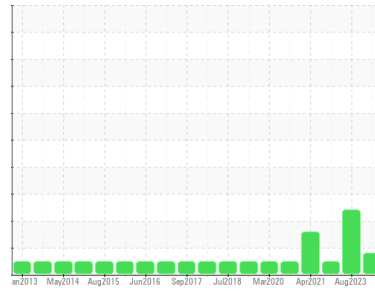




OIL ANALYSIS REPORT

Sample Rating Trend



WEAR



Machine Id
TURBINA 04 (S/N 101282)

Component
Wind Turbine Gearbox

Fluid
FUCHS RENOLIN UNISYN CLP 320 (320 LTR)

DIAGNOSIS

| SAMPLE INFORMATION | method | limit/base | current | history1 | history2 |
|--------------------|-------------|-------------|--------------------|-------------|-------------|
| Sample Number | Client Info | | WC0831484 | WC0831514 | WC05582424 |
| Sample Date | Client Info | | 03 May 2024 | 12 Aug 2023 | 05 Apr 2022 |
| Machine Age | yrs | Client Info | 12 | 11 | 72 |
| Oil Age | yrs | Client Info | 9 | 7 | 0 |
| Oil Changed | Client Info | | N/A | Changed | N/A |
| Sample Status | | | ABNORMAL | ABNORMAL | NORMAL |

| WEAR METALS | method | limit/base | current | history1 | history2 |
|-------------|------------|-------------|------------------|----------|----------|
| PQ | ASTM D8184 | >50 | 15 | 12 | 19 |
| Iron | ppm | ASTM D5185m | >30 ▲ 51 | ▲ 46 | 26 |
| Chromium | ppm | ASTM D5185m | >3 <1 | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >3 <1 | 1 | 0 |
| Titanium | ppm | ASTM D5185m | >10 <1 | 0 | 0 |
| Silver | ppm | ASTM D5185m | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >30 1 | 0 | <1 |
| Lead | ppm | ASTM D5185m | >15 <1 | <1 | <1 |
| Copper | ppm | ASTM D5185m | >10 <1 | <1 | <1 |
| Tin | ppm | ASTM D5185m | >10 <1 | 0 | 0 |
| Antimony | ppm | ASTM D5185m | >5 --- | --- | --- |
| Vanadium | ppm | ASTM D5185m | 0 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | <1 | 0 | 0 |

| ADDITIVES | method | limit/base | current | history1 | history2 |
|------------|--------|-------------|--------------|----------|----------|
| Boron | ppm | ASTM D5185m | 0 | 0 | 0 |
| Barium | ppm | ASTM D5185m | 1 | 2 | 0 |
| Molybdenum | ppm | ASTM D5185m | <1 | 0 | 0 |
| Manganese | ppm | ASTM D5185m | 0 | 0 | 0 |
| Magnesium | ppm | ASTM D5185m | <1 | <1 | 0 |
| Calcium | ppm | ASTM D5185m | 10 | 8 | 4 |
| Phosphorus | ppm | ASTM D5185m | 200 | 211 | 135 |
| Zinc | ppm | ASTM D5185m | 118 | 113 | 87 |
| Sulfur | ppm | ASTM D5185m | 4103 | 4803 | 3207 |

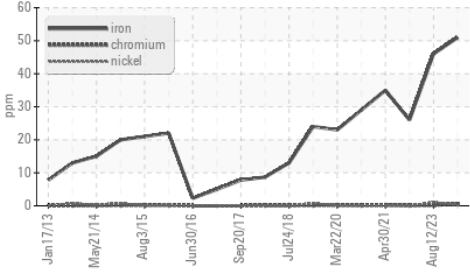
| CONTAMINANTS | method | limit/base | current | history1 | history2 |
|--------------|--------|-------------|--------------------|----------|----------|
| Silicon | ppm | ASTM D5185m | >+15 1 | 9 | <1 |
| Sodium | ppm | ASTM D5185m | 3 | 0 | 1 |
| Potassium | ppm | ASTM D5185m | >20 1 | <1 | 0 |
| Water | % | ASTM D6304 | >0.02 0.007 | ▲ 0.021 | 0.012 |
| ppm Water | ppm | ASTM D6304 | >200 75 | ▲ 215.9 | 127.4 |

| FLUID CLEANLINESS | method | limit/base | current | history1 | history2 |
|-------------------|--------------|------------|-----------------|----------|----------|
| Particles >4µm | ASTM D7647 | | 2146 | 5233 | 3862 |
| Particles >6µm | ASTM D7647 | >5000 | 186 | 1605 | 133 |
| Particles >14µm | ASTM D7647 | >640 | 16 | 148 | 7 |
| Particles >21µm | ASTM D7647 | >160 | 7 | 33 | 3 |
| Particles >38µm | ASTM D7647 | >40 | 5 | 2 | 0 |
| Particles >71µm | ASTM D7647 | >10 | 4 | 1 | 0 |
| Oil Cleanliness | ISO 4406 (c) | >--/19/16 | 18/15/11 | 20/18/14 | 19/14/10 |

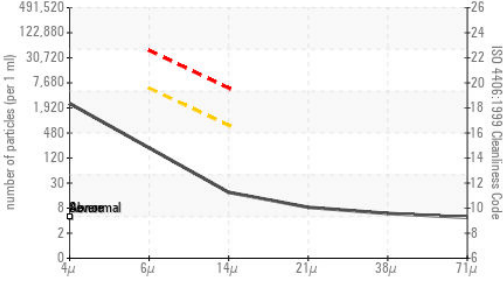


OIL ANALYSIS REPORT

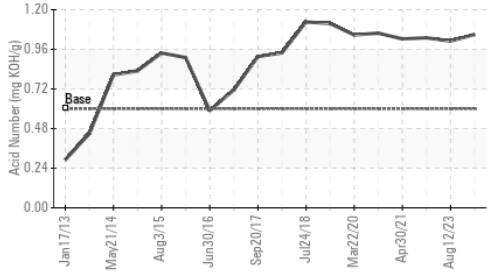
▲ Ferrous Alloys



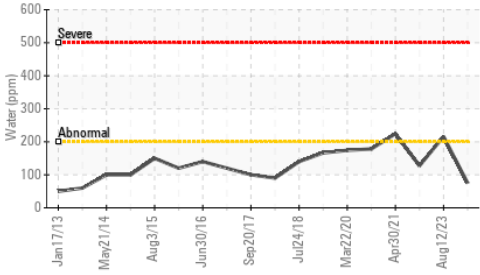
Particle Count



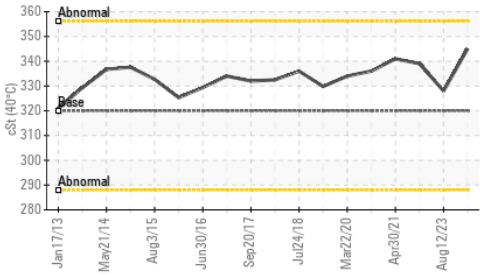
Acid Number



Water (KF)



Viscosity @ 40°C



| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|-------------------|----------|------------|------------|--------------|----------|----------|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 0.6 | 1.05 | 1.01 | 1.03 |
| 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 | 345 | 328 | 339 |

SAMPLE IMAGES

| | method | limit/base | current | history1 | history2 |
|-----------|--------|------------|---------|----------|----------|
| Color | | | | | |
| Bottom | | | | | |
| PrtFilter | | | | | |

no image

no image

no image



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0831484 **Received** : 29 May 2024
Lab Number : **06194667** **Tested** : 31 May 2024
Unique Number : 11056790 **Diagnosed** : 31 May 2024 - Angela Borella
Test Package : IND 2 (Additional Tests: KF, PQ, PrtCount)

EOL DE NICARAGUA S.A.
 DEL SEMAFORO DEL CLUB TERRAZA, 1 CUADRA AL SUR
 MANAGUA, ZZ
 NI
 Contact: Rafael Bermudez

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)