

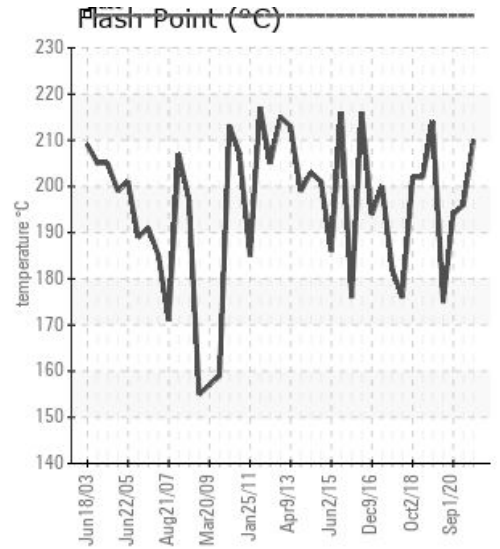
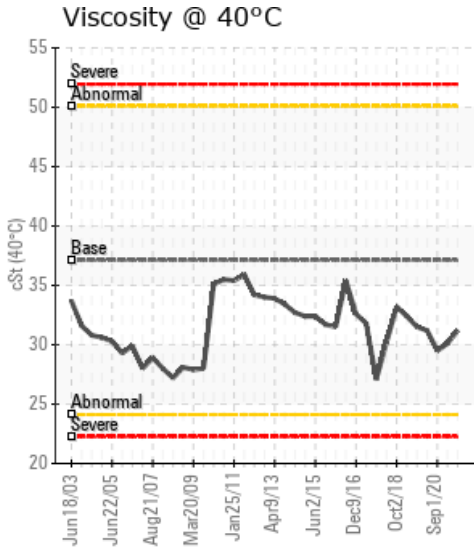
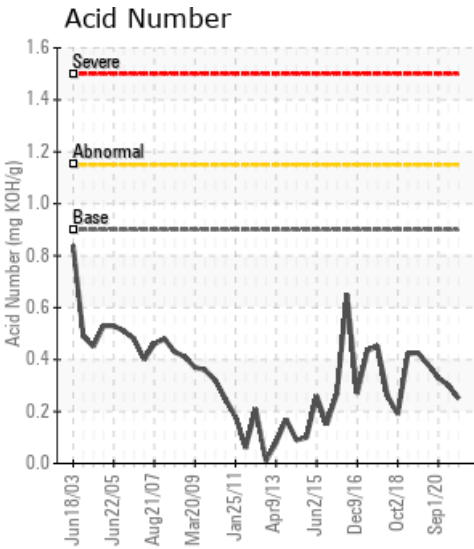
RELUTHERM RTAG-14

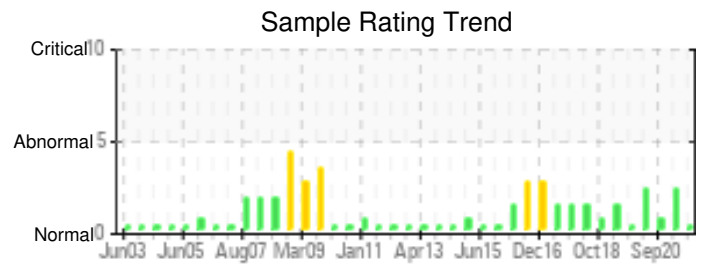
Customer: PTRHTF40043	System Information	Sample Information
MORA PRODUCTIE BV FREGATWEG 53 MAASTRICHT 6222NZ MAASTRICHT, 6222NZ Netherlands Attn: WILBERT SNIJERS Tel: E-Mail: w.snijers@klt.nl	System Volume: 10000 ltr Bulk Operating Temp: 275F / 135C Heating Source: Blanket: Fluid: PETRO CANADA PURITY FG HEAT TRANSFER FLUID Make: RELUTHERM	Lab No: 02446370 Analyst: Luis Rodriguez Sample Date: 09/21/21 Received Date: 09/27/21 Completed: 10/15/21 Luis Rodriguez luis.rodriguez@hollyfrontier.com

Recommendation: All parameter are within normal limits. Oil is fit for further use. Resample at normal interval.

Comments:

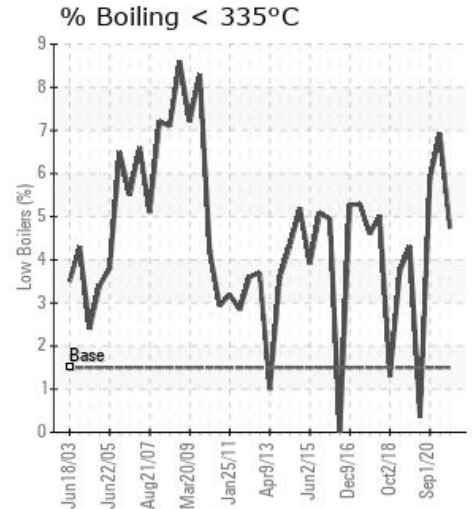
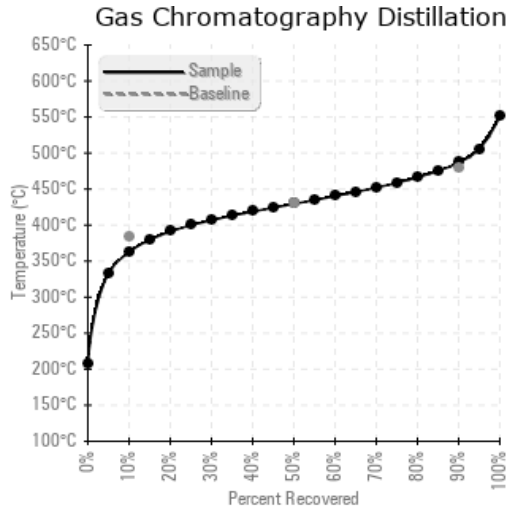
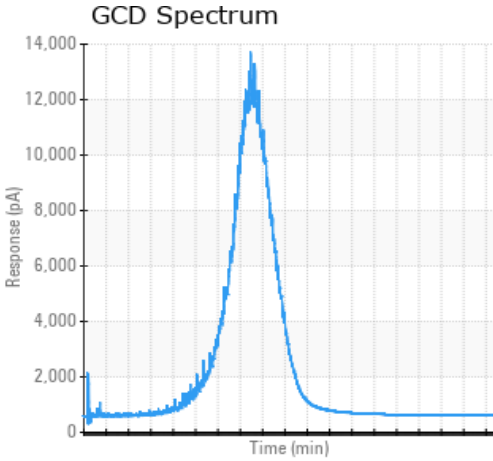
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
09/21/21	09/27/21	18.3y		410 / 210	15.7	31.2	0.25	0.148	685 / 363	805 / 429	908 / 487	4.74
03/09/21	03/15/21	17.8y		385 / 196	20.6	30.1	0.30	0.106	664 / 351	798 / 425	917 / 492	6.92
09/01/20	09/09/20	17.3y		381 / 194	5.9	29.5	0.33	0.150	678 / 359	805 / 429	908 / 487	5.89
02/18/20	02/25/20	16.8y		347 / 175	7.1	31.2	0.380	0.148	722 / 384	815 / 435	915 / 491	0.35
09/05/19	09/11/19	16.3y		417 / 214	22.6	31.5	0.426	0.099	681 / 361	791 / 422	880 / 471	4.31
Baseline Data				459 / 237		37.12	0.90		721 / 383	807 / 431	892 / 478	1.5





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	
09/21/21	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	1	
03/09/21	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	34	1
09/01/20	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0
02/18/20	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	1
09/05/19	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	38	2
Baseline Data			0	0						0			0	0				0	0					230	

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



Historical Comments	
03/09/21	The oil is fit for further use but first signs of thermal degradation are visible. Increase in low boilers confirms trend from previous result. Vent light ends from the system if possible. Resample in 6 months time. (GCD) 90% Distillation Point is marginally high. COC Flash Point is marginally low. (GCD) 10% Distillation Point is marginally low.
09/01/20	Product within normal working limits and fit for further use. Please sample at next designated interval COC Flash Point is marginally low.
02/18/20	COC Flash Point has dropped out of acceptable limits low. If the fluid can be safely vented to recover (looks to have been done before). System temp is 275F (or 135C) which remains below the current flash point of the fluid but should still look to recover COC Flash Point is severely low. (GCD) 90% Distillation Point is abnormally high. (GCD) % < 335°C measurement of 0.35% too low, as flash point indicates much higher content of light molecules.
09/05/19	Product within normal working limits and fit for further use. Please sample at next designated interval

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