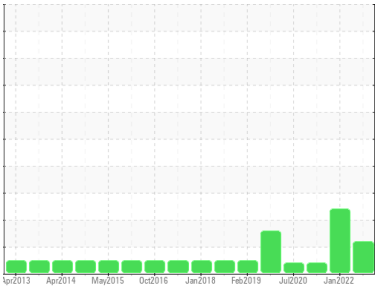
PROBLEM SUMMARY

Sample Rating Trend

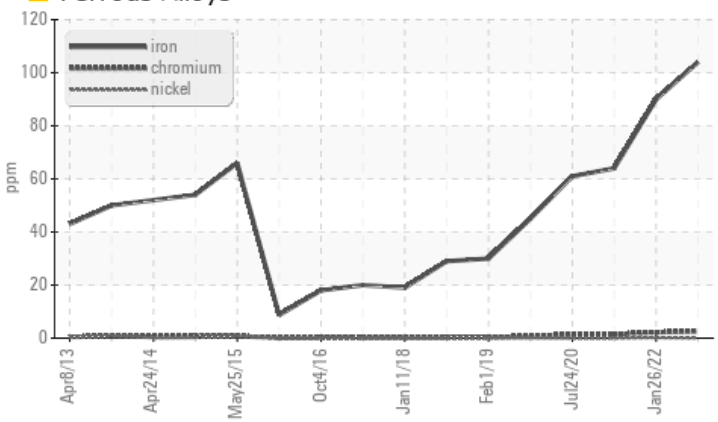


WEAR

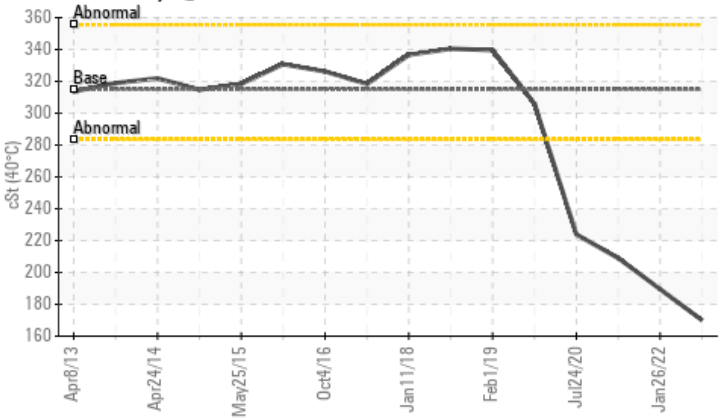
Area
2
Machine Id
WINERGY GEARBOX WTG-201 (S/N 4836486-0020-3)
Component
Wind Turbine Gearbox
Fluid
FUCHS RENOLIN UNISYN CKC ISO 320 (340 LTR)

COMPONENT CONDITION SUMMARY

▲ Ferrous Alloys



▲ Viscosity @ 40°C



RECOMMENDATION

No corrective action is recommended at this time.
Resample at the next service interval to monitor.

PROBLEMATIC TEST RESULTS

Sample Status				**ABNORMAL**	ABNORMAL	ATTENTION
Iron	ppm	ASTM D5185m	>65	▲ **104**	▲ 90	64
Visc @ 40°C	cSt	ASTM D445	315	▲ **170**	▲ 189.5	▲ 209

Customer Id: ENEFRA
Sample No.: WC0804477
Lab Number: 05857924
Test Package: IND 2

To manage this report scan the QR code

To discuss the diagnosis or test data:
Don Baldridge +1
don.b505@comcast.net

To change component or sample information:
Customer Service +1 1-800-237-1369
customerservice@wearcheck.com

RECOMMENDED ACTIONS

There are no recommended actions for this sample.

HISTORICAL DIAGNOSIS

26 Jan 2022 Diag: Aaron Black

WEAR

We recommend you service the filters on this component if applicable. We recommend an early resample to monitor this condition. We were unable to perform a particle count due to a high concentration of particles present in this sample.Iron ppm levels are abnormal. The low ferrous density (PQ) index indicates the wear metal levels are due to corrosion. Analytical ferrography: Normal amounts of wear debris are present with typical amounts of ferrous rubbing wear on the ferrogram. Moderate concentration of visible dirt/debris present in the oil. Analytical ferrography: Elevated amounts of contamination appear to be present. Without a corresponding elevated amount of wear debris, this is suspected to be due to sample contamination rather than equipment ingression, or the particulate is too soft to damage the components. Viscosity of sample indicates oil is within ISO 220 range, advise investigate. The AN level is acceptable for this fluid.

view report

01 Mar 2021 Diag: Don Baldridge

VISCOSITY

Resample at the next service interval to monitor.All component wear rates are normal. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The system and fluid cleanliness is acceptable. Viscosity of sample indicates oil is within ISO 220 range, advise investigate. The AN level is acceptable for this fluid.

view report

24 Jul 2020 Diag: Doug Bogart

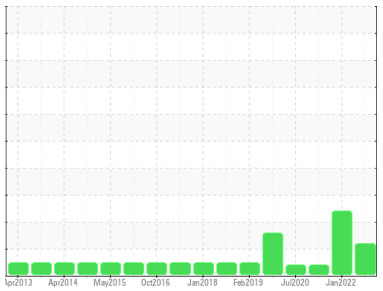
VISCOSITY

Resample at the next service interval to monitor. All ferrographic tests and evaluation performed at WC Canada laboratory.All component wear rates are normal. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The system and fluid cleanliness is acceptable. Viscosity of sample indicates oil is within ISO 220 range, advise investigate. The AN level is acceptable for this fluid.

view report

OIL ANALYSIS REPORT

Sample Rating Trend



WEAR

Area
2
Machine Id
WINERGY GEARBOX WTG-201 (S/N 4836486-0020-3)
Component
Wind Turbine Gearbox
Fluid
FUCHS RENOLIN UNISYN CKC ISO 320 (340 LTR)

DIAGNOSIS

Recommendation
No corrective action is recommended at this time. Resample at the next service interval to monitor.

Wear
Gear wear is indicated. All other component wear rates are normal.

Contamination
The amount and size of particulates present in the system are acceptable. There is no indication of any contamination in the oil.

Fluid Condition
The oil viscosity is lower than normal. Confirm oil type. The AN level is acceptable for this fluid.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC0804477**	WC05504532	WC0547140
Sample Date		Client Info		**22 Feb 2023**	26 Jan 2022	01 Mar 2021
Machine Age	mths	Client Info		**89**	74	120
Oil Age	mths	Client Info		**89**	0	65
Oil Changed		Client Info		**N/A**	N/A	Not Changd
Sample Status				**ABNORMAL**	ABNORMAL	ATTENTION

WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184	>50	**17**	16	21
Iron	ppm	ASTM D5185m	>65	▲ **104**	▲ 90	64
Chromium	ppm	ASTM D5185m	>3	**3**	2	2
Nickel	ppm	ASTM D5185m	>3	**0**	<1	0
Titanium	ppm	ASTM D5185m	>10	**0**	0	0
Silver	ppm	ASTM D5185m		**0**	<1	0
Aluminum	ppm	ASTM D5185m	>10	**1**	<1	0
Lead	ppm	ASTM D5185m	>5	**0**	0	0
Copper	ppm	ASTM D5185m	>10	**3**	3	2
Tin	ppm	ASTM D5185m	>10	**<1**	0	0
Antimony	ppm	ASTM D5185m	>5	**---**	---	0
Vanadium	ppm	ASTM D5185m		**0**	0	0
Cadmium	ppm	ASTM D5185m		**0**	0	0

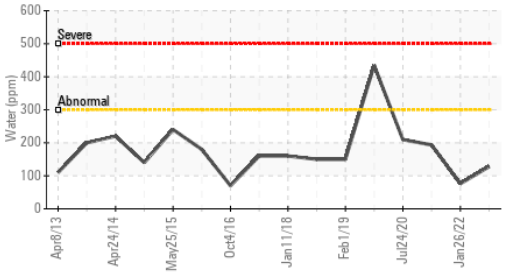
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	25	**0**	0	3
Barium	ppm	ASTM D5185m		**0**	0	0
Molybdenum	ppm	ASTM D5185m		**<1**	0	<1
Manganese	ppm	ASTM D5185m		**1**	1	<1
Magnesium	ppm	ASTM D5185m		**<1**	<1	<1
Calcium	ppm	ASTM D5185m	17	**16**	20	19
Phosphorus	ppm	ASTM D5185m	200	**208**	225	140
Zinc	ppm	ASTM D5185m		**87**	87	57
Sulfur	ppm	ASTM D5185m	5000	**5449**	4596	3307

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>15	**<1**	<1	0
Sodium	ppm	ASTM D5185m		**5**	2	3
Potassium	ppm	ASTM D5185m	>20	**1**	0	<1
Water	%	ASTM D6304	>0.03	**0.012**	0.007	0.019
ppm Water	ppm	ASTM D6304	>300	**127.8**	76.2	193.3

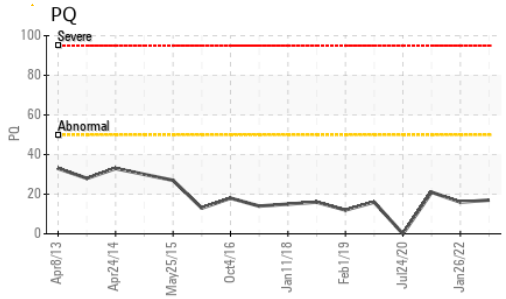
FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647		**7951**	---	1305
Particles >6µm		ASTM D7647	>5000	**783**	---	129
Particles >14µm		ASTM D7647	>640	**8**	---	11
Particles >21µm		ASTM D7647	>160	**3**	---	5
Particles >38µm		ASTM D7647	>40	**1**	---	0
Particles >71µm		ASTM D7647	>10	**1**	---	0
Oil Cleanliness		ISO 4406 (c)	>--/19/16	**20/17/10**	---	18/14/11

OIL ANALYSIS REPORT

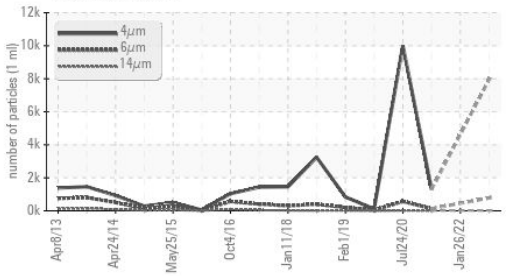
Water (KF)



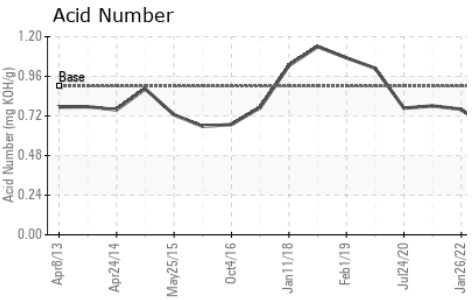
PQ



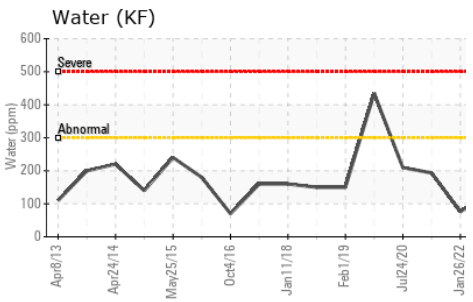
Particle Trend



Acid Number



Water (KF)

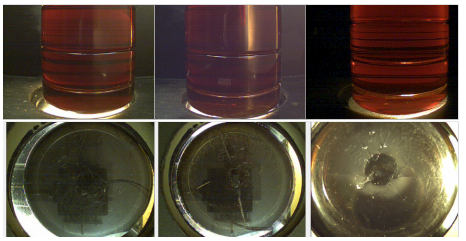


FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045	0.9	**0.64**	0.76	0.781

VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	▲ MODER	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	>0.03	**NEG**	NEG	NEG
Free Water	scalar	*Visual		**NEG**	NEG	NEG

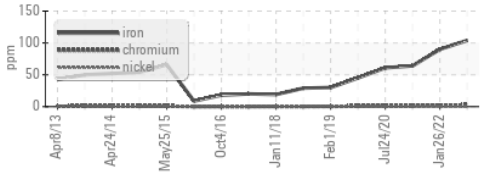
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	315	▲ **170**	▲ 189.5	▲ 209

SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					
Bottom					

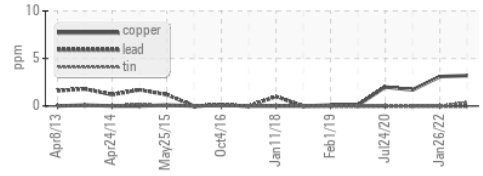


GRAPHS

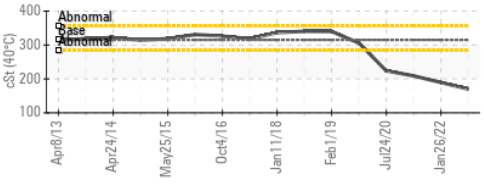
▲ Ferrous Alloys



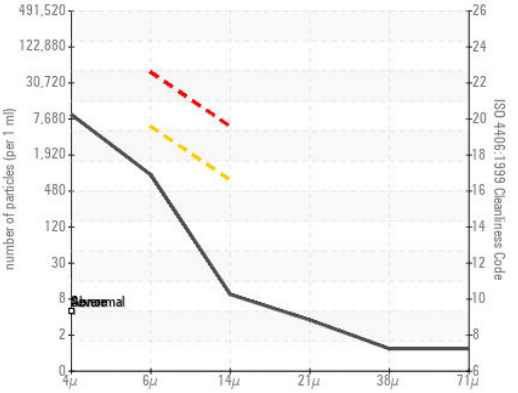
Non-ferrous Metals



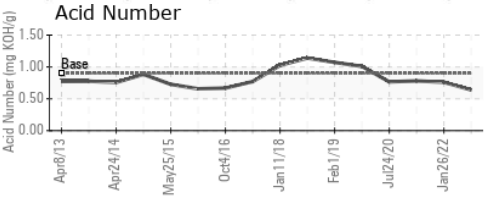
▲ Viscosity @ 40°C



Particle Count



Acid Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0804477 **Received** : 26 May 2023
Lab Number : 05857924 **Diagnosed** : 30 May 2023
Unique Number : 10492389 **Diagnostician** : Don Baldridge
Test Package : IND 2 (Additional Tests: KF, PQ, PrtCount)

To discuss this sample report, contact Customer Service at 1-800-237-1369.
** - Denotes test methods that are outside of the ISO 17025 scope of accreditation.*
Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

ENERGIA EOLICA
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FRANCISCO MORAZAN, ZZ
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