

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

Customer: PTRHTF20039
 BRENNTAG CANADA INC
 3124-54TH AVENUE SE
 CALGARY, AB T2C 0A8 Canada
 Attn: Matthew Kryska
 Tel:
 E-Mail: mkryska@brenntag.ca

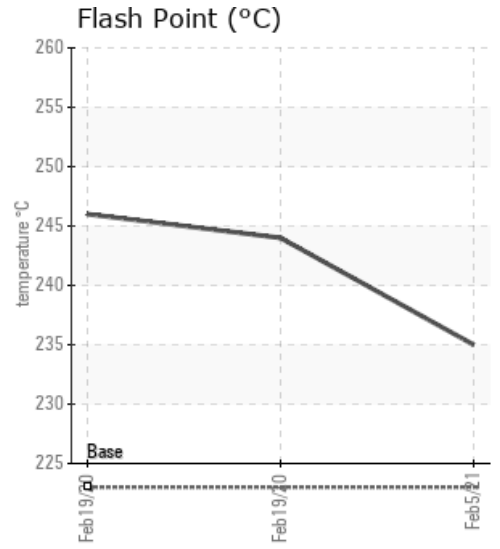
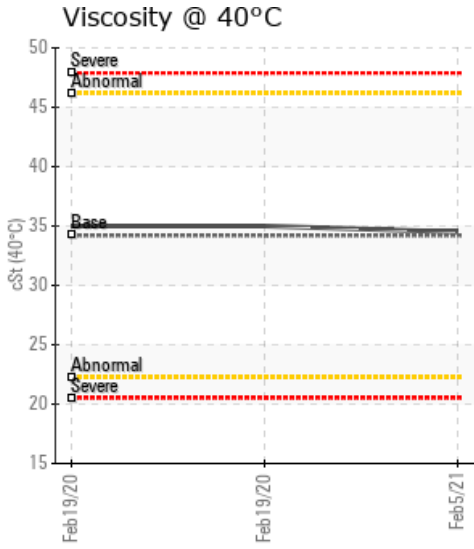
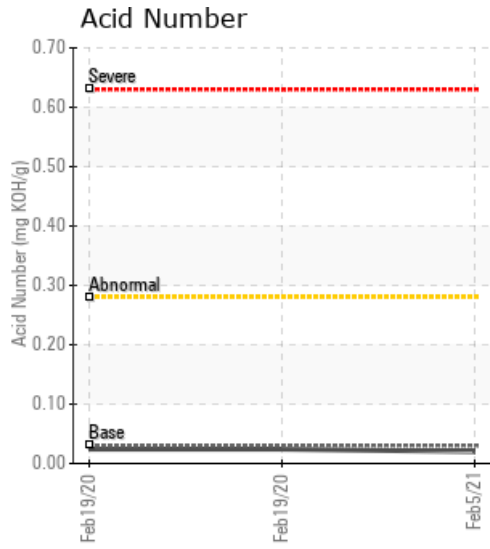
System Information
 System Volume: 180000 ltr
 Bulk Operating Temp: 302F / 150C
 Heating Source:
 Blanket:
 Fluid: PETRO CANADA PETRO-THERM
 Make: HEATECK

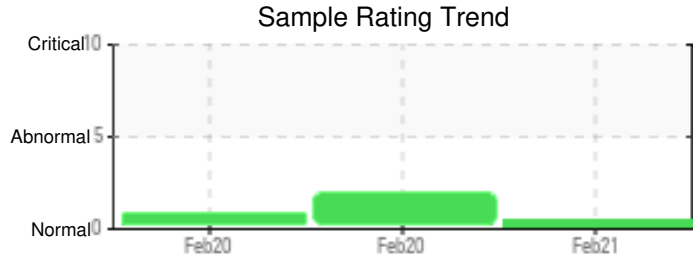
Sample Information
 Lab No: 02405479
 Analyst: Clinton Buhler
 Sample Date: 02/05/21
 Received Date: 02/23/21
 Completed: 02/25/21
 Clinton Buhler
 Clinton.Buhler@hollyfrontier.com

Recommendation: Sample results indicate that the fluid is in suitable condition for continued service. Please re-sample in 12 months.

Comments:

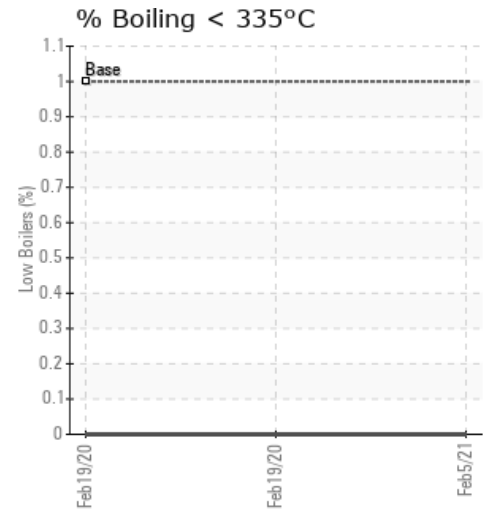
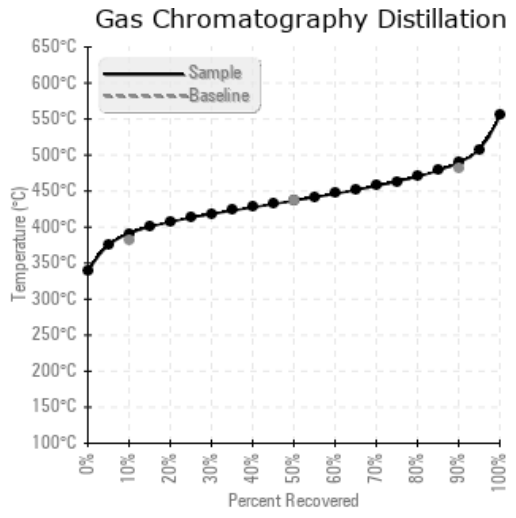
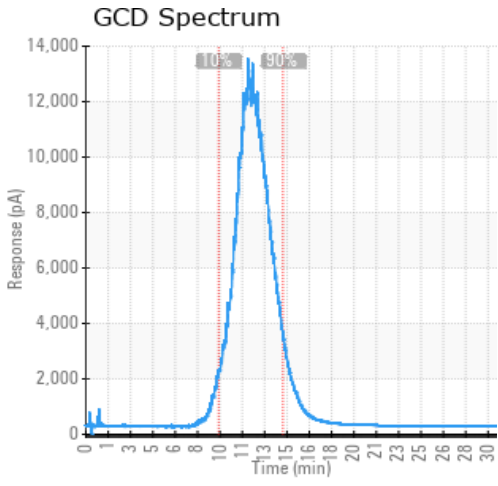
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
02/05/21	02/23/21	14.0d	Pump Suction	455 / 235	14.2	34.5	0.02	0.056	736 / 391	818 / 437	913 / 489	0.00
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
02/05/21	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	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 severely high.
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.

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.