

# **PROBLEM SUMMARY**

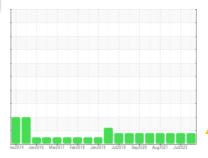
Sample Rating Trend

**WEAR** 

# SkyWay8/351544 Southgate-Melancton Townline 202628 SkyWay8 T1

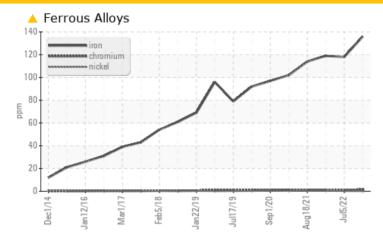
Component Wind Turbine Gearbox

**CASTROL OPTIGEAR SYNTHETIC CT 320 (395 LTR)** 





## **COMPONENT CONDITION SUMMARY**



### RECOMMENDATION

We recommend an early resample to monitor this condition.

PROBLEMATIC TEST RESULTS								
Sample Status				ABNORMAL	ABNORMAL	ABNORMAL		
Iron	ppm	ASTM D5185(m)	>75	<u> </u>	<u>118</u>	<u>119</u>		

**Customer Id: VESTAS Sample No.:** WC0783138 Lab Number: 02576947 Test Package: IND 2



To manage this report scan the QR code

To discuss the diagnosis or test data: Kevin Marson +1 (289)291-4644 x4644 Kevin.Marson@wearcheck.com

To change component or sample information: Gloria Gonzalez +1 (289)291-4643 x4643 gloria.gonzalez@wearcheck.com

### **RECOMMENDED ACTIONS**

Action	Status	Date	Done By	Description
Resample			?	We recommend an early resample to monitor this condition.

### HISTORICAL DIAGNOSIS

### 05 Jul 2022 Diag: Kevin Marson

WEAR



We recommend an early resample to monitor this condition. Iron ppm levels are abnormal. The low ferrous density (PQ) index indicates the wear metal levels are due to corrosion. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible. The system and fluid cleanliness is acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.



### 22 Feb 2022 Diag: Kevin Marson

WEAR



We recommend an early resample to monitor this condition. Iron ppm levels are abnormal. The low ferrous density (PQ) index indicates the wear metal levels are due to corrosion. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible. The system and fluid cleanliness is acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.



#### 18 Aug 2021 Diag: Kevin Marson

WEAR



We recommend an early resample to monitor this condition. Iron ppm levels are abnormal. The low ferrous density (PQ) index indicates the wear metal levels are due to corrosion. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible. The system and fluid cleanliness is acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.



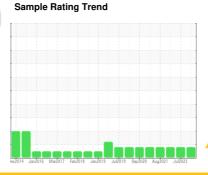


# **OIL ANALYSIS REPORT**

# SkyWay8/351544 Southgate-Melancton Townline 202628 SkyWay8 T1

**Wind Turbine Gearbox** 

**CASTROL OPTIGEAR SYNTHETIC CT 320 (395 LTR)** 





## **DIAGNOSIS**

### Recommendation

We recommend an early resample to monitor this condition.

#### Wear

Iron ppm levels are abnormal. The low ferrous density (PQ) index indicates the wear metal levels are due to corrosion.

### Contamination

The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible. The system and fluid cleanliness is acceptable.

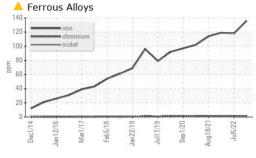
### **Fluid Condition**

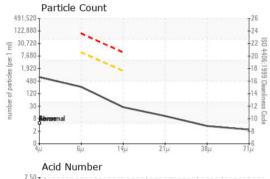
The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

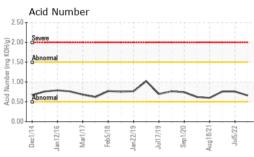
SAMPLE INFORMATION         method         limit/base         current         history1         history2           Sample Number         Client Info         WC0783138         WC0305843         WC0632660           Sample Date         Client Info         0 <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>							
Sample Date   Client Info   14 Aug 2023   05 Jul 2022   22 Feb 2022   Machine Age   yrs   Client Info   0   0   0   0   0   0   0   0   0	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         yrs         Client Info         0         0         0           Oil Age         yrs         Client Info         0         0         0           Oil Changed         Client Info         N/A         N/A         N/A           Sample Status         method         limit/base         current         history1         history2           PQ         ASTM D5184*         >50         0         0         0         0           Iron         ppm         ASTM D5185(m)         >55         1         1         1         1           Chromium         ppm         ASTM D5185(m)         >55         1         1         1         1           Nickel         ppm         ASTM D5185(m)         >10         0         <1         <1         1           Titanium         ppm         ASTM D5185(m)         >10         0         <1         <1         1           Lead         ppm         ASTM D5185(m)         >10         0         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1 </td <td>Sample Number</td> <td></td> <td>Client Info</td> <td></td> <th>WC0783138</th> <td>WC0305843</td> <td>WC0632660</td>	Sample Number		Client Info		WC0783138	WC0305843	WC0632660
Oil Age         yrs         Client Info         N/A         N/A         N/A         N/A           Coll Changed         Client Info         N/A         N/A         N/A         N/A         N/A           Sample Status         Client Info         N/A         N/A </td <td>Sample Date</td> <td></td> <td>Client Info</td> <td></td> <th>14 Aug 2023</th> <td>05 Jul 2022</td> <td>22 Feb 2022</td>	Sample Date		Client Info		14 Aug 2023	05 Jul 2022	22 Feb 2022
Oil Changed Sample Status         Client Info         N/A         N/A         N/A         ABNORMAL         ABNORMAL	Machine Age	yrs	Client Info		0	0	0
Sample Status         method         limit/base         current         history1         history2           PQ         ASTM D8184*         >50         0         0         0           Iron         ppm         ASTM D8185/m         >75         ▲ 136         ▲ 118         ▲ 119           Chromium         ppm         ASTM D8185/m         >5         1         1         1           Nickel         ppm         ASTM D8185/m         >10         0         <1         <1           Titlanium         ppm         ASTM D8185/m         >10         0         <0         0           Silver         ppm         ASTM D8185/m         >10         0         0         <1           Aluminum         ppm         ASTM D8185/m         >10         0         0         <1           Lead         ppm         ASTM D8185/m         >10         0         0         <1           Lead         ppm         ASTM D8185/m         >10         0         0         0           Capper         ppm         ASTM D8185/m         >10         0         0         0           Vanadium         ppm         ASTM D8185/m         0         0         0         <	Oil Age	yrs	Client Info		0	0	0
WEAR METALS         method         limit/base         current         history1         history2           PQ         ASTM D8184*         >50         0         0         0           Iron         ppm         ASTM D8185(m)         -75         ▲ 136         ▲ 118         ▲ 119           Chromium         ppm         ASTM D5185(m)         >5         1         1         1           Nickel         ppm         ASTM D5185(m)         >10         0         <1	Oil Changed		Client Info		N/A	N/A	N/A
PQ         ASTM D8184*         >50         0         0         0           Iron         ppm         ASTM D5185(m)         >75         ▲ 136         ▲ 118         ▲ 119           Chromium         ppm         ASTM D5185(m)         >5         1         1         1           Nickel         ppm         ASTM D5185(m)         >10         0         <1	Sample Status				ABNORMAL	ABNORMAL	ABNORMAL
Iron	WEAR METALS		method	limit/base	current	history1	history2
Chromium         ppm         ASTM D5185(m)         >5         1         1         1           Nickel         ppm         ASTM D5185(m)         >10         0         <1         <1           Titanium         ppm         ASTM D5185(m)         >10         0         0         0           Aluminum         ppm         ASTM D5185(m)         >10         0         0         <1           Aluminum         ppm         ASTM D5185(m)         >10         0         0         <1           Lead         ppm         ASTM D5185(m)         >10         0         0         <1           Lead         ppm         ASTM D5185(m)         >10         <1         <1         <1           Lead         ppm         ASTM D5185(m)         >10         0         0         0           Copper         ppm         ASTM D5185(m)         >5         0         <1         <1           Vanadium         ppm         ASTM D5185(m)         >5         0         <1         <1         <1           Vanadium         ppm         ASTM D5185(m)         0         0         0         0           Cadmium         ppm         ASTM D5185(m)         2	PQ		ASTM D8184*	>50	0	0	0
Nickel	Iron	ppm	ASTM D5185(m)	>75	<b>136</b>	<u></u> 118	<u></u> 119
Titanium	Chromium	ppm	ASTM D5185(m)	>5	1	1	1
Silver   ppm   ASTM D5185(m)   >10   0   0   0   0   0   0   0   0   0	Nickel	ppm	ASTM D5185(m)	>10	0	<1	<1
Aluminum	Titanium	ppm	ASTM D5185(m)	>10	0	0	0
Lead	Silver	ppm	ASTM D5185(m)		<1	0	0
Copper         ppm         ASTM D5185(m)         >10         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1 <td>Aluminum</td> <td>ppm</td> <td>ASTM D5185(m)</td> <td>&gt;10</td> <th>0</th> <td>0</td> <td>&lt;1</td>	Aluminum	ppm	ASTM D5185(m)	>10	0	0	<1
Tin         ppm         ASTM D5185(m)         >10         0         0         0           Antimony         ppm         ASTM D5185(m)         >5         0         <1	Lead	ppm	ASTM D5185(m)	>15	2	2	2
Antimony         ppm         ASTM D5185(m)         >5         0         -1         <1           Vanadium         ppm         ASTM D5185(m)         0         0         0           Beryllium         ppm         ASTM D5185(m)         0         0         0           Cadmium         ppm         ASTM D5185(m)         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	Copper	ppm	ASTM D5185(m)	>10	<1	<1	<1
Vanadium         ppm         ASTM D5185(m)         0         0         0           Beryllium         ppm         ASTM D5185(m)         0         0         0           Cadmium         ppm         ASTM D5185(m)         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         <1         <1         <1         <1           Barium         ppm         ASTM D5185(m)         2         2         2         2           Molybdenum         ppm         ASTM D5185(m)         0         0         0         0           Manganese         ppm         ASTM D5185(m)         2         2         2         2           Magnesium         ppm         ASTM D5185(m)         2         2         1         0         0           Calcium         ppm         ASTM D5185(m)         2         2         2         1           Phosphorus         ppm         ASTM D5185(m)         290         298         294           Zinc         ppm         ASTM D5185(m)         33         26         27           Sulfur	Tin	ppm	ASTM D5185(m)	>10	0	0	0
Beryllium	Antimony	ppm	ASTM D5185(m)	>5	0	<1	<1
Cadmium         ppm         ASTM D5185(m)         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         <1	Vanadium	ppm	ASTM D5185(m)		0	0	0
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         <1	Beryllium	ppm	ASTM D5185(m)				0
Boron	Cadmium	ppm	ASTM D5185(m)		0	0	0
Barium         ppm         ASTM D5185(m)         2         2         2         2           Molybdenum         ppm         ASTM D5185(m)         0         0         0           Manganese         ppm         ASTM D5185(m)         2         2         2           Magnesium         ppm         ASTM D5185(m)         2         2         1           Calcium         ppm         ASTM D5185(m)         290         298         294           Zinc         ppm         ASTM D5185(m)         33         26         27           Sulfur         ppm         ASTM D5185(m)         4817         4873         4864           Lithium         ppm         ASTM D5185(m)         <1         <1         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >40         2         2         2           Sodium         ppm         ASTM D5185(m)         >30         11         11         10           Potassium         ppm         ASTM D6304*         >0.02         0.005         0.008         0.003           p	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185(m)         0         0         0           Manganese         ppm         ASTM D5185(m)         2         2         2         2           Magnesium         ppm         ASTM D5185(m)         <1         0         0         0           Calcium         ppm         ASTM D5185(m)         2         2         1         1           Phosphorus         ppm         ASTM D5185(m)         290         298         294           Zinc         ppm         ASTM D5185(m)         33         26         27           Sulfur         ppm         ASTM D5185(m)         4817         4873         4864           Lithium         ppm         ASTM D5185(m)         <1         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >40         2         2         2           Sodium         ppm         ASTM D5185(m)         >30         11         11         10           Potassium         ppm         ASTM D5185(m)         >20         3         3         3	Boron	ppm	ASTM D5185(m)		<1	<1	<1
Manganese         ppm         ASTM D5185(m)         2         2         2           Magnesium         ppm         ASTM D5185(m)         <1         0         0           Calcium         ppm         ASTM D5185(m)         2         2         1           Phosphorus         ppm         ASTM D5185(m)         290         298         294           Zinc         ppm         ASTM D5185(m)         33         26         27           Sulfur         ppm         ASTM D5185(m)         4817         4873         4864           Lithium         ppm         ASTM D5185(m)         <1         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >40         2         2         2           Sodium         ppm         ASTM D5185(m)         >30         11         11         10           Potassium         ppm         ASTM D5185(m)         >20         3         3         3           Water         %         ASTM D6304*         >0.00         55.4         81.4         36.8           INFRA-RED         <	Barium		ASTM D5185(m)		2	2	2
Magnesium         ppm         ASTM D5185(m)         <1         0         0           Calcium         ppm         ASTM D5185(m)         2         2         1           Phosphorus         ppm         ASTM D5185(m)         290         298         294           Zinc         ppm         ASTM D5185(m)         33         26         27           Sulfur         ppm         ASTM D5185(m)         4817         4873         4864           Lithium         ppm         ASTM D5185(m)         <1         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >40         2         2         2           Sodium         ppm         ASTM D5185(m)         >30         11         11         10           Potassium         ppm         ASTM D5185(m)         >20         3         3         3           Water         %         ASTM D6304*         >0.02         0.005         0.008         0.003           ppm Water         ppm         ASTM D6304*         >200         55.4         81.4         36.8	24	ppm	710 1111 20 100(111)		L	_	_
Calcium         ppm         ASTM D5185(m)         2         2         1           Phosphorus         ppm         ASTM D5185(m)         290         298         294           Zinc         ppm         ASTM D5185(m)         33         26         27           Sulfur         ppm         ASTM D5185(m)         4817         4873         4864           Lithium         ppm         ASTM D5185(m)         <1			1				
Phosphorus         ppm         ASTM D5185(m)         290         298         294           Zinc         ppm         ASTM D5185(m)         33         26         27           Sulfur         ppm         ASTM D5185(m)         4817         4873         4864           Lithium         ppm         ASTM D5185(m)         <1	Molybdenum	ppm	ASTM D5185(m)		0	0	0
Zinc         ppm         ASTM D5185(m)         33         26         27           Sulfur         ppm         ASTM D5185(m)         4817         4873         4864           Lithium         ppm         ASTM D5185(m)         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >40         2         2         2           Sodium         ppm         ASTM D5185(m)         >30         11         11         10           Potassium         ppm         ASTM D5185(m)         >20         3         3         3           Water         %         ASTM D6304*         >0.02         0.005         0.008         0.003           ppm Water         ppm         ASTM D6304*         >200         55.4         81.4         36.8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7624*         0         0         0           Nitration         Abs/cm         ASTM D7624*         3.0         2.7         2.6 <td>Molybdenum Manganese</td> <td>ppm</td> <td>ASTM D5185(m) ASTM D5185(m)</td> <td></td> <th>0 2</th> <td>0 2</td> <td>0 2</td>	Molybdenum Manganese	ppm	ASTM D5185(m) ASTM D5185(m)		0 2	0 2	0 2
Sulfur         ppm         ASTM D5185(m)         4817         4873         4864           Lithium         ppm         ASTM D5185(m)         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >40         2         2         2           Sodium         ppm         ASTM D5185(m)         >30         11         11         10           Potassium         ppm         ASTM D5185(m)         >20         3         3         3           Water         %         ASTM D6304*         >0.02         0.005         0.008         0.003           ppm Water         ppm         ASTM D6304*         >200         55.4         81.4         36.8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         0         0         0           Nitration         Abs/cm         ASTM D7624*         3.0         2.7         2.6	Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)		0 2 <1	0 2 0	0 2 0
Lithium         ppm         ASTM D5185(m)         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >40         2         2         2           Sodium         ppm         ASTM D5185(m)         >30         11         11         10           Potassium         ppm         ASTM D5185(m)         >20         3         3         3           Water         %         ASTM D6304*         >0.02         0.005         0.008         0.003           ppm Water         ppm         ASTM D6304*         >200         55.4         81.4         36.8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7624*         0         0         0           Nitration         Abs/cm         ASTM D7624*         3.0         2.7         2.6	Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)		0 2 <1 2 290	0 2 0 2 298	0 2 0 1 294
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >40         2         2         2           Sodium         ppm         ASTM D5185(m)         >30         11         11         10           Potassium         ppm         ASTM D5185(m)         >20         3         3         3           Water         %         ASTM D6304*         >0.02         0.005         0.008         0.003           ppm Water         ppm         ASTM D6304*         >200         55.4         81.4         36.8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         0         0         0           Nitration         Abs/cm         ASTM D7624*         3.0         2.7         2.6	Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)		0 2 <1 2 290	0 2 0 2 298	0 2 0 1 294
Silicon         ppm         ASTM D5185(m)         >40         2         2         2           Sodium         ppm         ASTM D5185(m)         >30         11         11         10           Potassium         ppm         ASTM D5185(m)         >20         3         3         3           Water         %         ASTM D6304*         >0.02         0.005         0.008         0.003           ppm Water         ppm         ASTM D6304*         >200         55.4         81.4         36.8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         0         0         0           Nitration         Abs/cm         ASTM D7624*         3.0         2.7         2.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm	ASTM D5185(m)		0 2 <1 2 290 33	0 2 0 2 298 26	0 2 0 1 294 27
Sodium         ppm         ASTM D5185(m)         >30         11         11         10           Potassium         ppm         ASTM D5185(m)         >20         3         3         3           Water         %         ASTM D6304*         >0.02         0.005         0.008         0.003           ppm Water         ppm         ASTM D6304*         >200         55.4         81.4         36.8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         0         0         0           Nitration         Abs/cm         ASTM D7624*         3.0         2.7         2.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm	ASTM D5185(m)		0 2 <1 2 290 33 4817	0 2 0 2 298 26 4873	0 2 0 1 294 27 4864
Potassium         ppm         ASTM D5185(m)         >20         3         3         3           Water         %         ASTM D6304*         >0.02         0.005         0.008         0.003           ppm Water         ppm         ASTM D6304*         >200         55.4         81.4         36.8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         0         0         0           Nitration         Abs/cm         ASTM D7624*         3.0         2.7         2.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	limit/base	0 2 <1 2 290 33 4817	0 2 0 2 298 26 4873 <1	0 2 0 1 294 27 4864
Water         %         ASTM D6304*         >0.02         0.005         0.008         0.003           ppm Water         ppm         ASTM D6304*         >200         55.4         81.4         36.8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         0         0         0           Nitration         Abs/cm         ASTM D7624*         3.0         2.7         2.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)		0 2 <1 2 290 33 4817 <1	0 2 0 2 298 26 4873 <1	0 2 0 1 294 27 4864 <1
ppm Water         ppm         ASTM D6304*         >200         55.4         81.4         36.8           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         0         0         0           Nitration         Abs/cm         ASTM D7624*         3.0         2.7         2.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	>40	0 2 <1 2 290 33 4817 <1 current	0 2 0 2 298 26 4873 <1 history1	0 2 0 1 294 27 4864 <1 history2 2
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         0         0         0           Nitration         Abs/cm         ASTM D7624*         3.0         2.7         2.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)  method  ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	>40 >30	0 2 <1 2 290 33 4817 <1 current 2 11	0 2 0 2 298 26 4873 <1 history1 2	0 2 0 1 294 27 4864 <1 history2 2 10
Soot %         %         ASTM D7844*         0         0         0           Nitration         Abs/cm         ASTM D7624*         3.0         2.7         2.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)  METHOD  ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	>40 >30 >20	0 2 <1 2 290 33 4817 <1 current 2 11 3	0 2 0 2 298 26 4873 <1 history1 2 11 3	0 2 0 1 294 27 4864 <1 history2 2 10 3
Nitration         Abs/cm         ASTM D7624*         3.0         2.7         2.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	>40 >30 >20 >0.02	0 2 <1 2 290 33 4817 <1 current 2 11 3 0.005	0 2 0 2 298 26 4873 <1 history1 2 11 3 0.008	0 2 0 1 294 27 4864 <1 history2 2 10 3 0.003
	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water ppm Water	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)  MASTM D5185(m)  MASTM D5185(m)  ASTM D5185(m)  ASTM D5185(m)  ASTM D5185(m) ASTM D5185(m)  ASTM D5185(m)  ASTM D5185(m)  ASTM D5185(m)  ASTM D5185(m)  ASTM D5185(m)	>40 >30 >20 >0.02 >200	0 2 <1 2 290 33 4817 <1 current 2 11 3 0.005 55.4	0 2 0 2 298 26 4873 <1 history1 2 11 3 0.008 81.4	0 2 0 1 294 27 4864 <1 history2 2 10 3 0.003 36.8
	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water ppm Water INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D6304* ASTM D6304*	>40 >30 >20 >0.02 >200	0 2 <1 2 290 33 4817 <1 current 2 11 3 0.005 55.4 current	0 2 0 2 298 26 4873 <1 history1 2 11 3 0.008 81.4 history1	0 2 0 1 294 27 4864 <1 history2 2 10 3 0.003 36.8 history2
	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water ppm Water INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D6304* ASTM D6304*  method ASTM D6304*	>40 >30 >20 >0.02 >200	0 2 <1 2 290 33 4817 <1 current 2 11 3 0.005 55.4 current 0	0 2 0 2 298 26 4873 <1 history1 2 11 3 0.008 81.4 history1 0	0 2 0 1 294 27 4864 <1 history2 2 10 3 0.003 36.8 history2 0

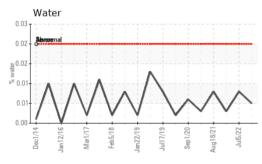


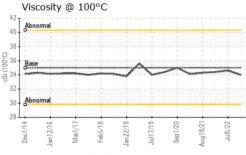
# **OIL ANALYSIS REPORT**











FLUID CLEANLIN	ESS	method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647		657	346	445
Particles >6µm		ASTM D7647	>10000	224	56	78
Particles >14µm		ASTM D7647	>1300	24	3	9
Particles >21µm		ASTM D7647	>320	9	3	3
Particles >38µm		ASTM D7647	>80	3	2	0
Particles >71µm		ASTM D7647	>20	2	2	0
Oil Cleanliness		ISO 4406 (c)	>/20/17	17/15/12	16/13/9	16/13/10
FLUID DEGRADA	TION	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	ASTM D7414*		7.4	5.5	4.6
Acid Number (AN)	mg KOH/g	ASTM D974*		0.66	0.76	0.76
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 PROPERT	IES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	335	327	328	329
Visc @ 100°C	cSt	ASTM D7279(m)	35	34.0	34.6	34.4
Viscosity Index (VI)	Scale	ASTM D2270*	148	146	149	148
SAMPLE IMAGES	6	method	limit/base	current	history1	history2
				The same of		
Color				7		
						2

**Bottom** 







CALA ISO 17025:2017

Accredited Laboratory

Laboratory Sample No. Lab Number **Unique Number** 

: WC0783138

: 02576947 : 5630007

: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 Vestas American Wind Technology Inc. Received : 18 Aug 2023 : 21 Aug 2023 Diagnosed

Diagnostician : Kevin Marson

Test Package : IND 2 ( Additional Tests: FT-IR, KF, KV100, PQ, TAN Man, VI )

1417 NW Everett Street Portland, OR US 97209

Contact: Adam Glen adgen@vestas.com T: (519)440-7208 F: (503)327-2001

To discuss this sample report, contact Customer Service at 1-800-268-2131. Test denoted (\*) outside scope of accreditation, (m) method modified, (e) tested at external lab.

Validity of results and interpretation are based on the sample and information as supplied.