

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

**Customer: PTRHTF20046**  
 QUADRA CHEMICALS  
 12925 146TH STREET  
 EDMONTON, AB T5L 2H6 CA  
 Attn: Quadra Samples  
 Tel:  
 E-Mail: quadra\_samples@quadra.ca

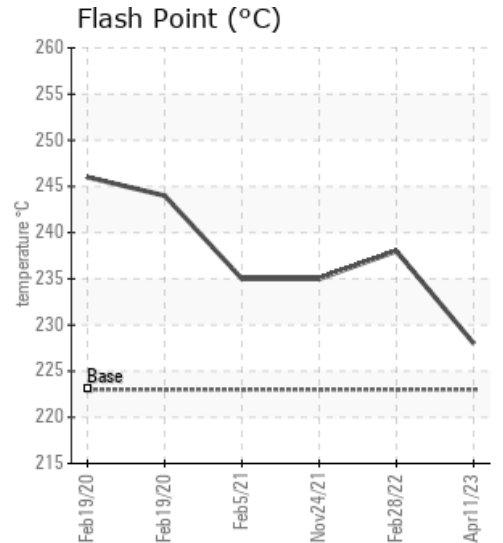
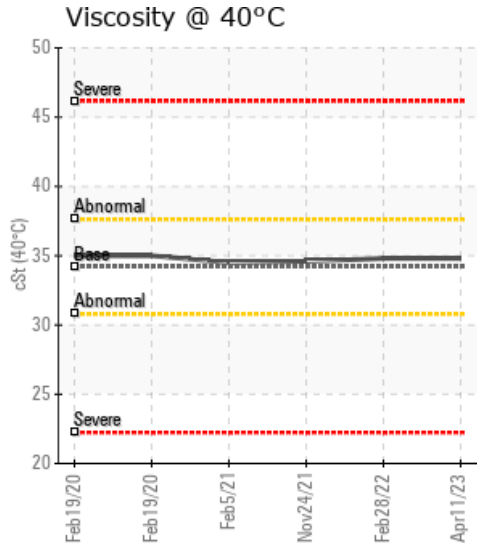
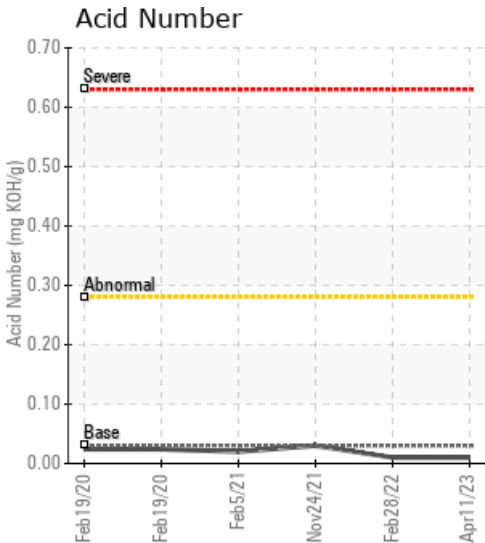
**System Information**  
 System Volume: 180000 ltr  
 Bulk Operating Temp: 302F / 150C  
 Heating Source:  
 Blanket:  
 Fluid: PETRO CANADA PETRO-THERM  
 Make: HEATECK

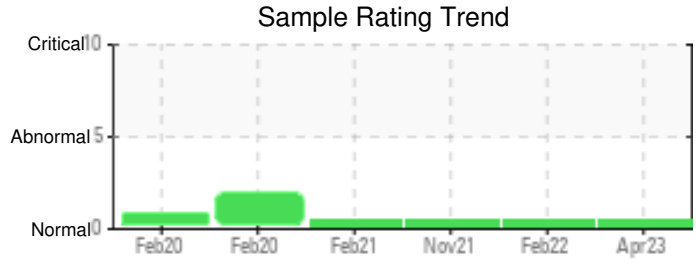
**Sample Information**  
 Lab No: 02557334  
 Analyst: Clinton Buhler  
 Sample Date: 04/11/23  
 Received Date: 05/12/23  
 Completed: 05/16/23  
 Clinton Buhler  
 Clinton.Buhler@HFSinclair.com

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

Comments:

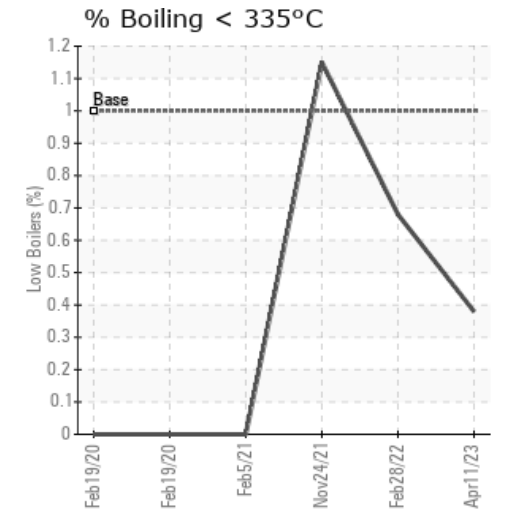
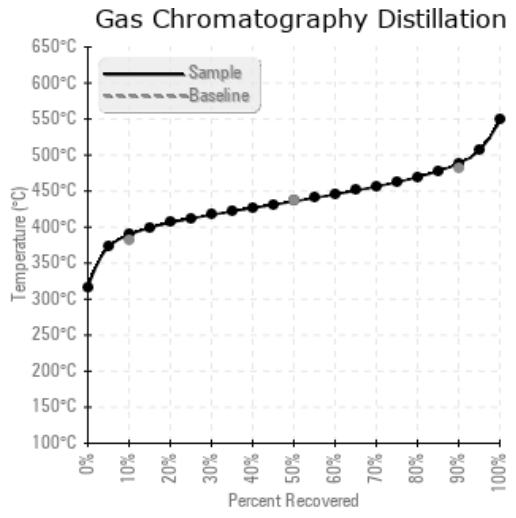
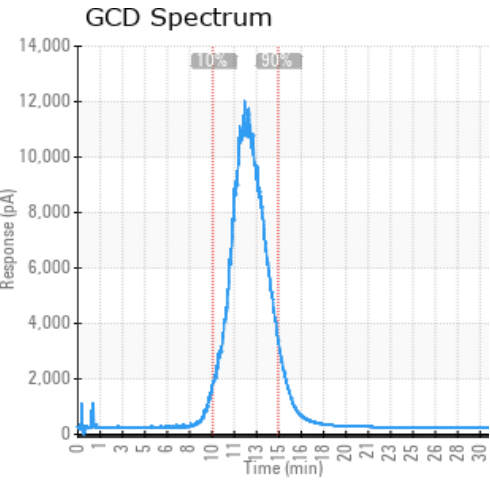
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
04/11/23	05/12/23	0.0d		442 / 228	27.0	34.8	0.01	0.052	732 / 389	816 / 436	911 / 488	0.38
02/28/22	03/10/22	90.0d	down of pump	460 / 238	16.5	34.8	0.01	0.049	732 / 389	817 / 436	911 / 488	0.68
11/24/21	12/06/21	14.0d	downstream P526A	455 / 235	9.0	34.6	0.03	0.057	731 / 388	816 / 436	911 / 488	1.15
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
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
04/11/23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02/28/22	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
11/24/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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
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	
02/28/22	Sample results indicate the fluid is in suitable condition for continued service. Please re-sample in 12 months
11/24/21	Sample results indicate the fluid is in suitable condition for continued service. Please re-sample in 12 months
02/05/21	Sample results indicate that the fluid is in suitable condition for continued service. Please re-sample in 12 months.
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.

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