

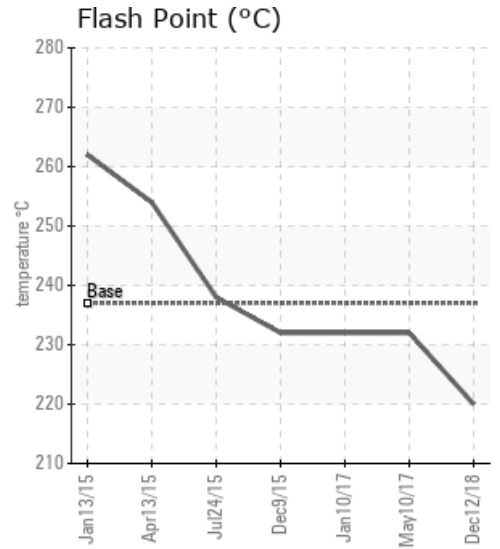
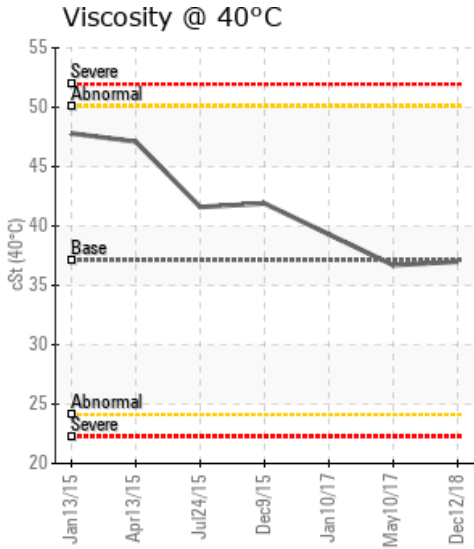
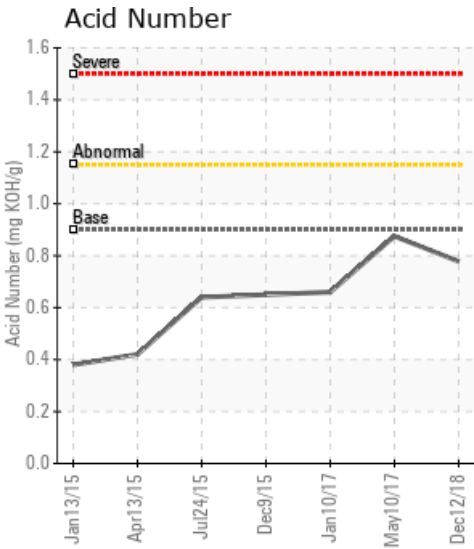
## DEXTRIN COOKER #2 (I-853-1-0140)

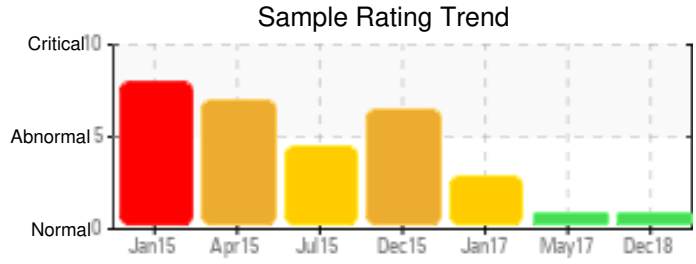
Customer: PTRHTF10156	System Information	Sample Information
<b>INGREDION</b> 1515 SOUTH DROVER ST INDIANAPOLIS, IN 46221 USA Attn: Randy Ward Tel: (317)656-2247 E-Mail: Randy.Ward@ingredion.com	System Volume: 200 gal Bulk Operating Temp: 400F / 204C Heating Source: Blanket: Fluid: PETRO CANADA PURITY FG HEAT TRANSFER FLUID Make: HEAT EXCHANGER/TRAN	Lab No: 02292385 Analyst: Yvette Trzcinski Sample Date: 12/12/18 Received Date: 06/20/19 Completed: 06/25/19

Recommendation: sample dated December 12 2018 - seeing some oxidation occurring in the system with the GCD 90% increasing but all other testing parameters look normal - resample in 6 months

Comments: (GCD) 90% Distillation Point is marginally high.

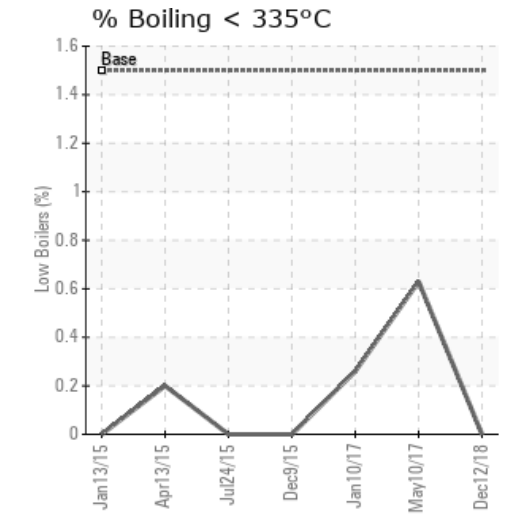
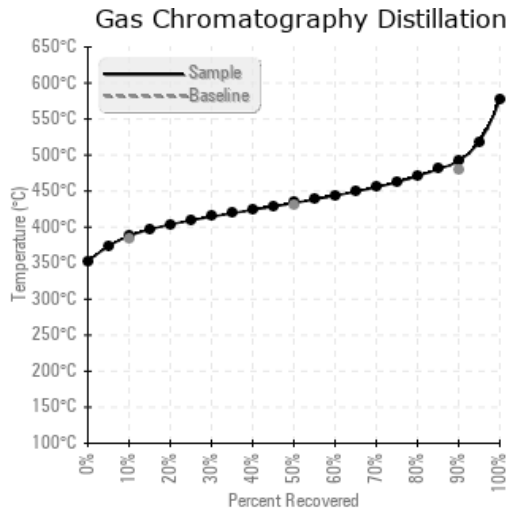
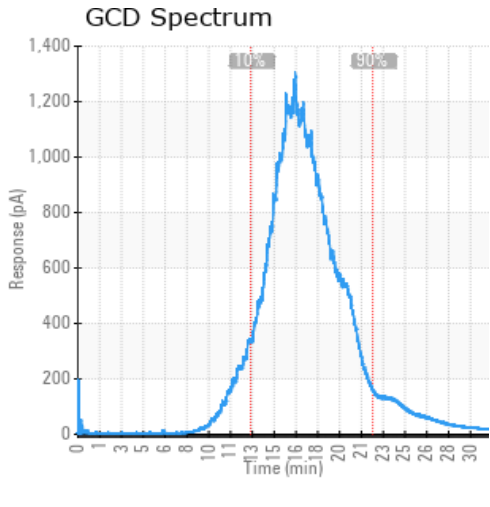
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
12/12/18	06/20/19	0m	SAMPLE PORT	428 / 220	23.2	37.0	0.778	0.121	730 / 388	812 / 433	917 / 492	0.00
05/10/17	05/16/17	6m	DRAIN PORT	450 / 232	9.5	36.7	0.875	0.056	725 / 385	821 / 438	926 / 497	0.63
01/10/17	01/23/17	8m		450 / 232	13.4	39.3	0.66	0.068	735 / 391	836 / 447	987 / 531	0.26
12/09/15	04/19/16	6m	HOT OIL COOLER	450 / 232	33.3	41.9	0.65	0.042	916 / 491	958 / 515	1016 / 547	0.00
07/24/15	08/06/15	0m	PAST THE STRAINER	460 / 238	6.6	41.6	0.64	0.030	751 / 400	893 / 478	1031 / 555	0.00
04/13/15	04/21/15	0m		489 / 254	32.4	47.1	0.42	0.034	819 / 437	966 / 519	1074 / 579	0.20
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
12/12/18	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180	6
05/10/17	53	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	215	1
01/10/17	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	166	2
12/09/15	17	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4	0	0	0	0	0	105	2
07/24/15	15	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	110	1
04/13/15	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1
<b>Baseline Data</b>			0	0						0		0	0					0					230	

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



Historical Comments	
05/10/17	Continued addition of Purity FG HTF is improving the viscosity and health of this system it is currently looking the best as compared to the other two systems. Resample at normal intervals
01/10/17	This system was in the worst shape and has seen a modest addition of Purity FG HTF since the last sample. The high viscosity from the degraded Interlube is being diluted and is getting closer to Purity FG HTF. The high GCD 10% alerts are also going away slowly, meaning the fluid is starting to look better. No immediate action deemed necessary at this time, but if the health of the fluid is this particular system is extremely critical, if budget and time allows, you could consider improving its condition rapidly by replacing 50% of it or more. Otherwise, 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	The sample is dated Dec 9 2015, so a fresh sample would provide more insight into the current fluid condition. The amount of Purity FG HTF is slowly increasing in this system. The oil viscosity remains high, between Interlube and Purity FG HTF. Please keep monitoring every 6 months considering how critical these cookers are. (GCD) 10% Distillation Point is severely high. (GCD) 50% Distillation Point is severely high. (GCD) 90% Distillation Point is severely high. Visc @ 40°C is abnormally high.
07/24/15	There is a steady change in properties to show the increasing amount of Purity FG HTF in the system (estimated at ~ 40%). The overall condition of the fluid appears to be better than previously thanks to the addition of fresh Purity FG HTF, judging by the the results on metals, water and insoluble solids at low levels. Please re-sample at next scheduled interval. (GCD) 50% Distillation Point is severely high. (GCD) 90% Distillation Point is severely high. Visc @ 40°C is abnormally high.
04/13/15	The oil shows some tests flagged but it's because the sample is labeled as Purity FG HTF when it appears the oil looks like the former Interlube HTF. The viscosity, GCD profile and flash point are very slowly trending towards Purity FG HTF as we can tell there was a minor addition. The TAN is increasing slowly towards fresh Purity FG HTF value but the fact is a TAN of 0.38-0.42 for Interlube is high and indicative of a certain oxidation level where actions would be suggested. If a system change-out is not in the plans for the next year, we would suggest to consider replacing approximately 50% of the fluid to reduce the oxidation level and add fresh anti-oxidants. We suggest to Re-sample in another 3 months to monitor.

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