

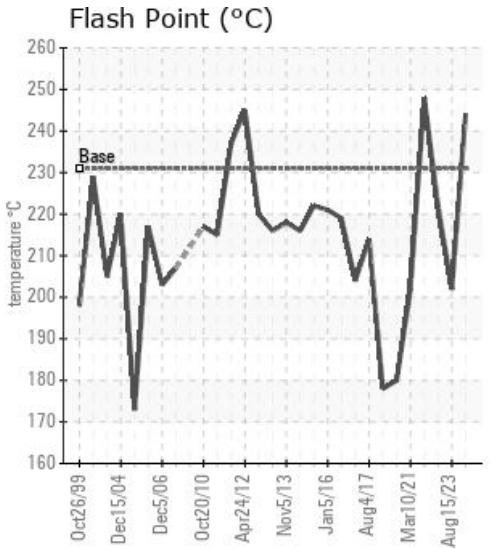
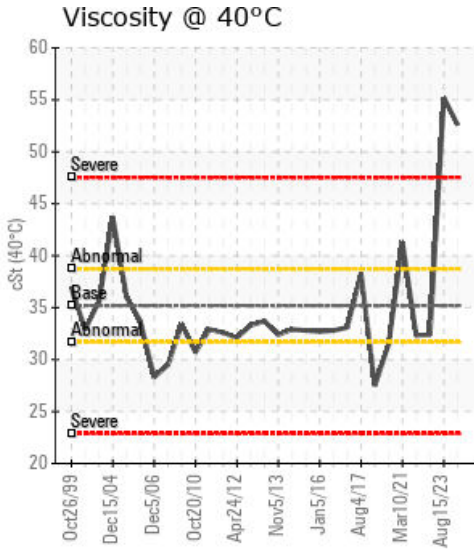
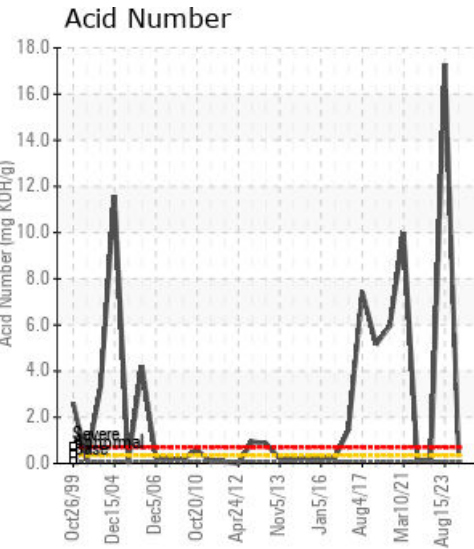
COMPOUNDING PRODEX

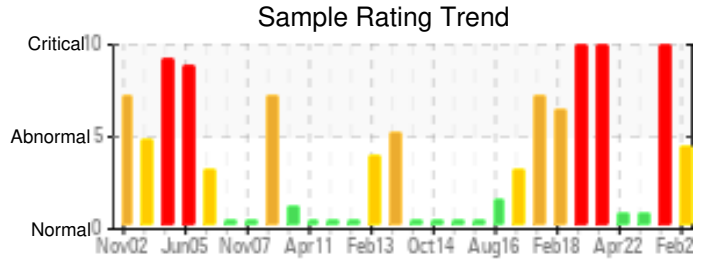
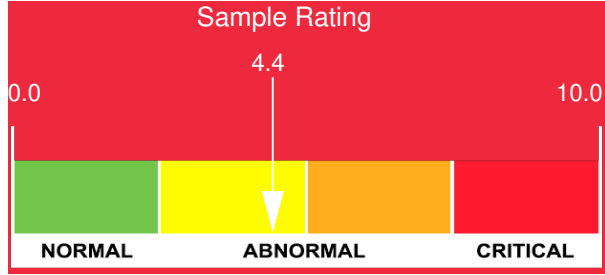
Customer: PTRHTF20087	System Information	Sample Information
Celanese Eva Performance Poly 4405-101 AVE. P.O. 428 EDMONTON, AB T5J 2K1 CA Attn: Greg Hein Tel: E-Mail: greg.hein@celanese.com	System Volume: 0 ltr Bulk Operating Temp: Not Specified Heating Source: Blanket: Fluid: PETRO CANADA CALFLO HTF Make: N/A	Lab No: 02614848 Analyst: Peter Harteveld Sample Date: 02/01/24 Received Date: 02/09/24 Completed: 02/16/24 Peter Harteveld peter.harteveld@HFSinclair.com

Recommendation: According to data provided fluid service life is 4.5 months which means the fill was replaced mid September 2023. (from Calflo AF to Calflo HTF) Currently the fluid is in a good condition and suitable for further use. Although the AN of the fluid is slightly elevated at 0.33, corrosion which was taking place previously, has been stopped. Evidenced by Fe content of 9 ppm. (561 ppm before) The Pentane Insoluble (solids) content is reduced significantly from 1.74% to 0.042%. (0.5% is reportable limit) The parameter which stand out is viscosity which is high. Fluid degradation by oxidation can be the cause of this but AN doesn't correlate with viscosity. Two potential causes for this are: 1. Leaving old degraded fluid behind when the fluid change out took place. This would also explain why the 10% GCD temperature is high. 2. Contamination with process fluid. (if that is a high viscosity fluid) Please check the blanket gas system for proper operation and re-sample in 6 months.

Comments: Visc @ 40°C is severely high. Acid Number (AN) is abnormally high. (GCD) 10% Distillation Point is marginally high. (GCD) 50% Distillation Point is marginally high. (GCD) 90% Distillation Point is marginally high.

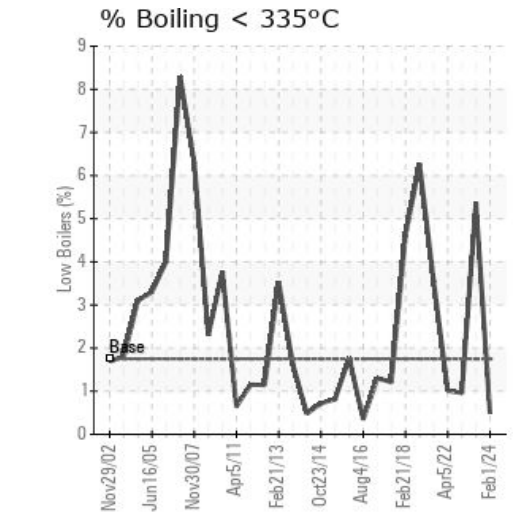
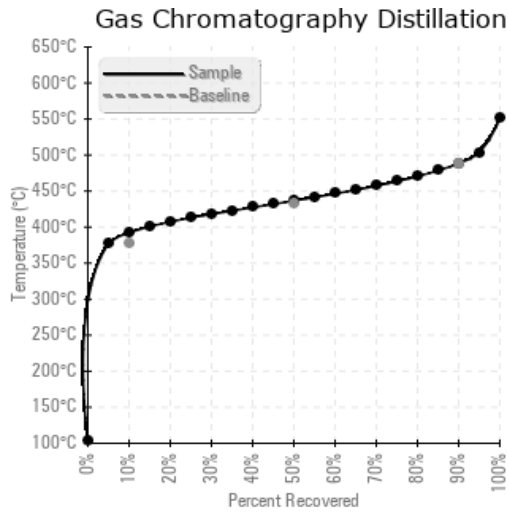
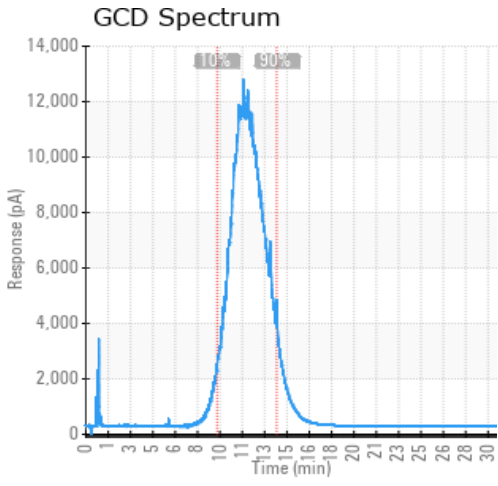
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
02/01/24	02/09/24	4.5m		471 / 244	5	52.6	0.33	0.042	738 / 392	818 / 437	911 / 488	0.49
08/15/23	08/22/23	19.0m		396 / 202	794.1	55.2	17.3	1.74	678 / 359	800 / 427	926 / 497	5.36
08/18/22	08/26/22	18.0m	TANK DRAIN	432 / 222	5.3	32.4	0.12	0.047	704 / 373	802 / 428	913 / 489	0.96
04/05/22	04/19/22	1.1m	Tank	478 / 248	4.6	32.3	0.15	0.048	702 / 372	800 / 427	910 / 488	1.01
03/10/21	03/22/21	1.5m		396 / 202	935.3	41.3	10.0	7.04	690 / 366	800 / 427	918 / 492	3.55
Baseline Data				448 / 231		35.20	.1		712 / 378	810 / 432	910 / 488	1.75





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
02/01/24	9	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	263	0
08/15/23	561	0	0	0	7	0	0	0	0	0	3	0	0	0	0	0	0	0	2	0	1	0	254	6
08/18/22	10	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	251	4
04/05/22	15	0	0	0	5	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	269	6
03/10/21	3572	2	0	1	333	22	0	0	0	0	1	0	0	0	0	0	12	0	3	0	0	0	265	204
Baseline Data			0	0						0			0	0				0	0				280	

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



Historical Comments	
08/15/23	*** Acid Number test performed twice (17.1, 17.3 mg KOH/g) ***The fluid is in a very poor condition and not suitable for further use. It is recommended to replace the fill with fresh fluid after cleaning/flushing the system. The reason for this poor fluid condition is degradation by oxidation. The Acid Number is extremely high which is resulting in corrosion hence the high Fe content. The increased 90% GCD temperature in combination with a viscosity of 55 cSt/40C confirm the degradation mode. In addition to this the water content of the fluid is elevated and the Pentane Insolubles (solids) content has exceeded the reportable limit of 0.5%. According to the information provided fluid service life is 19 months. This is extremely short considering the condition of the fluid. Please contact your Petro-Canada Technical Service Advisor to discuss the necessary steps going forward. Iron ppm levels are severe. Pentane Insolubles levels are severely high. Water contamination levels are abnormally high. ppm Water contamination levels are abnormally high. Acid Number (AN) is severely high. (GCD) 90% Distillation Point is severely high. Visc @ 40°C is severely high.
08/18/22	This sample has virtually the same conditions as last sample in April 2022. The oil viscosity, flash point and solid contents are all normal. There is minimum water or dirt contamination. It is suitable for further operation. Please take one sample in 12 months to monitor the conditions.
04/05/22	The current fluid has normal viscosity, flash point and distillation points. There are minimum solid content. It is suitable for further operation. Please take one sample in 12 months to monitor the condition.
03/10/21	The current fluid is severely contaminated by the particles and water. The oil viscosity has been increased a lot due to the severe oxidation. The out of grade high viscosity reduces the overall heat transfer efficiency. The fluid is not suitable for use. Please arrange oil change as soon as possible. Copper and iron ppm levels are severe. PQ levels are abnormal. Lead ppm levels are abnormal. Water contamination levels are severely high. ppm Water contamination levels are severely high. Pentane Insolubles levels are severely high. Acid Number (AN) is severely high. Zinc ppm levels are severely high. COC Flash Point is marginally low.

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