

HEAT TRANSFER FLUID

Customer: PTRHTF10167
 Polartec Tennessee Manufacturing LL...
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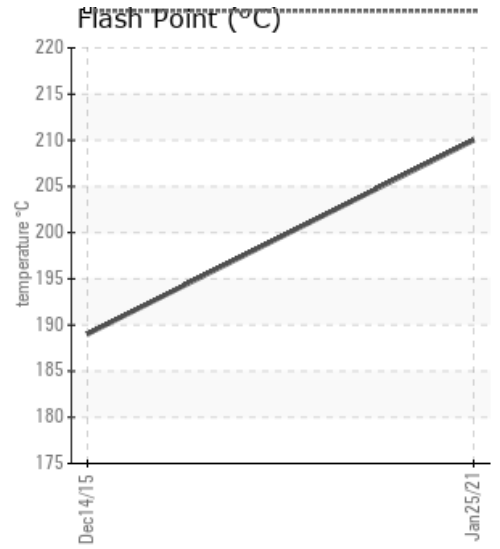
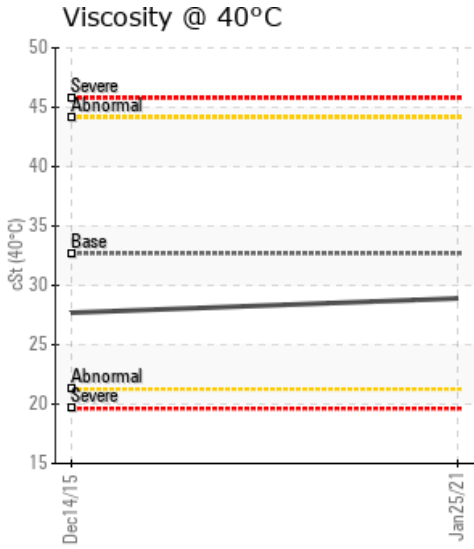
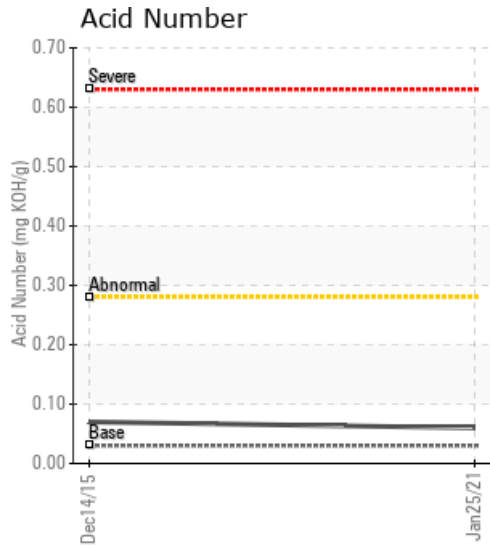
System Information
 System Volume: 2865 gal
 Bulk Operating Temp: 525F / 274C
 Heating Source:
 Blanket:
 Fluid: PETRO CANADA CALFLO AF
 Make: HEATEC

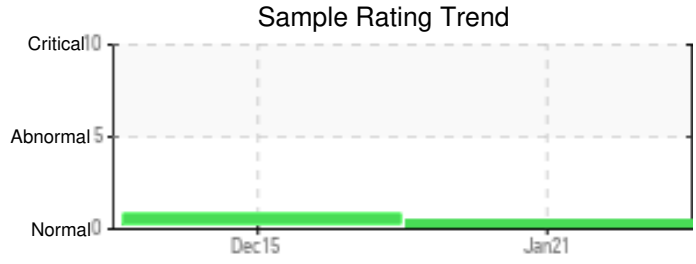
Sample Information
 Lab No: 02400935
 Analyst: Jake Finn
 Sample Date: 01/25/21
 Received Date: 02/01/21
 Completed: 02/09/21
 Jake Finn
 jake.finn@hollyfrontier.com

Recommendation: Fluid appears to be in great condition with no signs of degradation or contamination. Please resubmit for annual testing in one year.

Comments: N/A

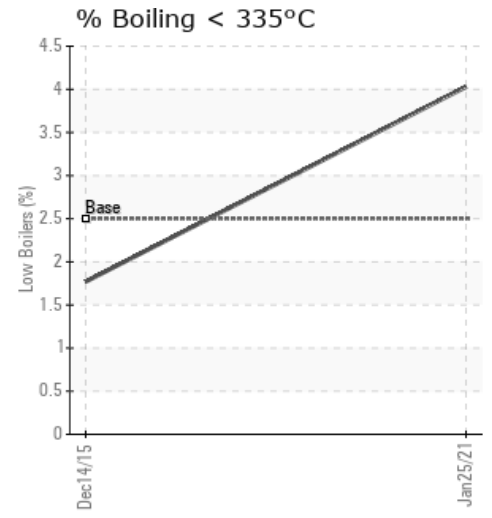
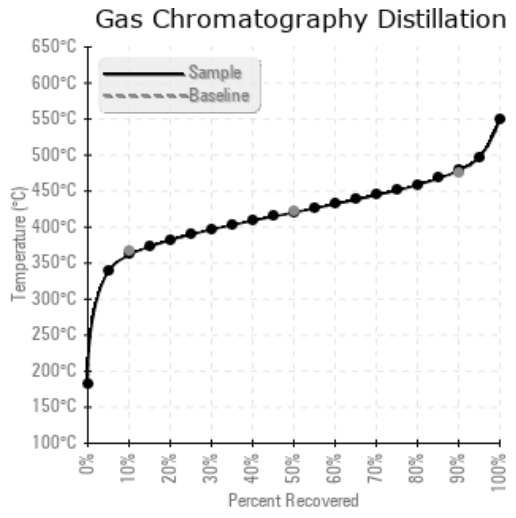
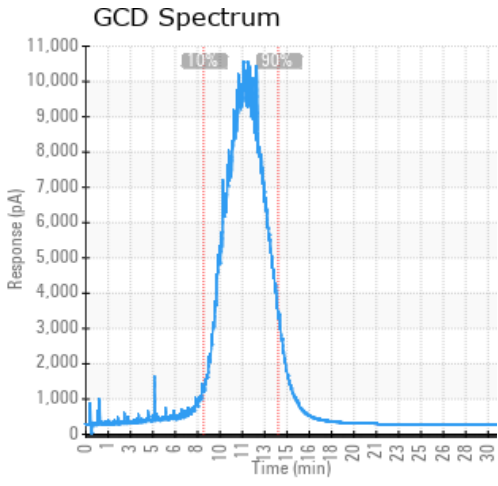
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/25/21	02/01/21	22.0y	Drain valve	410 / 210	9.6	28.9	0.06	0.065	683 / 361	788 / 420	893 / 479	4.03
12/14/15	12/17/15	18.0y	PUMP INLET	372 / 189	8.0	27.7	0.07	0.037	687 / 364	783 / 417	882 / 472	1.77
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5





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
01/25/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0
12/14/15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	0
Baseline Data			0	0						0			0	0					0				270	

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



Historical Comments	
12/14/15	Judging by the green flags, the oil condition is not so bad. Flash point is still strong enough for 525F operation, oxidation is minimal because of the nitrogen blanket. Overall the oil looks ok. However, if the oil life is truly 18 years as indicated, we would use the next shut down as an opportunity to replenish some of the additive reserve in the fluid by sweetening the system, i.e. replace a certain percentage (10% or 20%) of used oil with fresh Calflo. COC Flash Point is marginally low.

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