

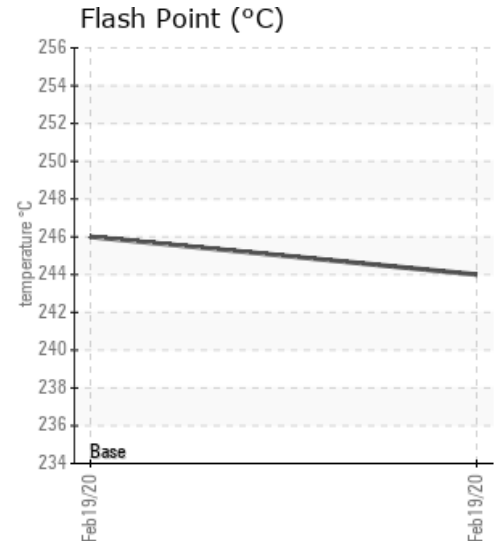
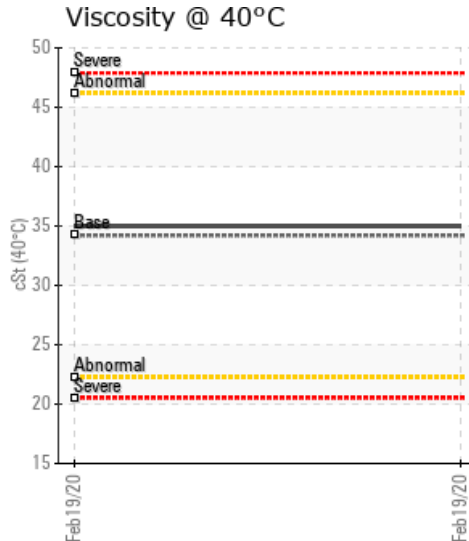
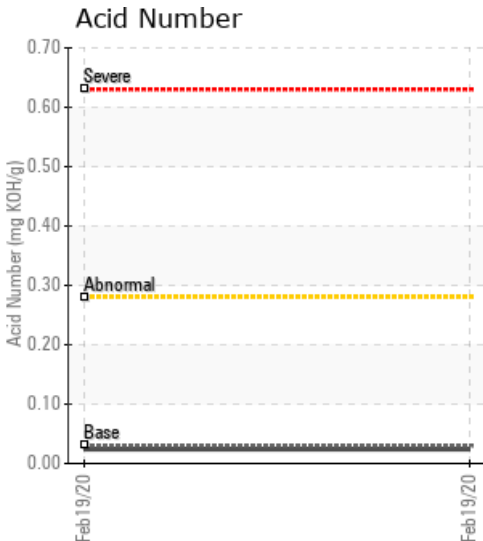
[TOURMALINE / C-46-C/94-H-4] UTILITY HEAT MEDIUM

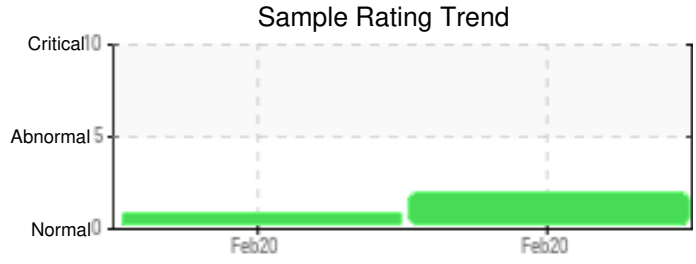
Customer: PTRHTF20039	System Information	Sample Information
BRENNTAG CANADA INC 3124-54TH AVENUE SE CALGARY, AB T2C 0A8 Canada Attn: Matthew Kryska Tel: E-Mail: mkryska@brenntag.ca	System Volume: 180000 ltr Bulk Operating Temp: 302F / 150C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: HEATECK	Lab No: 02341089 Analyst: Peter Harteveld Sample Date: 02/19/20 Received Date: 03/03/20 Completed: 03/17/20 Peter Harteveld peter.harteveld@hollyfrontier.com

Recommendation: The fluid is in a good condition and suitable for further use. 90% GCD temperature is high and so is the distillation curve as a whole. Flash Point is high as well. This is no problem but is either an indication of the presence of a heavier fluid (which is not supported by viscosity) or the onset of fluid oxidation (which is not supported by AN). More trending data is required to make a better evaluation of fluid condition. Please re-sample in 3 months and in the mean time check proper operation of the blanket gas system.

Comments: (GCD) 90% Distillation Point is severely high.

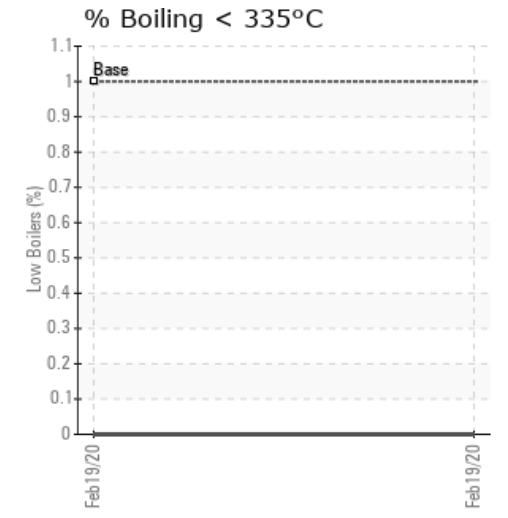
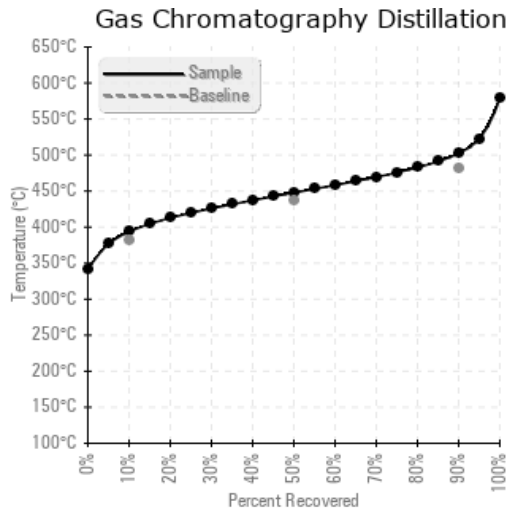
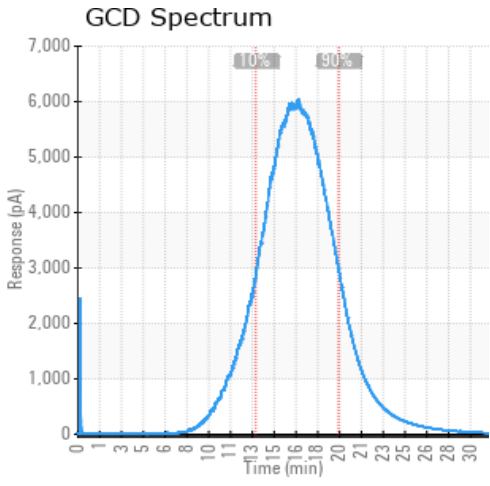
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
02/19/20	03/03/20	5.0d	PHM	471 / 244	0.003	35.0	0.024	0.123	740 / 394	838 / 448	936 / 502	0.00
02/19/20	03/03/20	5.0d	UHM	475 / 246	0.001	35.0	0.024	0.102	739 / 393	837 / 447	936 / 502	0.00
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00





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
02/19/20	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02/19/20	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Baseline Data																								
			0	0						0			0	0				0				0		

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



Historical Comments	
02/19/20	The fluid is in a good condition and suitable for further use. 90% GCD temperature is high and so is the distillation curve as a whole. Flash Point is high as well. This is no problem but is either an indication of the presence of a heavier fluid (which is not supported by viscosity) or the onset of fluid oxidation (which is not supported by AN). More trending data is required to make a better evaluation of fluid condition. Please re-sample in 3 months and in the mean time check proper operation of the blanket gas system. (GCD) 90% Distillation Point is abnormally high.

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