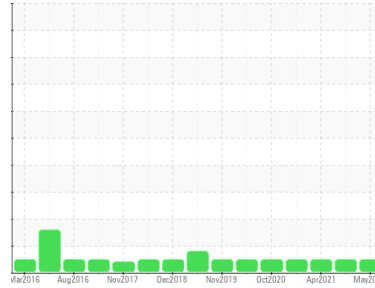




# OIL ANALYSIS REPORT

Sample Rating Trend



**NORMAL**



Area  
**THUNDER SPIRIT [200005313]**  
 Machine Id  
**06WEA84032**  
 Component  
**Wind Turbine Gearbox**  
 Fluid  
**FUCHS RENOLIN CLP ISO 320 (--- QTS)**

## DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

### Wear

All component wear rates are normal.

### 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. The condition of the oil is suitable for further service.

## SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		<b>NX013613</b>	NX004420	NX004868
Sample Date	Client Info		<b>24 May 2023</b>	23 Aug 2021	26 Apr 2021
Machine Age	hrs	Client Info	<b>0</b>	41795	39374
Oil Age	hrs	Client Info	<b>0</b>	0	0
Oil Changed	Client Info		<b>N/A</b>	N/A	N/A
Sample Status			<b>NORMAL</b>	NORMAL	NORMAL

## WEAR METALS

	method	limit/base	current	history1	history2	
PQ	ASTM D8184	>80	<b>15</b>	24	20	
Iron	ppm	ASTM D5185m	>150	<b>4</b>	20	14
Chromium	ppm	ASTM D5185m	>5	<b>0</b>	<1	0
Nickel	ppm	ASTM D5185m	>10	<b>0</b>	0	0
Titanium	ppm	ASTM D5185m	>10	<b>0</b>	0	0
Silver	ppm	ASTM D5185m		<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m	>10	<b>0</b>	0	0
Lead	ppm	ASTM D5185m	>20	<b>0</b>	0	0
Copper	ppm	ASTM D5185m	>50	<b>0</b>	<1	<1
Tin	ppm	ASTM D5185m	>10	<b>0</b>	0	0
Antimony	ppm	ASTM D5185m	>5	<b>---</b>	0	0
Vanadium	ppm	ASTM D5185m		<b>0</b>	0	0
Cadmium	ppm	ASTM D5185m		<b>0</b>	0	0

## ADDITIVES

	method	limit/base	current	history1	history2	
Boron	ppm	ASTM D5185m		<b>13</b>	2	1
Barium	ppm	ASTM D5185m		<b>0</b>	0	2
Molybdenum	ppm	ASTM D5185m		<b>33</b>	637	636
Manganese	ppm	ASTM D5185m		<b>0</b>	<1	<1
Magnesium	ppm	ASTM D5185m		<b>&lt;1</b>	5	4
Calcium	ppm	ASTM D5185m		<b>68</b>	1325	1182
Phosphorus	ppm	ASTM D5185m		<b>224</b>	319	291
Zinc	ppm	ASTM D5185m		<b>0</b>	0	0
Sulfur	ppm	ASTM D5185m		<b>6152</b>	1540	1356

## CONTAMINANTS

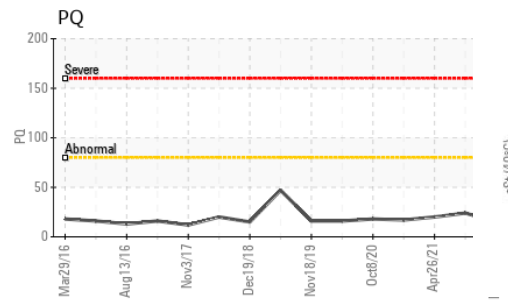
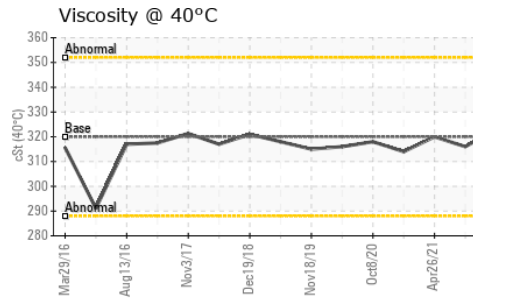
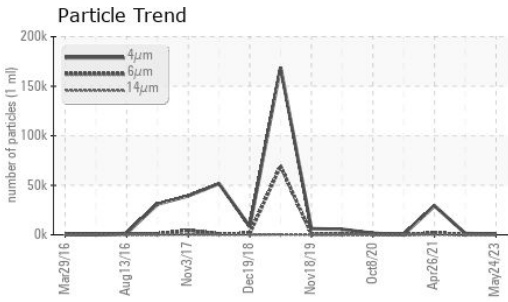
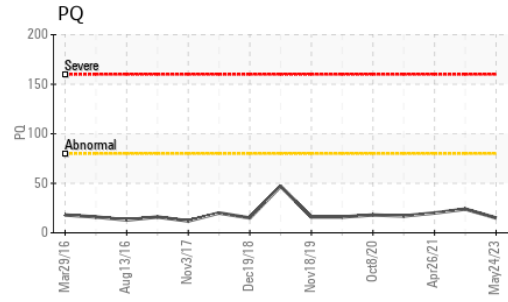
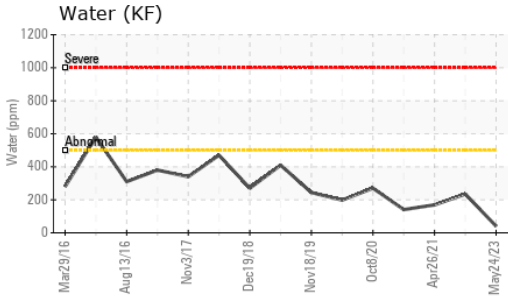
	method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m	>50	<b>&lt;1</b>	7	11
Sodium	ppm	ASTM D5185m	>20	<b>&lt;1</b>	3	4
Potassium	ppm	ASTM D5185m	>20	<b>2</b>	2	2
Water	%	ASTM D6304	>0.05	<b>0.004</b>	0.023	0.016
ppm Water	ppm	ASTM D6304	>500	<b>40.4</b>	234.8	169.1

## FLUID CLEANLINESS

	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647		<b>838</b>	1369	29257
Particles >6µm	ASTM D7647	>2500	<b>182</b>	112	1907
Particles >14µm	ASTM D7647	>320	<b>14</b>	5	108
Particles >21µm	ASTM D7647	>80	<b>4</b>	1	31
Particles >38µm	ASTM D7647	>20	<b>0</b>	0	2
Particles >71µm	ASTM D7647	>4	<b>0</b>	0	0
Oil Cleanliness	ISO 4406 (c)	>--/18/15	<b>17/15/11</b>	18/14/10	22/18/14



# OIL ANALYSIS REPORT

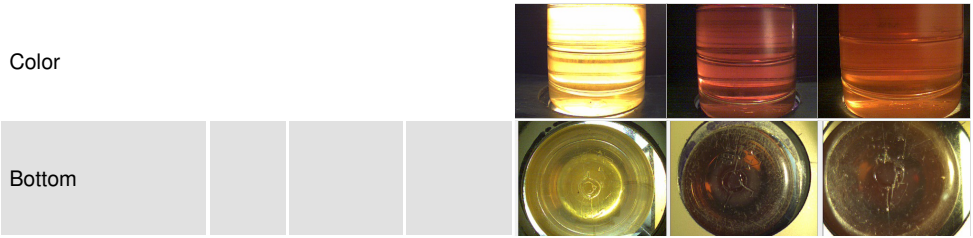


FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045		<b>0.34</b>	0.405	0.281

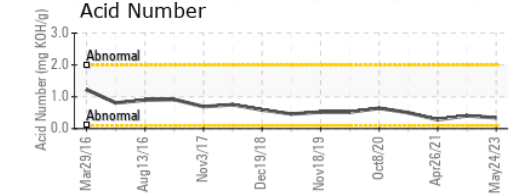
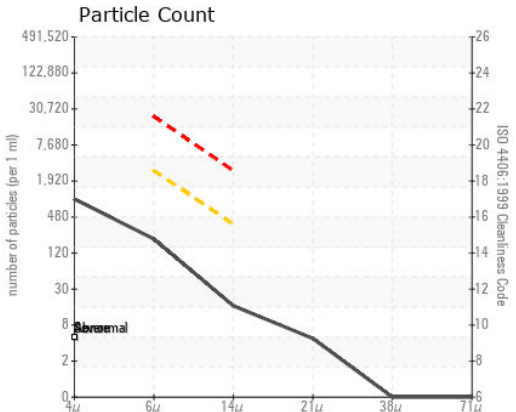
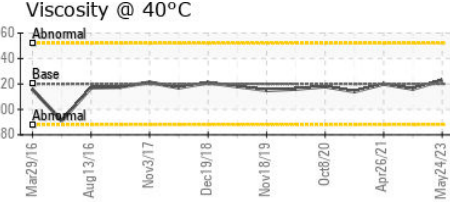
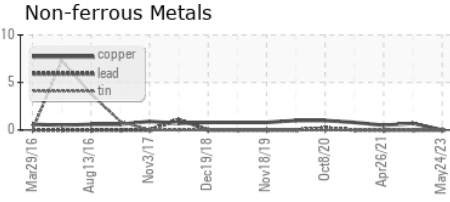
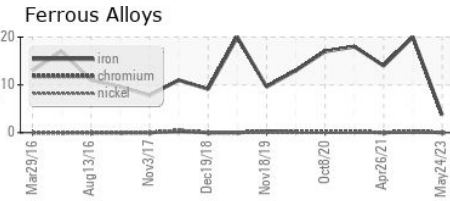
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Precipitate	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Silt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Debris	scalar	*Visual	NONE	<b>NONE</b>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

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	320	<b>323</b>	316	320

SAMPLE IMAGES		method	limit/base	current	history1	history2
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## GRAPHS



**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : NX013613  
**Lab Number** : **05866184**  
**Unique Number** : 10505968  
**Test Package** : IND 2 ( Additional Tests: KF, PQ, PrtCount )

**NORDEX USA - Chicago**  
 300 SOUTH WACKER DRIVE, SUITE 1500  
 CHICAGO, IL  
 US 60606  
 Contact: DEVIN LINEHAN  
 DLinehan@nordex-online.com  
 T: (312)386-4124  
 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)