

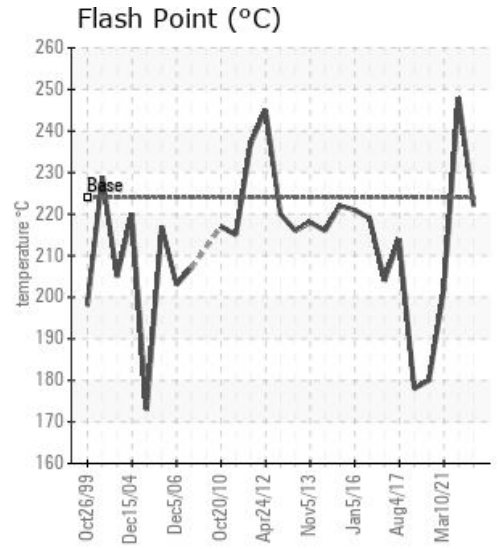
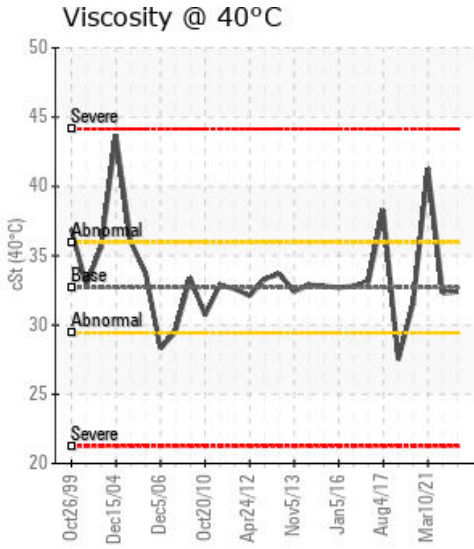
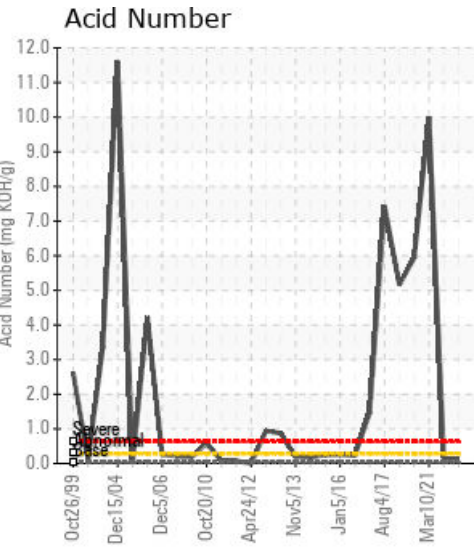
COMPOUNDING PRODEX

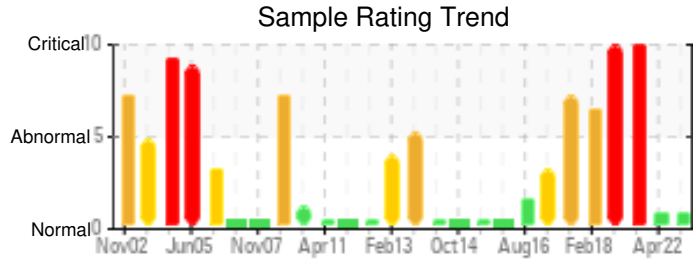
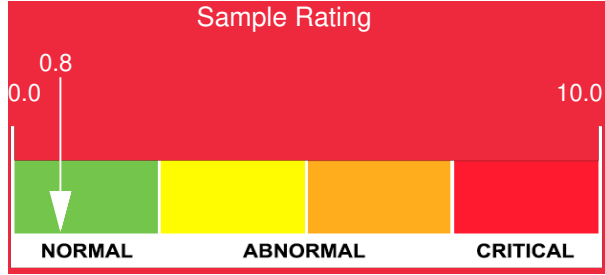
Customer: PTRHTF20087	System Information	Sample Information
Celanese Eva Performance Poly 4405-101 AVE. P.O. 428 EDMONTON, AB T5J 2K1 Canada Attn: Greg Hein Tel: E-Mail: greg.hein@celanese.com	System Volume: 0 ltr Bulk Operating Temp: Not Specified Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make: N/A	Lab No: 02507575 Analyst: Yutong Gao Sample Date: 08/18/22 Received Date: 08/26/22 Completed: 08/30/22 Yutong Gao yutong.gao@HFSinclair.com

Recommendation: 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.

Comments:

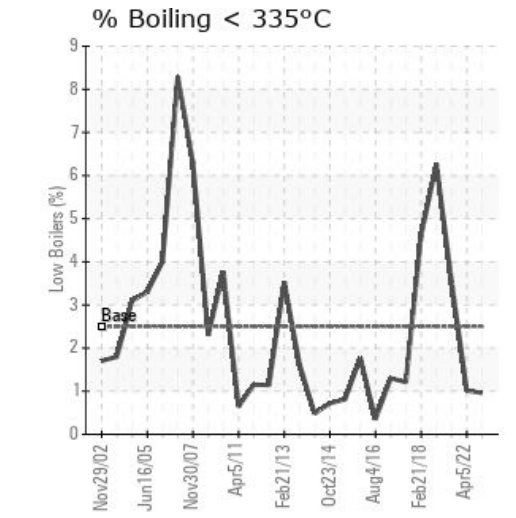
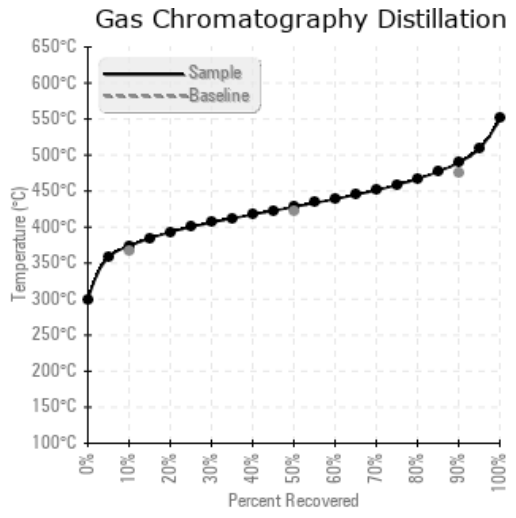
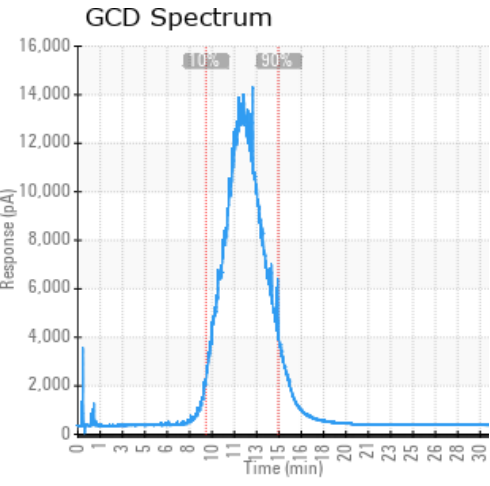
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
08/18/22	08/26/22	18.0m	TANK DRAIN	432 / 222	5.3	32.4	0.12	0.047	704 / 373	802 / 428	913 / 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
08/08/18	08/16/18	0.0m	TANK	356 / 180	1020.3	31.5	5.95	6.08	664 / 351	788 / 420	897 / 481	6.27
02/21/18	02/27/18	1.0m		352 / 178	131.6	27.5	5.16	0.980	672 / 356	778 / 414	870 / 466	4.61
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
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
08/08/18	698	0	0	0	219	15	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	217	167
02/21/18	177	0	0	0	23	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	240	32
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	
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.
08/08/18	Based on the analysis results, as presented, indicate a critical state. It appears that the oil may have experienced one or some of the following severe deteriorating conditions: Thermal degradation, severe component wear and / or oxidation. Iron, copper, zinc, water, pentane insolubles and acid number are all in a severe state. PQ, lead and COC flash point are abnormal. Results of this nature should be confirmed ASAP by means of a rush resample with extra care taken to ensure that a clean representative sample be taken and good sampling procedures are followed. The system should be monitored closely by engineering until the resample results are obtained and can be discussed. 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.
02/21/18	Based on the analysis results, it appears that the oil may have experienced one or both of the following deteriorating conditions. 1.) System wear. 2.) Heat transfer fluid oxidation. 3.) Thermal degradation. This may be due in part to the length of service on the oil (4 years indicated is not clear or consistent from sample to sample). Note the sample rating index continues to increase. The acid number increase is a measure of the acidic compounds in the oil. Increases in the acid number are likely due to the formation of oxidation by products in the oil. This value will increase exponentially once the process begins. Tendencies are for sludge and deposits to increase and corrosion to occur if the fluid continues to be utilized beyond its limits. The flash point level is below normal. The flash point is the lowest temperature at which the fluids vapor will momentarily ignite when contacted by an ignition source. Reduction is typically associated with thermal degradation of the heat transfer oil or possibly contamination. The Pentane Insolubles are abnormally high. This analysis is used for the determination of contaminants in used heat transfer oils, is to determine the amount of insoluble materials such as oxidation by products, dirt, carbonaceous material, and system wear components. These contaminants as a group are called pentane insolubles. Although, the test result is within acceptable guidelines, and reduced from the previous sample, please note the wear element iron (Fe) Iron typically comes from the system components and may indicate system wear. Also note the element copper. The copper level has risen significantly in this last sample. Please determine the source of the copper in your system and determine the severity of the wear. Sources of copper can be from heat exchangers (if so equipped) and possibly aftermarket anti seize compounds or pump components. Although it is still within normal guidelines, the viscosity level has dropped. Viscosity is the fluids ability to resist flow. A decrease in viscosity may be due to a lower viscosity oil being added, indicates that low boilers are present as a result of thermal degradation. Although still within normal ranges, the BP remains low. A low initial boiling point indicates that low boilers are present. This result can be corroborated by a lower flash point. This result can lead to pump cavitation. Copper ppm levels are abnormal. Pentane Insolubles levels are severely high. Acid Number (AN) is severely high. COC Flash Point is abnormally low.

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