

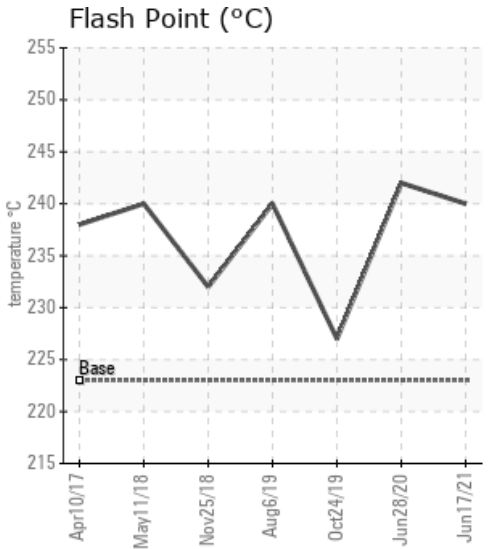
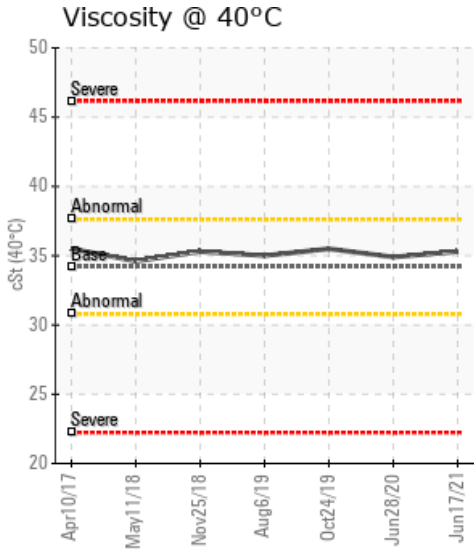
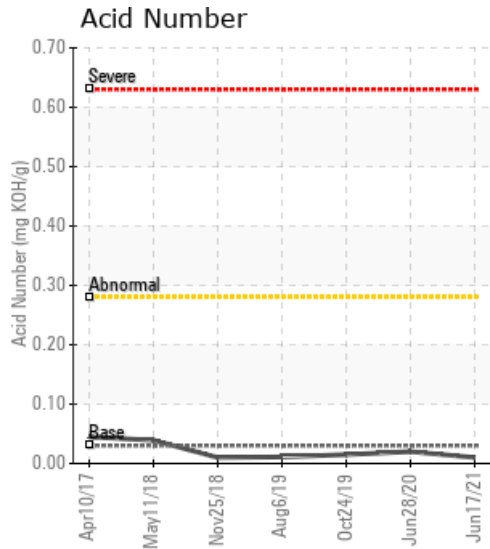
[Orlen Upstream Canada / 16-7-63-5w6] 5510/5610 HEAT MEDIUM

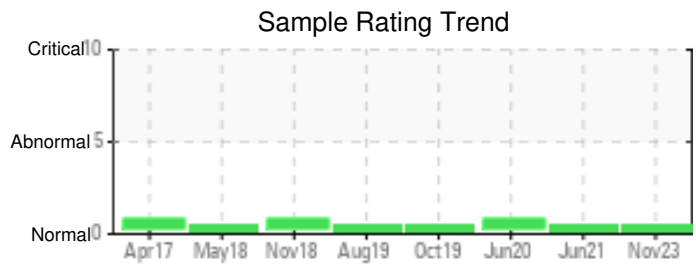
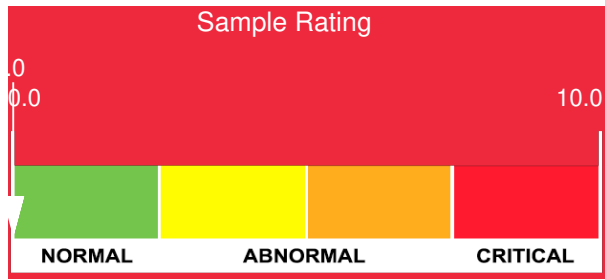
Customer: PTRHTF20262	System Information	Sample Information
Orlen upstream Canada Ltd. 850 2 St. SW Calgary, AB T2P 0R8 CA Attn: Ian Stewart Tel: E-Mail: ian.stewart@orlenustream.ca	System Volume: 10000 ltr Bulk Operating Temp: 374F / 190C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: RUSHTON	Lab No: 02600270 Analyst: Clinton Buhler Sample Date: 11/10/23 Received Date: 12/01/23 Completed: 12/05/23 Clinton Buhler Clinton.Buhler@HFSinclair.com

Recommendation: *** 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.

Comments: Water contamination levels are severe.

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	%
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
08/06/19	08/30/19	28.0m	SIGHTGLASS	464 / 240	8.6	35.0	0.011	0.160	722 / 383	794 / 423	886 / 475	0.00
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

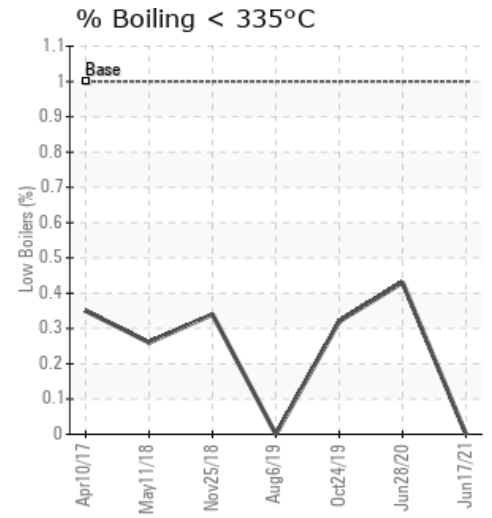




Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
11/10/23																								
06/17/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/28/20	0	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
08/06/19	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Baseline Data			0	0						0			0	0					0				0	

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

GCD Spectrum



Historical Comments

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
08/06/19	Sample results indicate that the heat transfer fluid is suitable for continued service. Please re-sample in 12 months

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