

OIL ANALYSIS REPORT



ISO



Component Compressor

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

DIAGNOSIS

Recommendation

Oil and 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.

Iron ppm ASTM D5185m >50 <1	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 1183 Oil Age hrs Client Info 1200 Sample Status Client Info Changed WEAR METALS method Imil/base current history1 history1 Vickel ppm ASTM D5185m >50 <1	Sample Number		Client Info		KC63247		
Di Age hrs Client Info 1200 Sample Status Client Info Changed WEAR METALS method limit/base current history1 history1 Ton ppm ASTM DS185m >50 <1	Sample Date		Client Info		23 Apr 2018		
Dil Changed Client Info Changed Sample Status Image Image current history1 history1 WEAR METALS method Imil/base current history1 history1 Chromium ppm ASTM D5185m >50 <1	Machine Age	hrs	Client Info		1183		
Sample Status method limit/base current history1 history1 WEAR METALS method limit/base current history1 history1 tron ppm ASTM D5185m >50 <1	Oil Age	hrs	Client Info		1200		
WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >50 <1	Oil Changed		Client Info		Changed		
Iron ppm ASTM D5185m >50 <1 Chromium ppm ASTM D5185m >10 0 Nickel ppm ASTM D5185m >3 0 Silver ppm ASTM D5185m >2 0 ALuminum ppm ASTM D5185m >10 <1	Sample Status				ABNORMAL		
Chromium ppm ASTM D5185m >10 0 Nickel ppm ASTM D5185m >3 0 Silver ppm ASTM D5185m >2 0 Auminum ppm ASTM D5185m >2 0 Lead ppm ASTM D5185m >10 <1	WEAR METALS		method	limit/base	current	history1	history2
Chromium ppm ASTM D5185m >10 0 Nickel ppm ASTM D5185m >3 0 Silver ppm ASTM D5185m >2 0 Auminum ppm ASTM D5185m >2 0 Lead ppm ASTM D5185m >10 <1	Iron	maa	ASTM D5185m	>50	<1		
Nickel ppm ASTM D5185m >3 0 Titanium ppm ASTM D5185m >3 0 Silver ppm ASTM D5185m >2 0 Aluminum ppm ASTM D5185m >10 <1	Chromium		ASTM D5185m	>10			
Titanium ppm ASTM D5185m >3 0 Silver ppm ASTM D5185m >2 0 Aluminum ppm ASTM D5185m >10 <1					0		
Silver ppm ASTM D5185m >2 0 Aluminum ppm ASTM D5185m >10 <1	Titanium		ASTM D5185m	>3	0		
Auminum ppm ASTM D5185m >10 <1 Lead ppm ASTM D5185m >10 0 Copper ppm ASTM D5185m >50 4 Antimony ppm ASTM D5185m 0 Antimony ppm ASTM D5185m 0 Addition ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history1 histor Barium ppm ASTM D5185m 0 0 Maganese ppm ASTM D5185m 0 0 Maganese ppm ASTM D5185m 0 38 Calcium ppm ASTM D5185m 0 38 Zinc ppm ASTM D5185m 0 16 <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td>					-		
Lead ppm ASTM D5185m >10 0 Copper ppm ASTM D5185m >50 4 Tin ppm ASTM D5185m >10 <1					-		
Copper product ASTM D5185m >50 4 Antimony ppm ASTM D5185m >10 <1							
Tin ppm ASTM D5185m >10 <1							
Antimony ppm ASTM D5185m 0 Vanadium ppm ASTM D5185m 0 Cadmium ppm ASTM D5185m 0 ADDITIVES method limit/base current history1 histor Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 0 0 Maganese ppm ASTM D5185m 0 0 Magnesium ppm ASTM D5185m 0 0 Calcium ppm ASTM D5185m 0 38 Zinc ppm ASTM D5185m 0 16 CONTAMINANTS method limit/base current history1 histor Silicon ppm ASTM D5185m >20 0 -					-		
Vanadium ppm ASTM D5185m 0 Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history1 histor Boron ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 90 <1 Magnese ppm ASTM D5185m 0 0 Magnesium ppm ASTM D5185m 100 2 Calcium ppm ASTM D5185m 0 38 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m 0 38 Sodium ppm ASTM D5185m >20 0 Sodium ppm ASTM D6185m>20 0				>10			
Cadmium ppm ASTM D5185m 0 ADDITIVES method limit/base current history1 histor Boron ppm ASTM D5185m 0 0 Barium ppm ASTM D5185m 90 <1	•						
ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 0 Barium ppm ASTM D5185m 90 <1							
Boron ppm ASTM D5185m 0 0 Barium ppm ASTM D5185m 90 <1	Cadmium	ppm	ASTM D5185m		0		
Barium ppm ASTM D5185m 90 <1 Molybdenum ppm ASTM D5185m 0 0 Maganese ppm ASTM D5185m 0 0 Magnesium ppm ASTM D5185m 100 2 Calcium ppm ASTM D5185m 0 0 Phosphorus ppm ASTM D5185m 0 38 Zinc ppm ASTM D5185m 0 38 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 0 0 Manganese ppm ASTM D5185m 100 2 Magnesium ppm ASTM D5185m 0 0 Calcium ppm ASTM D5185m 0 38 Phosphorus ppm ASTM D5185m 0 38 CONTAMINANTS method limit/base current history1 history1 Solicon ppm ASTM D5185m >25 <1	Boron	ppm	ASTM D5185m	0	0		
Marganese ppm ASTM D5185m 0 Magnesium ppm ASTM D5185m 100 2 Calcium ppm ASTM D5185m 0 0 Phosphorus ppm ASTM D5185m 0 38 Zinc ppm ASTM D5185m 0 16 CONTAMINANTS method limit/base current history1 histor Silicon ppm ASTM D5185m >25 <1	Barium	ppm	ASTM D5185m	90	<1		
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Calcium ppm ASTM D5185m 0 0 Phosphorus ppm ASTM D5185m 0 38 Zinc ppm ASTM D5185m 0 16 CONTAMINANTS method limit/base current history1 histor Solicon ppm ASTM D5185m >25 <1	Manganese	ppm	ASTM D5185m		0		
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ZincppmASTM D5185m016CONTAMINANTSmethodlimit/basecurrenthistory1history1SiliconppmASTM D5185m>25<1	Calcium	ppm	ASTM D5185m	0	0		
CONTAMINANTSmethodlimit/basecurrenthistory1history1SiliconppmASTM D5185m>25<1	Phosphorus	ppm	ASTM D5185m	0	38		
Silicon ppm ASTM D5185m >25 <1 Sodium ppm ASTM D5185m >20 0 Potassium ppm ASTM D5185m >20 0 Water % ASTM D6304 >0.05 0.004 opm Water ppm ASTM D6304 >500 40 FLUID CLEANLINESS method limit/base current history1 histor Particles >4µm ASTM D7647 1300 4254 Particles >6µm ASTM D7647 >80 58 Particles >1µm ASTM D7647 >20 13 Particles >38µm ASTM D7647 >3 0 Particles >71µm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/13 FLUID DEGRADATION metho	Zinc	ppm	ASTM D5185m	0	16		
Silicon ppm ASTM D5185m >25 <1 Sodium ppm ASTM D5185m >20 0 Potassium ppm ASTM D5185m >20 0 Water % ASTM D6304 >0.05 0.004 opm Water ppm ASTM D6304 >500 40 FLUID CLEANLINESS method limit/base current history1 histor Particles >4µm ASTM D7647 >1300 4254 Particles >6µm ASTM D7647 >80 58 Particles >1µm ASTM D7647 >20 13 Particles >38µm ASTM D7647 >3 0 Particles >71µm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/13	CONTAMINANTS	3	method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m <1 Potassium ppm ASTM D5185m >20 0 Water % ASTM D6304 >0.05 0.0004 opm Water ppm ASTM D6304 >500 40 FLUID CLEANLINESS method limit/base current history1 history1 Particles >4µm ASTM D7647 15855 Particles >6µm ASTM D7647 >1300 4254 Particles >14µm ASTM D7647 >20 13 Particles >21µm ASTM D7647 >20 13 Particles >38µm ASTM D7647 >3 0 Particles >71µm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/13	Silicon	ppm	ASTM D5185m	>25	<1		
Potassium ppm ASTM D5185m >20 0 Water % ASTM D6304 >0.05 0.004 ppm Water ppm ASTM D6304 >500 40 FLUID CLEANLINESS method limit/base current history1 histor Particles >4µm ASTM D7647 15855 Particles >6µm ASTM D7647 >1300 4254 Particles >14µm ASTM D7647 >80 58 Particles >21µm ASTM D7647 >20 13 Particles >38µm ASTM D7647 >3 0 Particles >71µm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/13 FLUID DEGRADATION method limit/base current history1 history	Sodium		ASTM D5185m		<1		
Water % ASTM D6304 >0.05 0.004 ppm Water ppm ASTM D6304 >500 40 FLUID CLEANLINESS method limit/base current history1 histor Particles >4µm ASTM D7647 15855 Particles >6µm ASTM D7647 >1300 4254 Particles >14µm ASTM D7647 >20 13 Particles >21µm ASTM D7647 >20 13 Particles >38µm ASTM D7647 >3 0 Particles >71µm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/13 FLUID DEGRADATION method limit/base current history1 history1				>20			
ppm ASTM D6304 >500 40 FLUID CLEANLINESS method limit/base current history1 histor Particles >4µm ASTM D7647 15855 Particles >6µm ASTM D7647 >1300 4254 Particles >6µm ASTM D7647 >80 58 Particles >14µm ASTM D7647 >20 13 Particles >21µm ASTM D7647 >20 13 Particles >38µm ASTM D7647 >4 2 Particles >71µm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) /17/13 19/13 FLUID DEGRADATION method limit/base current history1 history1					-		
FLUID CLEANLINESS method limit/base current history1 history1 Particles >4µm ASTM D7647 15855 Particles >6µm ASTM D7647 >1300 ▲ 4254 Particles >6µm ASTM D7647 >80 58 Particles >14µm ASTM D7647 >20 13 Particles >21µm ASTM D7647 >20 13 Particles >38µm ASTM D7647 >4 2 Particles >38µm ASTM D7647 >3 0 Particles >71µm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/13 FLUID DEGRADATION method limit/base current history1 history1							
Particles >4μm ASTM D7647 15855 Particles >6μm ASTM D7647 >1300 4254 Particles >14μm ASTM D7647 >80 58 Particles >14μm ASTM D7647 >20 13 Particles >21μm ASTM D7647 >20 13 Particles >38μm ASTM D7647 >4 2 Particles >71μm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/13 FLUID DEGRADATION method limit/base current history1 history1						history1	history2
Particles >6µm ASTM D7647 >1300 ▲ 4254 Particles >14µm ASTM D7647 >80 58 Particles >21µm ASTM D7647 >20 13 Particles >21µm ASTM D7647 >20 13 Particles >38µm ASTM D7647 >4 2 Particles >71µm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/13 FLUID DEGRADATION method limit/base current history1 history1							
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Particles >21μm ASTM D7647 >20 13 Particles >38μm ASTM D7647 >4 2 Particles >38μm ASTM D7647 >4 2 Particles >71μm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/13 FLUID DEGRADATION method limit/base current history1 history1							
Particles >38μm ASTM D7647 >4 2 Particles >71μm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/13 FLUID DEGRADATION method limit/base current history1 history1							
Particles >71μm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 ▲ 19/13 FLUID DEGRADATION method limit/base current history1 history1							
Oil Cleanliness ISO 4406 (c) >/17/13 ▲ 19/13 FLUID DEGRADATION method limit/base current history1 history1							
FLUID DEGRADATION method limit/base current history1 histor	-						
· · · · · · · · · · · · · · · · · · ·	Oil Cleanliness		ISO 4406 (c)	>/17/13	<u> </u>		
	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
Acid Number (AN) mg KOH/g ASTM D8045 1.0 0.487	Acid Number (AN)	mg KOH/a	ASTM D8045	1.0	0.487		



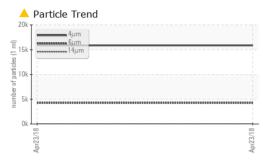
OIL ANALYSIS REPORT

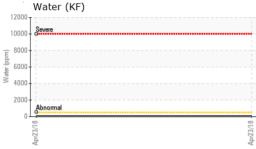
method

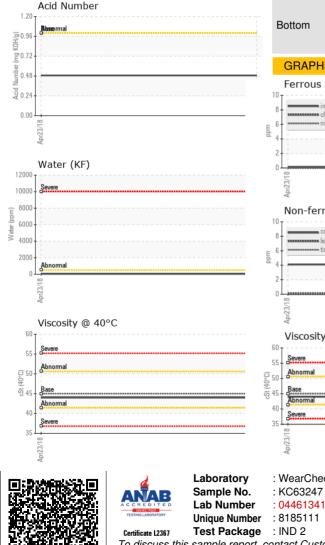
limit/base

current

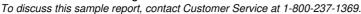
VISUAL







		method	limit/base	current	history1	history2
Vhite Metal	scalar	*Visual	NONE	VLITE		
ellow Metal	scalar	*Visual	NONE	NONE		
recipitate	scalar	*Visual	NONE	NONE		
ilt	scalar	*Visual	NONE	NONE		
ebris	scalar	*Visual	NONE	NONE		
and/Dirt	scalar	*Visual	NONE	NONE		
ppearance	scalar	*Visual	NORML	NORML		
dor	scalar	*Visual	NORML	NORML		
mulsified Water	scalar	*Visual	>0.05	NEG		
ree Water	scalar	*Visual		NEG		
FLUID PROPERT	IES	method	limit/base	current	history1	history2
isc @ 40°C	cSt	ASTM D445	45	44.00		
SAMPLE IMAGES	6	method	limit/base	current	history1	history2
olor					no imago	no imago
0101					no image	no image
ottom					no image	no image
GRAPHS						0
Ferrous Alloys				Particle Coun	ıt	
			491,520			T ²⁶
iron chromium						
			122,880			-24
nickel						
			30,720			-24 -22
nickel			30,720			-22
nickel			30,720	1.		-22
8 LEE20de			30,720	j.		-22
REFERENCE	5		30,720		•	-22
Non-ferrous Metals	5		30,720		•	-22
Non-ferrous Metals	5		30,720 7,680 (Im 1,920 81/22/dW 80/22/dW 480		•	-22
Non-ferrous Metals	5		30,720 7,680 7,680 1,920 80,0000 80,00000000		•	+22 +20 +18 +16 +14 +12
Non-ferrous Metals	5		30,720 7,680 7,680 1,920 80,0000 80,00000000	Bereenal		-22
Non-ferrous Metals	5		30,720 7,680 7,680 1,920 80,0000 80,00000000			+22 +20 +18 +16 +14 +12
Non-ferrous Metals	5		30,720 7,680 80,022 480 50 7,680 1,920 480 50 7,680 1,920 480 50 7,680 80,022 480 50 7,680 80,022 480 50 80,020 480 50 80,020 60 80,020 80,0000 80,0000 80,0000 80,0000 80,0000 80,0000 80,0000 80,00000000	Bbreemal		-22 -20 -18 -16 -14 -12 -10 -8 -6
Non-ferrous Metals	5		30,720 7,680 7,680 1,920 80,0000 80,00000000	Boreenal H 6µ	14μ 21μ	+22 +20 +18 +16 +14 +12
Non-ferrous Metals	5		30,720 7,680 1,920 81/22/dW 890 90 90 90 90 90 90 90 90 90 90 90 90 9	Boroemal Acid Number		-22 -20 -18 -16 -14 -12 -10 -8 -8
Non-ferrous Metals	5		30,720 7,680 1,920 81/22/dW 890 90 90 90 90 90 90 90 90 90 90 90 90 9	Boreenal H 6µ		-22 -20 -18 -16 -14 -12 -10 -8 -8
Non-ferrous Metals	5		30,720 7,680 1,920 81/22/dW 890 90 90 90 90 90 90 90 90 90 90 90 90 9	Boroemal Acid Number		-22 -20 -18 -16 -14 -12 -10 -8 -6
Non-ferrous Metals	5		30,720 7,680 1,920 81/22/dW 890 90 90 90 90 90 90 90 90 90 90 90 90 9	Boroemal Acid Number		-22 -20 -18 -16 -14 -12 -10 -8 -6
Non-ferrous Metals	5		30,720 7,680 7,680 80,000 80,000 1,920 1,9	Acid Number		-22 -20 -18 -16 -14 -14 -12 -10 -8 -38µ 71µ
Non-ferrous Metals	5		30,720 7,680 (Ter 1 a) 1,920 480 1,920 480 1,920 30 1,920 30 1,920 30 30 480 1,920 30 30 480 30 480 30 30 30 480 30 480 30 480 30 480 30 480 30 480 30 480 30 480 30 480 480 30 480 480 30 480 480 30 480 480 480 30 480 480 480 480 480 480 480 480 480 48	Boroemal Acid Number		-22 -20 -18 -16 -14 -12 -10 -8 -8



* - 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)

Diagnosed

Diagnostician

: 02 May 2018

: Angela Borella

historv1

historv2

US 44663

NEW PHILADELPHIA, OH

Contact: Service Manager