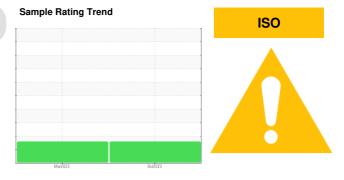


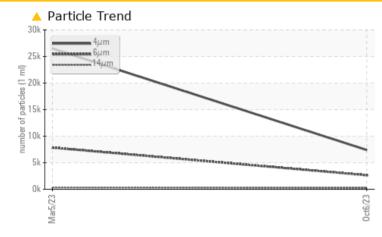
PROBLEM SUMMARY



Machine Id 8331556 (S/N 1485) Component

Compressor Fluid KAESER SIGMA (OEM) M-460 (--- GAL)

COMPONENT CONDITION SUMMARY



RECOMMENDATION

The filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

PROBLEMATIC TEST	RESULTS				
Sample Status			ABNORMAL	ABNORMAL	
Particles >6µm	ASTM D7647	>1300	<u> </u>	<u> </u>	
Particles >14µm	ASTM D7647	>80	<u> </u>	A 334	
Particles >21µm	ASTM D7647	>20	<u> </u>	4 5	
Oil Cleanliness	ISO 4406 (c)	>/17/13	A 20/19/15	<u> </u>	

Customer Id: TYRHUN Sample No.: KCPA000865 Lab Number: 05981247 Test Package: IND 2



To manage this report scan the QR code

To discuss the diagnosis or test data: Jonathan Hester +1 919-379-4092 x4092 jhester@wearcheckusa.com

To change component or sample information: Customer Service +1 1-800-237-1369 customerservice@wearcheck.com There are no recommended actions for this sample.

HISTORICAL DIAGNOSIS

05 Mar 2023 Diag: Doug Bogart



No corrective action is recommended at this time. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.All component wear rates are normal. There is a high amount of particulates present in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.





OIL ANALYSIS REPORT

Sample Rating Trend

ISO

Machine Id 8331556 (S/N 1485) Component

Compressor

Fluid KAESER SIGMA (OEM) M-460 (--- GAL)

DIAGNOSIS

A Recommendation

The filter change at the time of sampling has been noted. 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.

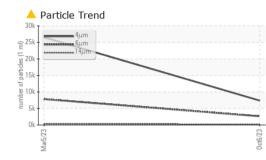
Fluid Condition

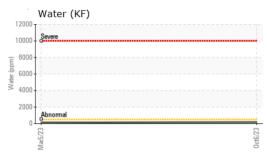
The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

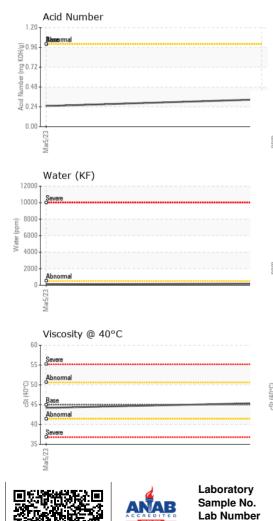
SAMPLE INFORMATION method limit/base ourrent history1 history2 Sample Number Client Info 06 0ct 2023 05 Mar 2023 Machine Age hrs Client Info 06 0ct 2023 05 Mar 2023 Oil Age hrs Client Info 0 0 0 Oil Age hrs Client Info N/A Changed Sample Status Imit/base Current History1 History2 WEAR METALS method Imit/base Current History1 History2 Iron ppm ASTM 051650 >50 0 Mickel ppm ASTM 051650 >10 0 Storer ppm ASTM 051650 >10 0 Muminum ppm ASTM 051650 >10 0 Auminum ppm ASTM 051650 >10 0 <				Mar2023	Oct2023		
Sample Date Client Info 06 Oct 2023 05 Mar 2023 Machine Age hrs Client Info 10152 5299 Oil Age hrs Client Info 0 0 Sample Status Client Info N/A Changed WEAR METALS method Imit/base current history1 Nickel ppm ASTM 05185m >10 0 0 Nickel ppm ASTM 05185m >3 0 0 Silver ppm ASTM 05185m >10 0 0 Cadmium ppm ASTM 05185m >10 0 0 Vanadium ppm ASTM 05185m >10 0 0 Adminum ppm ASTM 05185m >10 0 0 Cadmium ppm ASTM 05185m 0 0	SAMPLE INFORM	/IATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 10152 5299 Oil Age hrs Client Info 0 0 Sample Status Client Info N/A Changed WEAR METALS method limit/base current history1 history2 Iron ppm ASTM 05165m >50 0 <1	Sample Number		Client Info		KCPA000865	KCP54447	
Oil Age hrs Client Info 0 0 Oil Changed Client Info N/A Changed WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >50 0 <1	Sample Date		Client Info		06 Oct 2023	05 Mar 2023	
Oil Changed Client Info N/A Changed Sample Status Image Image ABNORMAL ABNORMAL ABNORMAL WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >50 0 <1	Machine Age	hrs	Client Info		10152	5299	
Oil Changed Client Info N/A Changed Sample Status Image Image Current ABNORMAL ABNORMAL WEAR METALS method limit/base current history1 Offormium ppm ASTM D5185m >50 0 <1	Oil Age	hrs	Client Info		0	0	
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM 05185m >50 0 <1	-		Client Info		N/A	Changed	
Iron ppm ASTM D5185m >50 0 <1 Chromium ppm ASTM D5185m >3 0 0 Nickel ppm ASTM D5185m >3 0 0 Silver ppm ASTM D5185m >3 0 0 Auminum ppm ASTM D5185m >10 0 <1	Sample Status				ABNORMAL	ABNORMAL	
ppm ASTM D5185m >10 0 0 Nickel ppm ASTM D5185m >3 0 0 Silver ppm ASTM D5185m >2 0 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >3 0 0 Titanium ppm ASTM D5185m >3 0 0 Silver ppm ASTM D5185m >2 0 <1	Iron	ppm	ASTM D5185m	>50	0	<1	
Titanium ppm ASTM D5185m >3 0 0 Silver ppm ASTM D5185m >2 0 <1	Chromium	ppm	ASTM D5185m	>10	0	0	
Silver ppm ASTM D5185m >2 0 <1 Aluminum ppm ASTM D5185m >10 0 <1	Nickel	ppm	ASTM D5185m	>3	0	0	
Aluminum ppm ASTM 05185m >10 0 <1 Lead ppm ASTM 05185m >10 0 0 Copper ppm ASTM 05185m >50 2 8 Vanadium ppm ASTM 05185m >10 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM 05185m 0 0 Barium ppm ASTM 05185m 0 0 Magnesium ppm ASTM 05185m 0 0 Magnesium ppm ASTM 05185m 0 0 Magnesium ppm ASTM 05185m 0 0 Sulfur ppm ASTM 05185m 0 0 Sulfur ppm ASTM 05185m 250	Titanium	ppm	ASTM D5185m	>3	0	0	
Lead ppm ASTM D5185m >10 0 0 Copper ppm ASTM D5185m >50 2 8 Tin ppm ASTM D5185m >10 0 0 Vanadium ppm ASTM D5185m 10 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 90 0 0 Maganese ppm ASTM D5185m 0 0 0 Magnesium ppm ASTM D5185m 100 24 17 Calcium ppm ASTM D5185m 0 0 12 Sulfur ppm ASTM D5185m 0 0 12 Sulfur ppm ASTM D5185m 23500 15566	Silver	ppm	ASTM D5185m	>2	0	<1	
Lead ppm ASTM D5185m >10 0 0	Aluminum	ppm	ASTM D5185m	>10	0	<1	
Copper ppm ASTM D5185m >50 2 8 Tin ppm ASTM D5185m >10 0 0 Vanadium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 Magnesee ppm ASTM D5185m 100 24 17 Calcium ppm ASTM D5185m 0 0 6 Sulfur ppm ASTM D5185m 0 0 12 Sulfur ppm ASTM D5185m 23500 15566 15948 Sulfur ppm ASTM D5185m >20 0 <td>Lead</td> <td></td> <td></td> <td></td> <td>0</td> <td>0</td> <td></td>	Lead				0	0	
Tin ppm ASTM D5185m >10 0 0 Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 Maganese ppm ASTM D5185m 0 0 0 Magnesium ppm ASTM D5185m 0 0 6 Magnesium ppm ASTM D5185m 0 0 12 Sulfur ppm ASTM D5185m 0 0 12 Sulfur ppm ASTM D5185m 23 2 Sulfur ppm ASTM D5185m 20 0 <1 Sulfur ppm ASTM D5185m 20 0 0							
Vanadium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 Barium ppm ASTM D5185m 90 0 Molybdenum ppm ASTM D5185m 0 0 0 Marganese ppm ASTM D5185m 0 0 0 Magnesium ppm ASTM D5185m 0 0 0 Calcium ppm ASTM D5185m 0 0 0 Sulfur ppm ASTM D5185m 0 0 0 Sulfur ppm ASTM D5185m 0 0 12 Sulfur ppm ASTM D5185m 23500 15566 15948					0	0	
Cadmium pm ASTM D5185m 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Manganese ppm ASTM D5185m 0 0 0 Calcium ppm ASTM D5185m 0 0 0 Calcium ppm ASTM D5185m 0 0 6 Calcium ppm ASTM D5185m 0 0 12 Sulfur ppm ASTM D5185m 0 0 12 Sulfur ppm ASTM D5185m 23500 15566 15948 Sulfur ppm ASTM D5185m				-	-		
Boron ppm ASTM D5185m 0 0 Barium ppm ASTM D5185m 90 0 <1					-		
Barium ppm ASTM D5185m 90 0 <1 Molybdenum ppm ASTM D5185m 0 0 0 Manganese ppm ASTM D5185m 100 24 17 Calcium ppm ASTM D5185m 100 24 17 Calcium ppm ASTM D5185m 0 0 <12	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5165m 0 0 0 Manganese ppm ASTM D5185m 100 24 17 Calcium ppm ASTM D5185m 0 0 <11	Boron	ppm	ASTM D5185m	0	0	0	
Molybdenum ppm ASTM D5185m 0 0 0 Manganese ppm ASTM D5185m 100 24 17 Magnesium ppm ASTM D5185m 100 24 17 Calcium ppm ASTM D5185m 0 0 Calcium ppm ASTM D5185m 0 0 6 Zinc ppm ASTM D5185m 0 0 12 Sulfur ppm ASTM D5185m 23500 15566 15948 Solium ppm ASTM D5185m 23500 15566 15948 Solium ppm ASTM D5185m >25 3 2 Solium ppm ASTM D5185m >20 0 <1	Barium	ppm	ASTM D5185m	90	0	<1	
Manganese ppm ASTM D5185m 0 0 Magnesium ppm ASTM D5185m 100 24 17 Calcium ppm ASTM D5185m 0 0 <1	Molybdenum	ppm	ASTM D5185m	0	0	0	
Magnesium ppm ASTM D5185m 100 24 17 Calcium ppm ASTM D5185m 0 0 <1	-		ASTM D5185m		0	0	
Calcium ppm ASTM D5185m 0 0 <1 Phosphorus ppm ASTM D5185m 0 0 6 Zinc ppm ASTM D5185m 0 0 12 Sulfur ppm ASTM D5185m 23500 15566 15948 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 2 Sodium ppm ASTM D5185m >20 0 <1	Magnesium		ASTM D5185m	100	24	17	
Phosphorus ppm ASTM D5185m 0 0 12 Zinc ppm ASTM D5185m 23500 15566 15948 Sulfur ppm ASTM D5185m 23500 15566 15948 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 2 Sodium ppm ASTM D5185m >20 0 <1	Calcium		ASTM D5185m	0	0	<1	
Zinc ppm ASTM D5185m 0 0 12 Sulfur ppm ASTM D5185m 23500 15566 15948 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 2 Sodium ppm ASTM D5185m >20 0 <1	Phosphorus		ASTM D5185m	0	0	6	
Sulfur ppm ASTM D5185m 23500 15566 15948 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 2 Sodium ppm ASTM D5185m >25 3 2 Potassium ppm ASTM D5185m >20 0 <1 Vater % ASTM D6304 >0.05 0.018 0.012 ppm Water ppm ASTM D6304 >500 184.2 126.1 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 >1300 2638 7840 Particles >6µm ASTM D7647 >80 223 334 Particles >1µm ASTM D7647 >20 36 45 Particles >21µm ASTM D7647 3 0	·		ASTM D5185m	0	0	12	
Silicon ppm ASTM D5185m >25 3 2 Sodium ppm ASTM D5185m >20 0 <1				23500	15566	15948	
Sodium ppm ASTM D5185m 7 4 Potassium ppm ASTM D5185m >20 0 <1	CONTAMINANTS	;	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 0 <1 Water % ASTM D6304 >0.05 0.018 0.012 ppm Water ppm ASTM D6304 >500 184.2 126.1 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 7396 26497 Particles >6µm ASTM D7647 >1300 2638 7840 Particles >14µm ASTM D7647 >20 36 45 Particles >21µm ASTM D7647 >20 36 45 Particles >38µm ASTM D7647 >3 0 0 Particles >71µm ASTM D7647 >3 0 0 Gli Cleanliness ISO 4406 (c) >/17/13 20/19/15 22/20/16 FLUID DEGRADATION method limit/base current history1 <	Silicon	ppm	ASTM D5185m	>25	3	2	
Water % ASTM D6304 >0.05 0.018 0.012 ppm Water ppm ASTM D6304 >500 184.2 126.1 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 7396 26497 Particles >6µm ASTM D7647 >1300 2638 7840 Particles >14µm ASTM D7647 >20 36 45 Particles >21µm ASTM D7647 >20 36 45 Particles >21µm ASTM D7647 >3 0 0 Particles >38µm ASTM D7647 >3 0 0 Particles >71µm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) /17/13 20/19/15 22/20/16 FLUID DEGRADATION method limit/base current history1 history2	Sodium	ppm	ASTM D5185m		7	4	
Water % ASTM D6304 >0.05 0.018 0.012 ppm Water ppm ASTM D6304 >500 184.2 126.1 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 7396 26497 Particles >6µm ASTM D7647 >1300 2638 7840 Particles >14µm ASTM D7647 >80 223 334 Particles >21µm ASTM D7647 >20 36 455 Particles >38µm ASTM D7647 >3 0 0 Particles >71µm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 20/19/15 22/20/16 FLUID DEGRADATION method limit/base current history1 history2	Potassium	ppm	ASTM D5185m	>20	0	<1	
ppm Water ppm ASTM D6304 >500 184.2 126.1 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 7396 26497 Particles >6µm ASTM D7647 >1300 2638 7840 Particles >14µm ASTM D7647 >80 223 334 Particles >14µm ASTM D7647 >20 36 455 Particles >21µm ASTM D7647 >4 0 0 Particles >38µm ASTM D7647 >3 0 0 Particles >71µm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) /17/13 20/19/15 22/20/16 FLUID DEGRADATION method limit/base current history1 history2	Water		ASTM D6304	>0.05	0.018	0.012	
Particles >4μm ASTM D7647 7396 26497 Particles >6μm ASTM D7647 >1300 2638 7840 Particles >14μm ASTM D7647 >80 223 334 Particles >14μm ASTM D7647 >20 36 45 Particles >21μm ASTM D7647 >20 36 45 Particles >38μm ASTM D7647 >4 0 0 Particles >71μm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 20/19/15 22/20/16 FLUID DEGRADATION method limit/base current history1 history2	ppm Water	ppm	ASTM D6304	>500	184.2	126.1	
Particles >6μm ASTM D7647 >1300 2638 7840 Particles >14μm ASTM D7647 >80 223 334 Particles >21μm ASTM D7647 >20 36 45 Particles >38μm ASTM D7647 >4 0 0 Particles >38μm ASTM D7647 >4 0 0 Particles >71μm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 20/19/15 22/20/16 FLUID DEGRADATION method limit/base current history1 history2	FLUID CLEANLIN	IESS	method	limit/base	current	history1	history2
Particles >14µm ASTM D7647 >80 ▲ 223 ▲ 334 Particles >21µm ASTM D7647 >20 ▲ 36 ▲ 45 Particles >38µm ASTM D7647 >4 0 0 Particles >38µm ASTM D7647 >4 0 0 Particles >71µm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 ▲ 20/19/15 ▲ 22/20/16 FLUID DEGRADATION method limit/base current history1 history2	Particles >4µm		ASTM D7647		7396	26497	
Particles >21μm ASTM D7647 >20 ▲ 36 45 Particles >38μm ASTM D7647 >4 0 0 Particles >38μm ASTM D7647 >4 0 0 Particles >71μm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 20/19/15 22/20/16 FLUID DEGRADATION method limit/base current history1 history2	Particles >6µm		ASTM D7647	>1300	<u> </u>	A 7840	
Particles >38μm ASTM D7647 >4 0 0 Particles >71μm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 ▲ 20/19/15 ▲ 22/20/16 FLUID DEGRADATION method limit/base current history1 history2	Particles >14µm		ASTM D7647	>80	<u> </u>	A 334	
Particles >71μm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 ▲ 20/19/15 ▲ 22/20/16 FLUID DEGRADATION method limit/base current history1 history2	Particles >21µm		ASTM D7647	>20	A 36	4 5	
Particles >71μm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 ▲ 20/19/15 ▲ 22/20/16 FLUID DEGRADATION method limit/base current history1 history2	Particles >38µm		ASTM D7647	>4	0	0	
Oil Cleanliness ISO 4406 (c) >/17/13 20/19/15 22/20/16 FLUID DEGRADATION method limit/base current history1 history2			ASTM D7647	>3	0	0	
	-				A 20/19/15	▲ 22/20/16	
Acid Number (AN) mg KOH/g ASTM D8045 1.0 0.33 0.25	FLUID DEGRADA		method	limit/base	current	history1	history2
	Acid Number (AN)	mg KOH/g	ASTM D8045	1.0	0.33	0.25	



Built for a lifetime."







OIL ANALYSIS REPORT

	VISUAL		method	limit/base	current	history1	history
	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	
<u> </u>	Debris	scalar	*Visual	NONE	NONE	NONE	
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
0ct6/23	Appearance	scalar	*Visual	NORML	NORML	NORML	
00	Odor	scalar	*Visual	NORML	NORML	NORML	
	Emulsified Water	scalar	*Visual	>0.05	NEG	NEG	
	Free Water	scalar	*Visual		NEG	NEG	
	FLUID PROPER	TIES	method	limit/base	current	history1	history
	Visc @ 40°C	cSt	ASTM D445	45	45.4	44.2	
	SAMPLE IMAGE	S	method	limit/base	current	history1	history
0ct6/23	Color				•		no image
	Bottom					()	no image
	GRAPHS						
	Ferrous Alloys				Particle Count	:	
	10 8			491,520			ľ
-	chromium			122,880	+		
	4 4			30,720			
	2-						
	0		-	,680 m ≘	· ·		
	Mar5/23			0ct6/23		E. E.	
•				cles (p		N	
	Non-ferrous Meta	als		480			
	8 copper			EC(900)	-	1	-
	these lead			E 30			
	4 4			30			
•	2			8	Sereve mal		
				EZ 2			
	Mar5/23			0ct6/23			
	∠ Viscosity @ 40°C			04	ŧμ 6μ	14µ 21µ	38µ 71,
	VISCOSITY @ 40°C			1.20	Acid Number		
	55 - Severe			(B/HO) HO 96	Basermal		
•				E 0 72			
	3 50 Abnormal			·			
1000117	Base						
10°007/ 10"	Base 45 Abnormal			ਵੈ 0.24	-		
	40 Severe			() 1.20 () 10.96 () 1.20 () 1.20 () 1.20 () 1.20 () 1.20 () 1.20 () 1.20 () 1.20 () 1.20 () 1.20 () 9 () 9 () 9 () 9 () 9 () 9 () 9 ()			
Notes and	40 Severe			0.00 Vertication 10 Verticatio 10 Vertication 10 Vertication 10 Vertication 10 Ve	ar5/23		
- Control of the second	345 - Base Abnormal 40 - Severe			W p0.24	Mar5/23		
Y	40 Severe	501 Madi	son Ave., Ca	0ct6/23	Mar5/23	TYF	

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.

Test Package : IND 2 (Additional Tests: KF, PrtCount)

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Certificate L2367

dm@tyr.com

T:

F:

Contact: Service Manager