

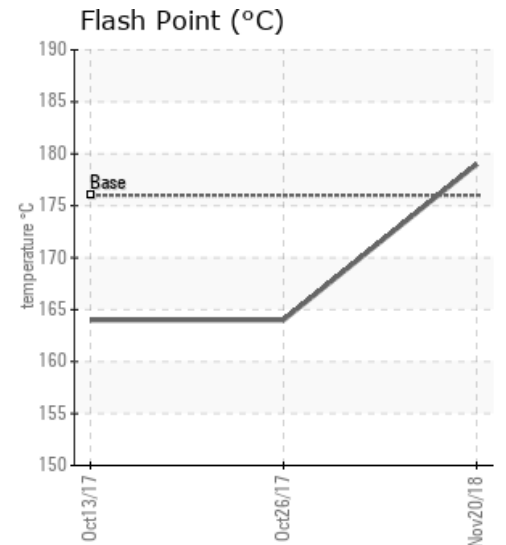
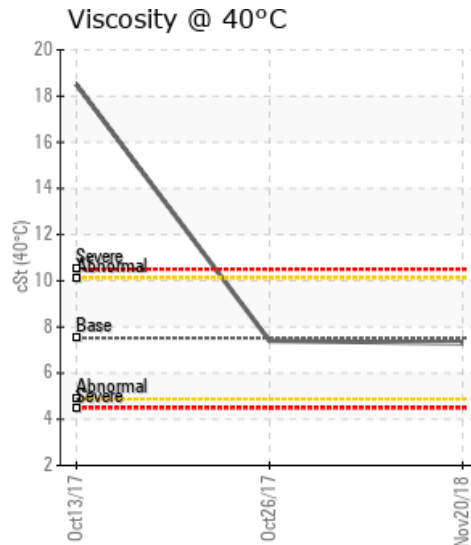
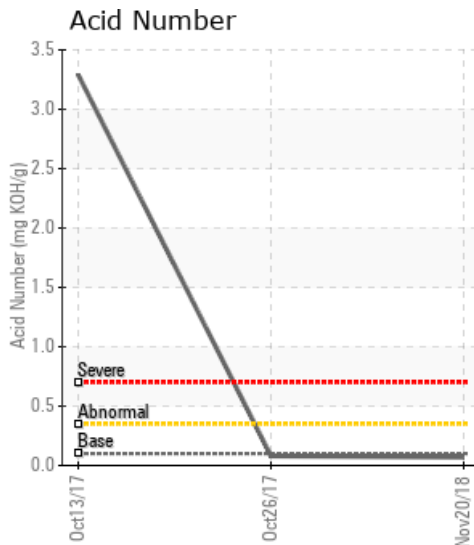
## POWDER SLUSH COLD OIL RETURN

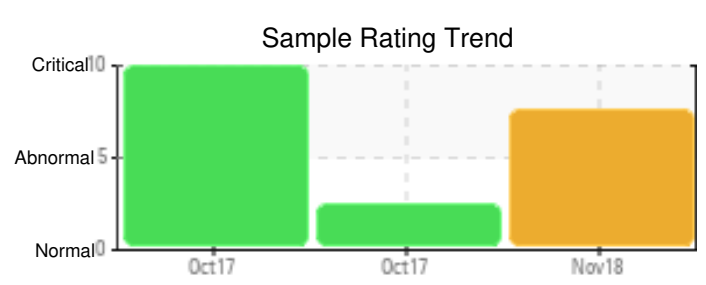
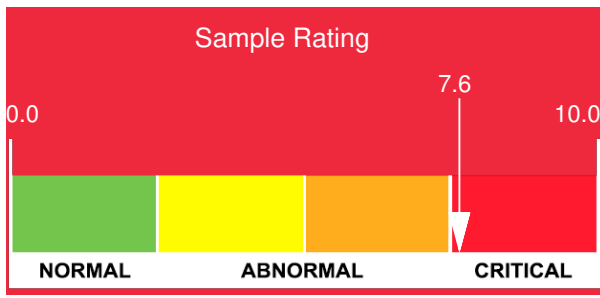
Customer: PTRHTF30023	System Information	Sample Information
INOAC INTERIOR SYSTEMS 575 JAMES STREET SOUTH ST MARYS, ON N4X 1B9 Canada Attn: ANDREW COCKBURN Tel: (519)349-3323 E-Mail: ANDREW.COCKBURN@JCI.COM	System Volume: 3200 gal Bulk Operating Temp: 473F / 245C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO LT Make: BP&R CONSTRUCTION	Lab No: 02253654 Analyst: Adam Koscielak Sample Date: 11/20/18 Received Date: 11/26/18 Completed: 12/10/18

Recommendation: Appears to be some low boilers in the system. Flash point is okay but the amount of material <335°C is elevated, 50% point is reduced, with the 90% Distillation point lower than normal. Please vent expansion tank for a day when the unit is at operating temperature, to release low boilers from system. Resample system after venting. All other parameters okay, viscosity is typical for Calflo LT, no water present, no appreciable amount of solids as Pentane insoluble level at 0.038%

Comments: (GCD) % < 335°C is severely high. (GCD) 90% Distillation Point is severely low. (GCD) 10% Distillation Point is marginally low. (GCD) 50% Distillation Point is marginally low.

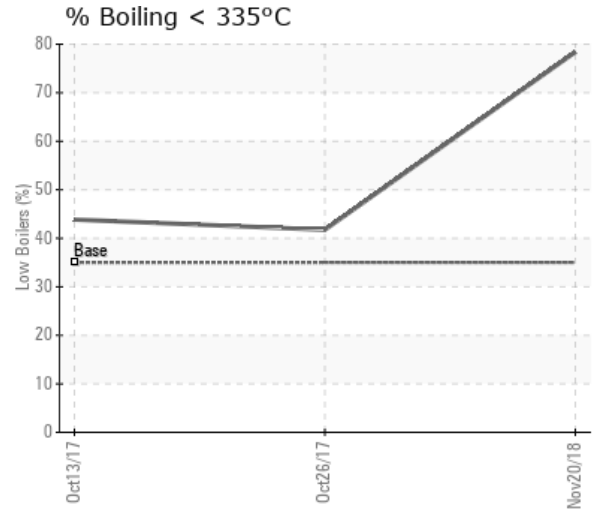
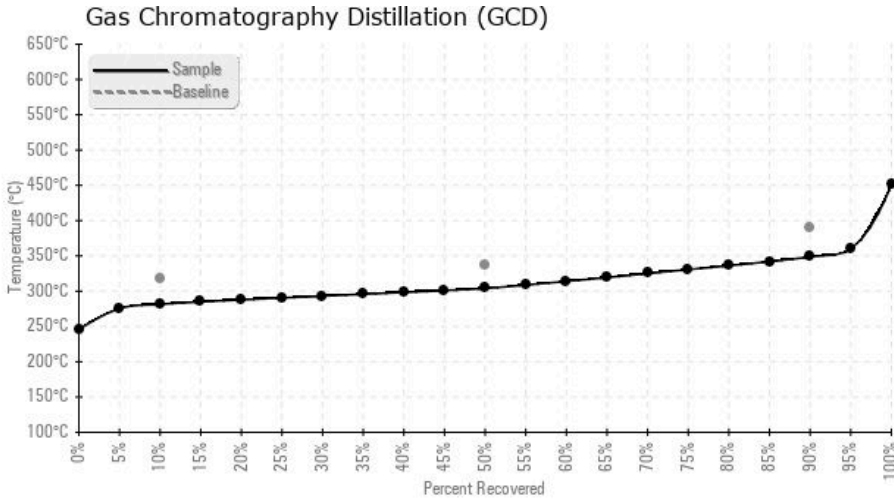
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
11/20/18	11/26/18	0h		354 / 179	4.6	7.3	0.07	0.038	539 / 281	579 / 304	660 / 349	78.39
10/26/17	10/27/17	0h	COLD OIL ROOM PUMP 6	327 / 164	29.1	7.4	0.08	0.045	607 / 320	642 / 339	736 / 391	41.74
10/13/17	10/13/17	0h		327 / 164	1020.8	18.5	3.29	2.49	607 / 320	640 / 338	735 / 391	43.86
Baseline Data				349 / 176		7.52	0.1		604 / 318	640 / 338	734 / 390	35.0





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
11/20/18	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	0
10/26/17	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	0
10/13/17	216	0	0	0	0	0	0	0	0	0	27	1	0	0	0	0	2	0	0	0	6	0	988	23
<b>Baseline Data</b>				0	0					0			0	0					0				270	

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



Historical Comments	
10/26/17	PHOSPHORUS LEVEL DEPLETED AT 64 PPM VERSUS TYPICAL LEVEL OF 270. Phosphorus ppm levels are noted. (GCD) % < 335°C is marginally high.
10/13/17	Sample Results are unexpected on the Cold Oil Side, This Sample was taken Oct 13th. Resample to be taken to verify. Iron ppm levels are abnormal. Water contamination levels are severely high. ppm Water contamination levels are severely high. Pentane Insolubles levels are severely high. Silicon ppm levels are abnormally high. Acid Number (AN) is severely high. Visc @ 40°C is severely high. (GCD) % < 335°C is marginally high.

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