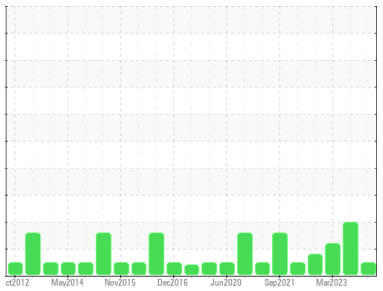
# OIL ANALYSIS REPORT

Sample Rating Trend




NORMAL

Area
## ROTH ROCK [200005321]
Machine Id
## 11WEA81547 (S/N 793000000409)
Component
**Wind Turbine Gearbox**
Fluid
**CASTROL OPTIGEAR SYNTHETIC A ISO 320 (500 LTR)**

## 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 component. The amount and size of particulates present in the system is 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 | | **NX013868** | NX012215 | NX012214 |
| Sample Date | | Client Info | | **06 May 2024** | 25 Sep 2023 | 28 Mar 2023 |
| Machine Age | mths | Client Info | | **0** | 0 | 0 |
| Oil Age | mths | Client Info | | **0** | 0 | 0 |
| Oil Changed | | Client Info | | **N/A** | N/A | N/A |
| Sample Status | | | | **NORMAL** | ATTENTION | ABNORMAL |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| PQ | | ASTM D8184 | >80 | **15** | 14 | 13 |
| Iron | ppm | ASTM D5185m | >150 | **30** | 44 | 52 |
| Chromium | ppm | ASTM D5185m | >5 | **0** | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >10 | **0** | 0 | <1 |
| Titanium | ppm | ASTM D5185m | >10 | **<1** | 0 | <1 |
| Silver | ppm | ASTM D5185m | | **<1** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >10 | **5** | 6 | <1 |
| Lead | ppm | ASTM D5185m | >20 | **0** | 0 | <1 |
| Copper | ppm | ASTM D5185m | >50 | **<1** | 2 | <1 |
| Tin | ppm | ASTM D5185m | >10 | **0** | 0 | <1 |
| Vanadium | ppm | ASTM D5185m | | **<1** | <1 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **0** | 10 | 0 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 1150 | **1019** | 517 | 576 |
| Manganese | ppm | ASTM D5185m | | **<1** | 2 | 2 |
| Magnesium | ppm | ASTM D5185m | 1800 | **1920** | 1563 | 1607 |
| Calcium | ppm | ASTM D5185m | 20 | **6** | 13 | 13 |
| Phosphorus | ppm | ASTM D5185m | 1450 | **1441** | 1087 | 1142 |
| Zinc | ppm | ASTM D5185m | 1650 | **1681** | 1236 | 1287 |
| Sulfur | ppm | ASTM D5185m | 4900 | **6906** | 4569 | 5426 |

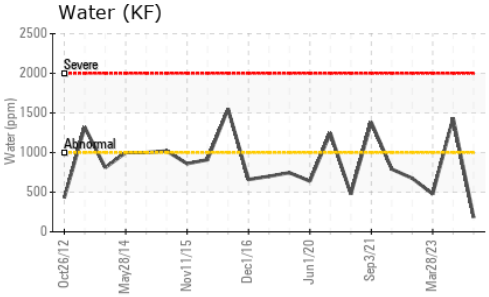
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >50 | **15** | 9 | 10 |
| Sodium | ppm | ASTM D5185m | >20 | **6** | 22 | 22 |
| Potassium | ppm | ASTM D5185m | >20 | **0** | 0 | 2 |
| Water | % | ASTM D6304 | >0.1 | **0.018** | 0.143 | 0.047 |
| ppm Water | ppm | ASTM D6304 | >1000 | **182** | 1436 | 477.8 |

| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Particles >4µm | | ASTM D7647 | | **6319** | 404 | --- |
| Particles >6µm | | ASTM D7647 | >2500 | **1029** | 97 | --- |
| Particles >14µm | | ASTM D7647 | >320 | **46** | 12 | --- |
| Particles >21µm | | ASTM D7647 | >80 | **9** | 4 | --- |
| Particles >38µm | | ASTM D7647 | >20 | **0** | 0 | --- |
| Particles >71µm | | ASTM D7647 | >4 | **0** | 0 | --- |
| Oil Cleanliness | | ISO 4406 (c) | >--/18/15 | **20/17/13** | 16/14/11 | --- |

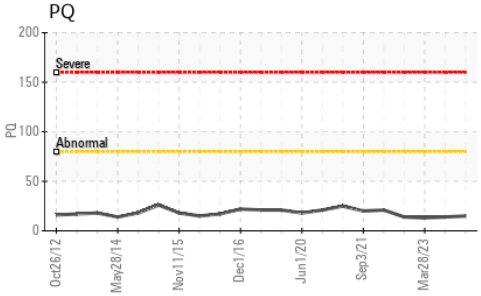
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 3.3 | **2.61** | 2.54 | 1.37 |

# OIL ANALYSIS REPORT

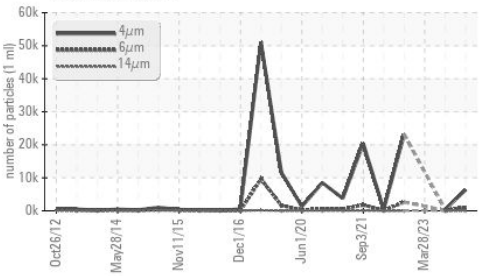
Water (KF)



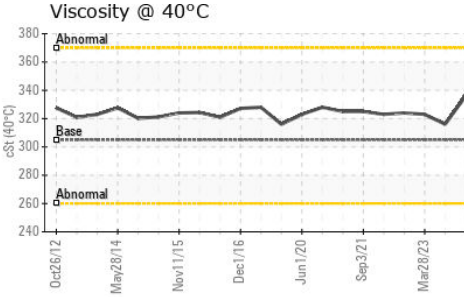

PQ



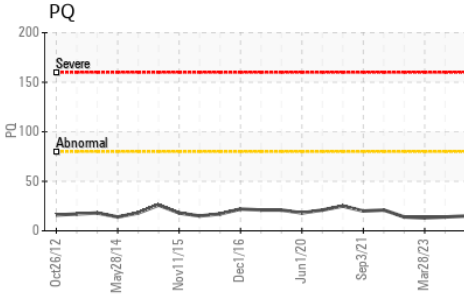

Particle Trend




Viscosity @ 40°C




PQ



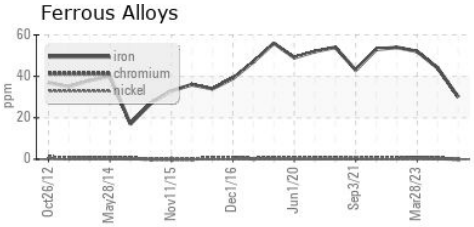

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Silt | scalar | *Visual | NONE | **NONE** | NONE | ▲ HEAVY |
| Debris | scalar | *Visual | NONE | **NONE** | NONE | 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 | >0.1 | **NEG** | NEG | NEG |
| Free Water | scalar | *Visual | | **NEG** | NEG | NEG |

| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 40°C | cSt | ASTM D445 | 305 | **336** | 316 | 323 |

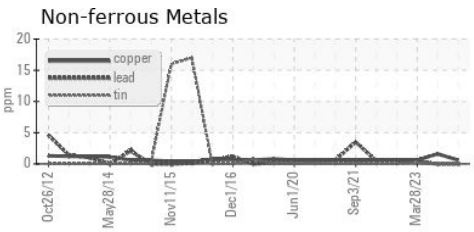
| SAMPLE IMAGES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Color | | | |  | | |
| Bottom | | | |  | | |

## GRAPHS

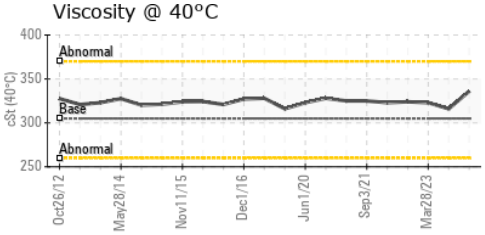
Ferrous Alloys



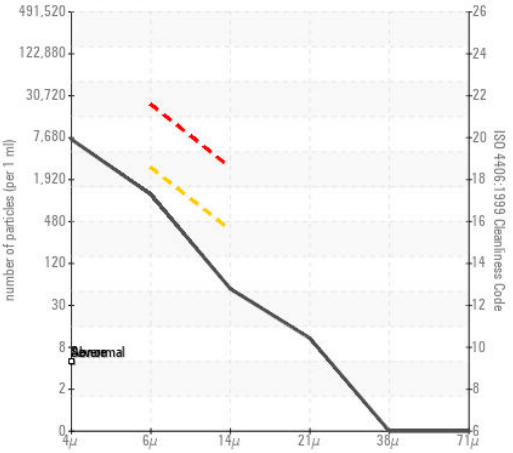

Non-ferrous Metals



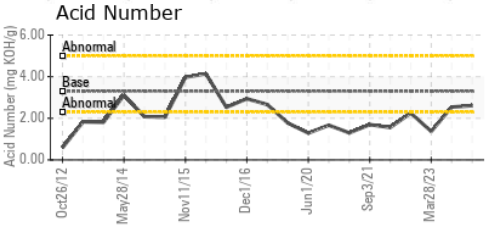

Viscosity @ 40°C




Particle Count




Acid Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : NX013868
**Lab Number** : 06182844
**Unique Number** : 11034170
**Test Package** : IND 2 ( Additional Tests: KF, PQ, PrtCount )

**Received** : 17 May 2024
**Tested** : 20 May 2024
**Diagnosed** : 21 May 2024 - Angela Borella

*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)*

**NORDEX USA - ROTH ROCK**
300 SOUTH WACKER DRIVE, SUITE 1500
CHICAGO, IL
US 60606
Contact: ADAY MAGEC
aday.magec@gestampren.com
T:
F: (312)386-7102