Sample Rating

0.0   0.8   10.0

| NORMAL | ABNORMAL | CRITICAL |

Sample Rating Trend

Critical 10
Abnormal 5
Normal 0
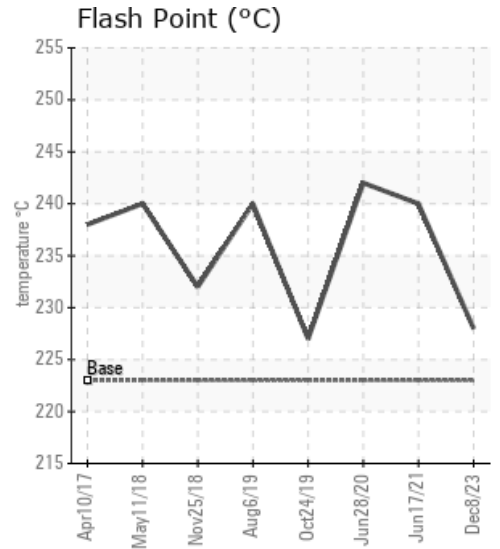
Apr17 May18 Nov18 Aug19 Oct19 Jun20 Jun21 Nov23 Dec23
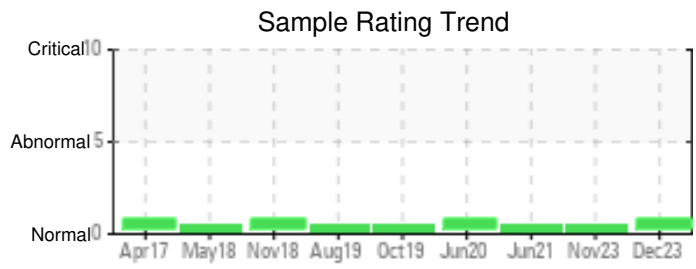
[Orlen Upstream Canada / 16-7-63-5w6] 5510/5610 HEAT MEDIUM

Customer: PTRHTF20262

Orlen upstream Canada Ltd.
850 2 St. SW
Calgary, AB T2P 0R8 CA
Attn: Ian Stewart
Tel:
E-Mail: ian.stewart@orlenupstream.ca

System Information

System Volume: 10000 ltr
Bulk Operating Temp: 374F / 190C
Heating Source:
Blanket:
Fluid: PETRO CANADA PETRO-THERM
Make: RUSHTON

Sample Information

Lab No: 02605136
Analyst: Clinton Buhler
Sample Date: 12/08/23
Received Date: 12/22/23
Completed: 01/03/24
Clinton Buhler
Clinton.Buhler@HFSinclair.com

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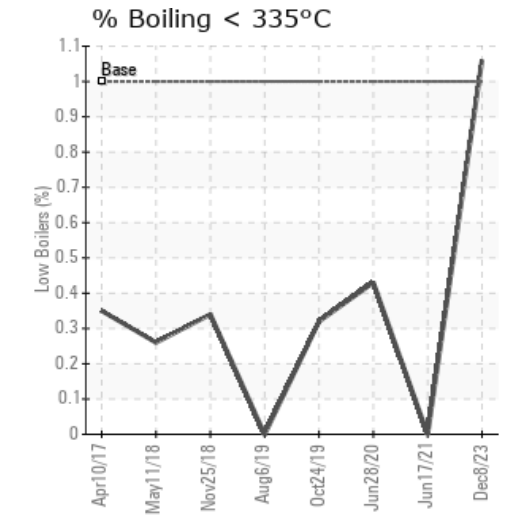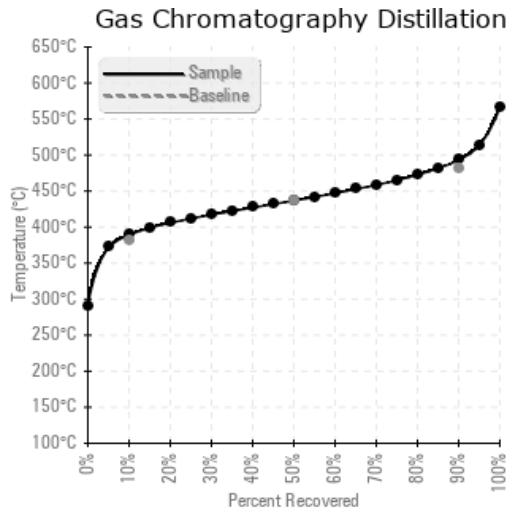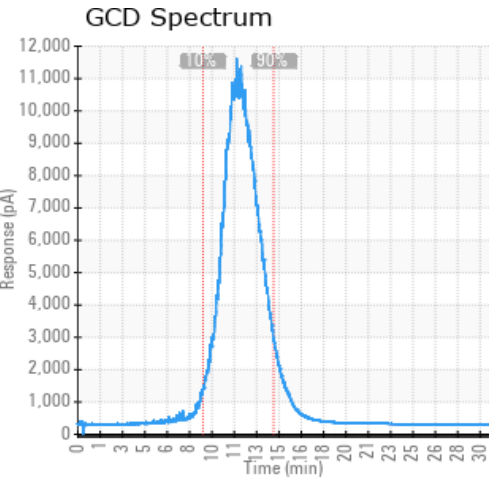
Comments:

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	%
12/08/23	12/22/23	0.0m		442 / 228	13	31.2	0.13	0.053	732 / 389	818 / 437	920 / 493	1.06
11/10/23	12/01/23	0.0m										
06/17/21	06/28/21	48.0m		464 / 240	3.6	35.3	0.01	0.144	729 / 387	803 / 428	924 / 496	0.00
06/28/20	07/13/20	24.0m		468 / 242	36.0	34.9	0.02	0.042	739 / 393	821 / 438	921 / 494	0.43
10/24/19	11/11/19	30.0m	FLOAT COLUMN	441 / 227	0.6	35.5	0.015	0.130	715 / 380	802 / 428	908 / 487	0.32
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

Acid Number

Viscosity @ 40°C

Flash Point (°C)

Sample Rating

0.0 — 0.8 — 10.0

NORMAL · ABNORMAL · CRITICAL

Sample Rating Trend

Critical 10 · Abnormal 5 · Normal 0

Apr17 May18 Nov18 Aug19 Oct19 Jun20 Jun21 Nov23 Dec23
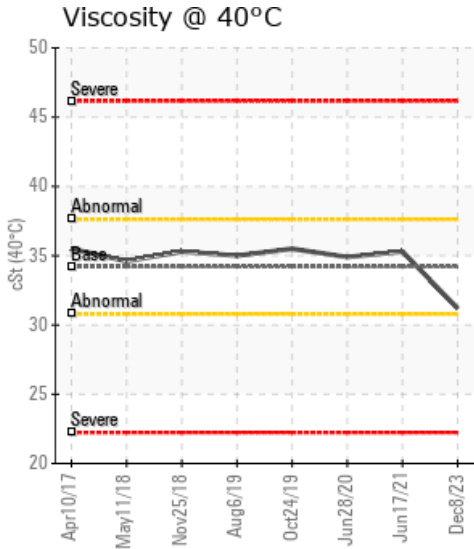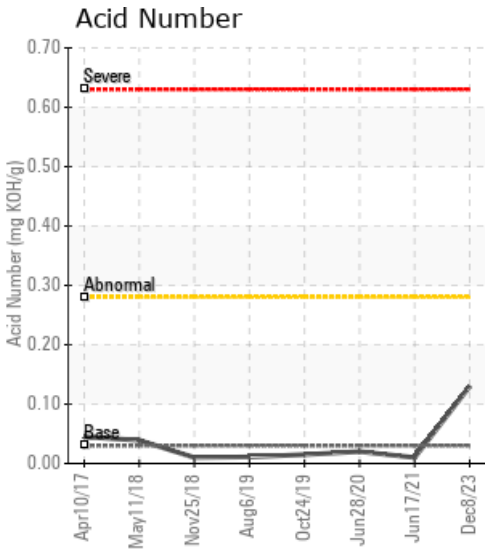
Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
12/08/23	7	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/10/23																								
06/17/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/28/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/24/19	0	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 anaysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]

GCD Spectrum

Gas Chromatography Distillation

% Boiling < 335°C

Historical Comments

11/10/23	*** sample was 100% water in the metal can. No thermal fluid ***Please re-sample immediately but ensure that the sample is taken from a representative point; pump discharge is ideal. Please thoroughly purge out sample point until hot heating fluid is coming out before taking the sample. Investigate the source of water contamination. Water contamination levels are severe.
06/17/21	Sample results indicate that the fluid is in suitable condition for continued service.Please re-sample in 12 months. (GCD) 90% Distillation Point is marginally high.
06/28/20	The fluid is in a good condition and suitable for further use. 10% and 90% GCD temperatures are slightly high. This is no concern at this time. Please re-sample in 12 months. (GCD) 90% Distillation Point is marginally high.
10/24/19	This was the re-sample after one of the initial August 2019 samples indicated excess water. Sample results indicate that the heat transfer fluid is suitable for continued service. Please re-sample in 12 months