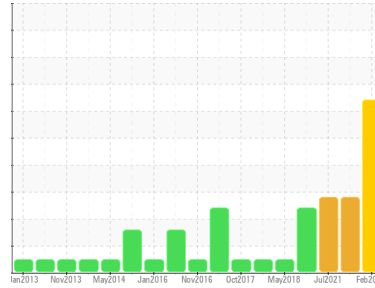




PROBLEM SUMMARY

Sample Rating Trend



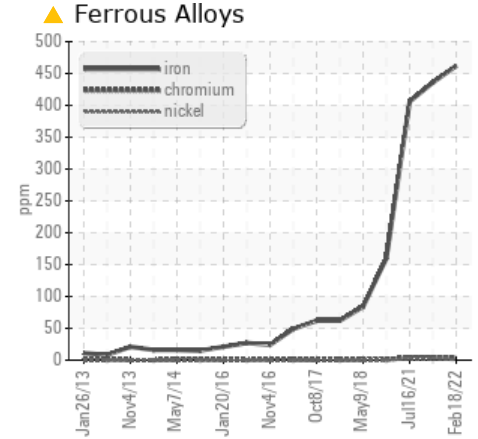
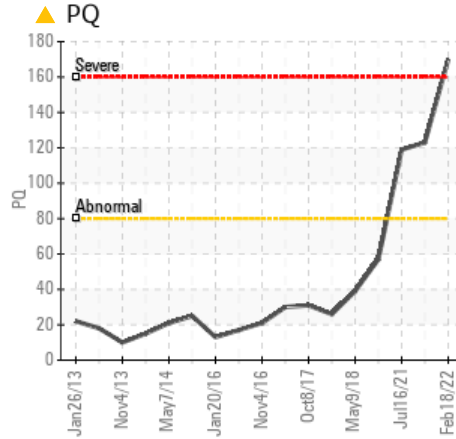
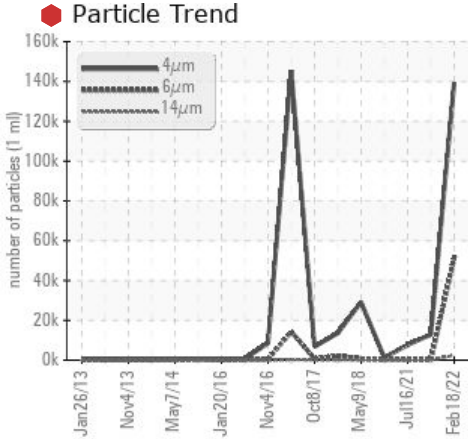
WEAR



Area
BEEBE [200005316]
 Machine Id
29WEA82331

Component
Wind Turbine Gearbox
 Fluid
CASTROL OPTIGEAR SYNTHETIC X 320 (4 LTR)

COMPONENT CONDITION SUMMARY



RECOMMENDATION

We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. We advise that you inspect for the source(s) of wear. We recommend an early resample to monitor this condition.

PROBLEMATIC TEST RESULTS

Sample Status			SEVERE	ABNORMAL	ABNORMAL
PQ		ASTM D8184 >80	▲ 170	▲ 123	▲ 119
Iron	ppm	ASTM D5185m >150	▲ 462	▲ 436	▲ 406
Particles >6µm		ASTM D7647 >2500	● 51238	146	221
Particles >14µm		ASTM D7647 >320	▲ 2424	3	9
Particles >21µm		ASTM D7647 >80	▲ 267	0	2
Oil Cleanliness		ISO 4406 (c) >--/18/15	● 24/23/18	21/14/9	20/15/10

Customer Id: NORBEE
 Sample No.: NX05568724
 Lab Number: 05568724
 Test Package: IND 2



To manage this report scan the QR code

To discuss the diagnosis or test data:
 Angela Borella +1 800-237-1369
angela.borella@wearcheckusa.com

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

RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Inspect Wear Source	---	---	?	We advise that you inspect for the source(s) of wear.
Change Filter	---	---	?	We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid.
Resample	---	---	?	We recommend an early resample to monitor this condition.
Filter Fluid	---	---	?	We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid.

HISTORICAL DIAGNOSIS

16 Aug 2021 Diag: Jonathan Hester

WEAR



We advise that you inspect for the source(s) of wear. We recommend an early resample to monitor this condition. Gear wear is indicated. The high ferrous density (PQ) index indicates that abnormal wear is occurring. There is no indication of any contamination in the oil. The amount and size of particulates present in the system are acceptable. The AN level is acceptable for this fluid.

[view report](#)



16 Jul 2021 Diag: Jonathan Hester

WEAR



We advise that you inspect for the source(s) of wear. We recommend an early resample to monitor this condition. Gear wear is indicated. The high ferrous density (PQ) index indicates that abnormal wear is occurring. There is no indication of any contamination in the oil. The amount and size of particulates present in the system are acceptable. The AN level is acceptable for this fluid.

[view report](#)



29 Jun 2019 Diag: Jonathan Hester

WATER



No corrective action is recommended at this time. Resample at the next service interval to monitor. Gear wear is indicated. There is a trace of moisture present in the oil. Confirmed. The amount and size of particulates present in the system are acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

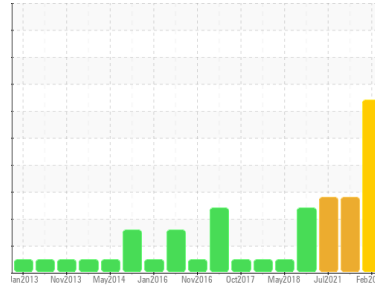
[view report](#)





OIL ANALYSIS REPORT

Sample Rating Trend



WEAR



Area
BEEBE [200005316]
 Machine Id
29WEA82331

Component
Wind Turbine Gearbox
 Fluid
CASTROL OPTIGEAR SYNTHETIC X 320 (4 LTR)

DIAGNOSIS

Recommendation

We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. We advise that you inspect for the source(s) of wear. We recommend an early resample to monitor this condition.

Wear

Gear wear is indicated. The high ferrous density (PQ) index indicates that abnormal wear is occurring.

Contamination

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

Fluid Condition

The AN level is acceptable for this fluid.

SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		NX05568724	NX005750	NX005667
Sample Date	Client Info		18 Feb 2022	16 Aug 2021	16 Jul 2021
Machine Age	hrs	Client Info	64016	60933	60491
Oil Age	hrs	Client Info	0	0	0
Oil Changed	Client Info		N/A	N/A	N/A
Sample Status			SEVERE	ABNORMAL	ABNORMAL

WEAR METALS

	method	limit/base	current	history1	history2
PQ	ASTM D8184	>80	▲ 170	▲ 123	▲ 119
Iron	ppm	ASTM D5185m	>150	▲ 462	▲ 436
Chromium	ppm	ASTM D5185m	>5	3	4
Nickel	ppm	ASTM D5185m	>10	<1	2
Titanium	ppm	ASTM D5185m		0	0
Silver	ppm	ASTM D5185m		0	<1
Aluminum	ppm	ASTM D5185m	>10	<1	0
Lead	ppm	ASTM D5185m	>20	0	<1
Copper	ppm	ASTM D5185m	>50	2	1
Tin	ppm	ASTM D5185m		<1	<1
Antimony	ppm	ASTM D5185m		---	0
Vanadium	ppm	ASTM D5185m		0	<1
Cadmium	ppm	ASTM D5185m		0	<1

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		17	1
Barium	ppm	ASTM D5185m		2	0
Molybdenum	ppm	ASTM D5185m	1150	763	831
Manganese	ppm	ASTM D5185m		4	4
Magnesium	ppm	ASTM D5185m		22	52
Calcium	ppm	ASTM D5185m	2000	1574	1720
Phosphorus	ppm	ASTM D5185m	400	338	360
Zinc	ppm	ASTM D5185m	0	8	21
Sulfur	ppm	ASTM D5185m	1850	1751	1851

CONTAMINANTS

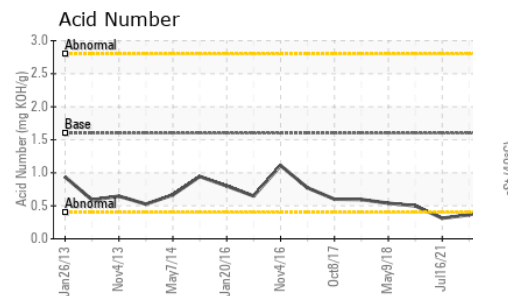
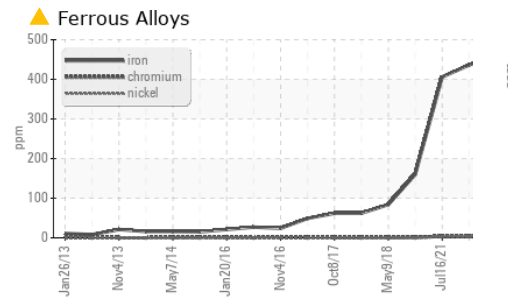
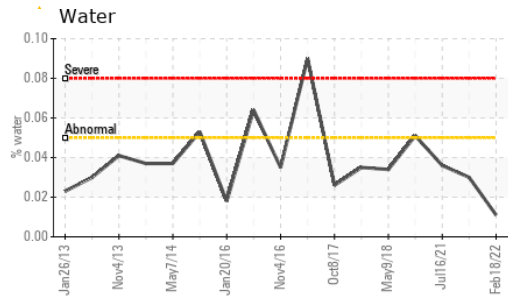
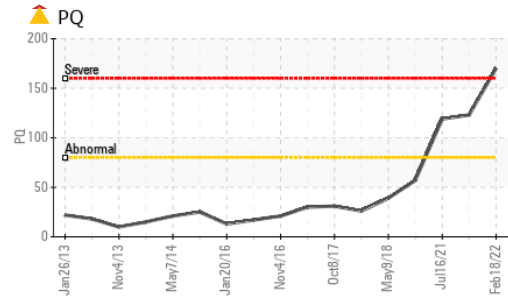
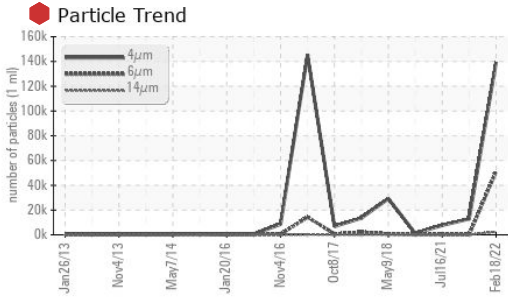
	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>50	10	10
Sodium	ppm	ASTM D5185m	>20	9	6
Potassium	ppm	ASTM D5185m	>20	0	<1
Water	%	ASTM D6304	>0.05	0.011	0.030
ppm Water	ppm	ASTM D6304	>500	116.7	305.9

FLUID CLEANLINESS

	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647		139345	12871	7687
Particles >6µm	ASTM D7647	>2500	▲ 51238	146	221
Particles >14µm	ASTM D7647	>320	▲ 2424	3	9
Particles >21µm	ASTM D7647	>80	▲ 267	0	2
Particles >38µm	ASTM D7647	>20	4	0	0
Particles >71µm	ASTM D7647	>4	0	0	0
Oil Cleanliness	ISO 4406 (c)	>--/18/15	▲ 24/23/18	21/14/9	20/15/10



OIL ANALYSIS REPORT

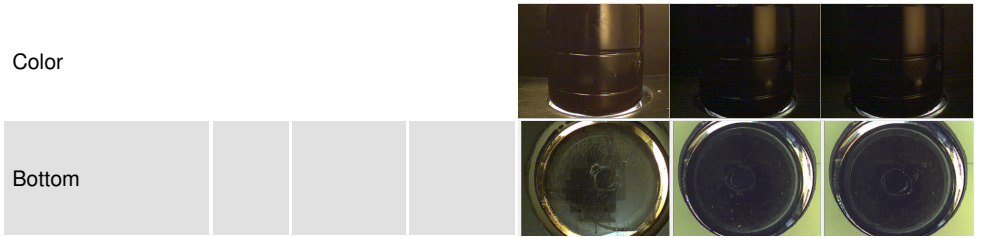


FLUID DEGRADATION	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045 1.6	0.473	0.363	0.312

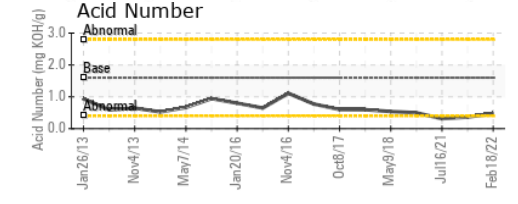
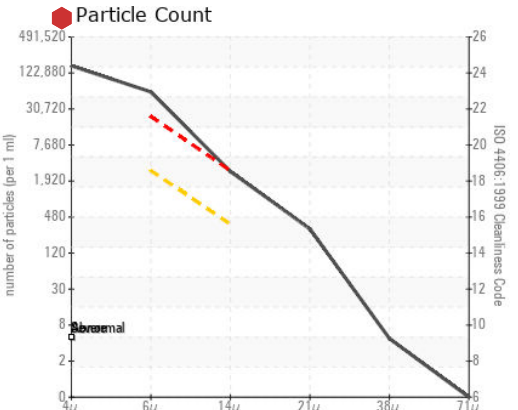
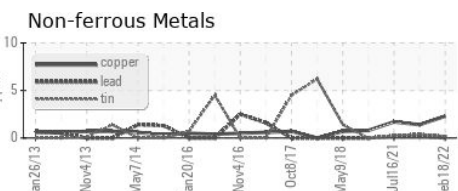
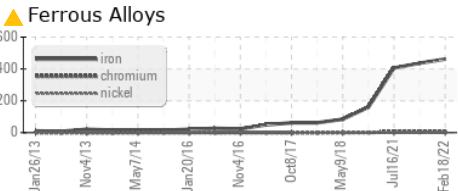
VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.05	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445 320	304	315	311

SAMPLE IMAGES	method	limit/base	current	history1	history2
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GRAPHS



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : NX05568724 **Received** : 14 Jun 2022
Lab Number : 05568724 **Diagnosed** : 15 Jun 2022
Unique Number : 10013124 **Diagnostician** : Angela Borella
Test Package : IND 2 (Additional Tests: KF, PQ, PrtCount)

NORDEX USA - BEEBE
 1200 S COUNTY FARM RD
 ITHACA, MI
 US 48847
 Contact: TUCKER WITT
 tucker.witt@constellation.com
 T:
 F: (312)386-7102

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)