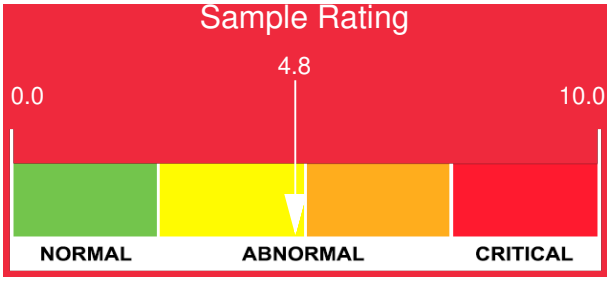
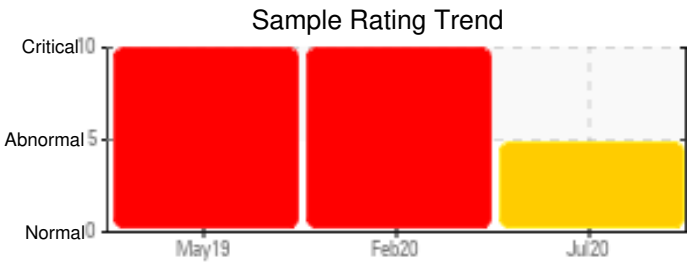




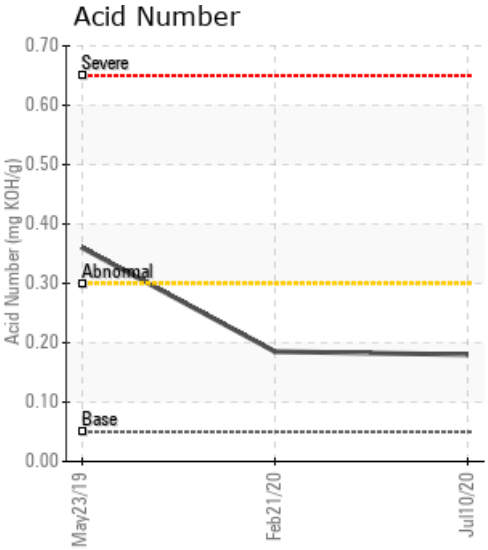
HEAT TRANSFER

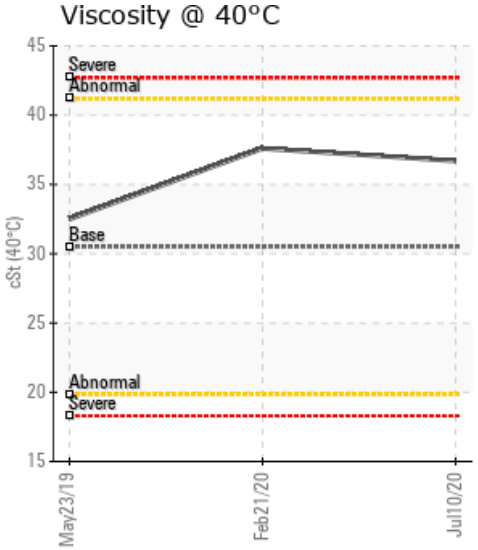
Customer: PTRHTF40131	System Information	Sample Information
ABC Maritime AG Rue Perdtemps 1 1260 Nyon, Switzerland Attn: Oleg Bashenko Tel: 4(122)365-7100 E-Mail: ob@abcmaritime.ch	System Volume: 14000 ltr Bulk Operating Temp: 374F / 190C Heating Source: Blanket: Fluid: CASTROL PERFECTO HT5 Make: AALBORG	Lab No: 02365683 Analyst: Philip Riley Sample Date: 07/10/20 Received Date: 07/20/20 Completed: 08/13/20 Philip Riley philip.riley@hollyfrontier.com

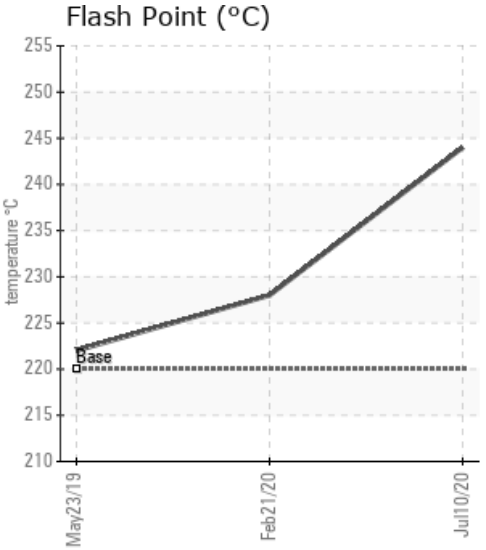
Recommendation: Competitor Fluid and no base to make formal diagnosis. The chemistry is unfamiliar and shows unexpected results. I would question the high levels of Calcium for example in a heat transfer oil. Some parameters improved from previous sample but as stated, we cannot diagnose a competitor product accurately and effectively

Comments: (GCD) 90% Distillation Point is severely high. Calcium ppm levels are severely high. Sodium ppm levels are abnormally high. Zinc ppm levels are abnormally high.

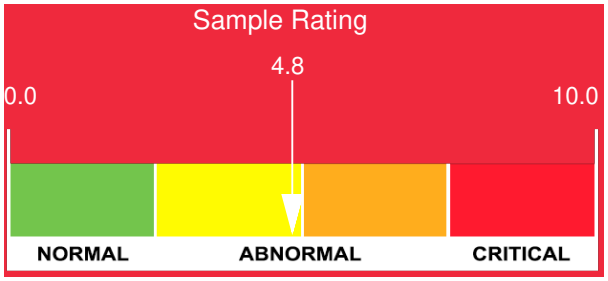
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
07/10/20	07/20/20	0.0m		471 / 244	219.8	36.7	0.18	0.164	726 / 386	822 / 439	925 / 496	0.94
02/21/20	02/25/20	6800.0m	HEATING COIL	442 / 228	209.0	37.6	0.185	0.520	730 / 388	838 / 448	951 / 511	0.24
05/23/19	05/27/19	1848.0m		432 / 222	4823.0	32.5	0.360	0.571	723 / 384	810 / 432	886 / 475	0.86
Baseline Data				428 / 220		30.5	0.05		734 / 390		849 / 454	

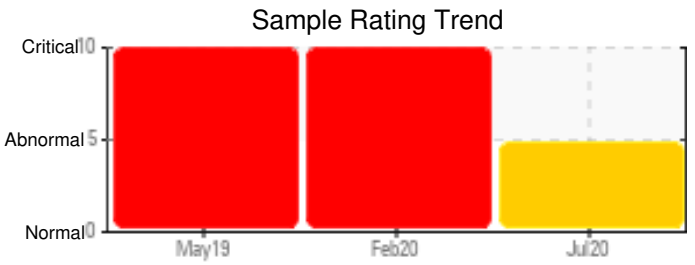






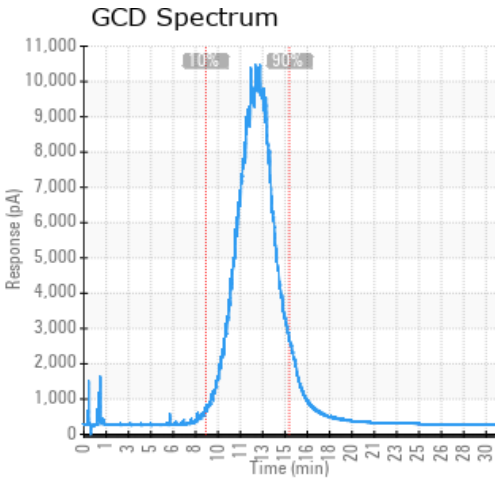
PETRO-CANADA LUBRICANTS

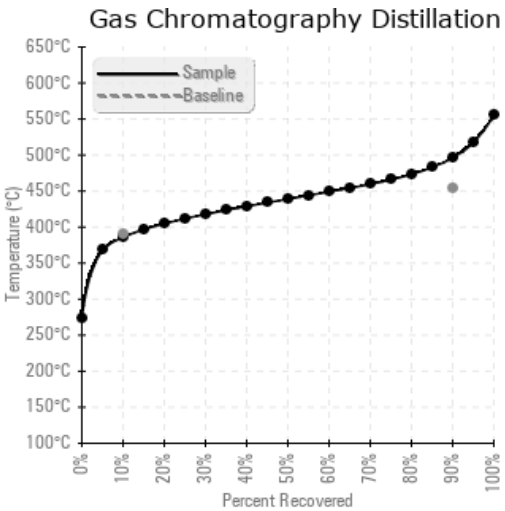


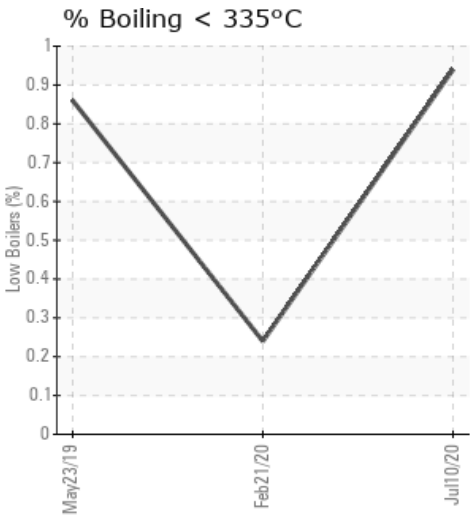


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
07/10/20	42	0	0	0	4	0	0	0	0	0	2	21	5	0	0	0	0	0	0	16	773	0	56	36
02/21/20	66	0	0	0	6	0	0	0	0	0	3	61	5	0	0	0	1	0	0	22	1136	0	60	46
05/23/19	376	0	0	0	3	0	0	0	0	0	3	104	14	0	0	0	3	0	1	43	90	0	11	6
Baseline Data			0	0						0			0	0					0				0	

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







Historical Comments

02/21/20	Competitor Fluid and no base to make formal diagnosis. The chemistry is unfamiliar and shows unexpected results. I would question the high levels of Calcium for example in a heat transfer oil. Insolubles indicate some degradation. Sample rated very poor consistent with the previous sample Pentane Insolubles levels are abnormally high. Sodium ppm levels are severely high. (GCD) 90% Distillation Point is severely high. Calcium ppm levels are severely high. Zinc ppm levels are severely high.
05/23/19	Competitor Fluid and no base to make formal diagnosis. However, the products looks to be in very poor condition in a number of areas and I would recommend a full system change, including clean and flush, based on the analysis reportPQ levels are severe. Iron ppm levels are abnormal. Water contamination levels are severely high. Water contamination levels are severely high.. ppm Water contamination levels are severely high. Pentane Insolubles levels are severely high. Sodium ppm levels are severely high. (GCD) 90% Distillation Point is severely high. Magnesium ppm levels are severely high. Calcium ppm levels are severely high. Acid Number (AN) is abnormally high.