

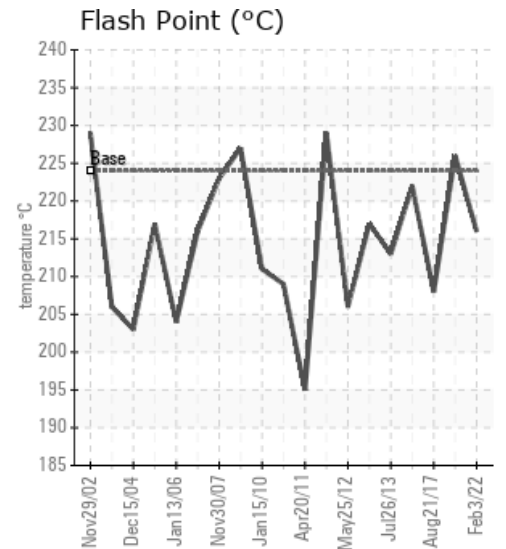
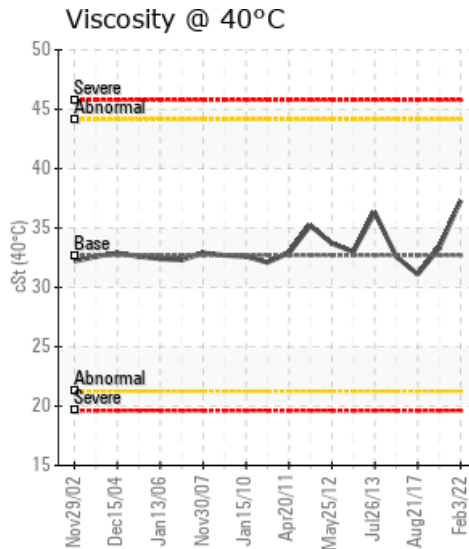
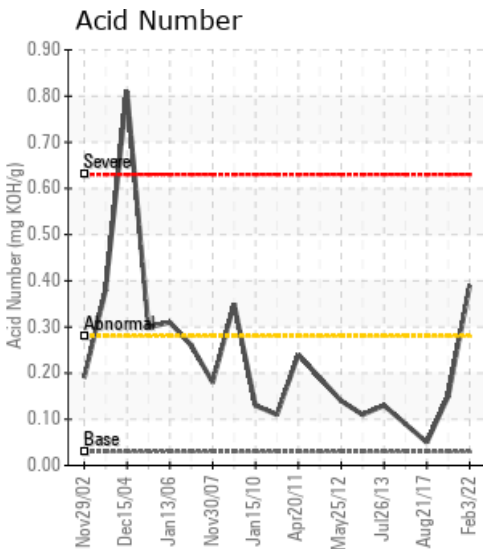
#3 Reactor Vessel Jackets] #3 REACTOR

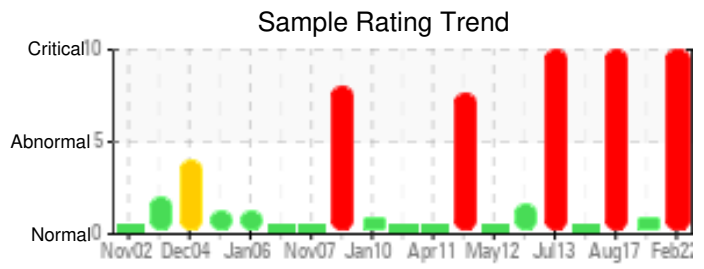
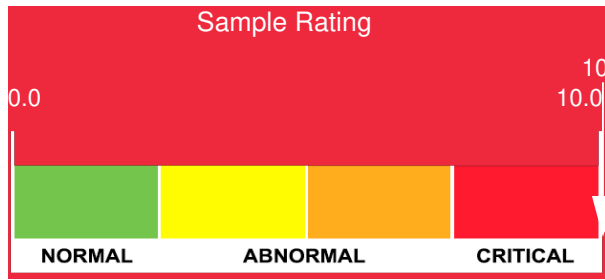
Customer: PTRHTF20087	System Information	Sample Information
Celanese Eva Performance Poly 4405-101 AVE. P.O. 428 EDMONTON, AB T5J 2K1 Canada Attn: Greg Hein Tel: E-Mail: greg.hein@celanese.com	System Volume: 0 ltr Bulk Operating Temp: 212F / 100C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make:	Lab No: 02471937 Analyst: Yutong Gao Sample Date: 02/03/22 Received Date: 02/14/22 Completed: 02/25/22 Yutong Gao yutong.gao@hollyfrontier.com

Recommendation: The current fluid has severe third party contaminations. The iron level is extremely high, which elevates the fluid viscosity and solid content reading. The fluid also has moderate oxidation, but is still OK to continue to use. It is better to find a way to filter the metals out ASAP. If the system volume is not huge, then it make sense to do a drain and fill.

Comments: Iron ppm levels are severe. PQ levels are severe. Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high. Manganese ppm levels are abnormally high. (GCD) 90% Distillation Point is marginally high.

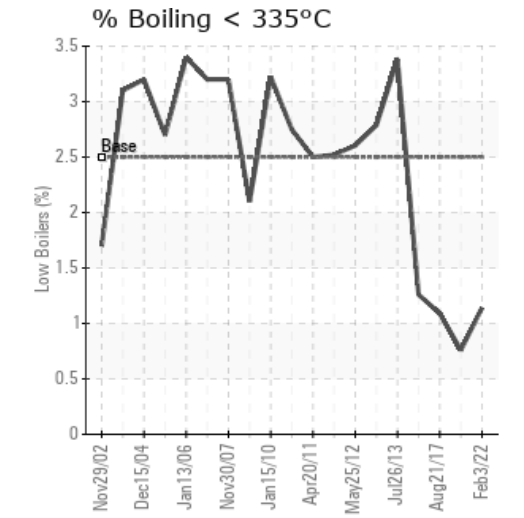
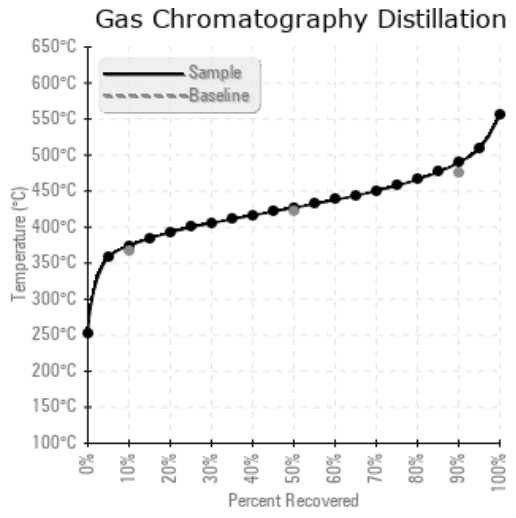
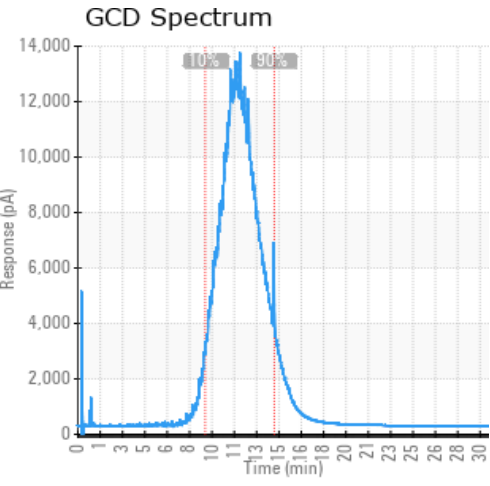
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
02/03/22	02/14/22	0.0h	RV heating jackets	421 / 216	42.3	37.3	0.39	1.41	704 / 374	800 / 427	913 / 489	1.14
06/22/20	07/15/20	0.0h		439 / 226	18.4	33.3	0.15	0.069	705 / 374	798 / 426	911 / 488	0.76
08/21/17	08/28/17	0.0h	REACTOR	406 / 208	13.9	31.1	0.05	0.573	700 / 371	799 / 426	897 / 481	1.09
03/01/16	03/02/16	0.0h	REACTOR PIPING	432 / 222	7.2	32.6	0.09	0.090	699 / 370	800 / 427	899 / 482	1.26
07/26/13	08/01/13	0.0h	REACTOR DIPING	415 / 213	137.4	36.3	0.13	1.90	684 / 362	789 / 421	890 / 477	3.38
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
02/03/22	2109	2	0	0	1	0	0	0	0	0	5	0	0	0	0	0	30	0	2	0	1	0	257	0
06/22/20	192	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3	0	0	0	0	0	247	0
08/21/17	1033	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	12	0	0	0	2	0	246	0
03/01/16	47	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	277	0
07/26/13	1359	1	0	0	2	2	0	0	0	0	6	0	2	0	0	0	10	0	0	2	2	0	203	2
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	
06/22/20	The current fluid has normal viscosity, flash point and solid content. The Acid Number is low, meaning there is minimum oxidation. the 192 ppm Fe indicates that there is minor contamination, which need to be monitored in the future. Please continue to run the current fluid, pay attention to the system contamination control and take one sample in 12 months to compare the fluid conditions.
08/21/17	Based on the analysis results, it appears the oil is experiencing some contamination. Please note the wear element iron (Fe). Iron typically comes from the system components. The pentane insolubles analysis result is the determination of contaminants in used heat transfer oils, and is used to determine the amount of insoluble materials such as oxidation by products, dirt, carbonaceous material, and system wear components in the fluid. These contaminants as a group are called pentane insolubles and the result is supported by the PQ result. It also appears that the sample results are not consistent with previous samples. Improper sampling techniques could result in unreliable test results. Iron ppm levels are severe. PQ levels are severe. Pentane Insolubles levels are severely high.
03/01/16	Results are normal. Resample at the next interval and continue to monitor the system.
07/26/13	There is high iron, solids and water in the sample. This is indicative of a poorly flushed sample port. Please flush at least 1 L of oil prior to collecting sample. The other test parameters indicate that the oil is in good condition and is suitable for further use. Please continue to sample on an annual basis. Iron ppm levels are severe. PQ levels are severe. Pentane Insolubles levels are severely high.

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