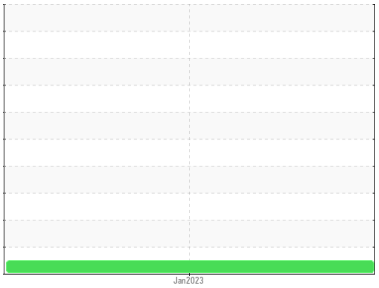
DIAMOND WTG ENGINEERING & SERVICES, INC.
a group company of MITSUBISHI HEAVY INDUSTRIES, LTD.

OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL

Machine Id
NOT GIVEN MHI025176 (S/N NO INFO ON SIF/BOTTLE)
Component
Wind Turbine Gearbox
Fluid
GEAR OIL (PAO) ISO 320 (--- GAL)

DIAGNOSIS

Recommendation
Resample at the next service interval to monitor.

Wear
All component wear rates are normal.

Contamination
The amount and size of particulates present in the system are acceptable. There is no indication of any contamination 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		**MHI025176**	---	---
Sample Date		Client Info		**16 Jan 2023**	---	---
Machine Age	hrs	Client Info		**0**	---	---
Oil Age	hrs	Client Info		**0**	---	---
Oil Changed		Client Info		**N/A**	---	---
Sample Status				**NORMAL**	---	---

WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184	>200	**8**	---	---
Iron	ppm	ASTM D5185m	>200	**9**	---	---
Chromium	ppm	ASTM D5185m	>3	**0**	---	---
Nickel	ppm	ASTM D5185m	>3	**0**	---	---
Titanium	ppm	ASTM D5185m	>10	**0**	---	---
Silver	ppm	ASTM D5185m		**0**	---	---
Aluminum	ppm	ASTM D5185m	>30	**0**	---	---
Lead	ppm	ASTM D5185m	>15	**0**	---	---
Copper	ppm	ASTM D5185m	>75	**23**	---	---
Tin	ppm	ASTM D5185m	>10	**0**	---	---
Vanadium	ppm	ASTM D5185m		**0**	---	---
Cadmium	ppm	ASTM D5185m		**0**	---	---

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	25	**0**	---	---
Barium	ppm	ASTM D5185m	12	**0**	---	---
Molybdenum	ppm	ASTM D5185m	5	**0**	---	---
Manganese	ppm	ASTM D5185m		**<1**	---	---
Magnesium	ppm	ASTM D5185m	25	**0**	---	---
Calcium	ppm	ASTM D5185m	25	**0**	---	---
Phosphorus	ppm	ASTM D5185m	375	**382**	---	---
Zinc	ppm	ASTM D5185m	25	**15**	---	---
Sulfur	ppm	ASTM D5185m	4900	**4319**	---	---

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>+30	**1**	---	---
Sodium	ppm	ASTM D5185m		**0**	---	---
Potassium	ppm	ASTM D5185m	>20	**0**	---	---
Water	%	ASTM D6304	>0.1	**0.014**	---	---
ppm Water	ppm	ASTM D6304	>1000	**147.5**	---	---

FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647		**2225**	---	---
Particles >6µm		ASTM D7647	>5000	**437**	---	---
Particles >14µm		ASTM D7647	>640	**19**	---	---
Particles >21µm		ASTM D7647	>160	**5**	---	---
Particles >38µm		ASTM D7647	>40	**1**	---	---
Particles >71µm		ASTM D7647	>10	**0**	---	---
Oil Cleanliness		ISO 4406 (c)	>--/19/16	**18/16/11**	---	---

FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045	1.10	**1.14**	---	---

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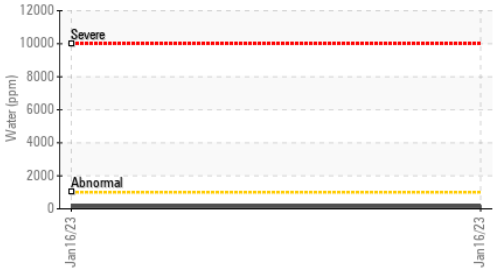
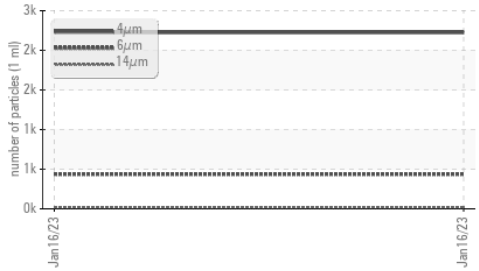
Water (KF)

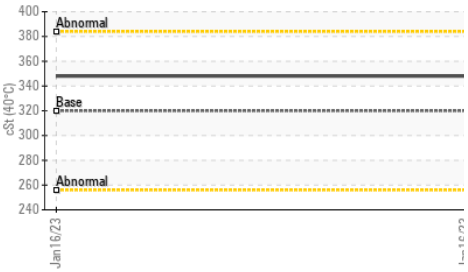


PQ

Particle Trend



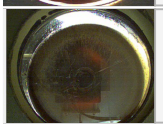
Viscosity @ 40°C



PQ

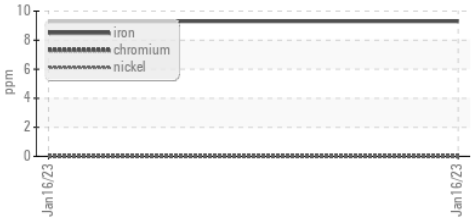
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	---	---
Yellow Metal	scalar	*Visual	NONE	**NONE**	---	---
Precipitate	scalar	*Visual	NONE	**NONE**	---	---
Silt	scalar	*Visual	NONE	**NONE**	---	---
Debris	scalar	*Visual	NONE	**NONE**	---	---
Sand/Dirt	scalar	*Visual	NONE	**NONE**	---	---
Appearance	scalar	*Visual	NORML	**NORML**	---	---
Odor	scalar	*Visual	NORML	**NORML**	---	---
Emulsified Water	scalar	*Visual	>0.1	**NEG**	---	---
Free Water	scalar	*Visual		**NEG**	---	---

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	320	**348**	---	---

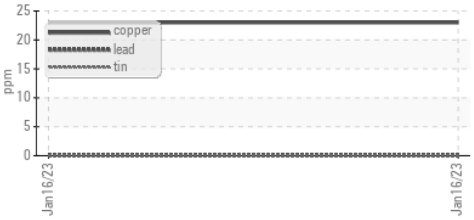
SAMPLE IMAGES	method	limit/base	current	history1	history2
Color				*no image*	*no image*
Bottom				*no image*	*no image*

GRAPHS

Ferrous Alloys

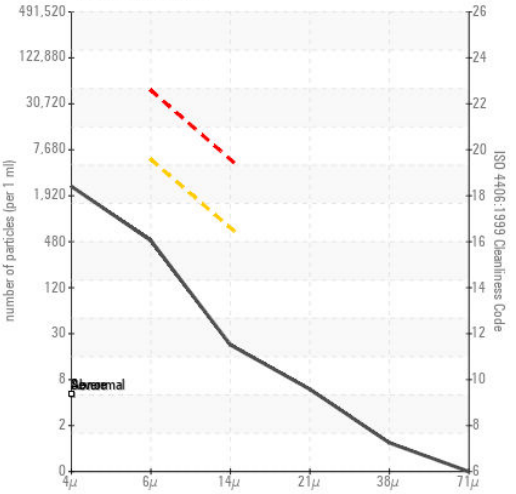


Non-ferrous Metals



Viscosity @ 40°C

Particle Count



Acid Number

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY
Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : MHI025176 **Received** : 17 Jan 2023
Lab Number : 05740534 **Tested** : 18 Jan 2023
Unique Number : 10295133 **Diagnosed** : 18 Jan 2023 - Jonathan Hester
Test Package : IND 2 (Additional Tests: KF, PQ, PrtCount)

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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