

OIL ANALYSIS REPORT

Sample Rating Trend

ISO

Machine Id 87028 SITE 29

Component Wind Turbine Gearbox

FUCHS RENOLIN UNISYN CLP 320 (650 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.

| , | | | Jan2022 | Oct2023 | | |
|--|--------------------------------------|---|---|--|--|--|
| SAMPLE INFORM | IATION | method | limit/base | current | history1 | history2 |
| Sample Number | | Client Info | | NX06054856 | NX009232 | |
| Sample Date | | Client Info | | 02 Oct 2023 | 31 Jan 2022 | |
| Machine Age | hrs | Client Info | | 0 | 0 | |
| Oil Age | hrs | Client Info | | 0 | 0 | |
| Oil Changed | | Client Info | | N/A | N/A | |
| Sample Status | | | | ABNORMAL | NORMAL | |
| WEAR METALS | | method | limit/base | current | history1 | history2 |
| PQ | | ASTM D8184 | >40 | 12 | 18 | |
| Iron | ppm | ASTM D5185m | >55 | 12 | 9 | |
| Chromium | ppm | ASTM D5185m | >2 | 0 | <1 | |
| Nickel | ppm | ASTM D5185m | >2 | 0 | 0 | |
| Titanium | ppm | ASTM D5185m | >10 | 0 | 0 | |
| Silver | ppm | ASTM D5185m | | 0 | <1 | |
| Aluminum | ppm | ASTM D5185m | >15 | 0 | 1 | |
| Lead | ppm | ASTM D5185m | >3 | <1 | 2 | |
| Copper | ppm | ASTM D5185m | >7 | <1 | <1 | |
| Tin | ppm | ASTM D5185m | >3 | 0 | <1 | |
| Antimony | ppm | ASTM D5185m | >3 | | 0 | |
| Vanadium | ppm | ASTM D5185m | - | 0 | 0 | |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 | |
| ADDITIVES | | method | limit/base | current | history1 | history2 |
| Boron | ppm | ASTM D5185m | | 3 | 8 | |
| Barium | ppm | ASTM D5185m | | 0 | 0 | |
| Molybdenum | ppm | ASTM D5185m | | 0 | 0 | |
| Manganese | | ASTM D5185m | | 0 | <1 | |
| Magnesium | ppm | ASTM D5185m | | 0 | 0 | |
| Calcium | ppm | ASTM D5185m | | 12 | 19 | |
| Phosphorus | ppm | ASTM D5185m | | 12 | 201 | |
| | ppm | | | | | |
| (100 | | | | | | |
| | ppm | ASTM D5185m | | 0 | 0 | |
| Sulfur | ppm | ASTM D5185m ASTM D5185m | | 0 4647 | 0 3971 | |
| Sulfur CONTAMINANTS | ppm | ASTM D5185m ASTM D5185m method | limit/base | 0 4647 current | 0 3971 history1 | |
| Sulfur CONTAMINANTS Silicon | ppm | ASTM D5185m ASTM D5185m method ASTM D5185m | limit/base | 0 4647 current 10 | 0 3971 history1 31 | |
| Sulfur CONTAMINANTS Silicon Sodium | ppm | ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m | >35 | 0 4647 current 10 6 | 0 3971 history1 31 0 | |
| Sulfur CONTAMINANTS Silicon Sodium Potassium | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m | >35 >20 | 0 4647 current 10 6 0 | 0 3971 history1 31 0 <1 | history2 |
| Silicon Sodium Potassium Water | ppm ppm ppm | ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m | >35 | 0 4647 current 10 6 0 0.002 | 0 3971 history1 31 0 <1 0.002 | history2 |
| Sulfur CONTAMINANTS Silicon Sodium Potassium Water | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m | >35 >20 | 0 4647 current 10 6 0 | 0 3971 history1 31 0 <1 | history2 |
| Sulfur CONTAMINANTS Silicon Sodium Potassium Water | ppm ppm ppm ppm % ppm | ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D6304 | >35 >20 >0.02 | 0 4647 current 10 6 0 0.002 | 0 3971 history1 31 0 <1 0.002 | history2 |
| Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water FLUID CLEANLIN | ppm ppm ppm ppm % ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D6304 ASTM D6304 | >35 >20 >0.02 >200 | 0 4647 current 10 6 0 0 0.002 24 | 0 3971 history1 31 0 <1 0.002 17.5 | history2 |
| Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water FLUID CLEANLIN Particles >4µm | ppm ppm ppm ppm % ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D6304 ASTM D6304 method | >35 >20 >0.02 >200 limit/base | 0 4647 current 10 6 0 0.002 24 current | 0 3971 history1 31 0 <1 0.002 17.5 history1 | history2 |
| Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water FLUID CLEANLIN Particles >4µm Particles >6µm | ppm ppm ppm ppm % ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D6304 ASTM D6304 ASTM D6304 ASTM D6304 | >35 >20 >0.02 >200 limit/base | 0 4647 current 10 6 0 0.002 24 24 current 17578 | 0 3971 history1 31 0 <1 0.002 17.5 history1 3876 | history2 history2 |
| Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water FLUID CLEANLIN Particles >4µm Particles >6µm Particles >14µm | ppm ppm ppm ppm % ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D6304 ASTM D6304 ASTM D6304 ASTM D6304 ASTM D7647 | >35 >20 >0.02 >200 limit/base >320 >40 | 0 4647 current 10 6 0 0 0.002 24 24 current 17578 ▲ 5324 | 0 3971 history1 31 0 <1 0.002 17.5 history1 3876 199 | history2 |
| Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water FLUID CLEANLIN Particles >4µm Particles >6µm Particles >14µm Particles >21µm | ppm ppm ppm ppm % ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D6304 ASTM D6304 ASTM D6304 ASTM D7647 ASTM D7647 ASTM D7647 | >35 >20 >0.02 >200 limit/base >320 >40 | 0 4647 current 10 6 0 0.002 24 24 current 17578 ▲ 5324 ▲ 5324 | 0 3971 history1 31 0 <1 0.002 17.5 history1 3876 199 33 | history2 history2 |
| Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water | ppm ppm ppm ppm % ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D6304 ASTM D6304 ASTM D6304 ASTM D7647 ASTM D7647 ASTM D7647 | >35 >20 >0.02 >200 limit/base >320 >40 >10 >3 | 0 4647 current 10 6 0 0.002 24 current 17578 ▲ 5324 ▲ 304 ▲ 57 | 0 3971 history1 31 0 <1 0.002 17.5 history1 3876 199 33 11 | history2 history2 |



OIL ANALYSIS REPORT

| | FLUID DEGRAD | ATION | method | limit/base | current | history1 | history2 |
|--|---|--|---|---|---------------------------------|--|--|
| 4µm | Acid Number (AN) | mg KOH/g | ASTM D8045 | 0.6 | 0.36 | 0.36 | |
| [E] 15k [] 15k [] 16k [] 5k | VISUAL | | method | limit/base | current | history1 | history2 |
| re 10k | White Metal | scalar | *Visual | NONE | NONE | NONE | |
| | Yellow Metal | scalar | *Visual | NONE | NONE | NONE | |
| 0)/ | Precipitate | scalar | *Visual | NONE | NONE | NONE | |
| Jan 3 /22 | Silt Debris | scalar | *Visual | NONE | NONE | NONE | |
| - en - Contra - Contr | Debilo | scalar | *Visual | NONE | LIGHT | NONE | |
| Water (KF) | Sand/Dirt | scalar | *Visual | NONE | NONE | NONE | |
| 600 | Appearance Odor | scalar | *Visual | NORML NORML | NORML | NORML | |
| 500 - Severe | Emulsified Water | scalar scalar | *Visual *Visual | >0.02 | NORML NEG | NEG | |
| Ē 400 | Free Water | scalar | *Visual | >0.02 | NEG | NEG | |
| _ 300 - ₽₽ 200 - Abnormal | FLUID PROPER | | method | limit/base | current | history1 | history2 |
| 100+ | Visc @ 40°C | cSt | ASTM D445 | 320 | 311 | 326 | |
| | — | | method | limit/base | current | history1 | history2 |
| 1/22 here L | SAMPLE IMAGE | _0 | method | IIIII/base | | Thistory I | mistoryz |
| PQ Severe | Color | | | | | | no image |
| 50 - Abnormal 40 - Abnormal 30 | Bottom | | | | | | no image |
| 10 | GRAPHS | | - | | | | |
| Jan 31/22 | Ferrous Alloys | | | | Particle Coun | t | |
| | o 15 | | | 491,520 | ,I | | 1 ²⁶ |
| Water (KF) | 10 - | | | 122,880 | - | | -24 |
| 600 Series | 5-5- | | | 30,720 | 1 | | -22 |
| 500 - Gevele | 0 | ******* | | ₩ = 7,680 | | | -20 😨 |
| (100 | Jan 31/22 | | | 0ct2/23 (ber 1 ml) 1.920 | | | 18 06 |
| 5 300 10 200 10 200 200 Abnomal | | | | Sa | * | | -20 180 4406:1999 Cleanfiness |
| | Non-ferrous Met | als | | jitan 480 | | | Clean |
| 100 | copper | | | ਸ਼ੂ 120 ਵ | ¹ | | -14 ness (|
| - 1/22 | 8 5 - tin | | | ² 3(| 1- | $\langle \rangle$ | -12 🛱 |
| Lan 3 | *************************************** | | | { | Bibrevernal | | -10 |
| Viscosity @ 40°C | 122 | | | 0ct2/23 | 2 | ` | -8 |
| 360 T Abnormal | Jan 31/27 | | | 30 | , | | |
| 350 | Viscosity @ 40°C | 2 | | 1 | ^{4µ 6µ} Acid Number | 14µ 21µ | 38µ 71µ́ |
| ç 330 | 360 Abnormal | | | 0.80 0.60 0.00 | | | |
| € 320 Base | 0 340 | | | B 0.60 | Base | | |
| 蓉 310 300 | 320 - Abnormal | | | ag 0.40 | | | |
| 290 - Abnormal | 280 Abnormal | | | | | | |
| 280 - 22 | Jan31/22 | | | 0ct2/23 - | Jan 31/22 - | | 0ct2/23 - |
| Jan 31/2 | , and | | | 0 | Jan | | 0 |
| Laboratory Sample No. Lab Number Unique Number Certificate L2367 To discuss this sample report * - Denotes test methods that Statements of conformity to spect | er : 10820805 e : IND 2 (Additional t, contact Customer Ser t are outside of the ISO | Recieved Diagnose Diagnose Tests: KF, vice at 1-8 17025 sco | d : 08 . ed : 10 . ician : Dor PQ, PrtCour 200-237-1365 pe of accred | Jan 2024 Jan 2024 n Baldridge nt) 9. <i>litation.</i> | 300 SO | JTH WACKER DRI Contact: DE DLinehan@nord T: (| CHICAGO, IL US 60606 VIN LINEHAN |

Contact/Location: DEVIN LINEHAN - NORDEX