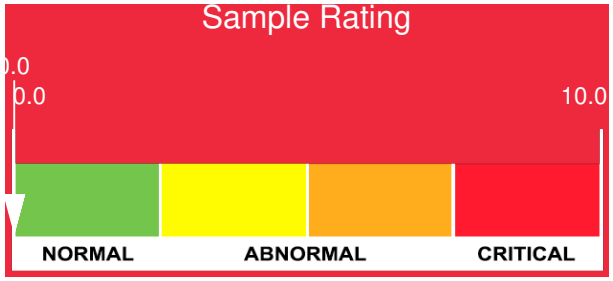
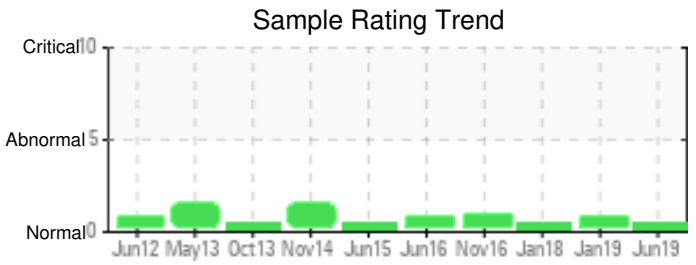




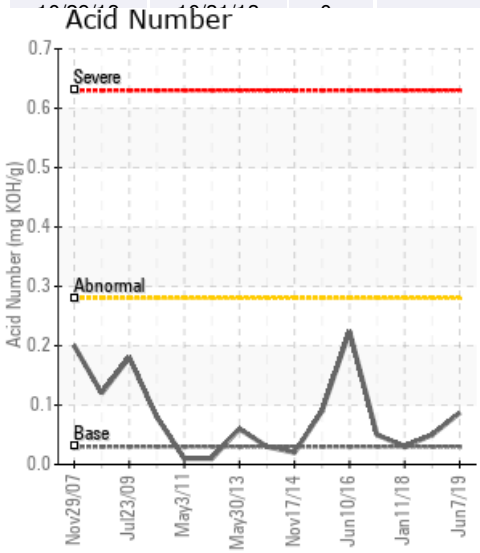
HEAT TRANSFER SYSTEM

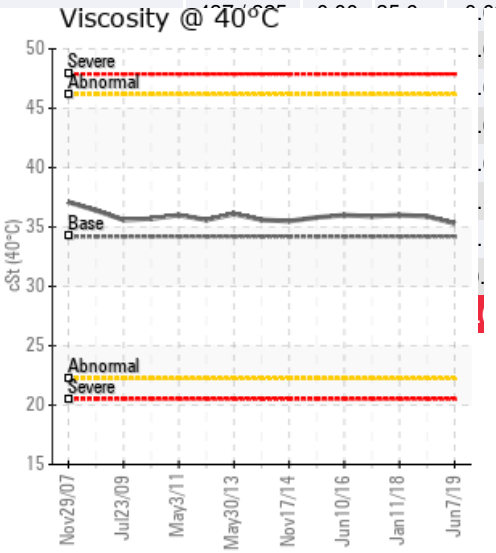
Customer: PTRHTF30019	System Information	Sample Information
IKO INDUSTRIES 628 VICTORIA AVENUE N. HAMILTON, ON L8L 8B3 CANADA Attn: Ahmed Momen Tel: (905)528-8707 E-Mail: ahmed.momen@iko.com	System Volume: 0 gal Bulk Operating Temp: 425F / 218C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make:	Lab No: 02290052 Analyst: Adam Koscielak Sample Date: 06/07/19 Received Date: 06/10/19 Completed: 06/13/19

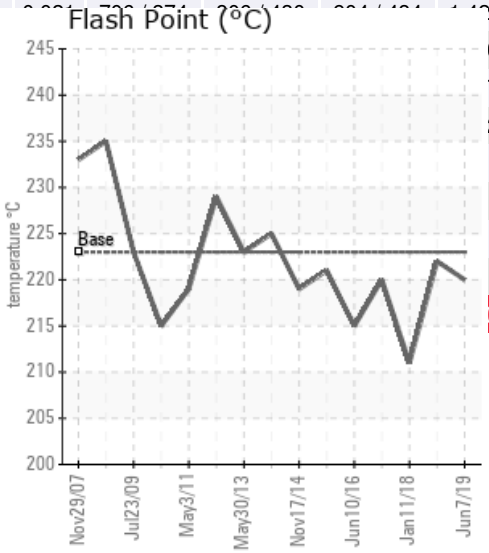
Recommendation: Sample Results indicate the Petro-Therm heat transfer fluid is suitable for continued use. No issues with fluid, pentane insolubles have decreased since previous sample. All other parameters are typical.

Comments:

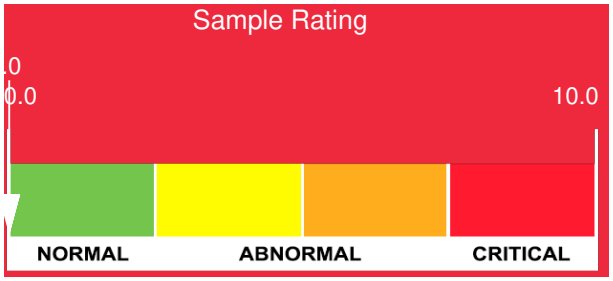
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
06/07/19	06/10/19	10y	0019	428 / 220	16.9	35.3	0.087	0.210	706 / 375	802 / 428	903 / 484	0.00
01/24/19	01/25/19	12y	SUCTION LINE CIR PP	432 / 222	19.7	35.9	0.05	0.333	683 / 362	781 / 416	879 / 471	1.92
01/11/18	01/12/18	11y		412 / 211	8.6	36.0	0.03	0.329	706 / 375	808 / 431	907 / 486	1.61
11/11/16	11/14/16	10y	SUCTION LINE OF PUMP	428 / 220	14.6	35.9	0.05	0.172	705 / 374	810 / 432	908 / 487	1.56
06/10/16	06/10/16	9y	SUCTION LINE	419 / 215	0.00	36.0	0.224	0.287	692 / 367	782 / 416	865 / 463	1.85
06/05/15	06/08/15	8y	SUCTION LINE OF PUMP	430 / 221	23.3	35.8	0.09	0.265	708 / 375	813 / 434	914 / 490	1.34
11/17/14	11/17/14	7y		426 / 219	18.2	35.5	0.02	0.428	705 / 374	806 / 430	919 / 493	1.43







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
06/07/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0
01/24/19	25	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
01/11/18	25	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
11/11/16	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0
06/10/16	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0
06/05/15	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0
11/17/14	26	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	17	0
10/29/13	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0
05/30/13	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0
06/05/12	24	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	17	0
05/03/11	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
04/27/10	19	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	13	0
07/23/09	21	0	0	0	0	0	2	0	0	0	0	2		0	0		0			0	0	0	16	0
05/26/08	30	0	0	0	0	0	0	0	0	0	0	0		0	0		0			0	0	0	23	0
11/29/07	38	0	0	0	0	0	0	0	0	0	0	0		0	0		0			0	2	0	21	0
Baseline Data			0	0						0			0	0					0				0	

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

Historical Comments

01/24/19	The 90% GCD Distillation point is slightly lower @ 470°C versus the typical of 482°C. Possibly some cracking of the fluid has occurred. Slight increase in the GCD %<335°C along with a slight decrease in the 10% and 50% GCD point is noted.Flash and Acid number are consistent with Petro-Therm. There is a slight increase in the Pentane insoluble levels. Pentane insoluble can lead to deposits in lines and dead legs.Fluid is suitable for continued service.Resample at normal interval. (GCD) 90% Distillation Point is marginally low.
01/11/18	Fluid condition indicates the fluid is suitable for continued use.Sample does indicate an increase in the Iron content in the oil which may be an indication of pump wear or scale from piping or tanks. Pentane insolubles level did increase over the last sample, but still below 0.5%. Sample frequency should be increased to at least twice per year to monitor iron and pentane insoluble levels. Last sample was taken in November 2016.
11/11/16	The oil is in good condition - the acid number has returned to normal levels. This oil is suitable for continued service - resample in six months.
06/10/16	Suitable for continued service - the acid number is higher than the previous sample. I would suggest another sample at the end of November 2016. (GCD) 90% Distillation Point is abnormally low.
06/05/15	Results indicate that the oil is in good condition and suitable for continued service
11/17/14	The Pentane Insolubles are above normal. The rest of the analysis indicates that the oil is in good condition. I would suggest another sample in 6 months and we will monitor the Pentane insolubles. Pentane Insolubles levels are above normal. (GCD) 90% Distillation Point is marginally high.
10/29/13	Despite its dark appearance, the oil is in excellent condition. All parameters tested are close to fresh oil and the moisture content is so low it's undetectable. Keep up the good work and re-sample at yoru next scheduled interval.

05/30/13

Everything appears normal and indocate the oil is suitable for further use. Pentane Insolubles levels are abnormally high. (GCD) 90% Distillation Point is marginally high.

06/05/12	

05/03/11	We are carefully for a rise in TAN (acidity) to make sure the acidic products of oxidation do not interfere with the critical components of the system as it did before. The TAN remains very low and all other properties look normal. Please re-sample around December 2012 for a follow-up sample.

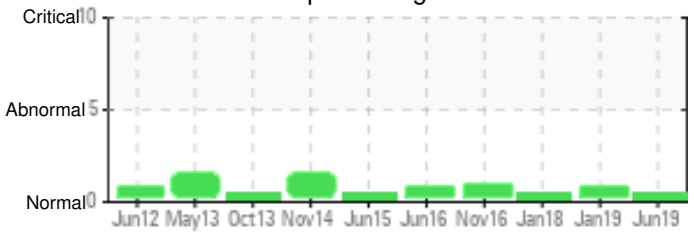
04/27/10	

07/23/09	The oil condition is suitable for further service. The Acid Number is not rising so we have no indication that the sensitive pump components are exposed to mild acidic products from oxidation. We recommend to re-sample every 6 months from here on.

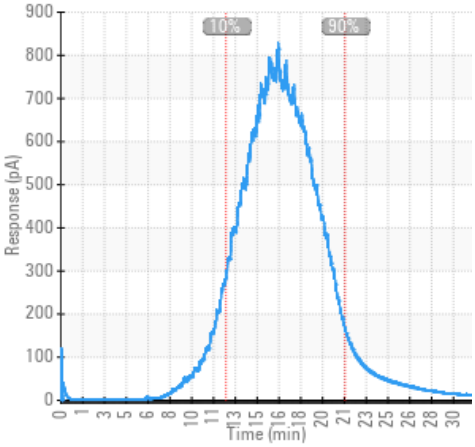
05/26/08	

11/29/07

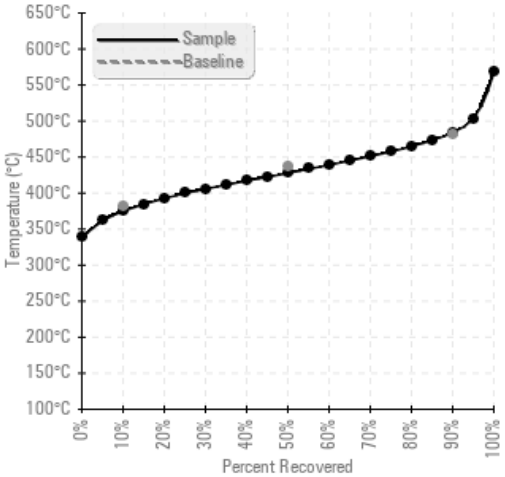
Sample Rating Trend



GCD Spectrum



Gas Chromatography Distillation



% Boiling < 335°C