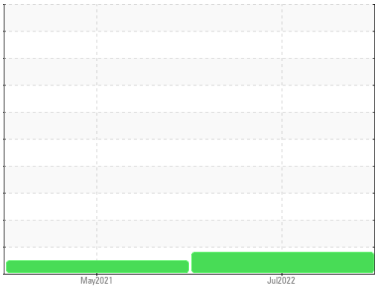
PROBLEM SUMMARY

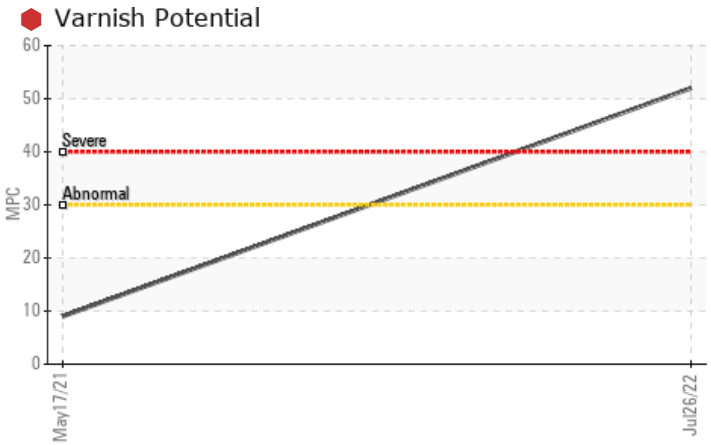
Area
Powerhouse
Machine Id
SOLAR UNIT 1
Component
Turbine
Fluid
PETRO CANADA TURBOFLO XL32 (1800 LTR)

Sample Rating Trend



INSOLUBLES

COMPONENT CONDITION SUMMARY



RECOMMENDATION

We recommend that you use electrostatic filtration to remove insolubles from the oil and to reduce the levels of varnish in the system. Alternatively draining a percentage of the oil and topping up with fresh oil (sweetening the oil) may provide a reduction in the varnish potential level. We recommend an early resample to monitor this condition.

PROBLEMATIC TEST RESULTS

Sample Status				**SEVERE**	NORMAL	---
MPC Varnish Potential	Scale	ASTM D7843(m)*	>15	**52**	9	---

Customer Id: INGLON
Sample No.: WC0659906
Lab Number: 02503038
Test Package: IND 3

To manage this report scan the QR code

To discuss the diagnosis or test data:
Kevin Marson +1 (289)291-4644 x4644
Kevin.Marson@wearcheck.com

To change component or sample information:
Gloria Gonzalez +1 (289)291-4643 x4643
gloria.gonzalez@wearcheck.com

RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Resample	---	---	?	We recommend an early resample to monitor this condition.
Filter Fluid	---	---	?	We recommend that you use electrostatic filtration to remove insolubles from the oil and to reduce the levels of varnish in the system. Alternatively draining a percentage of the oil and topping up with fresh oil (sweetening the oil) may provide a reduction in the varnish potential level.

HISTORICAL DIAGNOSIS

17 May 2021 Diag: Kevin Marson

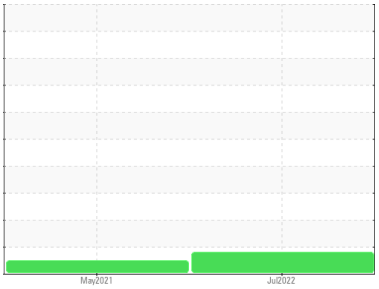
NORMAL

Resample at the next service interval to monitor.All component wear rates are normal. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system. MPC (Membrane Patch Colorimetry) test indicates acceptable levels of varnish present. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible. The system and fluid cleanliness is acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report

OIL ANALYSIS REPORT

Sample Rating Trend



INSOLUBLES

Area
Powerhouse
Machine Id
SOLAR UNIT 1
Component
Turbine
Fluid
PETRO CANADA TURBOFLO XL32 (1800 LTR)

DIAGNOSIS

Recommendation

We recommend that you use electrostatic filtration to remove insolubles from the oil and to reduce the levels of varnish in the system. Alternatively draining a percentage of the oil and topping up with fresh oil (sweetening the oil) may provide a reduction in the varnish potential level. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system.

Contaminants

MPC (Membrane Patch Colorimetry) test indicates a high concentration of varnish present. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible.

Oil Condition

The AN level is acceptable for this fluid.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC0659906**	WC0358649	---
Sample Date		Client Info		**26 Jul 2022**	17 May 2021	---
Machine Age	yrs	Client Info		**7**	6	---
Oil Age	yrs	Client Info		**7**	6	---
Oil Changed		Client Info		**N/A**	Filtered	---
Sample Status				**SEVERE**	NORMAL	---

WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184*		**0**	0	---
Iron	ppm	ASTM D5185(m)	>15	**0**	0	---
Chromium	ppm	ASTM D5185(m)	>4	**0**	0	---
Nickel	ppm	ASTM D5185(m)	>2	**0**	0	---
Titanium	ppm	ASTM D5185(m)		**0**	0	---
Silver	ppm	ASTM D5185(m)		**0**	<1	---
Aluminum	ppm	ASTM D5185(m)	>10	**<1**	<1	---
Lead	ppm	ASTM D5185(m)		**0**	<1	---
Copper	ppm	ASTM D5185(m)	>5	**1**	2	---
Tin	ppm	ASTM D5185(m)	>5	**0**	0	---
Antimony	ppm	ASTM D5185(m)		**0**	0	---
Vanadium	ppm	ASTM D5185(m)		**0**	0	---
Beryllium	ppm	ASTM D5185(m)		**0**	0	---
Cadmium	ppm	ASTM D5185(m)		**0**	0	---

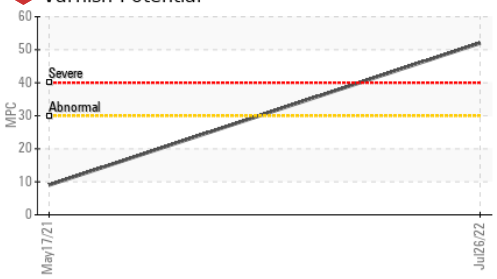
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m)	0	**<1**	<1	---
Barium	ppm	ASTM D5185(m)	0	**0**	0	---
Molybdenum	ppm	ASTM D5185(m)	0	**0**	0	---
Manganese	ppm	ASTM D5185(m)	0	**0**	0	---
Magnesium	ppm	ASTM D5185(m)	0	**0**	<1	---
Calcium	ppm	ASTM D5185(m)	0	**0**	<1	---
Phosphorus	ppm	ASTM D5185(m)	5	**48**	58	---
Zinc	ppm	ASTM D5185(m)	0	**<1**	<1	---
Sulfur	ppm	ASTM D5185(m)	750	**465**	484	---
Lithium	ppm	ASTM D5185(m)		**<1**	<1	---

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m)	>15	**<1**	<1	---
Sodium	ppm	ASTM D5185(m)		**0**	<1	---
Potassium	ppm	ASTM D5185(m)	>20	**<1**	<1	---
Water	%	ASTM D6304*	>0.03	**0.002**	0.002	---
ppm Water	ppm	ASTM D6304*	>300	**16.3**	15.7	---

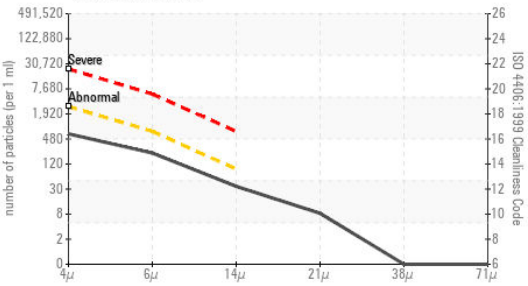
FLUID CLEANLINESS	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647	>2500	**560**	1225	---
Particles >6µm	ASTM D7647	>640	**194**	475	---
Particles >14µm	ASTM D7647	>80	**31**	63	---
Particles >21µm	ASTM D7647	>20	**7**	14	---
Particles >38µm	ASTM D7647	>4	**0**	0	---
Particles >71µm	ASTM D7647	>3	**0**	0	---
Oil Cleanliness	ISO 4406 (c)	>18/16/13	**16/15/12**	17/16/13	---

OIL ANALYSIS REPORT

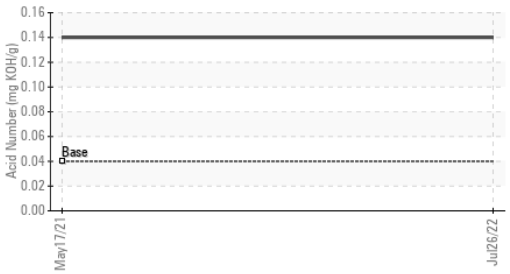
Varnish Potential



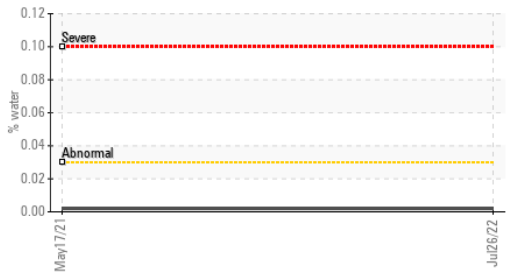
Particle Count



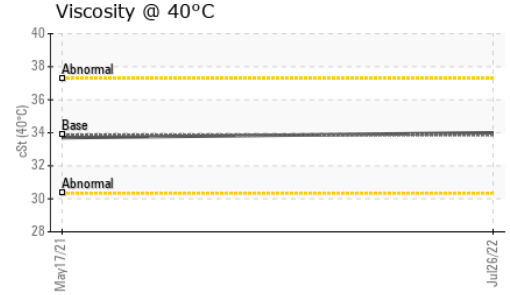
Acid Number



Water



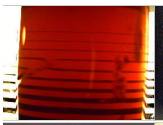
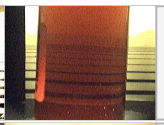
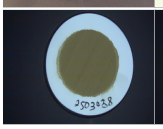
Viscosity @ 40°C



FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*	0.04	**0.14**	0.14	---
MPC Varnish Potential	Scale	ASTM D7843(m)*	>15	**52**	9	---

VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	**NONE**	NONE	---
Yellow Metal	scalar	Visual*	NONE	**NONE**	NONE	---
Precipitate	scalar	Visual*	NONE	**NONE**	NONE	---
Silt	scalar	Visual*	NONE	**NONE**	NONE	---
Debris	scalar	Visual*	NONE	**NONE**	NONE	---
Sand/Dirt	scalar	Visual*	NONE	**NONE**	NONE	---
Appearance	scalar	Visual*	NORML	**NORML**	NORML	---
Odor	scalar	Visual*	NORML	**NORML**	NORML	---
Emulsified Water	scalar	Visual*	>0.03	**NEG**	NEG	---
Free Water	scalar	Visual*		**NEG**	NEG	---

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	33.86	**34.0**	33.7	---

SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					*no image*
Bottom					*no image*
MPC					*no image*

ISO 17025:2017 Accredited Laboratory

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : WC0659906 **Received** : 03 Aug 2022
Lab Number : 02503038 **Diagnosed** : 04 Aug 2022
Unique Number : 5435999 **Diagnostician** : Kevin Marson
Test Package : IND 3 (Additional Tests: MPC)

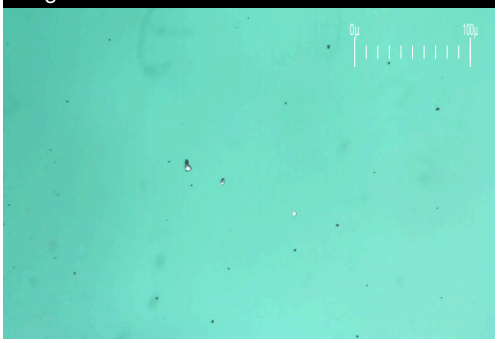
To discuss this sample report, contact Customer Service at 1-800-268-2131.
Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.
Validity of results and interpretation are based on the sample and information as supplied.

Ingredion Canada Corporation
1100 Green Valley Road
London, ON
CA N6N 1E3
Contact: Mike O'neil
mike.oneil@ingredion.com
T: (226)979-7229
F: (519)680-4416

FERROGRAPHY REPORT

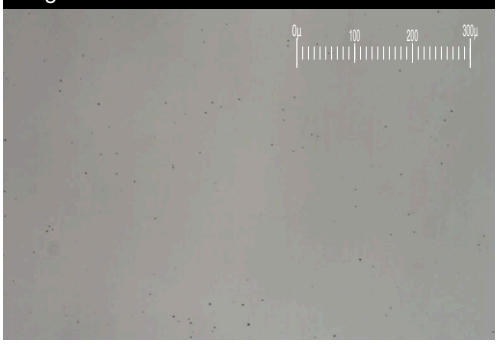
Area
Powerhouse
Machine Id
SOLAR UNIT 1
Component
Turbine
Fluid
PETRO CANADA TURBOFLO XL32 (1800 LTR)

Magn: 200x Illum: BC



Magn: 50x Illum: RW

Magn: 100x Illum: RW

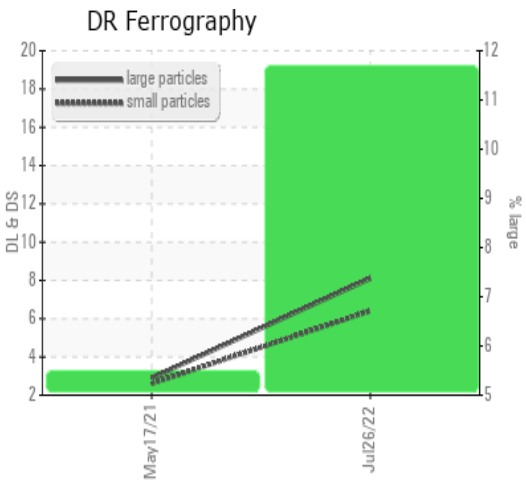


DR-FERROGRAPHY		method	limit/base	current	history1	history2
Large Particles		DR-Ferr*		**8.1**	2.9	---
Small Particles		DR-Ferr*		**6.4**	2.6	---
Total Particles		DR-Ferr*	>---	**14.5**	5.5	---
Large Particles Percentage	%	DR-Ferr*		**11.7**	5.5	---
Severity Index		DR-Ferr*		**14**	0.9	---

FERROGRAPHY		method	limit/base	current	history1	history2
Ferrous Rubbing	Scale 0-10	ASTM D7684*		**1**	1	
Ferrous Sliding	Scale 0-10	ASTM D7684*				
Ferrous Cutting	Scale 0-10	ASTM D7684*				
Ferrous Rolling	Scale 0-10	ASTM D7684*		**1**		
Ferrous Break-in	Scale 0-10	ASTM D7684*				
Ferrous Spheres	Scale 0-10	ASTM D7684*				
Ferrous Black Oxides	Scale 0-10	ASTM D7684*				
Ferrous Red Oxides	Scale 0-10	ASTM D7684*				
Ferrous Corrosive	Scale 0-10	ASTM D7684*				
Ferrous Other	Scale 0-10	ASTM D7684*				
Nonferrous Rubbing	Scale 0-10	ASTM D7684*				
Nonferrous Sliding	Scale 0-10	ASTM D7684*				
Nonferrous Cutting	Scale 0-10	ASTM D7684*				
Nonferrous Rolling	Scale 0-10	ASTM D7684*				
Nonferrous Other	Scale 0-10	ASTM D7684*				
Carbonaceous Material	Scale 0-10	ASTM D7684*				
Lubricant Degradation	Scale 0-10	ASTM D7684*				
Sand/Dirt	Scale 0-10	ASTM D7684*			1	
Fibres	Scale 0-10	ASTM D7684*				
Spheres	Scale 0-10	ASTM D7684*				
Other	Scale 0-10	ASTM D7684*		**1**	1	

WEAR

All component wear rates are normal. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system.



MPC (Varnish Test)

Sample Color & Clarity