

Unit ID **Wind energy system 1**  
 Component **Main Gear**  
 Current sample number **1704304**

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OELCHECK GmbH · Kerschelweg 28 · 83098 Brannenburg

Example report  
 Analysis scope: Wind power analysis kit

Machine type: **FL1000**  
 Manufacturer: **Zollern PZ3WF112**  
 Sample from: **Wind turbine - main gear**  
 Oil brand name: **Mobil Mobilgear SHC XMP 320**  
 Oil quantity in system: **260 l**

Serial number: 25107

### Diagnosis for the current laboratory values

There is no significant change of wear metals since the previous sample. The cleanliness class of the oil complies with the requirements. The water content is within the normal range. If no oil change has happened yet, it is possible to continue using the oil under similar operating conditions and under continuation of the usual maintenance schedule. I recommend that you send the next sample at the next service interval or at your regular inspection for trend analysis.

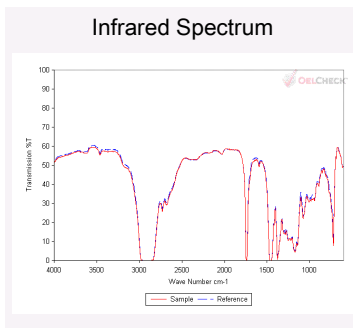
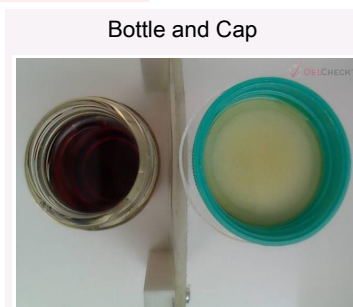
Dipl.-Ing. Andy Böhme (CLS)

### Sample Rating



normal

ANALYSIS RESULTS			Current sample	2 previous samples not shown			
LAB NUMBER			1704304	1704305	1704306	1704307	
SAMPLE RATING							
Date tested			08.06.2020	23.12.2019	01.07.2019	21.12.2018	
Date of sample taken			29.05.2020	14.12.2019	21.06.2019	08.12.2018	
Date of last oil change			-	-	-	-	
Top-up since change	l		-	-	10	0	
Operating time since change			-	-	-	-	
Total operating time	h		138011	134075	129920	125235	
Oil changed			no	no	no	no	
WEAR							
Iron	Fe	mg/kg	54	55	53	48	
Chrome	Cr	mg/kg	1	1	1	1	
Tin	Sn	mg/kg	0	0	0	0	
Aluminium	Al	mg/kg	0	0	0	0	
Nickel	Ni	mg/kg	0	0	0	0	
Copper	Cu	mg/kg	3	0	3	3	
Lead	Pb	mg/kg	0	0	0	0	
Manganese	Mn	mg/kg	1	1	1	0	
PQ index	-		< 25	< 25	< 25	< 25	
CONTAMINATION							
Silicon	Si	mg/kg	1	1	1	1	
Potassium	K	mg/kg	0	2	0	0	
Sodium	Na	mg/kg	0	0	0	0	
Water K. F.	ppm		97	68	133	-	
Water	%		-	-	-	< 0.10	
OIL CONDITION							
Viscosity at 40°C	mm²/s		321.11	320.22	318.66	317.57	
Viscosity at 100°C	mm²/s		36.56	36.13	36.58	36.35	
Viscosity index	-		162	160	163	162	
Oxidation	A/cm		-	-	-	-	
IR index	-		99.79	99.78	99.83	99.67	
ADDITIVES							
Calcium	Ca	mg/kg	0	0	0	1	
Magnesium	Mg	mg/kg	0	0	0	0	
Boron	B	mg/kg	1	1	1	1	
Zinc	Zn	mg/kg	10	9	11	10	
Phosphorus	P	mg/kg	412	445	429	420	
Barium	Ba	mg/kg	0	0	0	0	
Molybdenum	Mo	mg/kg	2	2	2	2	
Sulphur	S	mg/kg	3247	3495	3189	3211	



# LAB REPORT

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ANALYSIS RESULTS		Current sample	2 previous samples not shown		
LAB NUMBER		1704304	1704305	1704306	1704307
SAMPLE RATING		✓	✓	✓	✓
Date tested		<b>08.06.2020</b>	23.12.2019	01.07.2019	21.12.2018
Date of sample taken		<b>29.05.2020</b>	14.12.2019	21.06.2019	08.12.2018
Date of last oil change		-	-	-	-
Top-up since change	l	-	-	10	0
Operating time since change		-	-	-	-
Total operating time	h	<b>138011</b>	134075	129920	125235
Oil changed		<b>no</b>	no	no	no
ADDITIONAL TESTS					
AN / NN	mgKOH/g	<b>1.18</b>	1.12	1.02	0.97
Cleanliness class	ISO 4406	<b>17/16/12</b>	17/15/12	16/14/8	18/16/12
A: >4µm = ISO >4µm	Particles/100ml	<b>84766</b>	96494	38537	219604
B: >6µm = ISO >6µm	Particles/100ml	<b>34851</b>	23920	11327	54132
C: >14µm = ISO >14µm	Particles/100ml	<b>3603</b>	2873	200	2251
D: >21µm	Particles/100ml	<b>701</b>	718	0	450
E: >38µm	Particles/100ml	<b>100</b>	308	0	0
F: >70µm	Particles/100ml	<b>0</b>	0	0	0
Cleanliness class	SAE AS 4059	<b>7A</b>	8E	6A	9A

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Example report  
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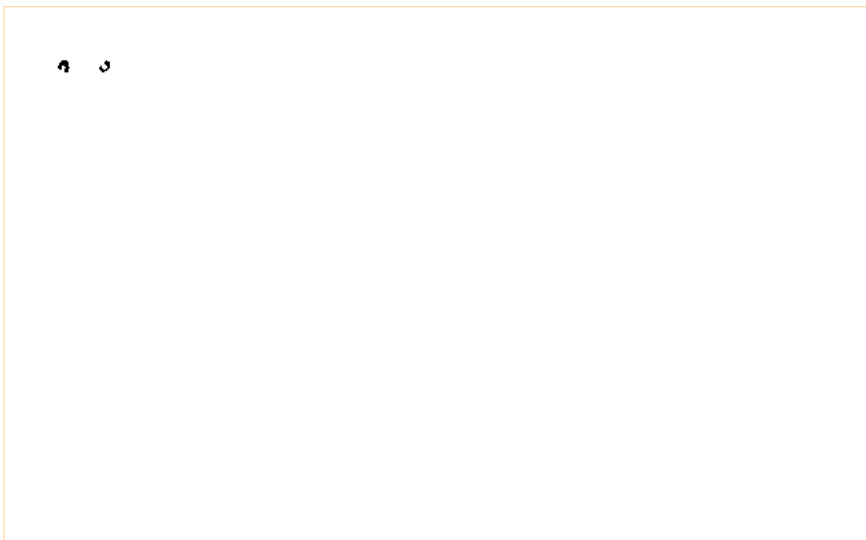
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### Diagnosis for the optical particle analysis (OPA)

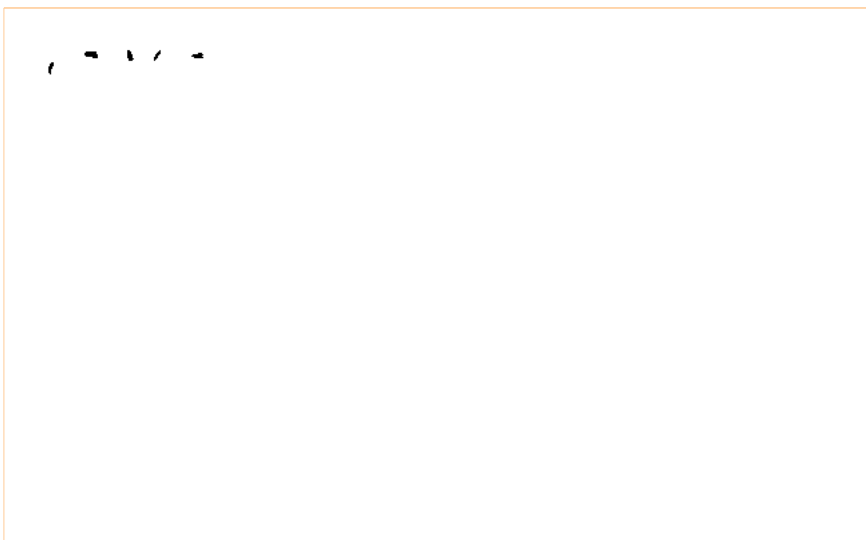
The values for the nonmetallic contaminants and for wear particles are within the normal range.

**Dipl.-Ing. Andy Böhme (CLS)**



#### Cutting wear

Caused by solid contaminants



#### Sliding wear

Caused by contact between metal surfaces under high specific load

### ANALYSIS RESULTS

LAB NUMBER		Current sample
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Date tested		08.06.2020
Date of sample taken		29.05.2020
Date of last oil change		-
Top-up since change	l	-
Operating time since change		-
Total operating time	h	138011
Oil changed		no

### Particles in the current sample

Number of particles >= 20 µm acc. to OPA	
Relates to 1ml oil	
Cutting wear	< 20
Sliding wear	< 20
Fatigue wear	< 20
Non metallic particles	< 20
Unclassified	< 20

Number of particles acc. to ISO 4406 (1999)	
Relates to 100ml oil	
Cleanliness class ISO 4406	17/16/12
>4µm	84766
>6µm	34851
>14µm	3603
>21µm	701
>38µm	100
Cleanliness class SAE AS 4059	7A

The graphs show the countours of the particles > 20 µm

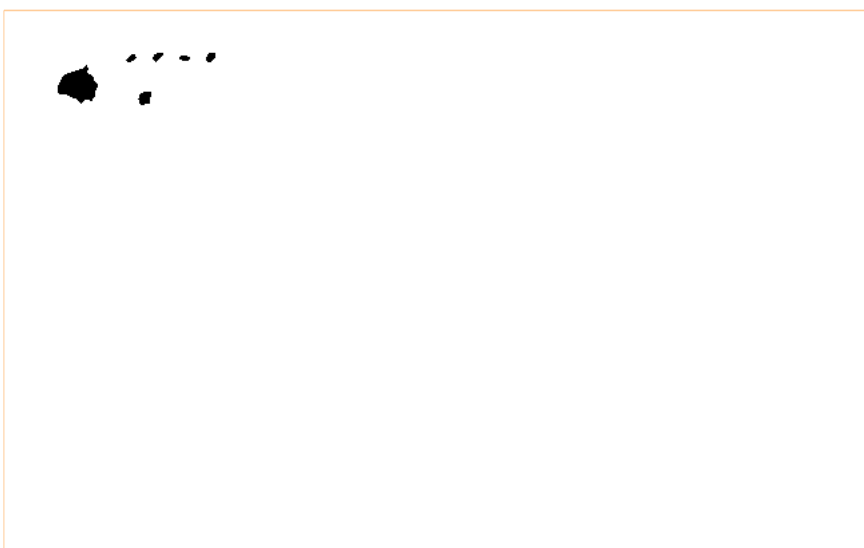
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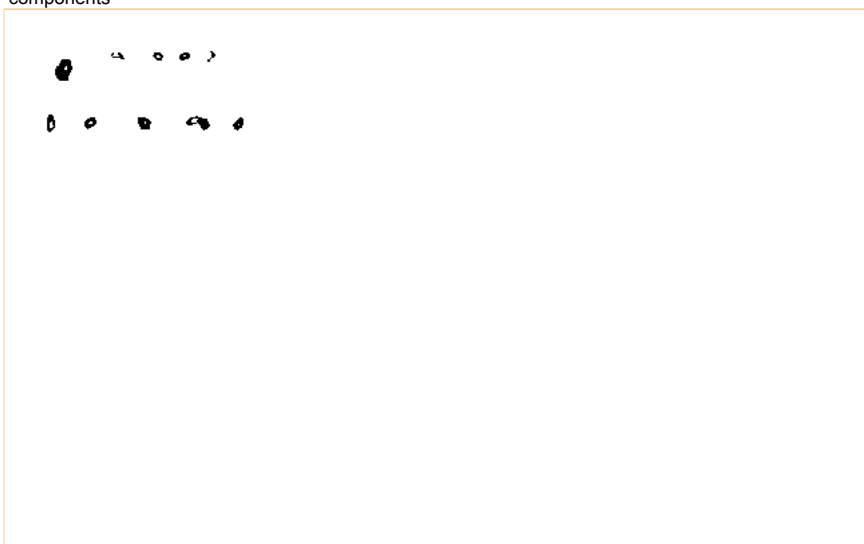


**Fatigue wear**

Caused by overload, vibration, long term use of components



1 scale line corresponds to 100 µm



**Non metallic particles**

Typical for additives, tribopolymers, soot, solid contaminants (dust)



1 scale line corresponds to 100 µm