AOM III

WEAR CHECK

OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINANTS	NORMAL
OIL CONDITION	SEVERE

Area
SAB1
Machine Id
SAB1 G2
Component
Thrust Bearing
Fluid
PETRO CANADA TURBOFLO XL46 (4250 LTR)

RECOMMENDATION

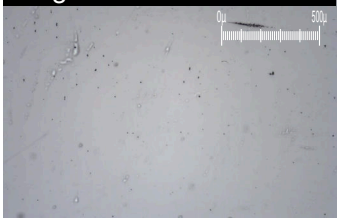
We recommend that you perform vacuum distillation and/or air drying to attempt to remove any residual water and/or entrained gases from this oil that may be contributing to abnormal foaming and/or poor water separability. We recommend that you investigate the system for introduction of a surfactant to the reservoir. Some potential surfactants include incorrect oil make-up with an oil containing emulsifying agents (engine oil, compressor oil, gear oil), or soaps entering the system after wash down. We recommend an early resample to monitor this condition.

WEAR

All component wear rates are normal. The ferrography results are normal indicating no abnormal wear in the system.

Magn: 200x Illum: BC

Magn: 50x Illum: RW



Magn: 100x Illum: RW

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0927743	WC0642850	WC0565953
Sample Date		Client Info		15 May 2024	21 Dec 2023	07 Mar 2023
Machine Age	hrs	Client Info		0	0	0
Oil Age	hrs	Client Info		0	0	0
Filter Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		N/A	N/A	N/A
Filter Changed		Client Info		N/A	N/A	N/A
Sample Status				SEVERE	NORMAL	NORMAL
PQ		ASTM D8184*		0	---	---
Iron	ppm	ASTM D5185(m)	>85	0	<1	<1
Chromium	ppm	ASTM D5185(m)	>20	0	0	0
Nickel	ppm	ASTM D5185(m)	>20	0	0	<1
Titanium	ppm	ASTM D5185(m)		0	0	0
Silver	ppm	ASTM D5185(m)		0	0	0
Aluminum	ppm	ASTM D5185(m)	>40	0	<1	0
Lead	ppm	ASTM D5185(m)	>60	0	0	0
Copper	ppm	ASTM D5185(m)	>7	<1	<1	0
Tin	ppm	ASTM D5185(m)	>40	0	0	0
Vanadium	ppm	ASTM D5185(m)		0	0	0
White Metal	scalar	Visual*	NONE	NONE	NONE	NONE
Yellow Metal	scalar	Visual*	NONE	NONE	NONE	NONE
Large Particles		DR-Ferr*		2.1	---	---
Small Particles		DR-Ferr*		1.8	---	---
Total Particles		DR-Ferr*	>---	3.9	---	---
Large Particles Percentage	%	DR-Ferr*		7.7	---	---
Severity Index		DR-Ferr*		1	---	---
Ferrous Rubbing	Scale 0-10	ASTM D7684*		2		
Ferrous Sliding	Scale 0-10	ASTM D7684*				
Ferrous Cutting	Scale 0-10	ASTM D7684*				
Ferrous Rolling	Scale 0-10	ASTM D7684*				
Ferrous Break-in	Scale 0-10	ASTM D7684*				
Ferrous Spheres	Scale 0-10	ASTM D7684*				
Ferrous Black Oxides	Scale 0-10	ASTM D7684*		1		
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*				

CONTAMINANTS

The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible. The system and fluid cleanliness is acceptable.

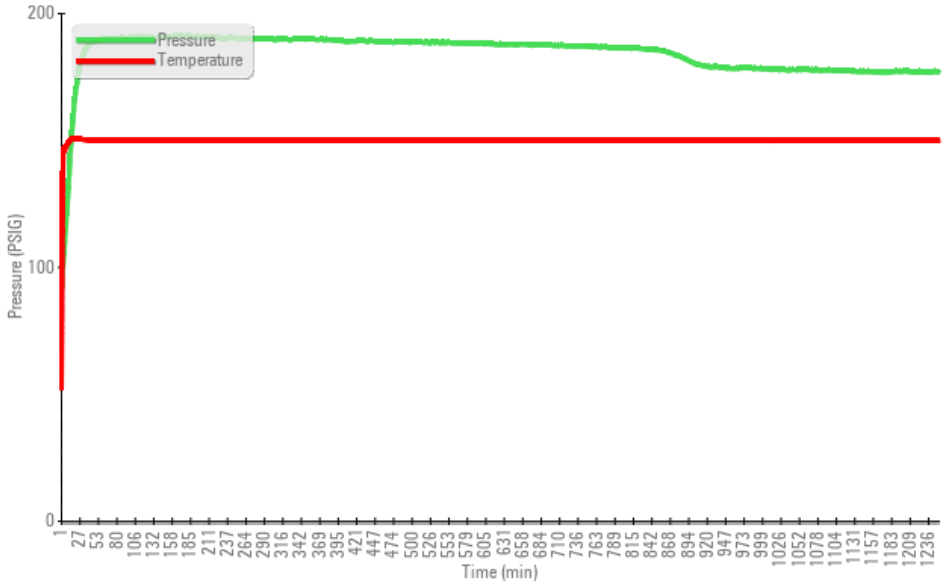
Silicon	ppm	ASTM D5185(m)	>20	**<1**	1	6
Potassium	ppm	ASTM D5185(m)	>20	**<1**	<1	<1
Water	%	ASTM D6304*	>2	**0.001**	---	---
ppm Water	ppm	ASTM D6304*		**1**	---	---
Soot %	%	ASTM D7844*		**0**	---	---
Nitration	Abs/cm	ASTM D7624*		**1.8**	---	---
Sulfation	Abs/.1mm	ASTM D7415*		**10.9**	---	---
Separability	oil/h2o/em	ASTM D1401*	40/40/0	**41/39/0 (30)**	---	---
MPC Varnish Potential	Scale	ASTM D7843(m)*	>15	**5**	---	---
Particles >4µm		ASTM D7647		**248**	1021	1223
Particles >6µm		ASTM D7647	>5000	**92**	201	436
Particles >14µm		ASTM D7647	>640	**13**	12	36
Particles >21µm		ASTM D7647	>160	**5**	4	10
Particles >38µm		ASTM D7647	>40	**1**	1	0
Particles >71µm		ASTM D7647	>10	**0**	0	0
Oil Cleanliness		ISO 4406 (c)	>--/19/16	**15/14/11**	17/15/11	17/16/12
Pentane Insolubles	%	ASTM D893(m)*		**0.038**	---	---
Toluene Insolubles	%	ASTM D893(m)*		**0.003**	---	---
Silt	scalar	Visual*	NONE	**NONE**	NONE	NONE
Debris	scalar	Visual*	NONE	**NONE**	NONE	NONE
Sand/Dirt	scalar	Visual*	NONE	**NONE**	NONE	NONE
Appearance	scalar	Visual*	NORML	**NORML**	NORML	NORML
Odor	scalar	Visual*	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	Visual*	>2	**NEG**	NEG	NEG
Carbonaceous Material	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*				

OIL CONDITION

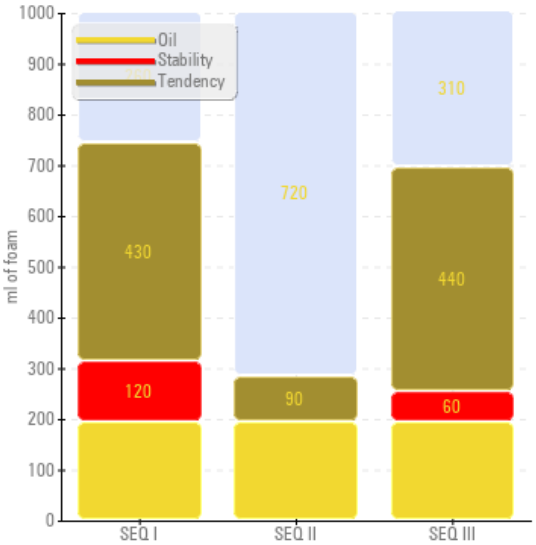
Foaming Stability (ASTM D892) results are abnormal indicating an oil foaming problem that could lead to erratic operation. Rust Prevention test (ASTM D665) indicates the oil retains good anti-corrosion properties. The AN level is acceptable for this fluid.

Sodium	ppm	ASTM D5185(m)		**0**	0	0
Boron	ppm	ASTM D5185(m)		**0**	0	<1
Barium	ppm	ASTM D5185(m)		**0**	0	0
Molybdenum	ppm	ASTM D5185(m)		**0**	0	0
Manganese	ppm	ASTM D5185(m)		**0**	0	<1
Magnesium	ppm	ASTM D5185(m)		**0**	<1	<1
Calcium	ppm	ASTM D5185(m)		**<1**	<1	0
Phosphorus	ppm	ASTM D5185(m)		**3**	2	<1
Zinc	ppm	ASTM D5185(m)	0	**1**	1	1
Sulfur	ppm	ASTM D5185(m)		**625**	701	655
Oxidation	Abs/.1mm	ASTM D7414*		**1.8**	---	---
Acid Number (AN)	mg KOH/g	ASTM D974*	0.04	**0.05**	0.09	0.03
Visc @ 40°C	cSt	ASTM D7279(m)	46.39	**45.4**	45.4	45.2
Visc @ 100°C	cSt	ASTM D7279(m)	6.79	**6.8**	---	---
Viscosity Index (VI)	Scale	ASTM D2270*	100	**103**	---	---
Air Release Time	min	ASTM D3427*	4	**6.90**	---	---
Foam Tendency	I/II/III	ASTM D892*	0	▲ **550/90/500**	---	---
Foam Stability	I/II/III	ASTM D892*	0	▲ **120/0/60**	---	---
ASTM Color	scalar	ASTM D1500*	0.5	**L1.5**	---	---
Rust Prevention	PASS/FAIL	ASTM D665*		**PASS**	---	---
Oxidation Test (RPVOT)	minutes	ASTM D2272*	2700	**3587**	---	---
Anti-Oxidant 1	%	ASTM D6971*	<25	**100**	---	---
Anti-Oxidant 2	%	ASTM D6971*	<25	**28**	---	---
Lubricant Degradation	Scale 0-10	ASTM D7684*				

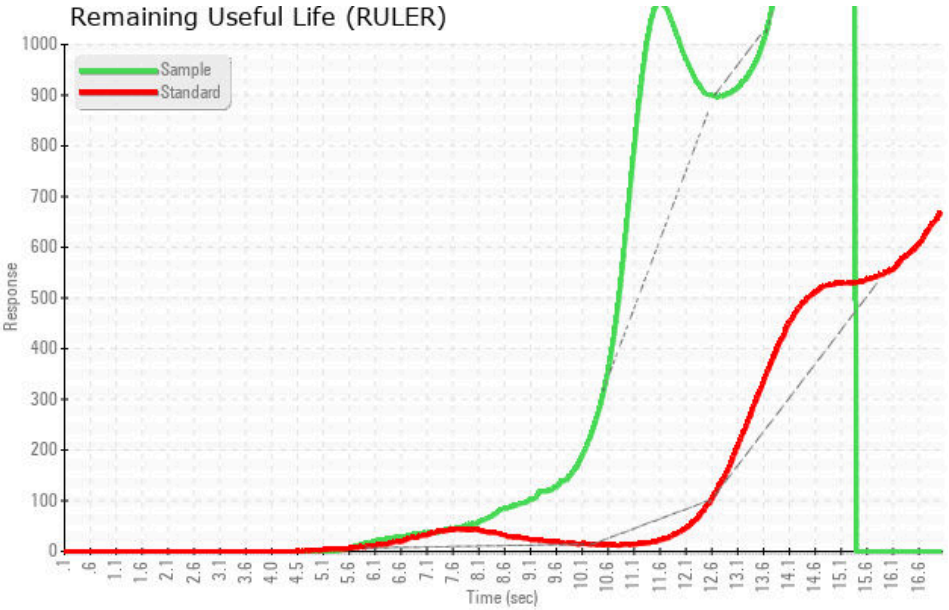
Rotating Pressure Vessel Oxidation Test



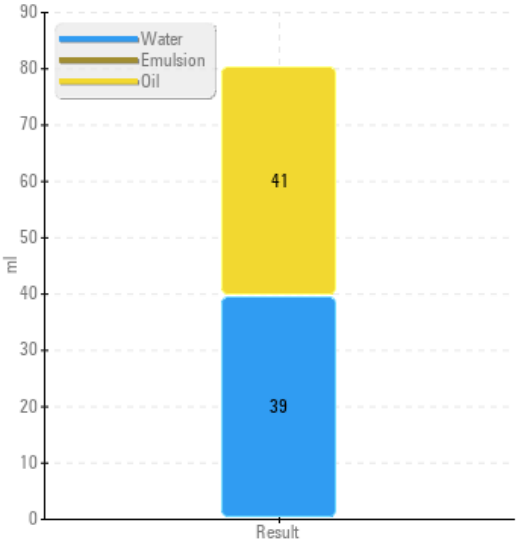
Foaming SEQ I/II/III



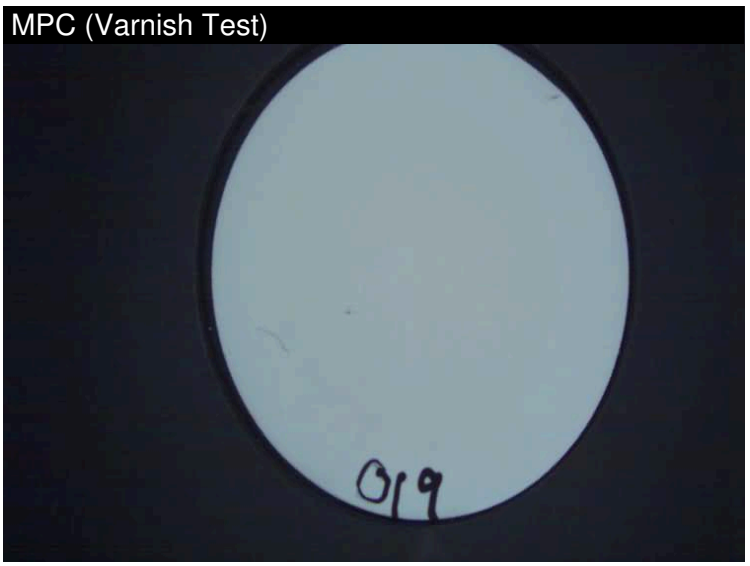
Remaining Useful Life (RULER)



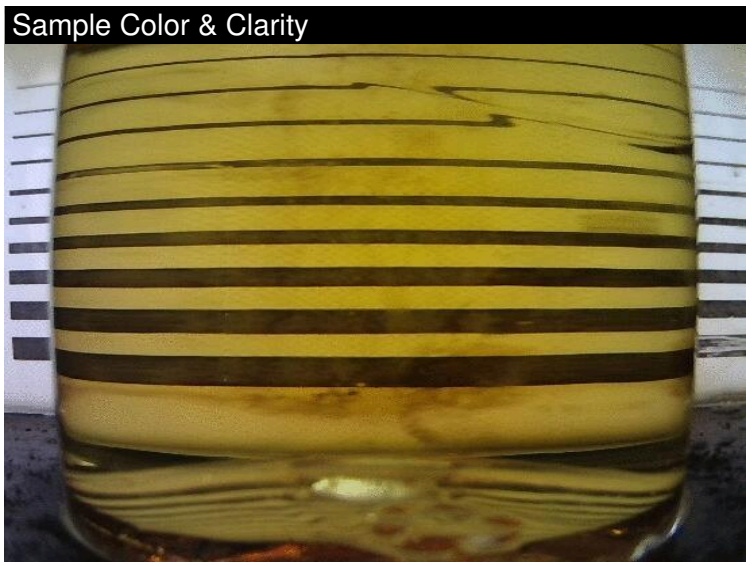
Water Separability



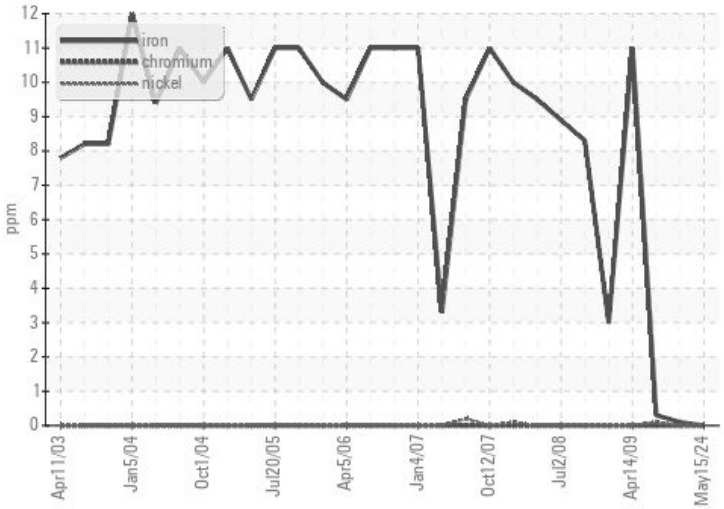
MPC (Varnish Test)



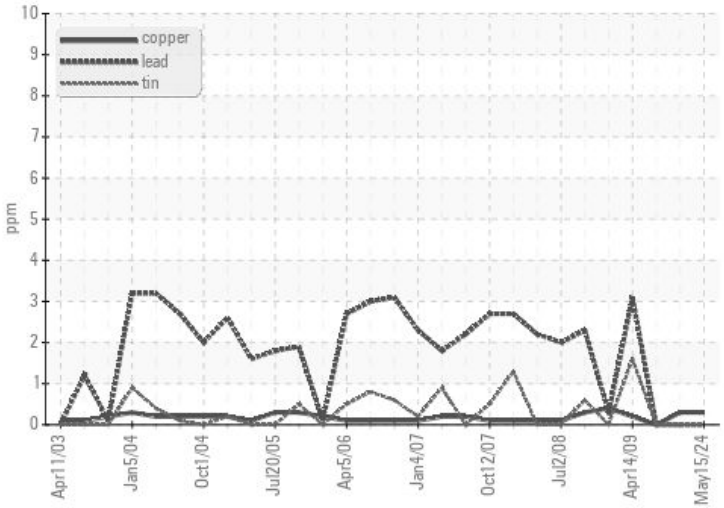
Sample Color & Clarity



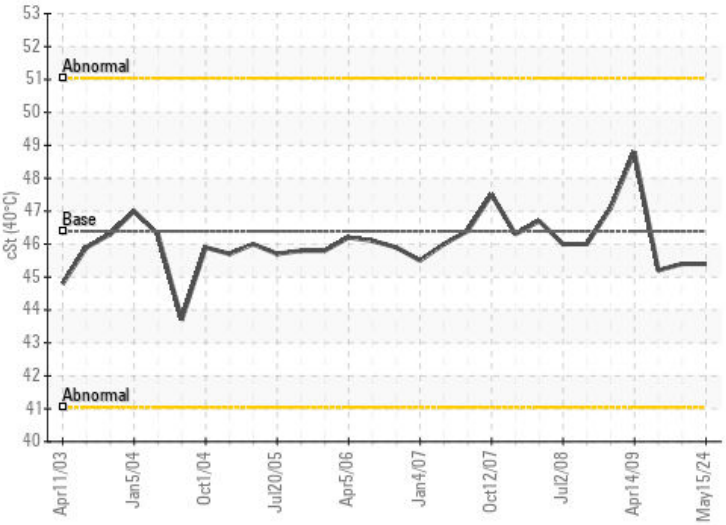
Ferrous Alloys



Non-ferrous Metals

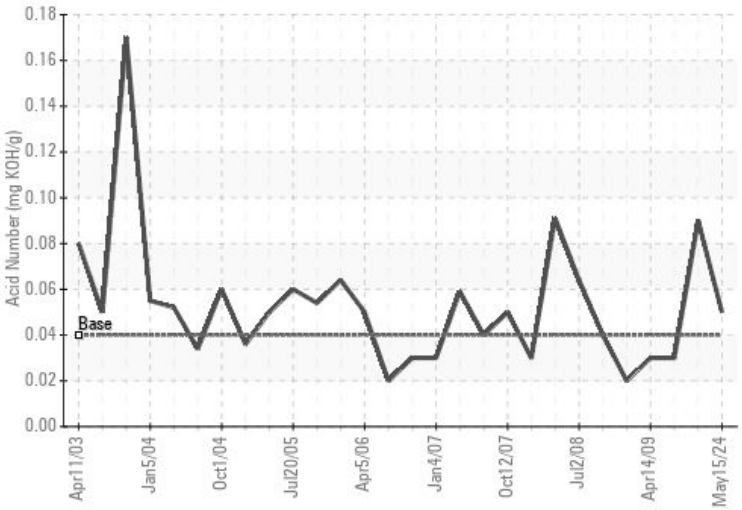


Viscosity @ 40°C



Particle Filter (Magn: 200 x)

Acid Number



ISO 17025:2017 Accredited Laboratory

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : WC0927743
Lab Number : 02636019
Unique Number : 5785181
Test Package : AOM 3 (Additional Tests: BottomAnalysis, FilterPatch, PrtFilter, TolInsol)

Received : 16 May 2024
Tested : 06 Jun 2024
Diagnosed : 06 Jun 2024 - Bill Quesnel

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.

Ontario Power Generation
NIAGARA PLANT GROUP,, 14000 NIAGARA PKWY
NIAGARA ON THE LAKE, ON
CA L0S 1J0
Contact: Michael Brochu
mike.brochu@opg.com
T: (905)357-0322
F: (905)374-5466