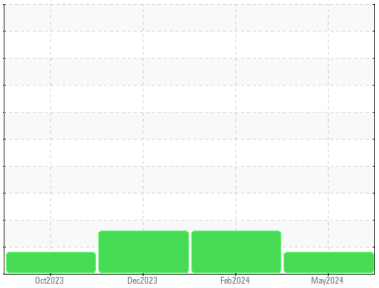
# OIL ANALYSIS REPORT

Sample Rating Trend




ISO

Area
## EL SAUZ [200007686]
Machine Id
## M03-34WEA90071 (S/N W-122935)
Component
**Wind Turbine Gearbox**
Fluid
**FUCHS RENOLIN UNISYN CLP 320 (--- LTR)**

## DIAGNOSIS

**Recommendation**
No corrective action is recommended at this time. Resample at the next service interval to monitor.

**Wear**
All component wear rates are normal.

**Contamination**
There is a high amount of silt (particulates < 14 microns in size) 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 | | **NX015080** | NX012703 | NX014600 |
| Sample Date | | Client Info | | **05 May 2024** | 13 Feb 2024 | 09 Dec 2023 |
| Machine Age | hrs | Client Info | | **0** | 0 | 0 |
| Oil Age | hrs | Client Info | | **0** | 0 | 0 |
| Oil Changed | | Client Info | | **N/A** | N/A | N/A |
| Sample Status | | | | **ABNORMAL** | ABNORMAL | ABNORMAL |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| PQ | | ASTM D8184 | >40 | **19** | 11 | 13 |
| Iron | ppm | ASTM D5185m | >55 | **44** | 41 | 9 |
| Chromium | ppm | ASTM D5185m | >2 | **0** | <1 | 0 |
| Nickel | ppm | ASTM D5185m | >2 | **<1** | <1 | 0 |
| Titanium | ppm | ASTM D5185m | >10 | **0** | 0 | 0 |
| Silver | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >15 | **<1** | 2 | 0 |
| Lead | ppm | ASTM D5185m | >3 | **0** | <1 | <1 |
| Copper | ppm | ASTM D5185m | >7 | **1** | <1 | <1 |
| Tin | ppm | ASTM D5185m | >3 | **<1** | <1 | 0 |
| Vanadium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | | **2** | 2 | 2 |
| Barium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Manganese | ppm | ASTM D5185m | | **1** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | | **2** | <1 | 0 |
| Calcium | ppm | ASTM D5185m | | **12** | 17 | 19 |
| Phosphorus | ppm | ASTM D5185m | | **218** | 196 | 216 |
| Zinc | ppm | ASTM D5185m | | **19** | 17 | 0 |
| Sulfur | ppm | ASTM D5185m | | **5928** | 4783 | 5039 |

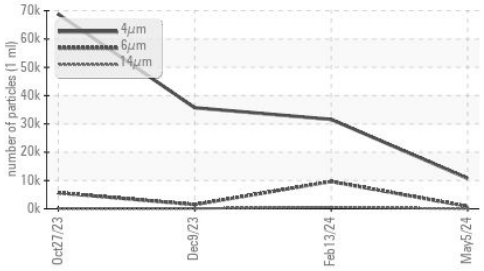
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >35 | **7** | 8 | 4 |
| Sodium | ppm | ASTM D5185m | | **3** | 2 | 1 |
| Potassium | ppm | ASTM D5185m | >20 | **4** | 2 | <1 |
| Water | % | ASTM D6304 | >0.02 | **0.008** | 0.002 | 0.010 |
| ppm Water | ppm | ASTM D6304 | >200 | **89** | 19 | 108 |

| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Particles >4µm | | ASTM D7647 | | **10766** | 31596 | 35707 |
| Particles >6µm | | ASTM D7647 | >320 | ▲ **854** | ▲ 9641 | ▲ 1483 |
| Particles >14µm | | ASTM D7647 | >40 | **6** | ▲ 579 | ▲ 102 |
| Particles >21µm | | ASTM D7647 | >10 | **1** | ▲ 119 | ▲ 29 |
| Particles >38µm | | ASTM D7647 | >3 | **0** | 2 | 1 |
| Particles >71µm | | ASTM D7647 | >3 | **0** | 0 | 0 |
| Oil Cleanliness | | ISO 4406 (c) | >--/15/12 | ▲ **21/17/10** | ▲ 22/20/16 | ▲ 22/18/14 |

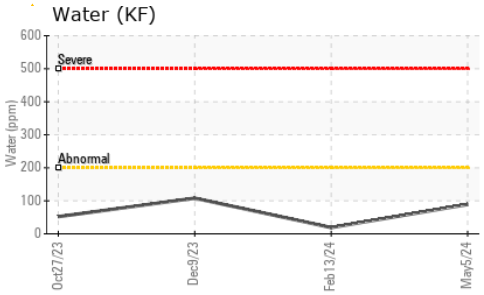
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 0.6 | **0.35** | 0.34 | 0.36 |

# OIL ANALYSIS REPORT

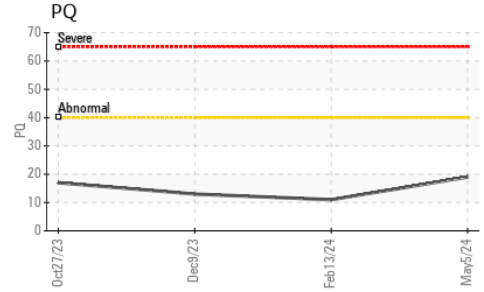
Particle Trend



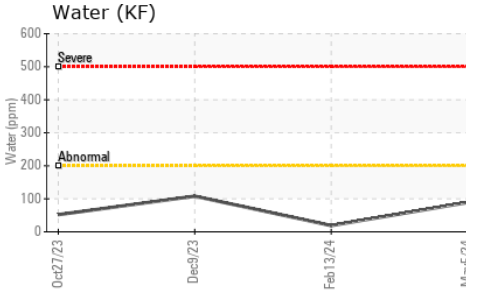

Water (KF)



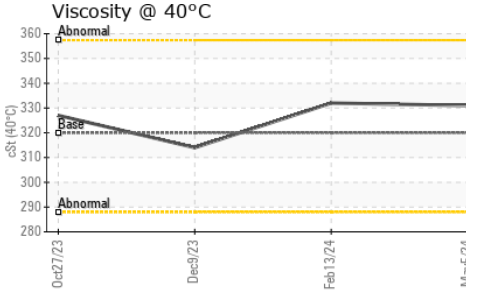

PQ




Water (KF)

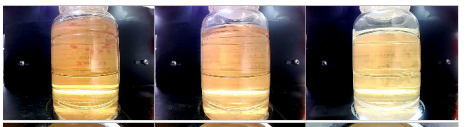



Viscosity @ 40°C



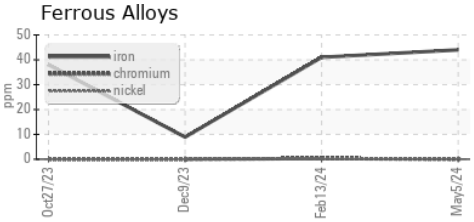

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Silt | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| 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 | >0.02 | **NEG** | NEG | NEG |
| Free Water | scalar | *Visual | | **NEG** | NEG | NEG |

| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 40°C | cSt | ASTM D445 | 320 | **331** | 332 | 314 |

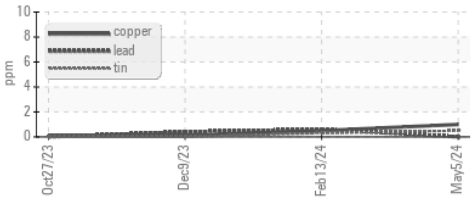
| SAMPLE IMAGES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Color | | | |  | | |
| Bottom | | | |  | | |

## GRAPHS

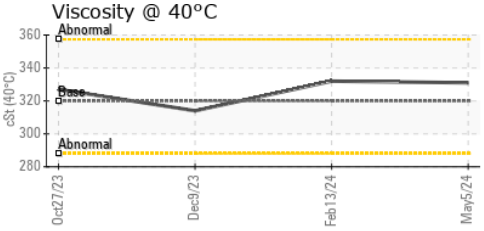
Ferrous Alloys



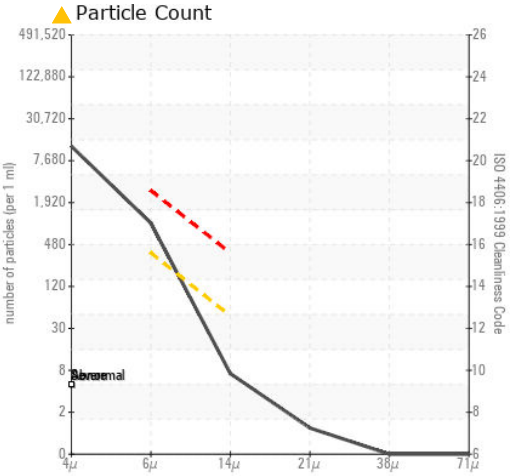

Non-ferrous Metals



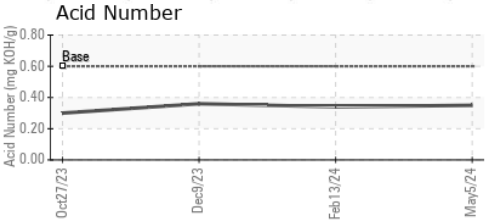

Viscosity @ 40°C




Particle Count




Acid Number




**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : NX015080
**Lab Number** : 06214011
**Unique Number** : 11086875
**Test Package** : IND 2 ( Additional Tests: KF, PQ, PrtCount )

**Received** : 18 Jun 2024
**Tested** : 20 Jun 2024
**Diagnosed** : 20 Jun 2024 - Don Baldridge

Certificate L2367

*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)*

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