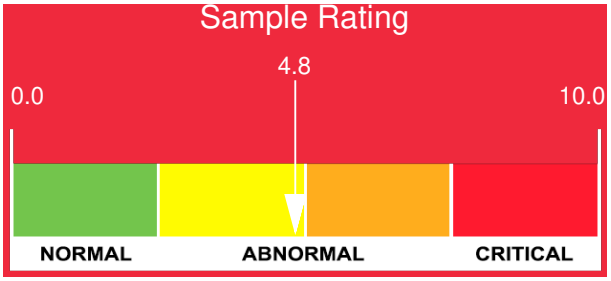
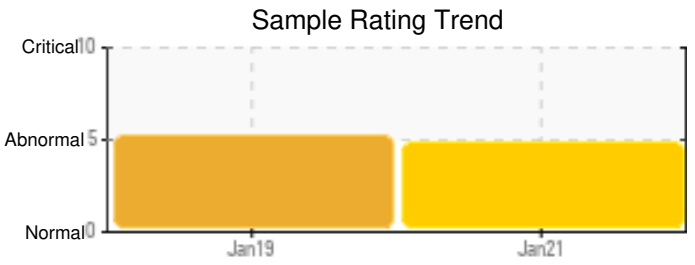




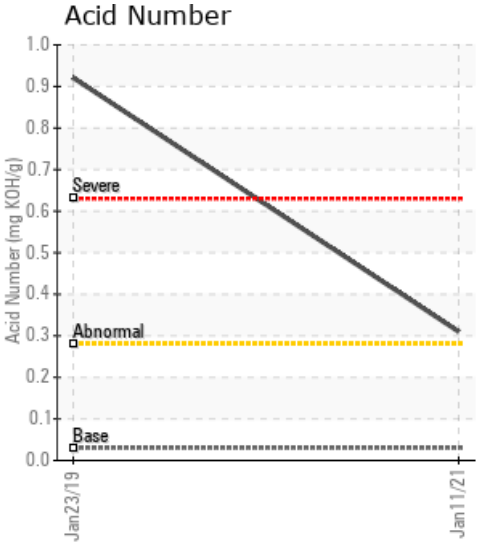
EAIM E-SAN FURTHER 1

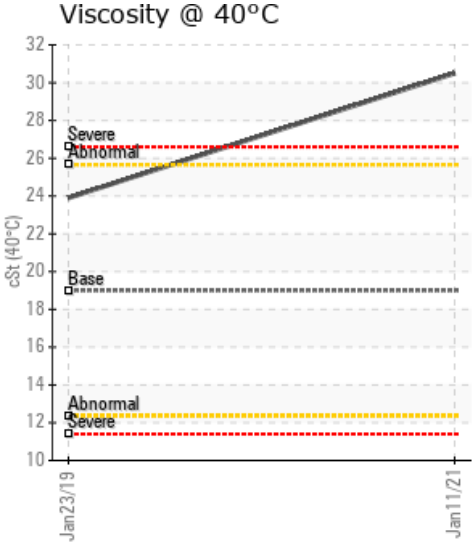
Customer: PTRHTF60010	System Information	Sample Information
SYNLUBE INTERNATIONAL CO LTD 76/1 MOO.7 THACHIN MUANG SAMUTSAKHON, 74000 THAILAND Attn: CHERNPORN CHOBKUI Tel: 034421290 E-Mail: chernporn@synlube.co.th	System Volume: 12000 ltr Bulk Operating Temp: 482F / 250C Heating Source: Blanket: Fluid: EASTMAN THERMINOL 55 Make:	Lab No: 02399574 Analyst: Philip Riley Sample Date: 01/11/21 Received Date: 01/25/21 Completed: 02/08/21 Philip Riley philip.riley@hollyfrontier.com

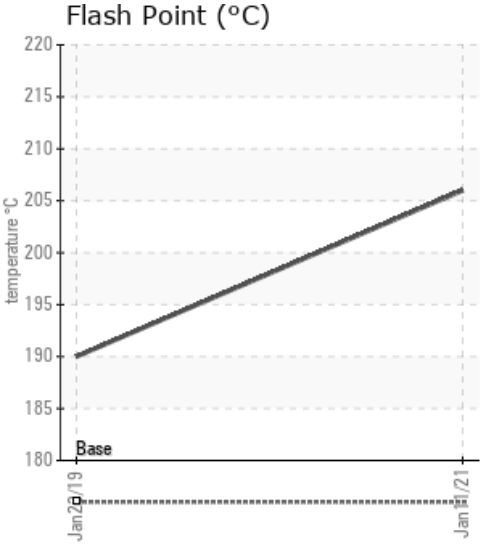
Recommendation: Unfamiliar with chemistry of competitor products and cannot comment with full confidence on actual results. However, it can be seen from the GCD Distillation there is evidence of fluid thermal cracking. Other parameters are also off spec in relation to viscosity, GCD boiling range, acid number

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	%
01/11/21	01/25/21	15m		403 / 206	19.5	30.5	0.31	0.177	680 / 360	799 / 426	905 / 485	3.81
01/23/19	02/27/19	9m	SUPPLY ROOM	374 / 190	49.7	23.9	0.921	0.148	636 / 335	693 / 367	835 / 446	9.23
Baseline Data				349 / 176		19.0	0.03		655 / 346		790 / 421	3.40







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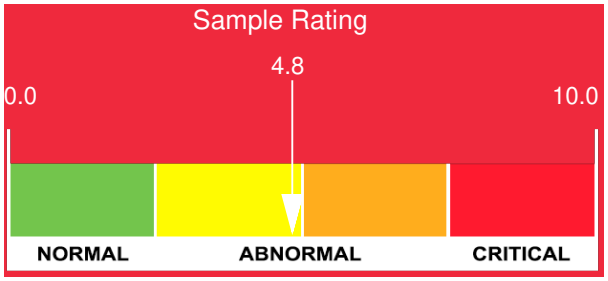
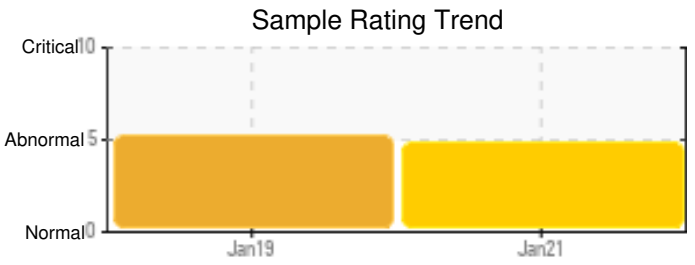
PETRO-CANADA LUBRICANTS

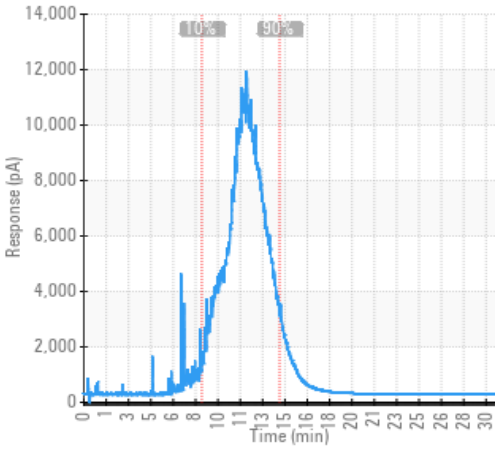




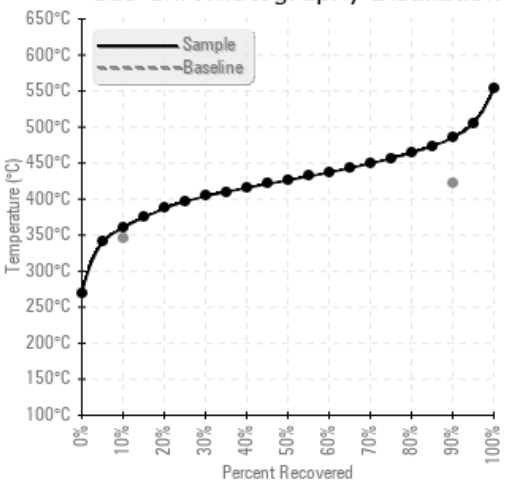
Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
01/11/21	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	0
01/23/19	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baseline Data			0	0						0			0	0					0				0	

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

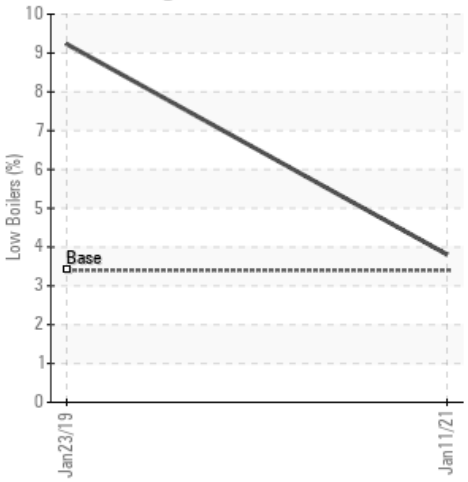
GCD Spectrum



Gas Chromatography Distillation



% Boiling < 335°C



Historical Comments

01/23/19	The current fluid has OK viscosity and flash point. The particle or water contamination are all quite low. However, acid number has been increased substantially from the new fluid base line, indicating the oil has severe oxidation over the 9 years operation at 250C bulk temperature conditions. The oil oxidation by-product typically causes the metal corrosion and form soft and hard carbon deposits inside the boiler and piping, so that the system heat transfer efficiency is reduced. Please plan a fluid change and continue to monitor the fluid conditions in the future. Acid Number (AN) is high. (GCD) 90% Distillation Point is high.

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