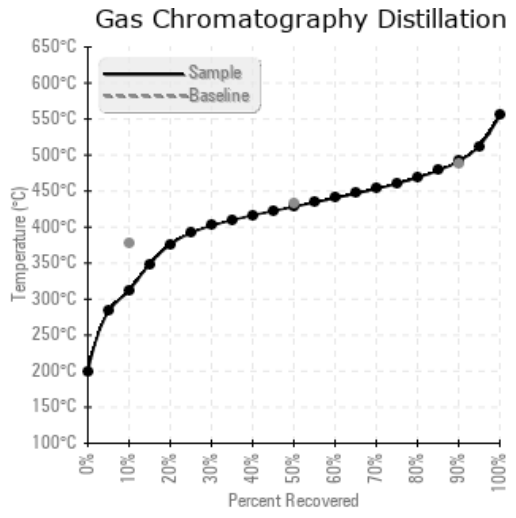
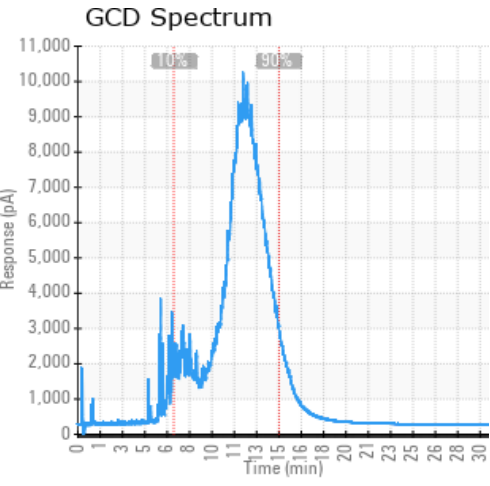
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC) °F/°C	Water (KF) ppm	Viscosity (40°C) cSt	Acid Number mg/KOH/g	Solids %wt	GCD 10% °F/°C	GCD 50% °F/°C	GCD 90% °F/°C	GCD % < 335°C %
	mm/dd/yy											
09/29/20	10/07/20	0m		352 / 178	12.3	23.0	0.07	0.046	593 / 312	803 / 428	916 / 491	12.87
03/05/20	03/13/20	0m	PORT	435 / 224	15.7	31.9	0.062	0.073	708 / 376	803 / 428	904 / 485	0.13
10/03/19	10/15/19	0m		381 / 194	27.2	32.7	0.158	0.081	729 / 387	822 / 439	919 / 493	0.41
02/25/19	03/06/19	18m	PORT	381 / 194	16.1	32.1	0.050	0.070	696 / 369	798 / 425	893 / 478	3.00
08/24/18	09/04/18	24m	PORT	428 / 220	17.1	32.2	0.01	0.052	710 / 377	808 / 431	903 / 484	1.78
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	
09/29/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	
03/05/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0
10/03/19	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0
02/25/19	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
08/24/18	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	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	
03/05/20	COC Flash point has improved since last sample, and this fluid appears to be in great condition. Please remember to include time on oil and filter in future sample submissions. Fluid is suitable for continued use, please resubmit in one year.N/A
10/03/19	Oil is suitable for continued use. Please resubmit sample in one year.COC Flash Point is marginally low. Venting the system may improve flash point. Iron levels have continued to improve over previous samples.
02/25/19	Fluid is suitable for continued use. Please re-sample and send to lab in 12 months.COC Flash Point is marginally low. Venting the system may improve flash point. Iron levels have continued to improve compared to previous two samples.
08/24/18	Fluid is suitable for continued use and sample from this 100-gal system should be re-submitted in August of 2019. All critical fluid parameters are in-line and free of contaminants.Some very lite debris was noticed by the lab technician. If system has any filters please change them. Furthermore, the fluid could be filtered using a kidney loop system during a safe shutdown period to obtain optimum cleanliness levels.

Petro-Canada makes no representation or warranty of any kind, either express or implied, as to the accuracy or completeness of the analysis and assumes no responsibility and shall have no liability whatsoever with respect to such analysis, or a party's use of it. Petro-Canada is a division of HollyFrontier Corporation.