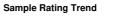


# **OIL ANALYSIS REPORT**



ISO

KAESER 5897562 (S/N 1331)

Compressor

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

## 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 acceptable for the time in service.

Sample NumberClient InfoKCPA01494Sample DateClient Info28 Mar 2024Machine AgehrsClient Info47531Oil AgehrsClient InfoChangedOil Changed'Client InfoMBNORMAWEAR METALSmethodinformMathoreMathoreMathoreMathoreMathoreIronppmASTM 05165 <th>SAMPLE INFORM</th> <th><b>IATION</b></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	SAMPLE INFORM	<b>IATION</b>	method	limit/base	current	history1	history2	
Machine Age  hrs  Client Info  47531      Oil Age  hrs  Client Info  0      Sample Status  I  Imit/base  current  history1     WEAR METALS  method  Imit/base  current  history1     WEAR METALS  method  Imit/base  current  history1     Nickel  ppm  ASTM D5185m  >30  0      Nickel  ppm  ASTM D5185m  >30  0      Silver  ppm  ASTM D5185m  >30  0      Lead  ppm  ASTM D5185m  >10  -1      Vanadium  ppm  ASTM D5185m  >10  -1      Vanadium  ppm  ASTM D5185m  >10  -1      Cadmium  ppm  ASTM D5185m  0  0      Maganese  ppm  ASTM D5185m  0  0	Sample Number		Client Info		KCPA014941			
Oil Age    hrs    Client Info    Changed        Sample Status    I    Image    Client Info    Changed        WEAR METALS    method    limit/base    current    history1    history2      Iron    ppm    ASTM 05185m    >50    0        Nickel    ppm    ASTM 05185m    >3    1        Nickel    ppm    ASTM 05185m    >3    0        Aluminum    ppm    ASTM 05185m    >10    0        Copper    ppm    ASTM 05185m    >10    0        Adminum    ppm    ASTM 05185m    >10    0        Vanadium    ppm    ASTM 05185m    >10    0        ASTM 05185m    0    0         ASTM 05185m    0    0	Sample Date		Client Info		28 Mar 2024			
Oil Changed Sample Status    Client Info    Changed ABNORMAL	Machine Age	hrs	Client Info		47531			
Sample Status    Imath of the status    ABNORMAL        WEAR METALS    method    limit/base    current    history1    history2      Iron    ppm    ASTM D5185m    >50    0        Nickel    ppm    ASTM D5185m    >3    1        Silver    ppm    ASTM D5185m    >2    0        Aluminum    ppm    ASTM D5185m    >10    <1	Oil Age	hrs	Client Info		0			
WEAR METALS    method    limit/base    current    history1    history2      Iron    ppm    ASTM D5185m    >50    0        Nickel    ppm    ASTM D5185m    >3    1        Nickel    ppm    ASTM D5185m    >3    0        Silver    ppm    ASTM D5185m    >2    0        Aluminum    ppm    ASTM D5185m    >10    <1	Oil Changed		Client Info		Changed			
Iron    ppm    ASTM D5185m    >50    0        Nickel    ppm    ASTM D5185m    >3    1        Nickel    ppm    ASTM D5185m    >3    0        Silver    ppm    ASTM D5185m    >3    0        Aluminum    ppm    ASTM D5185m    >10    <1        Lead    ppm    ASTM D5185m    >10    0        Copper    ppm    ASTM D5185m    >10    <1        Vanadium    ppm    ASTM D5185m    >10    <1        ADDITIVES    method    limit/base    current    history1    history2      Boron    ppm    ASTM D5185m    0    0        Magnesse    ppm    ASTM D5185m    0    0        Magnesse    ppm    ASTM D5185m    0 </th <th>Sample Status</th> <th></th> <th></th> <th></th> <th>ABNORMAL</th> <th></th> <th></th>	Sample Status				ABNORMAL			
Dromium    ppm    ASTM D5185m    >10    0        Nickel    ppm    ASTM D5185m    >3    0        Silver    ppm    ASTM D5185m    >2    0        Aluminum    ppm    ASTM D5185m    >10    <1        Lead    ppm    ASTM D5185m    >10    <1        Copper    ppm    ASTM D5185m    >10    <1        Vanadium    ppm    ASTM D5185m    >10    <1        Vanadium    ppm    ASTM D5185m    0    0        ADDITIVES    method    limit/base    current    history1    history2      Boron    ppm    ASTM D5185m    0    0        Magnese    ppm    ASTM D5185m    0    0        Calcium    ppm    ASTM D5185m <td< th=""><th>WEAR METALS</th><th></th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></td<>	WEAR METALS		method	limit/base	current	history1	history2	
Nickel    ppm    ASTM D5185m    >3    1        Titanium    ppm    ASTM D5185m    >3    0        Silver    ppm    ASTM D5185m    >2    0        Aluminum    ppm    ASTM D5185m    >10    0        Copper    ppm    ASTM D5185m    >50    7        Cadmium    ppm    ASTM D5185m    >10    <1	Iron	ppm	ASTM D5185m	>50	0			
Titanium  ppm  ASTM D5185m  >3  0      Silver  ppm  ASTM D5185m  >2  0      Aluminum  ppm  ASTM D5185m  >10  <1      Lead  ppm  ASTM D5185m  >10  0      Copper  ppm  ASTM D5185m  >10  <1      Vanadium  ppm  ASTM D5185m  0  7      ADDITIVES  method  limit/base  current  history1  history2    Boron  ppm  ASTM D5185m  0  0      Molybdenum  ppm  ASTM D5185m  0  0      Maganese  ppm  ASTM D5185m  0  0      Magnesium  ppm  ASTM D5185m  0  0      Galcium  ppm  ASTM D5185m  0  0      Sulfur  ppm  ASTM D5185m  2.5< <th>1<!--</td--><td>Chromium</td><td>ppm</td><td>ASTM D5185m</td><td>&gt;10</td><th>0</th><td></td><td></td></th>	1 </td <td>Chromium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;10</td> <th>0</th> <td></td> <td></td>	Chromium	ppm	ASTM D5185m	>10	0		
Silver    ppm    ASTM D5185m    >2    0        Aluminum    ppm    ASTM D5185m    >10    0        Lead    ppm    ASTM D5185m    >10    0        Copper    ppm    ASTM D5185m    >10    <1	Nickel	ppm	ASTM D5185m	>3	1			
Aluminum  ppm  ASTM D5185m  >10  <1	Titanium	ppm	ASTM D5185m	>3	0			
Lead    ppm    ASTM D5185m    >10    0        Copper    ppm    ASTM D5185m    >50    7        Tin    ppm    ASTM D5185m    >10    <1	Silver	ppm	ASTM D5185m	>2	0			
Copper    ppm    ASTM D5185m    >50    7        Tin    ppm    ASTM D5185m    >10    <1	Aluminum	ppm	ASTM D5185m	>10	<1			
Tin  ppm  ASTM D5185m  >10  <1      Vanadium  ppm  ASTM D5185m  0      ADDITIVES  method  limit/base  current  history1  history2    Boron  ppm  ASTM D5185m  0  0      Barium  ppm  ASTM D5185m  0  0      Molybdenum  ppm  ASTM D5185m  0  0      Magnesse  ppm  ASTM D5185m  0  0      Magnesium  ppm  ASTM D5185m  0  0      Calcium  ppm  ASTM D5185m  0  0  11      Sulfur  ppm  ASTM D5185m  0  0  1      Sulfur  ppm  ASTM D5185m  0.5  current  history1  history2    Sulfur  ppm  ASTM D5185m  >25  <1      Sulfur  ppm  ASTM D5185m	Lead	ppm	ASTM D5185m	>10	0			
Tin  ppm  ASTM D5185m  >10  <1      Vanadium  ppm  ASTM D5185m  0      Cadmium  ppm  ASTM D5185m  0      ADDITIVES  method  limit/base  current  history1  history2    Boron  ppm  ASTM D5185m  0  0      Mainganese  ppm  ASTM D5185m  0  0      Manganese  ppm  ASTM D5185m  0  0      Manganesum  ppm  ASTM D5185m  0  0      Calcium  ppm  ASTM D5185m  0  0      Zinc  ppm  ASTM D5185m  0  1      Sulfur  ppm  ASTM D5185m  0  1      Sulfur  ppm  ASTM D5185m  22       Sulfur  ppm  ASTM D5185m  20  1 <td< td=""><td>Copper</td><td></td><td>ASTM D5185m</td><td>&gt;50</td><th>7</th><td></td><td></td></td<>	Copper		ASTM D5185m	>50	7			
Vanadium    ppm    ASTM D5185m    0        Cadmium    ppm    ASTM D5185m    0        ADDITIVES    method    limit/base    current    history1    history2      Boron    ppm    ASTM D5185m    0    0        Barium    ppm    ASTM D5185m    0    0        Maganese    ppm    ASTM D5185m    0    0        Magnesium    ppm    ASTM D5185m    100    3        Magnesium    ppm    ASTM D5185m    0    0        Sulfur    ppm    ASTM D5185m    0    1        Sulfur    ppm    ASTM D5185m    0    1        Sulfur    ppm    ASTM D5185m    2.5    <1				>10	<1			
Cadmium    ppm    ASTM D5185m    0        ADDITIVES    method    limit/base    current    history1    history2      Boron    ppm    ASTM D5185m    0    0        Barium    ppm    ASTM D5185m    0    0        Molybdenum    ppm    ASTM D5185m    0    0        Magnesse    ppm    ASTM D5185m    100    3        Magnessium    ppm    ASTM D5185m    0    0        Calcium    ppm    ASTM D5185m    0    0        Sulfur    ppm    ASTM D5185m    0    1        Sulfur    ppm    ASTM D5185m    23500    15985        Sulfur    ppm    ASTM D5185m    >20    1        Sulfur    ppm    ASTM D5185m    >20    1	Vanadium		ASTM D5185m					
Boron    ppm    ASTM D5185m    0    0        Barium    ppm    ASTM D5185m    90    0        Molybdenum    ppm    ASTM D5185m    0    0        Magnese    ppm    ASTM D5185m    100    3        Magnesium    ppm    ASTM D5185m    100    3        Calcium    ppm    ASTM D5185m    0    0        Phosphorus    ppm    ASTM D5185m    0    1        Zinc    ppm    ASTM D5185m    0    1        Sulfur    ppm    ASTM D5185m    23500    15985        Sulfur    ppm    ASTM D5185m    >25    <1	Cadmium		ASTM D5185m		0			
Barium    ppm    ASTM D5185m    90    0        Molybdenum    ppm    ASTM D5185m    0    0        Manganese    ppm    ASTM D5185m    0    3        Magnesium    ppm    ASTM D5185m    100    3        Calcium    ppm    ASTM D5185m    0    0        Phosphorus    ppm    ASTM D5185m    0    0        Zinc    ppm    ASTM D5185m    0    1        Sulfur    ppm    ASTM D5185m    23500    15985        Sodium    ppm    ASTM D5185m    >25    <1        Potassium    ppm    ASTM D5185m    >20    1        Vater    %    ASTM D6304    >0.05    0.012        ppm Water    ppm    ASTM D647    >13907<	ADDITIVES		method	limit/base	current	history1	history2	
Molybdenum    ppm    ASTM D5185m    0        Manganese    ppm    ASTM D5185m    100    3        Magnesium    ppm    ASTM D5185m    100    3        Calcium    ppm    ASTM D5185m    0    0        Phosphorus    ppm    ASTM D5185m    0    1        Zinc    ppm    ASTM D5185m    0    1        Sulfur    ppm    ASTM D5185m    23500    15985        Sulfur    ppm    ASTM D5185m    >25    <1	Boron	ppm	ASTM D5185m	0	0			
Manganese  ppm  ASTM D5185m  <1	Barium	ppm	ASTM D5185m	90	0			
Magnesium    ppm    ASTM D5185m    100    3        Calcium    ppm    ASTM D5185m    0    0        Phosphorus    ppm    ASTM D5185m    0    0        Zinc    ppm    ASTM D5185m    0    1        Sulfur    ppm    ASTM D5185m    23500    15985        Sulfur    ppm    ASTM D5185m    23500    15985        Sulfur    ppm    ASTM D5185m    >25    <1	Molybdenum	ppm	ASTM D5185m	0	0			
Magnesium    ppm    ASTM D5185m    100    3        Calcium    ppm    ASTM D5185m    0    0        Phosphorus    ppm    ASTM D5185m    0    0        Zinc    ppm    ASTM D5185m    0    1        Sulfur    ppm    ASTM D5185m    23500    159855        Sulfur    ppm    ASTM D5185m    23500    159855        Sodium    ppm    ASTM D5185m    >25    <1	-	ppm	ASTM D5185m		<1			
Phosphorus    ppm    ASTM D5185m    0    0        Zinc    ppm    ASTM D5185m    0    1        Sulfur    ppm    ASTM D5185m    23500    15985        CONTAMINANTS    method    limit/base    current    history1    history2      Silicon    ppm    ASTM D5185m    >25    <1	Magnesium	ppm	ASTM D5185m	100	3			
Zinc    ppm    ASTM D5185m    0    1        Sulfur    ppm    ASTM D5185m    23500    15985        CONTAMINANTS    method    limit/base    current    history1    history2      Silicon    ppm    ASTM D5185m    >25    <1	Calcium	ppm	ASTM D5185m	0	0			
SulfurppmASTM D5185m2350015985CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25<1	Phosphorus	ppm	ASTM D5185m	0	0			
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25<1	Zinc	ppm	ASTM D5185m	0	1			
Silicon  ppm  ASTM D5185m  >25  <1	Sulfur	ppm	ASTM D5185m	23500	15985			
Sodium    ppm    ASTM D5185m    2        Potassium    ppm    ASTM D5185m    >20    1        Water    %    ASTM D6304    >0.05    0.012        ppm Water    ppm    ASTM D6304    >500    120        FLUID CLEANLINESS    method    limit/base    current    history1    history2      Particles >4µm    ASTM D7647    13907         Particles >6µm    ASTM D7647    >1300    5760        Particles >14µm    ASTM D7647    >80    787        Particles >21µm    ASTM D7647    >20    246        Particles >38µm    ASTM D7647    >3    0        Particles >71µm    ASTM D7647    >3    0        Oil Cleanliness    ISO 4406 (c)    >17/13    20/17	CONTAMINANTS		method	limit/base	current	history1	history2	
Potassium    ppm    ASTM D5185m    >20    1        Water    %    ASTM D6304    >0.05    0.012        ppm Water    ppm    ASTM D6304    >500    120        FLUID CLEANLINESS    method    limit/base    current    history1    history2      Particles >4µm    ASTM D7647    13907         Particles >6µm    ASTM D7647    >1300    5760        Particles >14µm    ASTM D7647    >80    787        Particles >21µm    ASTM D7647    >20    246        Particles >38µm    ASTM D7647    >4    8        Particles >71µm    ASTM D7647    >3    0        Oil Cleanliness    ISO 4406 (c)    >17/13    20/17        FLUID DEGRADATION    method    limit/base    current    history1    history2	Silicon	ppm	ASTM D5185m	>25	<1			
Water  %  ASTM D6304  >0.05  0.012      ppm Water  ppm  ASTM D6304  >500  120      FLUID CLEANLINESS  method  limit/base  current  history1  history2    Particles >4µm  ASTM D7647  13907      Particles >6µm  ASTM D7647  >1300  5760      Particles >6µm  ASTM D7647  >80  787      Particles >14µm  ASTM D7647  >20  246      Particles >38µm  ASTM D7647  >4  8      Particles >71µm  ASTM D7647  >3  0      Oil Cleanliness  ISO 4406 (c)  >17/13  20/17      FLUID DEGRADATION  method  limit/base  current  history1  history2	Sodium	ppm	ASTM D5185m		2			
ppm Water    ppm    ASTM D6304    >500    120        FLUID CLEANLINESS    method    limit/base    current    history1    history2      Particles >4µm    ASTM D7647    13907        Particles >6µm    ASTM D7647    >1300    5760        Particles >6µm    ASTM D7647    >80    787        Particles >14µm    ASTM D7647    >20    246        Particles >21µm    ASTM D7647    >4    8        Particles >38µm    ASTM D7647    >4    8        Particles >71µm    ASTM D7647    >3    0        Oil Cleanliness    ISO 4406 (c)    >17/13    20/17        FLUID DEGRADATION    method    limit/base    current    history1    history2		ppm	ASTM D5185m	>20	1			
FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4 $\mu$ mASTM D764713907Particles >6 $\mu$ mASTM D7647>13005760Particles >14 $\mu$ mASTM D7647>80787Particles >21 $\mu$ mASTM D7647>20246Particles >38 $\mu$ mASTM D7647>48Particles >71 $\mu$ mASTM D7647>30Oil CleanlinessISO 4406 (c)>17/1320/17FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2	Water	%	ASTM D6304	>0.05	0.012			
Particles >4μm  ASTM D7647  13907      Particles >6μm  ASTM D7647  >1300  5760      Particles >14μm  ASTM D7647  >80  787      Particles >21μm  ASTM D7647  >20  246      Particles >38μm  ASTM D7647  >4  8      Particles >38μm  ASTM D7647  >4  8      Particles >71μm  ASTM D7647  >3  0      Oil Cleanliness  ISO 4406 (c)  >17/13  20/17      FLUID DEGRADATION  method  limit/base  current  history1  history2	ppm Water	ppm	ASTM D6304	>500	120			
Particles >6µm  ASTM D7647  >1300  ▲ 5760      Particles >14µm  ASTM D7647  >80  ▲ 787      Particles >21µm  ASTM D7647  >20  ▲ 246      Particles >38µm  ASTM D7647  >4  ● 8      Particles >38µm  ASTM D7647  >4  ● 8      Particles >71µm  ASTM D7647  >3  0      Oil Cleanliness  ISO 4406 (c)  >17/13  ▲ 20/17      FLUID DEGRADATION  method  limit/base  current  history1  history2	FLUID CLEANLIN	IESS	method	limit/base	current	history1	history2	
Particles >14μm  ASTM D7647  >80  ▲ 787      Particles >21μm  ASTM D7647  >20  ▲ 246      Particles >38μm  ASTM D7647  >4  ● 8      Particles >38μm  ASTM D7647  >3  0      Particles >71μm  ASTM D7647  >3  0      Oil Cleanliness  ISO 4406 (c)  >17/13  ▲ 20/17      FLUID DEGRADATION  method  limit/base  current  history1  history2	Particles >4µm		ASTM D7647		13907			
Particles >21μm    ASTM D7647    >20    ▲ 246        Particles >38μm    ASTM D7647    >4    ● 8        Particles >38μm    ASTM D7647    >3    0        Particles >71μm    ASTM D7647    >3    0        Oil Cleanliness    ISO 4406 (c)    >17/13    ▲ 20/17        FLUID DEGRADATION    method    limit/base    current    history1    history2	Particles >6µm		ASTM D7647	>1300	<u> </u>			
Particles >38μm    ASTM D7647    >4    8        Particles >71μm    ASTM D7647    >3    0        Oil Cleanliness    ISO 4406 (c)    >17/13    ▲ 20/17        FLUID DEGRADATION    method    limit/base    current    history1    history2	Particles >14µm		ASTM D7647	>80	<b>A</b> 787			
Particles >71μm    ASTM D7647    >3    0        Oil Cleanliness    ISO 4406 (c)    >17/13    ▲ 20/17        FLUID DEGRADATION    method    limit/base    current    history1    history2	Particles >21µm		ASTM D7647	>20	<u> </u>			
Oil Cleanliness  ISO 4406 (c) >17/13 ▲ 20/17      FLUID DEGRADATION  method  limit/base  current  history1  history2	Particles >38µm		ASTM D7647	>4	8 🛑			
FLUID DEGRADATION method limit/base current history1 history2	Particles >71µm		ASTM D7647	>3	0			
	Oil Cleanliness		ISO 4406 (c)	>17/13	<b>20/17</b>			
Acid Number (AN) mg KOH/g ASTM D8045 1.0 0.45	FLUID DEGRADA	TION	method	limit/base	current	history1	history2	
	Acid Number (AN)	mg KOH/g	ASTM D8045	1.0	0.45			



16k 144

12k

10k and particles (1 8k 9 8k 9k 4k

2

0

12000

1000

800 (maa)

600 Water 400

200

1.20

(B/H0) E0.72

E 0 41

Poid 0.2

0.00

1000

600 Water (

4000

200

60

55

<u>ှ</u> 50

-₹3 45 Base

40

35

Abnormal

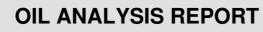
Aar28/

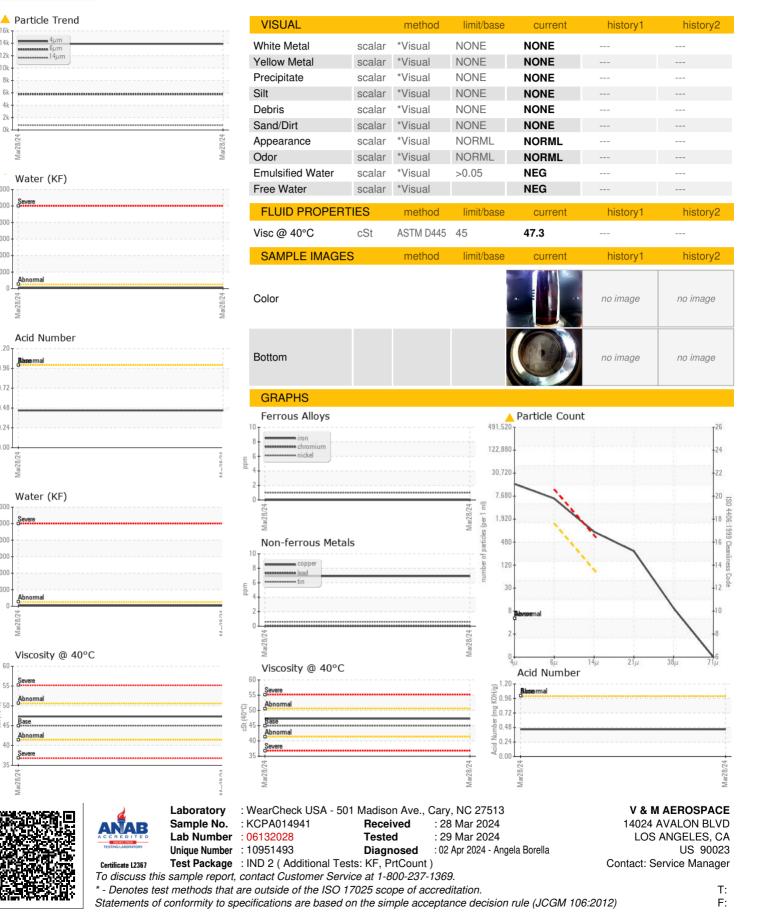
Se

Abnorma

Se

Built for a lifetime





Contact/Location: Service Manager - VMALOS