

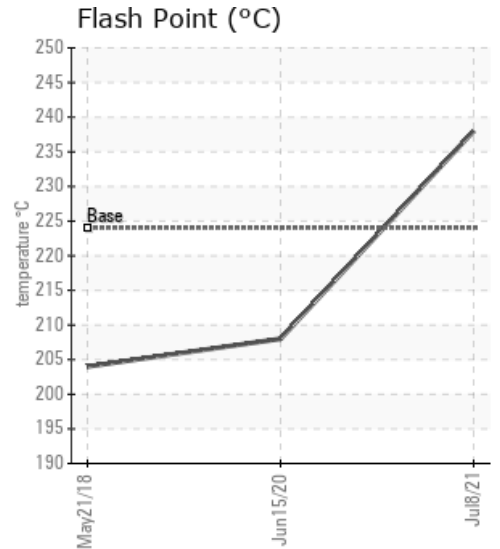
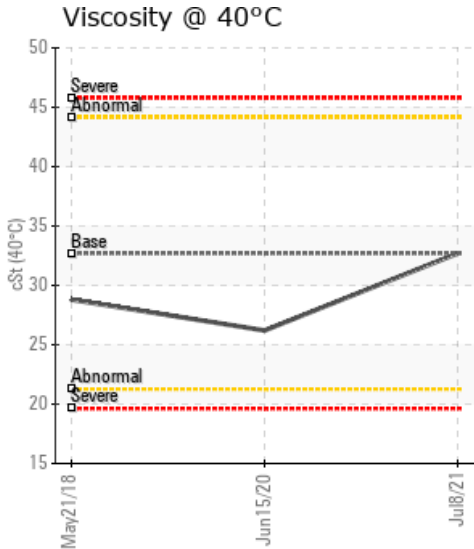
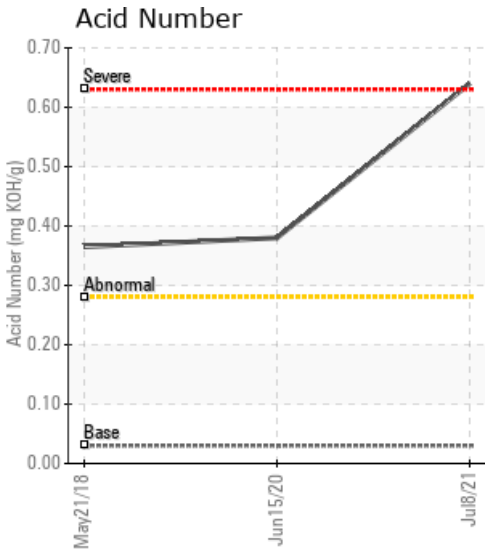
## [7K AREA] 009-HE-104

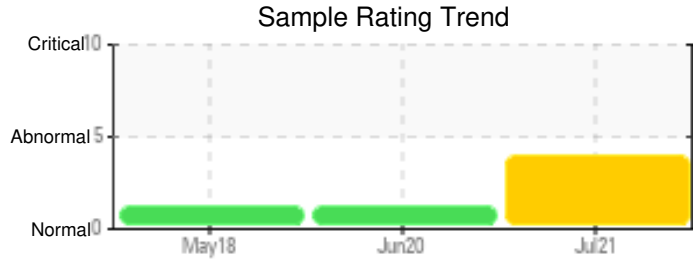
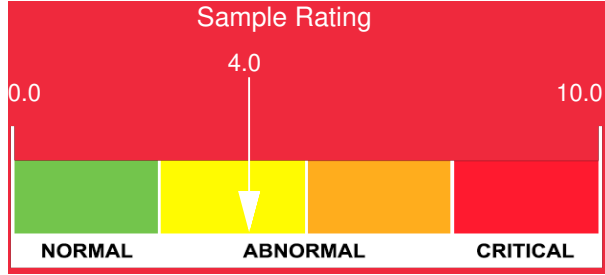
Customer: PTRHTF10177	System Information	Sample Information
Materia Inc 7629 State Hwy 75 South Huntsville, TX 77340 USA Attn: Robert Durr Tel: (713)447-9561 E-Mail: rdurr@materia-inc.com	System Volume: 300 g Bulk Operating Temp: 320F / 160C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make:	Lab No: 02434452 Analyst: Garrett Bapp Sample Date: 07/08/21 Received Date: 07/22/21 Completed: 08/12/21 Garrett Bapp Garrett.Bapp@hollyfrontier.com

Recommendation: Sample acid number is severely high. Recommended to change fluid at earliest convenience.

Comments: Acid Number (AN) is severely high.

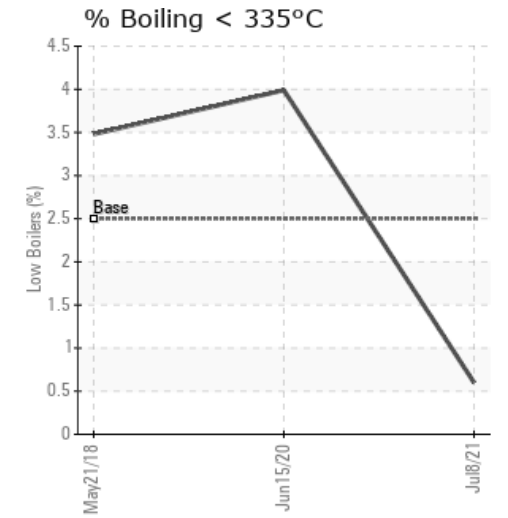
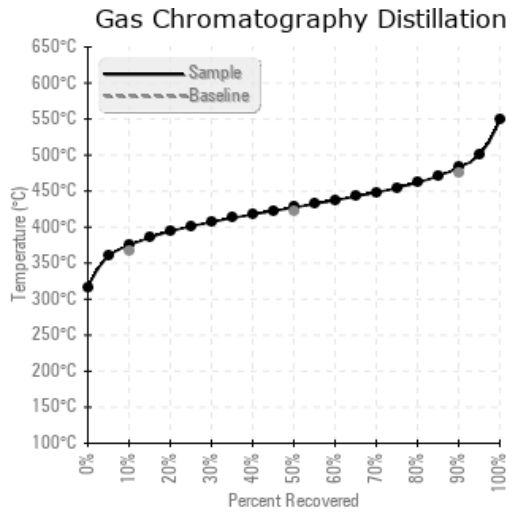
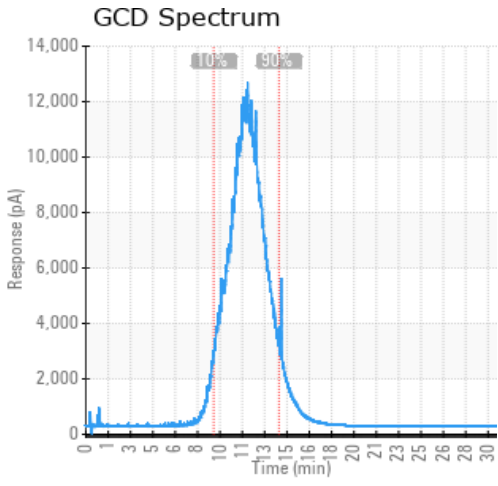
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
07/08/21	07/22/21	2.0y	STORAGE TANK	460 / 238	18.9	32.7	0.64	0.098	706 / 375	801 / 427	901 / 483	0.60
06/15/20	06/25/20	4.0y	TANK	406 / 208	8.8	26.2	0.38	0.105	685 / 363	793 / 423	891 / 477	3.99
05/21/18	06/06/18	0.0y		399 / 204	9.0	28.8	0.365	0.084	686 / 364	793 / 423	890 / 477	3.48
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
07/08/21	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	268	0
06/15/20	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	251	0
05/21/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	233	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	
06/15/20	Acid Number (AN) is abnormally high. Fluid condition appears to have worsened over the last two years. There is increased thermal degradation. Because of the increase of thermal degradation, the fluid viscosity has dropped from an ISO 32 fluid to an ISO 22 fluid. Because of the drop in viscosity, thermal transfer rates may have changed over the last four years. If it has, then a fluid change out and heater inspection to look for carbon deposits is warranted.
05/21/18	Total Acid Number is high without any other properties supporting a symptom with the fluid. Look for possible system contamination and resample in 6 months. Acid Number (AN) is abnormally high.

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.