



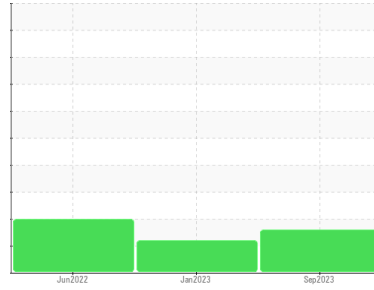
# PROBLEM SUMMARY

## Sample Rating Trend

ISO

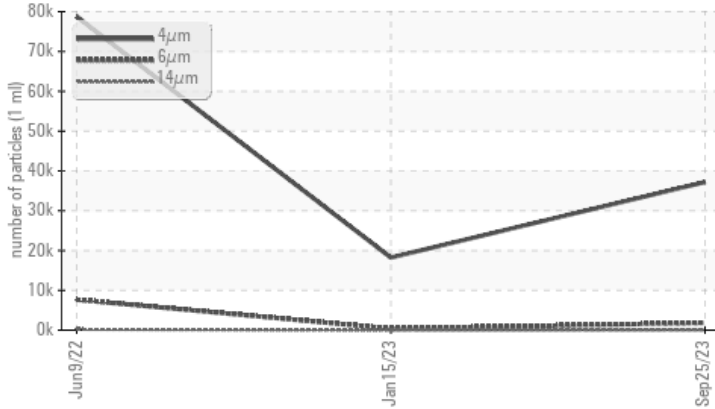


Area  
**IRON STAR [200006142]**  
 Machine Id  
**05WEA88305**  
 Component  
**Wind Turbine Gearbox**  
 Fluid  
**GEAR OIL (PAO) ISO 320 (--- LTR)**



## 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	ATTENTION	ABNORMAL
Particles >6µm	ASTM D7647	>320	▲ 1821	▲ 391	▲ 7659
Particles >14µm	ASTM D7647	>40	▲ 50	20	▲ 195
Particles >21µm	ASTM D7647	>10	▲ 14	5	▲ 24
Oil Cleanliness	ISO 4406 (c)	>--/15/12	▲ 22/18/13	▲ 21/16/11	▲ 23/20/15

Customer Id: NORDEX  
 Sample No.: NX05961225  
 Lab Number: 05961225  
 Test Package: IND 2



To manage this report scan the QR code

To discuss the diagnosis or test data:  
 Don Baldrige +1  
[don.b505@comcast.net](mailto:don.b505@comcast.net)

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

### 15 Jan 2023 Diag: Doug Bogart

#### VISCOSITY



Resample at the next service interval to monitor. All component wear rates are normal. There is a moderate amount of silt (particulates < 14 microns in size) present in the oil. The oil viscosity is higher than normal. The AN level is acceptable for this fluid.

[view report](#)



### 09 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.

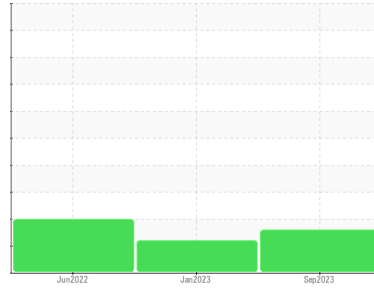
[view report](#)





# OIL ANALYSIS REPORT

Sample Rating Trend



ISO



Area  
**IRON STAR [200006142]**  
 Machine Id  
**05WEA88305**  
 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>NX05961225</b>	NX05739629	NX05596455
Sample Date	Client Info		<b>25 Sep 2023</b>	15 Jan 2023	09 Jun 2022
Machine Age	hrs	Client Info	<b>0</b>	0	0
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>ABNORMAL</b>	ATTENTION	ABNORMAL

## WEAR METALS

	method	limit/base	current	history1	history2	
PQ	ASTM D8184	>50	<b>17</b>	10	16	
Iron	ppm	ASTM D5185m	>30	<b>20</b>	21	10
Chromium	ppm	ASTM D5185m	>3	<b>0</b>	0	0
Nickel	ppm	ASTM D5185m	>3	<b>0</b>	0	0
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	0
Lead	ppm	ASTM D5185m	>15	<b>0</b>	<1	<1
Copper	ppm	ASTM D5185m	>10	<b>&lt;1</b>	0	<1
Tin	ppm	ASTM D5185m	>10	<b>&lt;1</b>	<1	<1
Vanadium	ppm	ASTM D5185m		<b>&lt;1</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>5</b>	8	8
Barium	ppm	ASTM D5185m	12	<b>0</b>	0	0
Molybdenum	ppm	ASTM D5185m	5	<b>0</b>	0	0
Manganese	ppm	ASTM D5185m		<b>&lt;1</b>	<1	<1
Magnesium	ppm	ASTM D5185m	25	<b>0</b>	0	<1
Calcium	ppm	ASTM D5185m	25	<b>16</b>	21	15
Phosphorus	ppm	ASTM D5185m	375	<b>212</b>	221	173
Zinc	ppm	ASTM D5185m	25	<b>0</b>	4	1
Sulfur	ppm	ASTM D5185m	4900	<b>5539</b>	5634	4439

## CONTAMINANTS

	method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m	>+15	<b>10</b>	11	11
Sodium	ppm	ASTM D5185m		<b>2</b>	4	1
Potassium	ppm	ASTM D5185m	>20	<b>1</b>	0	1
Water	%	ASTM D6304	>0.02	<b>0.002</b>	0.004	0.007
ppm Water	ppm	ASTM D6304	>200	<b>20.3</b>	40.3	73.8

## FLUID CLEANLINESS

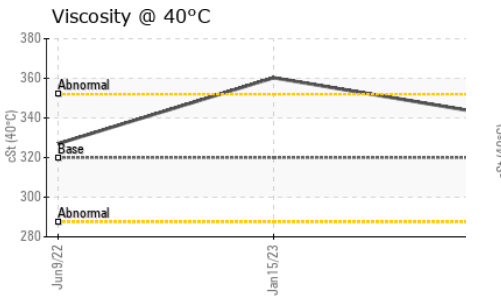
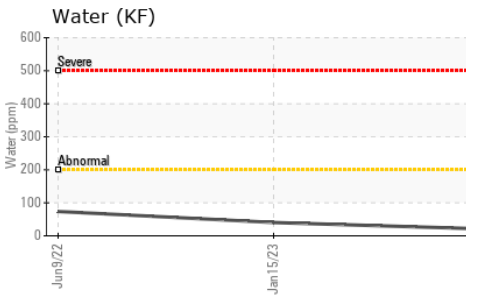
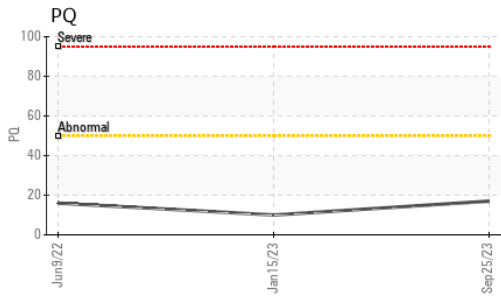
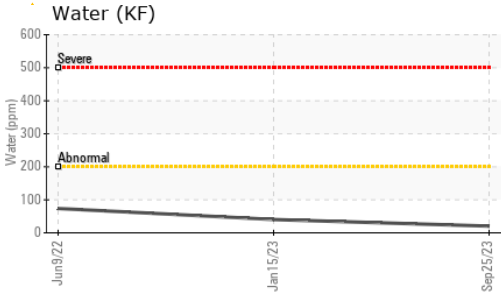
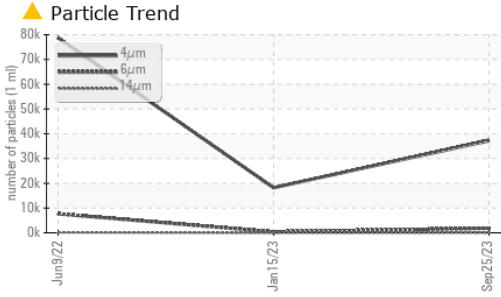
	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647		<b>37209</b>	18225	78757
Particles >6µm	ASTM D7647	>320	<b>▲ 1821</b>	▲ 391	▲ 7659
Particles >14µm	ASTM D7647	>40	<b>▲ 50</b>	20	▲ 195
Particles >21µm	ASTM D7647	>10	<b>▲ 14</b>	5	▲ 24
Particles >38µm	ASTM D7647	>3	<b>1</b>	1	▲ 3
Particles >71µm	ASTM D7647	>3	<b>1</b>	1	2
Oil Cleanliness	ISO 4406 (c)	>--/15/12	<b>▲ 22/18/13</b>	▲ 21/16/11	▲ 23/20/15

## FLUID DEGRADATION

	method	limit/base	current	history1	history2	
Acid Number (AN)	mg KOH/g	ASTM D8045	1.10	<b>0.37</b>	0.36	0.14



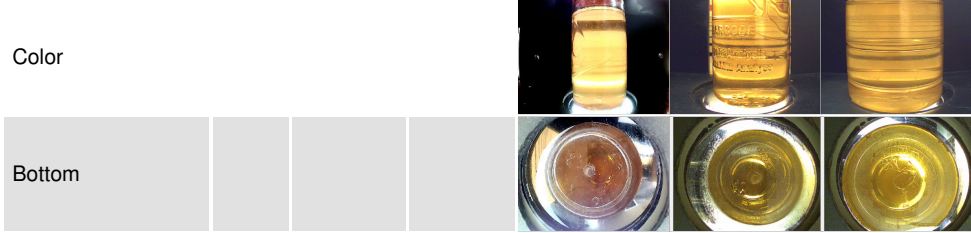
# OIL ANALYSIS REPORT



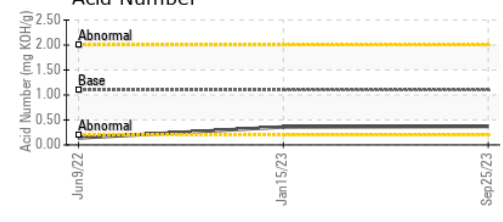
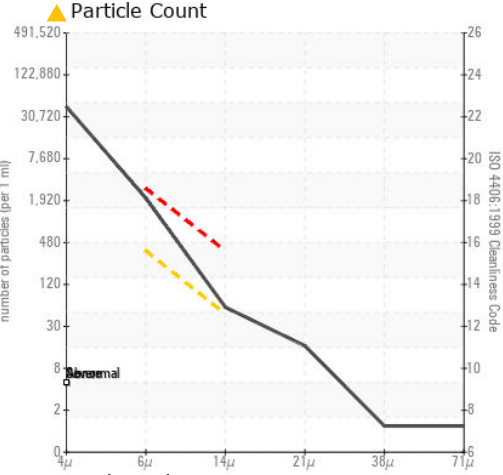
VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	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	342	360.3	327

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



**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : NX05961225 **Received** : 26 Sep 2023  
**Lab Number** : 05961225 **Diagnosed** : 27 Sep 2023  
**Unique Number** : 10662438 **Diagnostician** : Don Baldrige  
**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)