

OIL ANALYSIS REPORT

SAMPLE INCODMATION

Sample Rating Trend



Aachine Id 2758344 (S/N 1086)

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

DIAGNOSIS

Recommendation

No corrective action is recommended at this time. The filter change at the time of sampling has been noted. Resample at the next service interval to monitor. We were unable to perform a particle count due to a high concentration of particles present in this sample.

Wear

All component wear rates are normal.

Contamination

Moderate concentration of visible dirt/debris present in the oil.

Fluid Condition

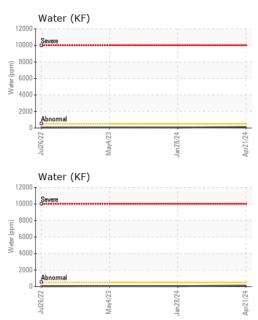
The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

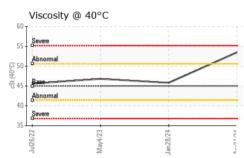
| Sample NumberClient InfoKCPA012789KCPA003415KCPA002828Sample DateClient Info21 Apr 202428 Jan 202404 May 2023Machine AgehrsClient Info000Oil AgeLient InfoNC ChangedN/AN/ASample StatusClient InfoNC ChangedN/AABNORMALWEAR METALSmethodImmuseNorte AndN/AABNORMALIronppmASTM 05165>50001ChromiumppmASTM 05165>50001NickelppmASTM 05165>50001SilverppmASTM 05165>501111LeadppmASTM 05165>101111CopperppmASTM 05165>101111VanadiumppmASTM 05165>101100ADDITIVESmethodImit/basecurrontNiktory100ADITIVESmethodSitt 0516510<13210MaganeseppmASTM 05165100<13210May adumppmASTM 0516510<1322MandanppmASTM 0516510<1321MandanppmASTM 0516510<1322Mandanppm | SAMPLE INFORM | IATION | method | limit/base | current | history1 | history2 |
|---|------------------|---------------|--------------|------------|-------------|-------------|-------------------|
| Machine Age hrs Client Info 138016 136112 129778 Oil Age irrs Client Info 0 0 0 0 Sample Status a imit/base current NixA N/A WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >50 0 0 1 Nickel ppm ASTM D5185m >30 1 <1 <1 Titanium ppm ASTM D5185m >32 <1 0 0 Silver ppm ASTM D5185m >32 <1 <1 1 Cadadium ppm ASTM D5185m >30 1 <1 1 Cadadium ppm ASTM D5185m >10 1 <1 0 Cadamium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 hi | Sample Number | | Client Info | | KCPA012789 | KCPA003415 | KCPA002828 |
| Oil Age hrs Client Info Not Changed N/A N/A Sample Status I Image Not Changed N/A N/A WEAR METALS method limit/base current history1 history2 Iron ppm ASTM 05185m >50 0 0 1 Othormium ppm ASTM 05185m >30 1 <1 <1 Nickel ppm ASTM 05185m >30 1 <1 0 <1 Auminum ppm ASTM 05185m >10 2 <1 1 <1 0 Auminum ppm ASTM 05185m >10 1 <1 <1 <1 Copper ppm ASTM 05185m >10 1 <1 <1 <1 Vanadium ppm ASTM 05185m >10 1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <th>Sample Date</th> <th></th> <th>Client Info</th> <th></th> <th>21 Apr 2024</th> <th>28 Jan 2024</th> <th>04 May 2023</th> | Sample Date | | Client Info | | 21 Apr 2024 | 28 Jan 2024 | 04 May 2023 |
| Oil Changed Sample Status Client Info Not Changd ABNORMAL N/A N/A WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >50 0 0 1 Chromium ppm ASTM D5185m >30 -1 <1 <1 Nickel ppm ASTM D5185m >33 -1 <1 <1 Intanium ppm ASTM D5185m >33 <1 <1 <1 Aluminum ppm ASTM D5185m >30 2 <1 0 0 Aluminum ppm ASTM D5185m >10 1 2 1 1 Lead ppm ASTM D5185m >10 1 <1 0 0 Vanadium ppm ASTM D5185m >10 1 <1 0 Adminum ppm ASTM D5185m 0 1 <1 0 Admium ppm ASTM D5185m | Machine Age | hrs | Client Info | | 138016 | 136112 | 129778 |
| Sample Status Imate of the image of the im | Oil Age | hrs | Client Info | | 0 | 0 | 0 |
| WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >50 0 0 1 Nickel ppm ASTM D5185m >3 1 <1 <1 Nickel ppm ASTM D5185m >3 <1 0 0 Silver ppm ASTM D5185m >2 <1 1 0 Aluminum ppm ASTM D5185m >10 1 2 1 1 Lead ppm ASTM D5185m >10 1 1 <1 0 Vanadium ppm ASTM D5185m >10 1 1 <1 0 Adminum ppm ASTM D5185m 0 0 0 0 0 Adminum ppm ASTM D5185m 0 1 <1 0 0 Manganese ppm ASTM D5185m 0 3 <1 0 0 0 0 <t< th=""><th>Oil Changed</th><th></th><th>Client Info</th><th></th><th>Not Changd</th><th>N/A</th><th>N/A</th></t<> | Oil Changed | | Client Info | | Not Changd | N/A | N/A |
| Iron ppm ASTM D5185m >50 0 0 1 Nickel ppm ASTM D5185m >30 -1 0 <1 Nickel ppm ASTM D5185m >3 1 <1 <1 Titanium ppm ASTM D5185m >3 <1 0 0 Silver ppm ASTM D5185m >10 2 <1 1 0 Aluminum ppm ASTM D5185m >10 1 2 1 0 Copper ppm ASTM D5185m >50 9 8 4 1 Vanadium ppm ASTM D5185m >50 9 8 4 1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 1 <1 0 Magnaese ppm ASTM D5185m 0 1 <1 0 Manganesium ppm <th>Sample Status</th> <th></th> <th></th> <th></th> <th></th> <th>NORMAL</th> <th>ABNORMAL</th> | Sample Status | | | | | NORMAL | ABNORMAL |
| Chromium ppm ASTM D5185m >10 <1 | WEAR METALS | | method | limit/base | current | history1 | history2 |
| Nickel ppm ASTM D5185m >3 1 <1 | Iron | ppm | ASTM D5185m | >50 | 0 | 0 | 1 |
| Titanium ppm ASTM D5185m >3 <1 | Chromium | ppm | ASTM D5185m | >10 | <1 | 0 | <1 |
| Silver ppm ASTM D5185m >2 <1 | Nickel | ppm | ASTM D5185m | >3 | 1 | <1 | <1 |
| Aluminum ppm ASTM D5185m >10 2 <1 | Titanium | ppm | ASTM D5185m | >3 | <1 | 0 | 0 |
| Lead ppm ASTM D5185m >10 1 2 1 Copper ppm ASTM D5185m >50 9 8 4 Tin ppm ASTM D5185m >10 1 1 <1 | Silver | ppm | ASTM D5185m | >2 | <1 | <1 | 0 |
| Copper ppm ASTM D5185m >50 9 8 4 Tin ppm ASTM D5185m >10 1 1 <1 Vanadium ppm ASTM D5185m >10 1 1 <1 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Malganesian ppm ASTM D5185m 0 1 <1 0 Magnesian ppm ASTM D5185m 0 1 <1 0 Magnesian ppm ASTM D5185m 0 2 0 0 Calcium ppm ASTM D5185m 0 2 0 0 Sulfur ppm ASTM D5185m 0 2 0 0 Sulfur ppm ASTM D5185m 25 1 <1 <1 | Aluminum | ppm | ASTM D5185m | >10 | 2 | <1 | 1 |
| Tin ppm ASTM D5185m >10 1 1 <1 | Lead | ppm | ASTM D5185m | >10 | 1 | 2 | 1 |
| Vanadium ppm ASTM D5185m <1 | Copper | ppm | ASTM D5185m | >50 | 9 | 8 | 4 |
| Cadmium ppm ASTM D5185m <1 | Tin | ppm | ASTM D5185m | >10 | 1 | 1 | <1 |
| ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Barium ppm ASTM D5185m 90 <1 0 0 Molybdenum ppm ASTM D5185m 0 1 <1 0 Magnesee ppm ASTM D5185m 100 <1 3 2 Calcium ppm ASTM D5185m 100 <1 3 2 Calcium ppm ASTM D5185m 100 3 <1 0 Phosphorus ppm ASTM D5185m 0 2 0 0 Sulfur ppm ASTM D5185m 23500 20759 16002 20974 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 20 1 4 2 Vater ppm ASTM D6185m 20 1 | Vanadium | ppm | ASTM D5185m | | <1 | 0 | 0 |
| Boron ppm ASTM D5185m 0 0 0 0 Barium ppm ASTM D5185m 90 <1 | Cadmium | ppm | ASTM D5185m | | <1 | <1 | 0 |
| Barium ppm ASTM D5185m 90 <1 | ADDITIVES | | method | limit/base | current | history1 | history2 |
| Molybdenum ppm ASTM D5185m 0 1 <1 | Boron | ppm | ASTM D5185m | 0 | 0 | 0 | 0 |
| Marganese ppm ASTM D5185m <1 | Barium | ppm | ASTM D5185m | 90 | <1 | 0 | 0 |
| Magnesium ppm ASTM D5185m 100 <1 | Molybdenum | ppm | ASTM D5185m | 0 | 1 | <1 | 0 |
| Calcium ppm ASTM D5185m 0 3 <1 | Manganese | ppm | ASTM D5185m | | <1 | 2 | <1 |
| Phosphorus ppm ASTM D5185m 0 2 0 0 Zinc ppm ASTM D5185m 0 0 0 0 0 Sulfur ppm ASTM D5185m 23500 20759 16002 20974 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 1 <1 | Magnesium | ppm | ASTM D5185m | 100 | <1 | 3 | 2 |
| Zinc ppm ASTM D5185m 0 0 0 0 0 Sulfur ppm ASTM D5185m 23500 20759 16002 20974 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 1 <1 <1 Sodium ppm ASTM D5185m >25 1 <1 <1 Sodium ppm ASTM D5185m >20 1 4 2 Potassium ppm ASTM D6304 >0.05 0.013 0.004 0.005 ppm Water ppm ASTM D6304 >500 135 50 59.7 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 = 1849 36929 Particles >6µm ASTM D7647 >80 = 177 173 Particles >21µm ASTM D7647 >20 = | Calcium | ppm | ASTM D5185m | 0 | 3 | <1 | 0 |
| SulfurppmASTM D5185m23500207591600220974CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>251<1<1SodiumppmASTM D5185m>20142PotassiumppmASTM D6304>0.050.0130.0040.005ppm Water%ASTM D6304>5001355059.7FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmASTM D7647>1300184936929Particles >6µmASTM D7647>130017173Particles >14µmASTM D7647>20435Particles >21µmASTM D7647>2002Particles >38µmASTM D7647>300Oli CleanlinessISO 4406 (c)>/17/1318/16/1122/20/15FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2 | Phosphorus | ppm | ASTM D5185m | 0 | 2 | 0 | 0 |
| CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>251<1<1SodiumppmASTM D5185m>20142PotassiumppmASTM D5185m>20142Water%ASTM D6304>0.050.0130.0040.005ppm WaterppmASTM D6304>5001355059.7FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmASTM D7647184936929Particles >6µmASTM D7647>13003657553Particles >6µmASTM D7647>8017173Particles >38µmASTM D7647>20435Particles >38µmASTM D7647>300Ol CleanlinessISO 4406 (c)>/17/1318/16/1122/20/15FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2 | Zinc | ppm | ASTM D5185m | 0 | 0 | 0 | 0 |
| Silicon ppm ASTM D5185m >25 1 <1 <1 Sodium ppm ASTM D5185m 0 2 2 Potassium ppm ASTM D5185m >20 1 4 2 Water % ASTM D6304 >0.05 0.013 0.004 0.005 ppm Water ppm ASTM D6304 >500 135 50 59.7 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 >1300 1849 36929 Particles >6µm ASTM D7647 >80 17 173 Particles >14µm ASTM D7647 >20 44 35 Particles >21µm ASTM D7647 >20 44 35 Particles >38µm ASTM D7647 >4 0 2 Particles >71µm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 18/16/11 22/20/15 | Sulfur | ppm | ASTM D5185m | 23500 | 20759 | 16002 | 20974 |
| Sodium ppm ASTM D5185m 0 2 2 Potassium ppm ASTM D5185m >20 1 4 2 Water % ASTM D6304 >0.05 0.013 0.004 0.005 ppm Water ppm ASTM D6304 >500 135 50 59.7 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 1849 36929 Particles >6µm ASTM D7647 >1300 1849 36929 Particles >6µm ASTM D7647 >80 17 173 Particles >14µm ASTM D7647 >80 17 173 Particles >21µm ASTM D7647 >20 0 2 Particles >38µm ASTM D7647 >3 0 2 Particles >71µm ASTM D7647 >3 0 0 OI Cleanliness <td< th=""><th>CONTAMINANTS</th><th></th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></td<> | CONTAMINANTS | | method | limit/base | current | history1 | history2 |
| Potassium ppm ASTM D5185m >20 1 4 2 Water % ASTM D6304 >0.05 0.013 0.004 0.005 ppm Water ppm ASTM D6304 >500 135 50 59.7 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 1849 36929 Particles >6µm ASTM D7647 >1300 3655 7553 Particles >14µm ASTM D7647 >80 17 173 Particles >21µm ASTM D7647 >20 44 35 Particles >38µm ASTM D7647 >20 44 35 Particles >38µm ASTM D7647 >4 0 2 Particles >71µm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 18/16/11 22/20/15 FLUI | | ppm | | >25 | | | |
| Water % ASTM D6304 >0.05 0.013 0.004 0.005 ppm Water ppm ASTM D6304 >500 135 50 59.7 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 1849 36929 Particles >6µm ASTM D7647 >1300 365 7553 Particles >14µm ASTM D7647 >80 17 173 Particles >21µm ASTM D7647 >20 4 35 Particles >38µm ASTM D7647 >4 0 2 Particles >38µm ASTM D7647 >3 0 2 Particles >71µm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 18/16/11 22/20/15 FLUID DEGRADATION method limit/base current history1 history2 | | ppm | | | 0 | | |
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| FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmASTM D7647184936929Particles >6µmASTM D7647>13003657553Particles >14µmASTM D7647>8017173Particles >21µmASTM D7647>204435Particles >38µmASTM D7647>402Particles >71µmASTM D7647>318/16/1122/20/15FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2 | | % | | | | | |
| Particles >4μm ASTM D7647 1849 36929 Particles >6μm ASTM D7647 >1300 365 7553 Particles >14μm ASTM D7647 >80 17 ▲ 173 Particles >21μm ASTM D7647 >20 4 35 Particles >21μm ASTM D7647 >20 4 35 Particles >38μm ASTM D7647 >4 0 2 Particles >71μm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 18/16/11 22/20/15 FLUID DEGRADATION method limit/base current history1 history2 | ppm Water | ppm | ASTM D6304 | >500 | 135 | 50 | 59.7 |
| Particles >6μm ASTM D7647 >1300 365 ▲ 7553 Particles >14μm ASTM D7647 >80 17 ▲ 173 Particles >21μm ASTM D7647 >20 4 ▲ 35 Particles >38μm ASTM D7647 >4 0 2 Particles >38μm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 18/16/11 ▲ 22/20/15 FLUID DEGRADATION method limit/base current history1 history2 | FLUID CLEANLIN | IESS | method | limit/base | current | history1 | history2 |
| Particles >14μm ASTM D7647 >80 17 ▲ 173 Particles >21μm ASTM D7647 >20 4 ▲ 35 Particles >38μm ASTM D7647 >4 0 2 Particles >71μm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 18/16/11 ▲ 22/20/15 FLUID DEGRADATION method limit/base current history1 history2 | | | | | | | |
| Particles >21 μm ASTM D7647 >20 4 ▲ 35 Particles >38μm ASTM D7647 >4 0 2 Particles >71μm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 18/16/11 ▲ 22/20/15 FLUID DEGRADATION method limit/base current history1 history2 | Particles >6µm | | | >1300 | | 365 | <u> </u> |
| Particles >38μm ASTM D7647 >4 0 2 Particles >71μm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 18/16/11 22/20/15 FLUID DEGRADATION method limit/base current history1 history2 | | | | | | | |
| Particles >71μm ASTM D7647 >3 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 18/16/11 22/20/15 FLUID DEGRADATION method limit/base current history1 history2 | | | | | | | |
| Oil Cleanliness ISO 4406 (c) >/17/13 18/16/11 ▲ 22/20/15 FLUID DEGRADATION method limit/base current history1 history2 | | | | | | | |
| FLUID DEGRADATION method limit/base current history1 history2 | - | | | | | | 0 |
| | Oil Cleanliness | | ISO 4406 (c) | >/17/13 | | 18/16/11 | A 22/20/15 |
| Acid Number (AN) mg KOH/g ASTM D8045 1.0 0.61 0.42 0.44 | FLUID DEGRADA | TION | method | limit/base | current | history1 | history2 |
| | Acid Number (AN) | mg KOH/g | ASTM D8045 | 1.0 | 0.61 | 0.42 | 0.44 |

Contact/Location: SEAN NEVOLI - STRSAN Page 1 of 2



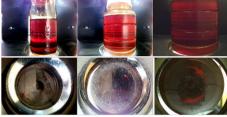
OIL ANALYSIS REPORT



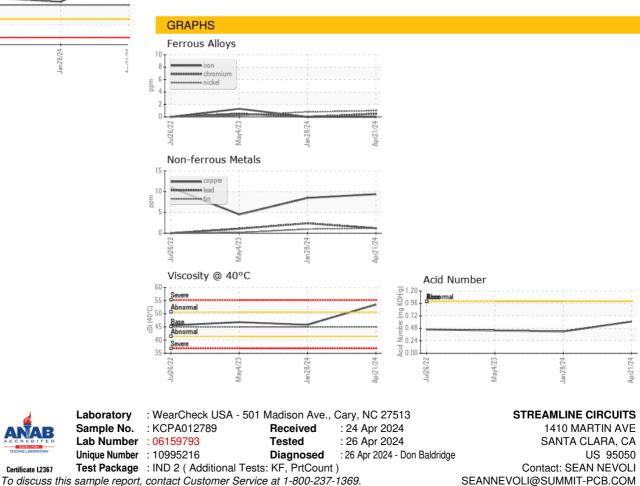


| VISUAL | | method | limit/base | current | history1 | history2 |
|------------------|-------------|-----------|------------|---------|----------|----------|
| White Metal | scalar | *Visual | NONE | NONE | LIGHT | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | NONE | NONE | NONE |
| Silt | scalar | *Visual | NONE | NONE | NONE | NONE |
| Debris | scalar | *Visual | NONE | A MODER | NONE | LIGHT |
| 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 | >0.05 | NEG | NEG | NEG |
| Free Water | scalar | *Visual | | NEG | NEG | NEG |
| FLUID PROPER | FIES | method | limit/base | current | history1 | history2 |
| Visc @ 40°C | cSt | ASTM D445 | 45 | 53.5 | 45.8 | 46.8 |
| SAMPLE IMAGES | | method | limit/base | current | history1 | history2 |
| | | | | | | |

Color



Bottom



* - 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)

Certificate 12367

Contact/Location: SEAN NEVOLI - STRSAN

Т:

F: