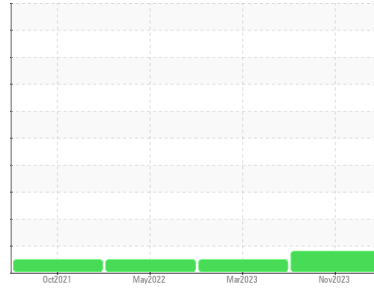




PROBLEM SUMMARY

Sample Rating Trend

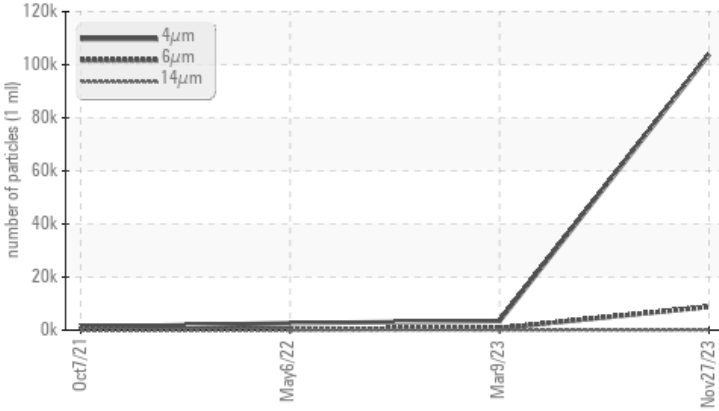
ISO



Area
FRONTIER II [200006776]
 Machine Id
12WEA86929
 Component
Wind Turbine Gearbox
 Fluid
FUCHS RENOLIN CLP ISO 320 (--- LTR)

COMPONENT CONDITION SUMMARY

▲ Particle Trend



RECOMMENDATION

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

PROBLEMATIC TEST RESULTS

| Sample Status | | ABNORMAL | NORMAL | NORMAL |
|-----------------|------------------------|------------|----------|----------|
| Particles >6µm | ASTM D7647 >2500 | ▲ 8805 | 782 | 393 |
| Oil Cleanliness | ISO 4406 (c) >--/18/15 | ▲ 24/20/14 | 19/17/12 | 19/16/12 |

Customer Id: NORDEX
 Sample No.: NX06026392
 Lab Number: 06026392
 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

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

RECOMMENDED ACTIONS

There are no recommended actions for this sample.

HISTORICAL DIAGNOSIS

09 Mar 2023 Diag: Jonathan Hester

NORMAL



Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The amount and size of particulates present in the system are acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report



06 May 2022 Diag: Doug Bogart

NORMAL



Resample at the next service interval to monitor. Please note that this is a corrected copy for diagnostic comment updates. All component wear rates are normal. There is no indication of any contamination in the oil. The amount and size of particulates present in the system are acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report



07 Oct 2021 Diag: Angela Borella

NORMAL



Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The amount and size of particulates present in the system are acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

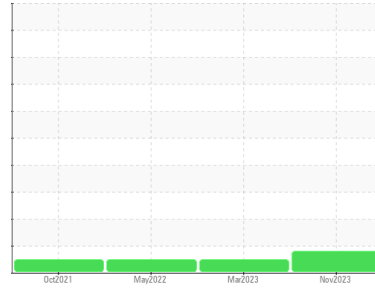
view report





OIL ANALYSIS REPORT

Sample Rating Trend



ISO



Area
FRONTIER II [200006776]
 Machine Id
12WEA86929
 Component
Wind Turbine Gearbox
 Fluid
FUCHS RENOLIN CLP ISO 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 | NX06026392 | NX05798680 | NX05565459 |
| Sample Date | Client Info | 27 Nov 2023 | 09 Mar 2023 | 06 May 2022 |
| Machine Age | hrs | Client Info | 0 | 10423 |
| Oil Age | hrs | Client Info | 0 | 0 |
| Oil Changed | Client Info | N/A | N/A | N/A |
| Sample Status | | ABNORMAL | NORMAL | NORMAL |

WEAR METALS

| method | limit/base | current | history1 | history2 | | |
|----------|------------|-------------|-----------|--------------|-----|-----|
| PQ | ASTM D8184 | >80 | 17 | 9 | 21 | |
| Iron | ppm | ASTM D5185m | >150 | 28 | 19 | 17 |
| Chromium | ppm | ASTM D5185m | >5 | 0 | 0 | 0 |
| Nickel | ppm | ASTM D5185m | >10 | <1 | <1 | 0 |
| Titanium | ppm | ASTM D5185m | >10 | 0 | 0 | 0 |
| Silver | ppm | ASTM D5185m | | 0 | 0 | <1 |
| Aluminum | ppm | ASTM D5185m | >10 | 0 | <1 | <1 |
| Lead | ppm | ASTM D5185m | >20 | <1 | 1 | <1 |
| Copper | ppm | ASTM D5185m | >50 | <1 | <1 | <1 |
| Tin | ppm | ASTM D5185m | >10 | 0 | 0 | 0 |
| Antimony | ppm | ASTM D5185m | >5 | --- | --- | --- |
| 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 | | 4 | 4 | 5 |
| Barium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | 0 | <1 | 0 |
| Manganese | ppm | ASTM D5185m | | 1 | 1 | <1 |
| Magnesium | ppm | ASTM D5185m | | 0 | 2 | <1 |
| Calcium | ppm | ASTM D5185m | | 15 | 23 | 17 |
| Phosphorus | ppm | ASTM D5185m | | 176 | 182 | 198 |
| Zinc | ppm | ASTM D5185m | | 0 | 15 | 8 |
| Sulfur | ppm | ASTM D5185m | | 4473 | 4220 | 4479 |

CONTAMINANTS

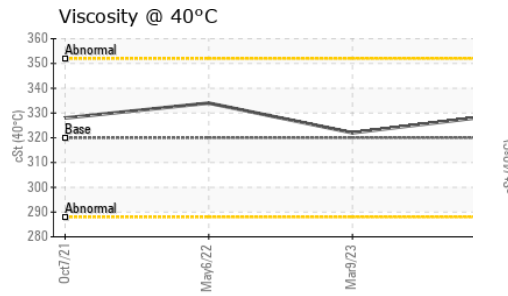
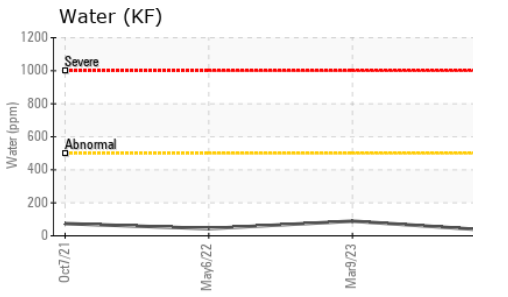
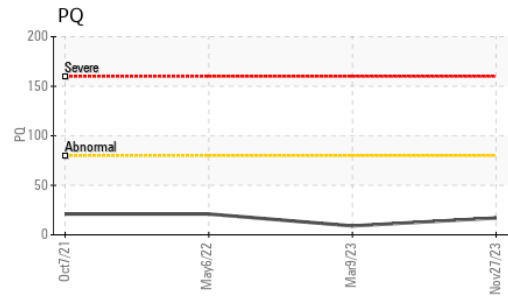
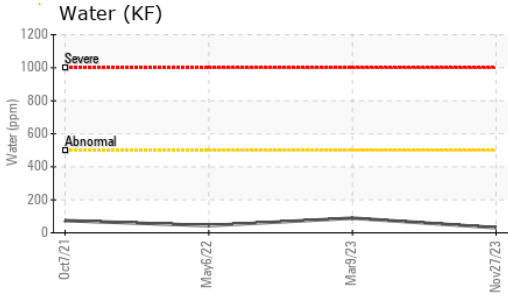
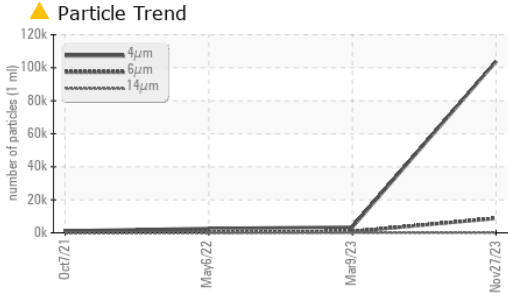
| method | limit/base | current | history1 | history2 | | |
|-----------|------------|-------------|----------|--------------|-------|-------|
| Silicon | ppm | ASTM D5185m | >50 | 10 | 11 | 10 |
| Sodium | ppm | ASTM D5185m | >20 | 4 | 0 | 2 |
| Potassium | ppm | ASTM D5185m | >20 | 0 | <1 | 1 |
| Water | % | ASTM D6304 | >0.05 | 0.003 | 0.008 | 0.004 |
| ppm Water | ppm | ASTM D6304 | >500 | 31 | 89.1 | 43.7 |

FLUID CLEANLINESS

| method | limit/base | current | history1 | history2 | |
|-----------------|--------------|-----------|-----------------|----------|----------|
| Particles >4µm | ASTM D7647 | | 103863 | 3451 | 2624 |
| Particles >6µm | ASTM D7647 | >2500 | 8805 | 782 | 393 |
| Particles >14µm | ASTM D7647 | >320 | 85 | 26 | 24 |
| Particles >21µm | ASTM D7647 | >80 | 20 | 2 | 5 |
| Particles >38µm | ASTM D7647 | >20 | 2 | 1 | 0 |
| Particles >71µm | ASTM D7647 | >4 | 0 | 1 | 0 |
| Oil Cleanliness | ISO 4406 (c) | >--/18/15 | 24/20/14 | 19/17/12 | 19/16/12 |



OIL ANALYSIS REPORT

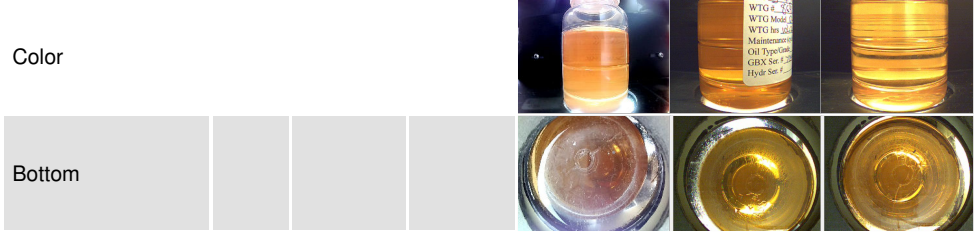


| FLUID DEGRADATION | method | limit/base | current | history1 | history2 |
|-------------------|----------|------------|-------------|----------|----------|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 0.29 | 0.28 | 0.38 |

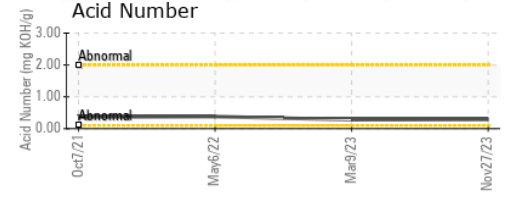
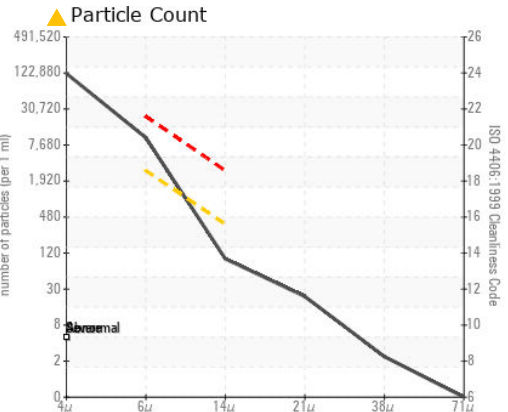
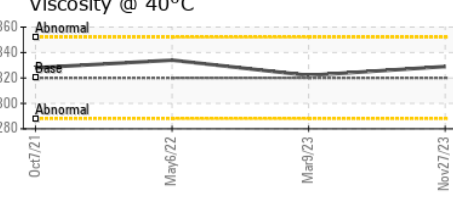
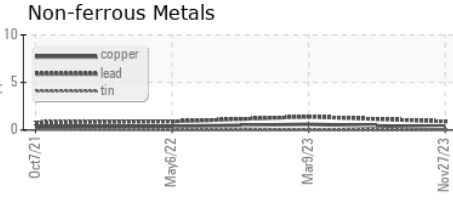
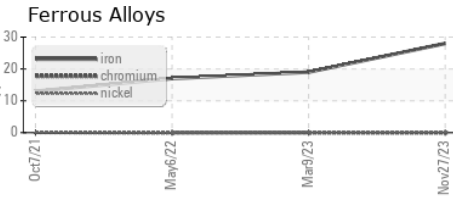
| VISUAL | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| White Metal | scalar | *Visual | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | NONE | 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 | >0.05 | NEG | NEG |
| Free Water | scalar | *Visual | | NEG | NEG |

| FLUID PROPERTIES | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|------------|----------|----------|
| Visc @ 40°C | cSt | ASTM D445 | 329 | 322 | 334 |

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



GRAPHS



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : NX06026392 **Received** : 06 Dec 2023
Lab Number : 06026392 **Diagnosed** : 07 Dec 2023
Unique Number : 10776183 **Diagnostician** : Don Baldrige
Test Package : IND 2 (Additional Tests: KF, PQ, PrtCount)

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 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)