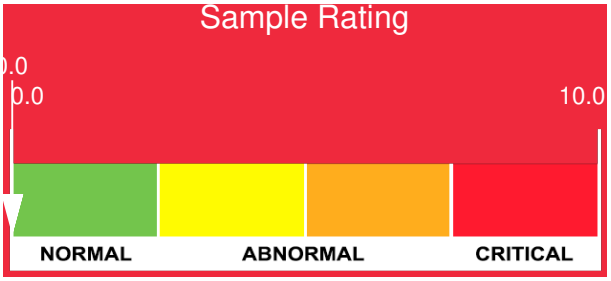
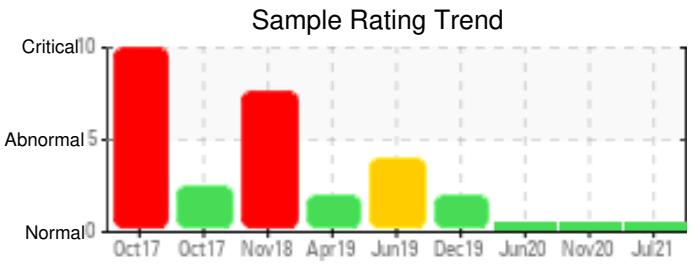




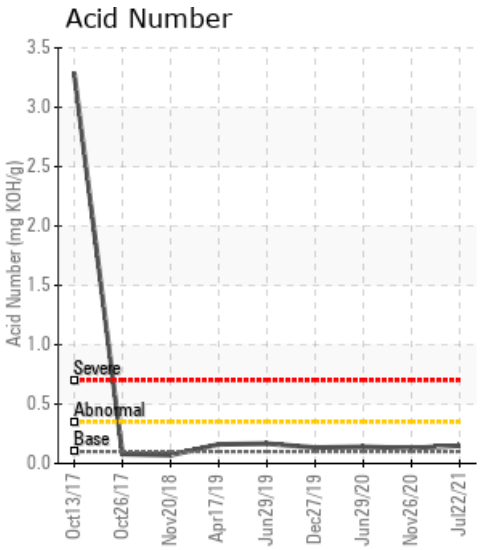
POWDER SLUSH COLD OIL RETURN

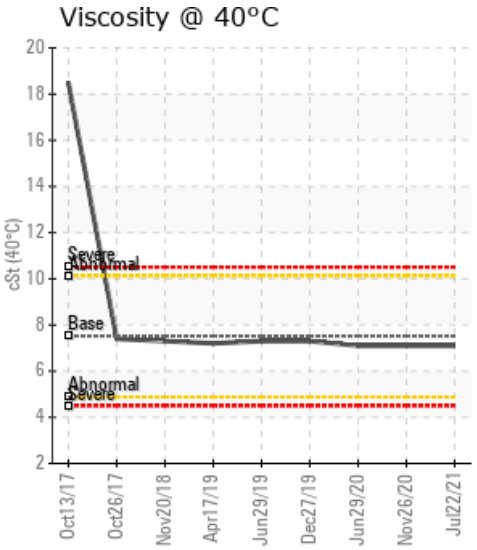
Customer: PTRHTF30023	System Information	Sample Information
INOAC INTERIOR SYSTEMS 575 JAMES STREET SOUTH ST MARYS, ON N4X 1B9 Canada Attn: Brent Dietrich Tel: (519)808-0372 E-Mail: bdietrich@inoacusa.com	System Volume: 14000 ltr Bulk Operating Temp: 500F / 260C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO LT Make: BP&R CONSTRUCTION	Lab No: 02434767 Analyst: Adam Koscielak Sample Date: 07/22/21 Received Date: 07/23/21 Completed: 07/26/21 Adam Koscielak adam.koscielak@hollyfrontier.com

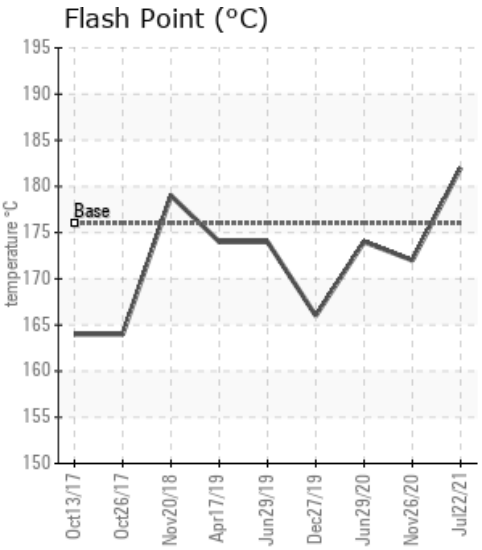
Recommendation: Results of the heat transfer oil for the Cold Oil Return are typical for Calflo LT. No evidence of product degradation. Viscosity, Total Acid Number, GCD, Flash Point are within typical parameters. Fluid is suitable for continued use. Submit sample at next appropriate interval (6 - 9 months).

Comments:

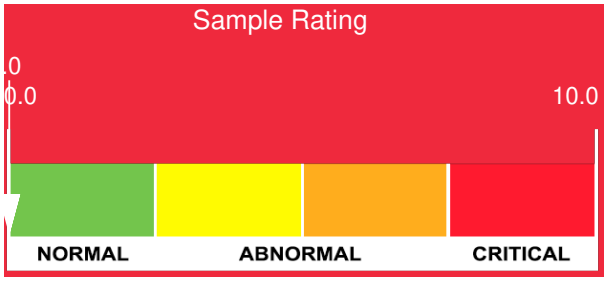
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
07/22/21	07/23/21	0.0h		360 / 182	24.5	7.1	0.15	0.146	606 / 319	635 / 335	735 / 391	49.73
11/26/20	12/03/20	0.0h		342 / 172	19.3	7.1	0.13	0.047	608 / 320	636 / 336	737 / 392	47.03
06/29/20	06/30/20	0.0h		345 / 174	19.4	7.1	0.14	0.101	609 / 321	637 / 336	737 / 392	46.59
12/27/19	01/08/20	0.0h		331 / 166	14.3	7.3	0.134	0.209	607 / 320	637 / 336	730 / 388	47.75
06/29/19	07/08/19	0.0h		345 / 174	8.7	7.3	0.167	0.033	604 / 318	632 / 334	737 / 392	51.23
Baseline Data				349 / 176		7.52	0.1		604 / 318	640 / 338	734 / 390	47.0

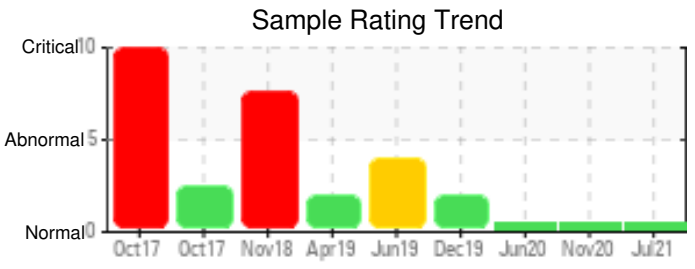






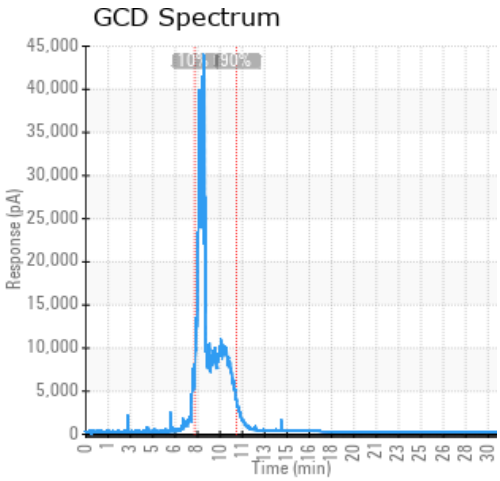
PETRO-CANADA LUBRICANTS

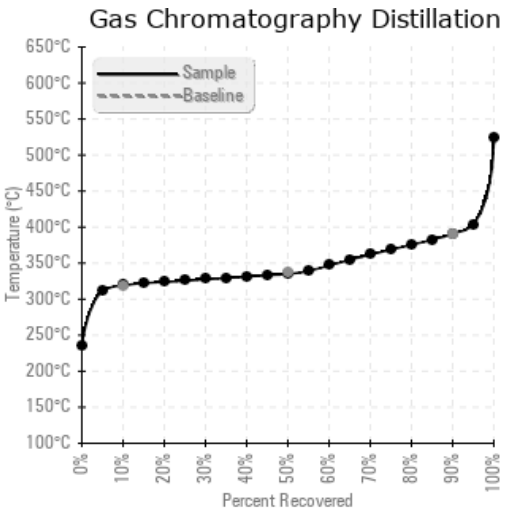


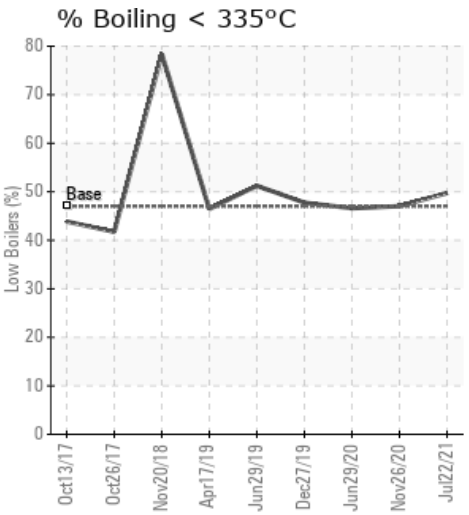


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
07/22/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	106	0
11/26/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81	0
06/29/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	0
12/27/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0
06/29/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	0
Baseline Data			0	0						0			0	0				0	0				270	

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







Historical Comments

11/26/20	Sample is consistent with used Calflo LT. Sample indicates fluid is suitable for continued use.Sample at next interval.
06/29/20	Current analysis of the Cold Oil Return system indicates the oil is suitable for continued use. GCD profile is consistent with Calflo LT. Acid number, viscosity and water are consistent as well. No indication of wear metals indicated either. The flash point has increased slightly. Pentane insolubles have decreased from 0.209 to 0.101. Always ensure that the sample line is flushed thoroughly to remove any insolubles that may have accumulated over time, before the sample is taken. Resample at next interval.
12/27/19	Current analysis of the Cold Oil Return system indicates the oil is suitable for continued use. GCD profile is consistent with Calflo LT. Acid number, Viscosity are consistent. No indication of wear metals. Pentane insoluble have shown an increase from 0.033 to 0.209. Please ensure that sample line is flushed thoroughly, to remove an insolubles that may have accumulated over time, before the sample is taken. Resample at next interval.
06/29/19	GCD indicates a slight increase in the %<335°C compared to the hot side. Difference in the cold side and hot was approx. 2.5%, not a huge difference, and could be due to sampling points. Distillation point at 10%, 50%, and 90% were all typical for Calflo LT. Flash Point was consistent with Calflo LT indicating no significant amount of light ends present to reduce the flash point of the fluid. Acid Number and Viscosity @ 40°C are consistent with Calflo LT. Solids level is consistent and at a low level, 0.033%. Fluid is suitable for continued use. Sample at the next interval.