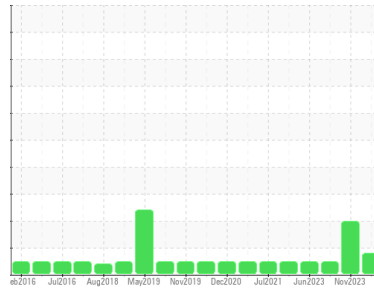




OIL ANALYSIS REPORT

Sample Rating Trend



ISO



Area
THUNDER SPIRIT [200009532]
 Machine Id
28WEA84026 (S/N 72802187428)
 Component
Wind Turbine Gearbox
 Fluid
CASTROL OPTIGEAR SYNTHETIC X 320 (--- QTS)

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 moderate 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		NX015545	NX013651	NX013591
Sample Date	Client Info		18 Mar 2024	14 Nov 2023	12 Jun 2023
Machine Age	hrs	Client Info	41563	54918	500
Oil Age	hrs	Client Info	0	0	0
Oil Changed	Client Info		N/A	N/A	N/A
Sample Status			ATTENTION	ABNORMAL	NORMAL

WEAR METALS

	method	limit/base	current	history1	history2	
PQ	ASTM D8184	>80	24	21	11	
Iron	ppm	ASTM D5185m	>150	53	44	7
Chromium	ppm	ASTM D5185m	>5	1	<1	0
Nickel	ppm	ASTM D5185m	>10	<1	1	0
Titanium	ppm	ASTM D5185m	>10	<1	0	0
Silver	ppm	ASTM D5185m		0	<1	0
Aluminum	ppm	ASTM D5185m	>10	6	6	0
Lead	ppm	ASTM D5185m	>20	<1	<1	0
Copper	ppm	ASTM D5185m	>50	5	1	2
Tin	ppm	ASTM D5185m	>10	<1	<1	0
Vanadium	ppm	ASTM D5185m		<1	<1	0
Cadmium	ppm	ASTM D5185m		<1	<1	0

ADDITIVES

	method	limit/base	current	history1	history2	
Boron	ppm	ASTM D5185m		0	23	0
Barium	ppm	ASTM D5185m		<1	<1	6
Molybdenum	ppm	ASTM D5185m	1150	704	728	1055
Manganese	ppm	ASTM D5185m		1	<1	0
Magnesium	ppm	ASTM D5185m		5	8	7
Calcium	ppm	ASTM D5185m	2000	1365	1308	1941
Phosphorus	ppm	ASTM D5185m	400	351	327	378
Zinc	ppm	ASTM D5185m	0	0	0	0
Sulfur	ppm	ASTM D5185m	1850	1996	1868	2437

CONTAMINANTS

	method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m	>50	11	8	11
Sodium	ppm	ASTM D5185m	>20	4	2	0
Potassium	ppm	ASTM D5185m	>20	2	5	2
Water	%	ASTM D6304	>0.05	0.011	▲ 0.243	0.017
ppm Water	ppm	ASTM D6304	>500	114	▲ 2430	178.4

FLUID CLEANLINESS

	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647		42546	---	949
Particles >6µm	ASTM D7647	>2500	● 4882	---	149
Particles >14µm	ASTM D7647	>320	47	---	20
Particles >21µm	ASTM D7647	>80	10	---	7
Particles >38µm	ASTM D7647	>20	0	---	0
Particles >71µm	ASTM D7647	>4	0	---	0
Oil Cleanliness	ISO 4406 (c)	>--/18/15	● 23/19/13	---	17/14/11

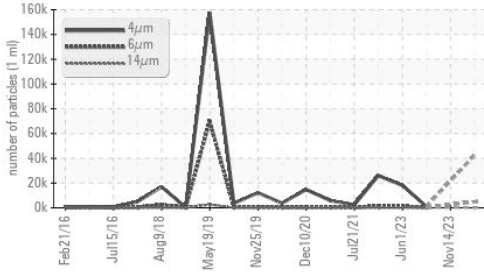
FLUID DEGRADATION

	method	limit/base	current	history1	history2	
Acid Number (AN)	mg KOH/g	ASTM D8045	1.6	1.24	0.61	1.39

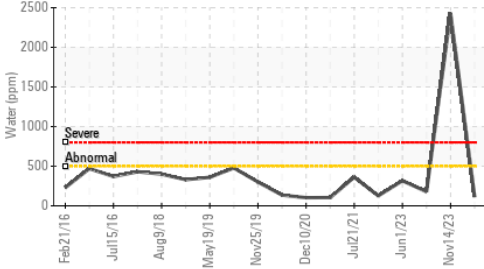


OIL ANALYSIS REPORT

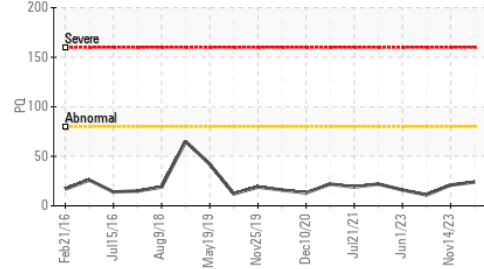
● Particle Trend



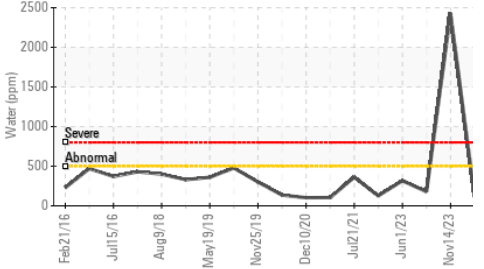
↘ Water (KF)



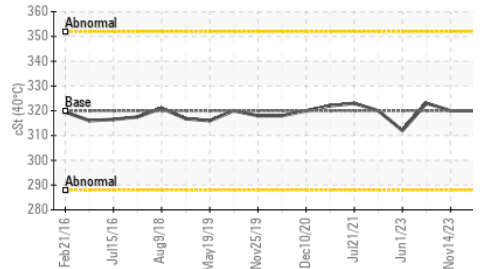
PQ



Water (KF)



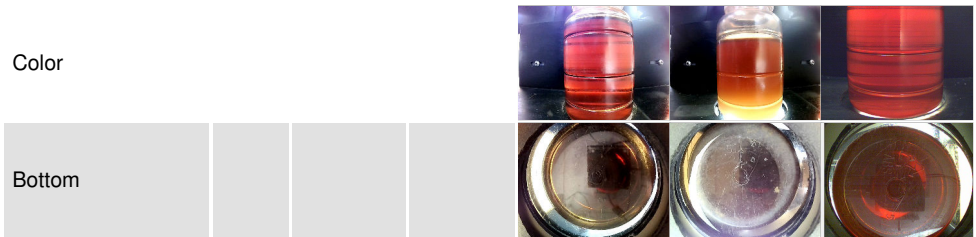
Viscosity @ 40°C



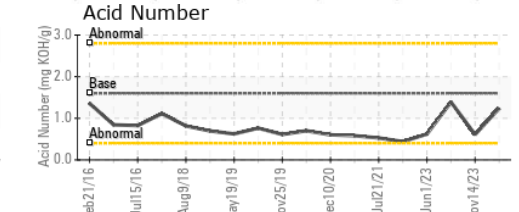
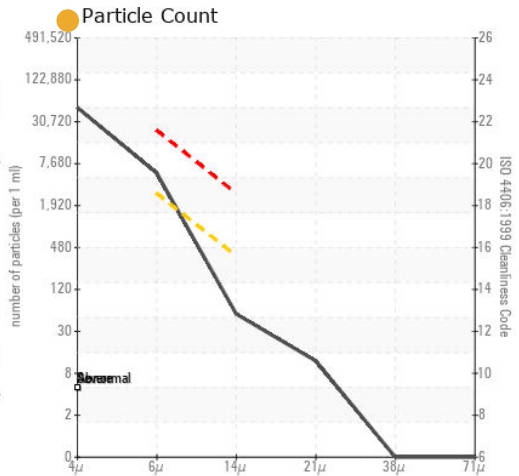
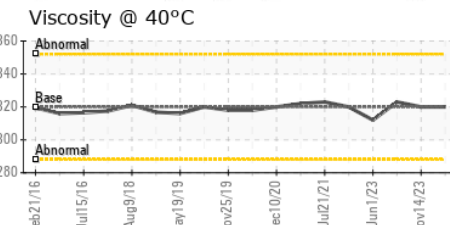
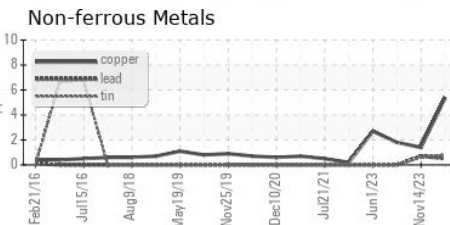
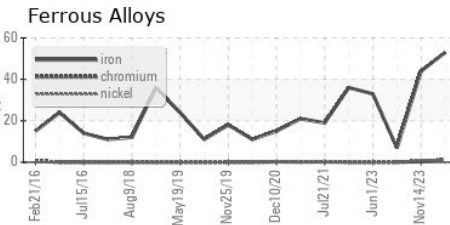
VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	▲ HEAVY	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.05	▲ 0.2%	NEG
Free Water	scalar	*Visual	NEG	NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	320	320	323

SAMPLE IMAGES	method	limit/base	current	history1	history2
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GRAPHS



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : NX015545
Lab Number : 06135616
Unique Number : 10955081
Test Package : IND 2 (Additional Tests: KF, PQ, PrtCount)

NORDEX USA - Chicago
 300 SOUTH WACKER DRIVE, SUITE 1500
 CHICAGO, IL
 US 60606

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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