

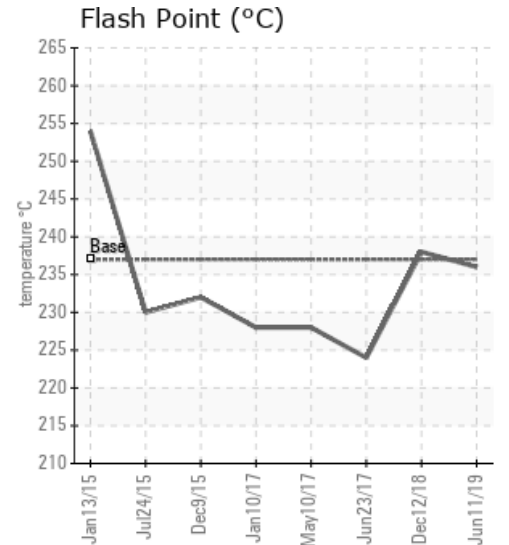
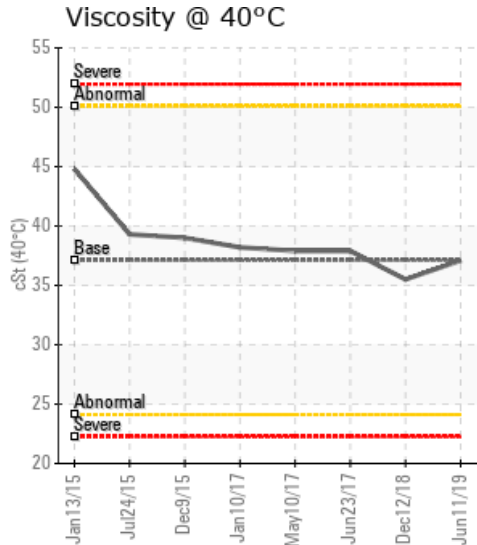
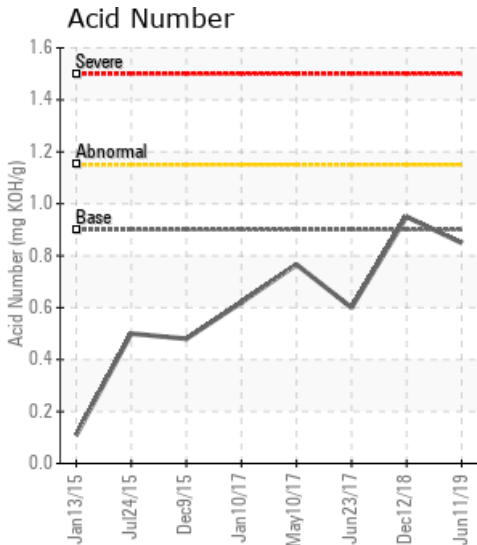
### #3 COOKER (I-854-1-0140)

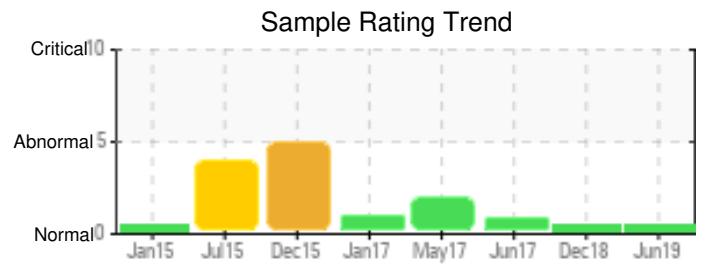
Customer: PTRHTF10156	System Information	Sample Information
<b>INGREDION</b> 1515 SOUTH DROVER ST INDIANAPOLIS, IN 46221 USA Attn: Randy Ward Tel: (317)656-2247 E-Mail: Randy.Ward@ingredion.com	System Volume: 200 gal Bulk Operating Temp: 400F / 204C Heating Source: Blanket: Fluid: PETRO CANADA PURITY FG HEAT TRANSFER FLUID Make: HEAT EXCHANGER/TRAN	Lab No: 02294440 Analyst: Yvette Trzcinski Sample Date: 06/11/19 Received Date: 06/28/19 Completed: 07/22/19

Recommendation: all parameters within specification re sample in 12 months

Comments:

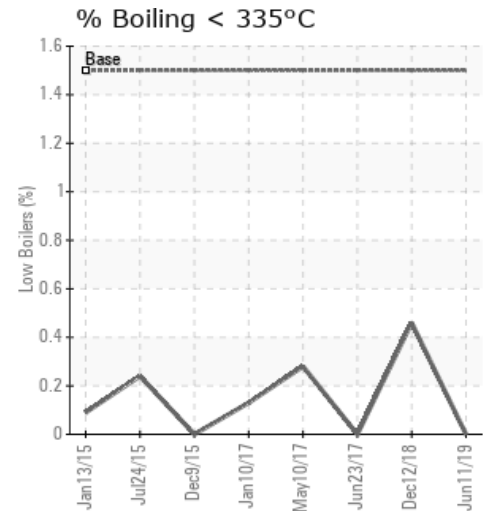
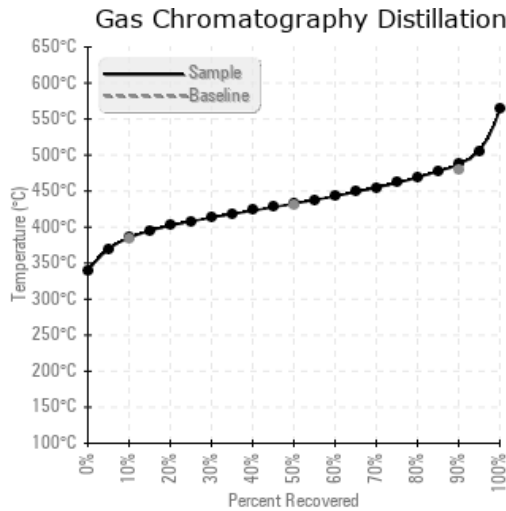
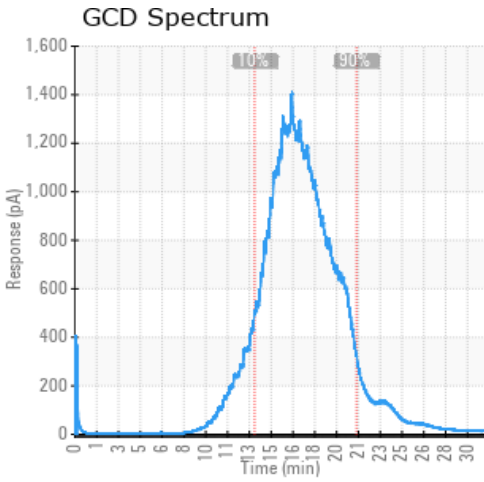
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
06/11/19	06/28/19	0m	SAMPLE PORT	457 / 236	120.1	37.1	0.849	0.016	725 / 385	811 / 433	909 / 487	0.00
12/12/18	06/20/19	0m	SAMPLE PORT	460 / 238	35.7	35.5	0.950	0.046	708 / 376	803 / 428	908 / 487	0.46
06/23/17	02/13/18	6m		435 / 224	13.4	37.9	0.60	0.014	747 / 397	825 / 440	924 / 496	0.00
05/10/17	05/16/17	6m	DRAIN PORT	442 / 228	12.9	37.9	0.766	0.033	732 / 389	831 / 444	965 / 518	0.28
01/10/17	01/23/17	7m		442 / 228	7.6	38.2	0.62	0.026	739 / 393	841 / 449	984 / 529	0.13
12/09/15	04/19/16	6m	HOT OIL HEAT EXCHNGR	450 / 232	9.4	39.0	0.48	0.034	819 / 437	902 / 483	991 / 533	0.00
Baseline Data				459 / 237		37.12	0.90		721 / 383	807 / 431	892 / 478	1.5





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
06/11/19	15	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	191	3
12/12/18	21	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	204	4
06/23/17	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	176	0
05/10/17	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	188	0
01/10/17	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	172	0
12/09/15	4	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	130	6
Baseline Data			0	0						0			0	0					0				230	

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



### Historical Comments

12/12/18	sample is dated December 12 2018 - some thermal degradation is occurring seeing slight decrease in viscosity and and AN increasing - resample in 6 months
06/23/17	very little insolubles and the viscosity and acid number suggest the fluid is acceptable for continued use. This sample is dated June 2017 I recommend sending in new samples.
05/10/17	There appears to be slight addition to the system viscosity closer to the Purity FG HTF. Sediment is low and flash point remaining constant. Resample in 3-6 months.
01/10/17	The lightening in color, the reduction in viscosity and other properties slowly moving towards Purity FG HTF, we notice the fluid is still a mixture of Interlube and Purity FG HTF at an approximate ratio of 15% - 85% respectively. The fluid condition is good with minimal amount of foreign elements, solids and water contamination. The flash point remains strong. No action deemed necessary at this time, just re-sample in 6 months for normal monitoring. (GCD) 90% Distillation Point is severely high. (GCD) 50% Distillation Point is marginally high.
12/09/15	Considering the sample was submitted much later than it was taken, we recommend to send another set of samples as they were monitored every 4 months anyways. The GC profile and additive content still shows high presence of Interlube. The oil condition is suitable for further service. (GCD) 10% Distillation Point is severely high. (GCD) 50% Distillation Point is severely high. (GCD) 90% Distillation Point is severely high.

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