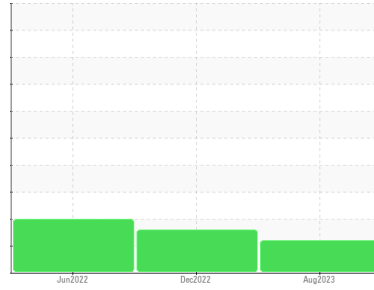




# PROBLEM SUMMARY

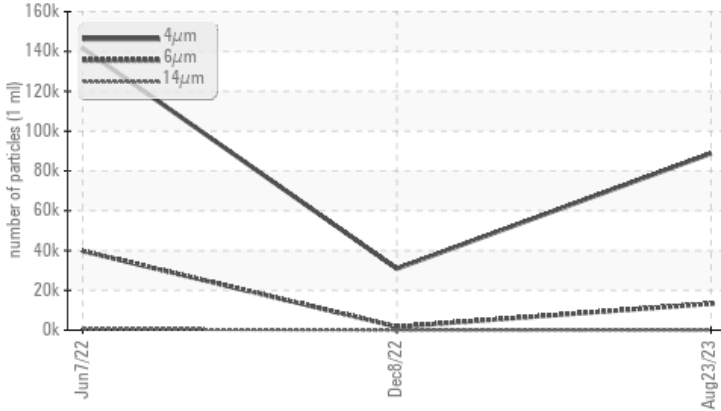
Area  
**IRON STAR [200006142]**  
 Machine Id  
**G02-33WEA88332**  
 Component  
**Wind Turbine Gearbox**  
 Fluid  
**GEAR OIL (PAO) ISO 320 (--- LTR)**

Sample Rating Trend



## COMPONENT CONDITION SUMMARY

▲ Particle Trend



## RECOMMENDATION

We recommend you service the filters on this component if applicable. Resample at the next service interval to monitor.

## PROBLEMATIC TEST RESULTS

Sample Status			ABNORMAL	ABNORMAL	ABNORMAL
Particles >6µm	ASTM D7647	>320	▲ 13292	▲ 1695	▲ 39723
Particles >14µm	ASTM D7647	>40	▲ 45	▲ 57	▲ 591
Oil Cleanliness	ISO 4406 (c)	>--/15/12	▲ 24/21/13	▲ 22/18/13	▲ 24/22/16

Customer Id: NORDEX  
 Sample No.: NX05933524  
 Lab Number: 05933524  
 Test Package: IND 2



To manage this report scan the QR code

To discuss the diagnosis or test data:  
 Jonathan Hester +1 919-379-4092 x4092  
[jhester@wearcheckusa.com](mailto:jhester@wearcheckusa.com)

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

## RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Change Filter	---	---	?	We recommend you service the filters on this component if applicable.

## HISTORICAL DIAGNOSIS

### 08 Dec 2022 Diag: Jonathan Hester

ISO



We recommend you service the filters on this component if applicable. Resample at the next service interval to monitor. All component wear rates are normal. There is a high amount of particulates present in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report



### 07 Jun 2022 Diag: Don Baldrige

ISO



We recommend you service the filters on this component if applicable. Resample at the next service interval to monitor. All component wear rates are normal. There is a high amount of particulates present in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

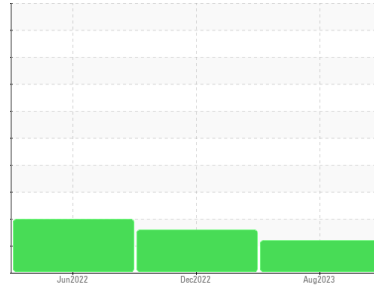
view report





# OIL ANALYSIS REPORT

## Sample Rating Trend



ISO



Area  
**IRON STAR [200006142]**  
 Machine Id  
**G02-33WEA88332**  
 Component  
**Wind Turbine Gearbox**  
 Fluid  
**GEAR OIL (PAO) ISO 320 (--- LTR)**

### DIAGNOSIS

#### ▲ Recommendation

We recommend you service the filters on this component if applicable. Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### ▲ Contamination

There is a high amount of particulates present in the oil.

#### 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>NX05933524</b>	NX05739640	NX05596462
Sample Date	Client Info	<b>23 Aug 2023</b>	08 Dec 2022	07 Jun 2022
Machine Age	hrs	Client Info	<b>0</b>	0
Oil Age	hrs	Client Info	<b>0</b>	0
Oil Changed	Client Info	<b>N/A</b>	N/A	N/A
Sample Status		<b>ABNORMAL</b>	ABNORMAL	ABNORMAL

### WEAR METALS

method	limit/base	current	history1	history2		
PQ	ASTM D8184	>50	<b>12</b>	6	24	
Iron	ppm	ASTM D5185m	>30	<b>22</b>	19	12
Chromium	ppm	ASTM D5185m	>3	<b>0</b>	0	0
Nickel	ppm	ASTM D5185m	>3	<b>0</b>	0	<1
Titanium	ppm	ASTM D5185m	>10	<b>0</b>	0	0
Silver	ppm	ASTM D5185m		<b>0</b>	0	<1
Aluminum	ppm	ASTM D5185m	>30	<b>0</b>	0	<1
Lead	ppm	ASTM D5185m	>15	<b>&lt;1</b>	<1	<1
Copper	ppm	ASTM D5185m	>10	<b>&lt;1</b>	0	<1
Tin	ppm	ASTM D5185m	>10	<b>0</b>	<1	<1
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	25	<b>4</b>	9	10
Barium	ppm	ASTM D5185m	12	<b>2</b>	0	0
Molybdenum	ppm	ASTM D5185m	5	<b>0</b>	0	<1
Manganese	ppm	ASTM D5185m		<b>&lt;1</b>	<1	<1
Magnesium	ppm	ASTM D5185m	25	<b>&lt;1</b>	0	<1
Calcium	ppm	ASTM D5185m	25	<b>18</b>	20	16
Phosphorus	ppm	ASTM D5185m	375	<b>205</b>	210	169
Zinc	ppm	ASTM D5185m	25	<b>6</b>	3	<1
Sulfur	ppm	ASTM D5185m	4900	<b>5151</b>	5444	4463

### CONTAMINANTS

method	limit/base	current	history1	history2		
Silicon	ppm	ASTM D5185m	>+15	<b>11</b>	10	8
Sodium	ppm	ASTM D5185m		<b>0</b>	3	1
Potassium	ppm	ASTM D5185m	>20	<b>2</b>	0	1
Water	%	ASTM D6304	>0.02	<b>0.004</b>	0.003	0.013
ppm Water	ppm	ASTM D6304	>200	<b>41.9</b>	35.7	136.0

### FLUID CLEANLINESS

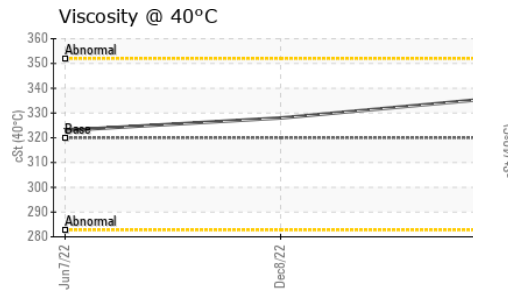
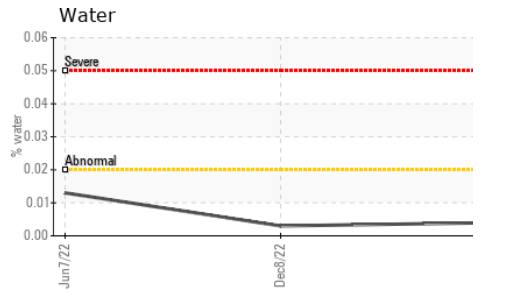
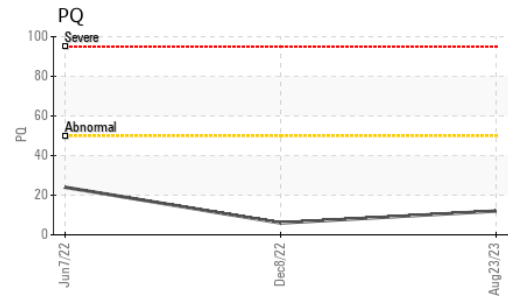
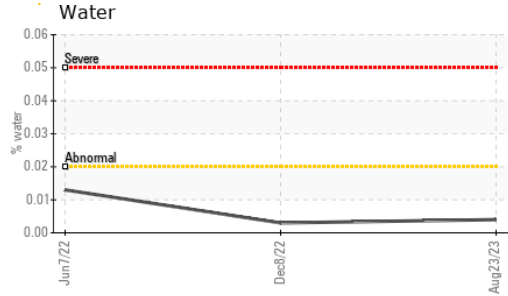
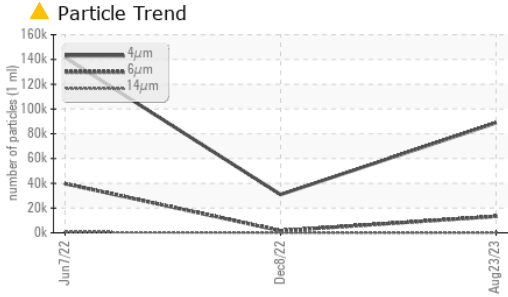
method	limit/base	current	history1	history2	
Particles >4µm	ASTM D7647		<b>88784</b>	30898	141579
Particles >6µm	ASTM D7647	>320	▲ <b>13292</b>	▲ 1695	▲ 39723
Particles >14µm	ASTM D7647	>40	▲ <b>45</b>	▲ 57	▲ 591
Particles >21µm	ASTM D7647	>10	<b>10</b>	▲ 13	▲ 139
Particles >38µm	ASTM D7647	>3	<b>1</b>	1	▲ 17
Particles >71µm	ASTM D7647	>3	<b>0</b>	0	2
Oil Cleanliness	ISO 4406 (c)	>--/15/12	▲ <b>24/21/13</b>	▲ 22/18/13	▲ 24/22/16

### FLUID DEGRADATION

method	limit/base	current	history1	history2		
Acid Number (AN)	mg KOH/g	ASTM D8045	1.10	<b>0.38</b>	0.32	0.25



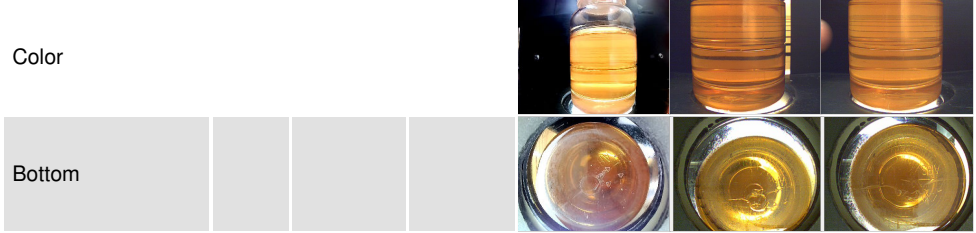
# OIL ANALYSIS REPORT



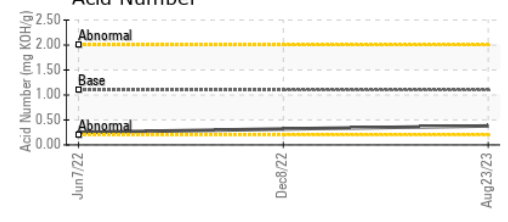
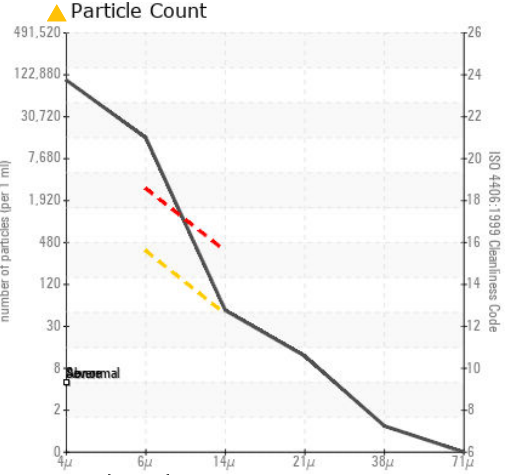
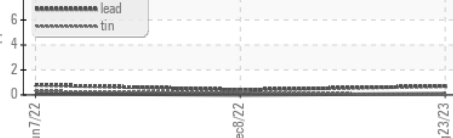
VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.02	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445 320	336	328	323

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



**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : NX05933524 **Received** : 24 Aug 2023  
**Lab Number** : 05933524 **Diagnosed** : 28 Aug 2023  
**Unique Number** : 10618795 **Diagnostician** : Jonathan Hester  
**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)