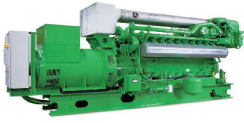




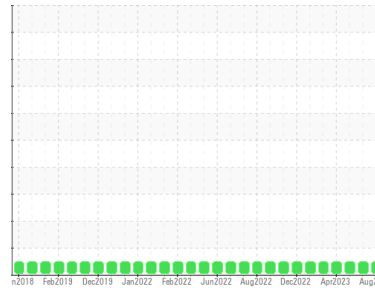
# OIL ANALYSIS REPORT

Sample Rating Trend

**NORMAL**



Machine Id  
**Durham unit 2 (S/N 6181211)**  
 Component  
**Biogas Engine**  
 Fluid  
**D-A Lubricant Blue Flame HB-8 40W (--- GAL)**



## DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

### Wear

All component wear rates are normal.

### Contamination

There is no indication of any contamination in the oil.

### Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

## SAMPLE INFORMATION

|               | method      | limit/base  | current            | history1    | history2    |
|---------------|-------------|-------------|--------------------|-------------|-------------|
| Sample Number | Client Info |             | <b>WCM2249772</b>  | WCM2249774  | WCM2249773  |
| Sample Date   | Client Info |             | <b>28 Aug 2023</b> | 09 Aug 2023 | 22 Jul 2023 |
| Machine Age   | hrs         | Client Info | <b>13243</b>       | 12809       | 12374       |
| Oil Age       | hrs         | Client Info | <b>434</b>         | 0           | 0           |
| Oil Changed   | Client Info |             | <b>Changed</b>     | N/A         | N/A         |
| Sample Status |             |             | <b>NORMAL</b>      | NORMAL      | NORMAL      |

## CONTAMINATION

|        | method    | limit/base | current        | history1 | history2 |
|--------|-----------|------------|----------------|----------|----------|
| Fuel   | WC Method | >4.0       | <b>&lt;1.0</b> | <1.0     | <1.0     |
| Glycol | WC Method |            | <b>NEG</b>     | NEG      | NEG      |

## WEAR METALS

|          | method | limit/base  | current | history1     | history2 |
|----------|--------|-------------|---------|--------------|----------|
| Iron     | ppm    | ASTM D5185m | >20     | <b>9</b>     | 10       |
| Chromium | ppm    | ASTM D5185m | >5      | <b>&lt;1</b> | 1        |
| Nickel   | ppm    | ASTM D5185m | >2      | <b>&lt;1</b> | <1       |
| Titanium | ppm    | ASTM D5185m |         | <b>0</b>     | <1       |
| Silver   | ppm    | ASTM D5185m | >5      | <b>0</b>     | 0        |
| Aluminum | ppm    | ASTM D5185m | >15     | <b>6</b>     | 7        |
| Lead     | ppm    | ASTM D5185m | >20     | <b>&lt;1</b> | <1       |
| Copper   | ppm    | ASTM D5185m | >15     | <b>1</b>     | 1        |
| Tin      | ppm    | ASTM D5185m | >5      | <b>2</b>     | 3        |
| Vanadium | ppm    | ASTM D5185m |         | <b>0</b>     | <1       |
| Cadmium  | ppm    | ASTM D5185m |         | <b>0</b>     | 0        |

## ADDITIVES

|            | method | limit/base  | current | history1     | history2 |
|------------|--------|-------------|---------|--------------|----------|
| Boron      | ppm    | ASTM D5185m |         | <b>1</b>     | 0        |
| Barium     | ppm    | ASTM D5185m |         | <b>2</b>     | 0        |
| Molybdenum | ppm    | ASTM D5185m |         | <b>6</b>     | 6        |
| Manganese  | ppm    | ASTM D5185m |         | <b>&lt;1</b> | <1       |
| Magnesium  | ppm    | ASTM D5185m |         | <b>48</b>    | 53       |
| Calcium    | ppm    | ASTM D5185m |         | <b>2481</b>  | 2594     |
| Phosphorus | ppm    | ASTM D5185m |         | <b>368</b>   | 409      |
| Zinc       | ppm    | ASTM D5185m |         | <b>468</b>   | 484      |
| Sulfur     | ppm    | ASTM D5185m |         | <b>3849</b>  | 4491     |

## CONTAMINANTS

|           | method | limit/base  | current | history1   | history2 |
|-----------|--------|-------------|---------|------------|----------|
| Silicon   | ppm    | ASTM D5185m | >200    | <b>163</b> | 196      |
| Sodium    | ppm    | ASTM D5185m | >20     | <b>0</b>   | 3        |
| Potassium | ppm    | ASTM D5185m | >20     | <b>2</b>   | 1        |

## INFRA-RED

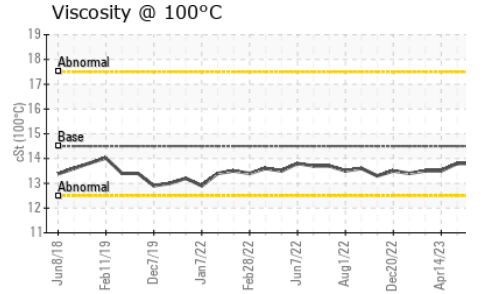
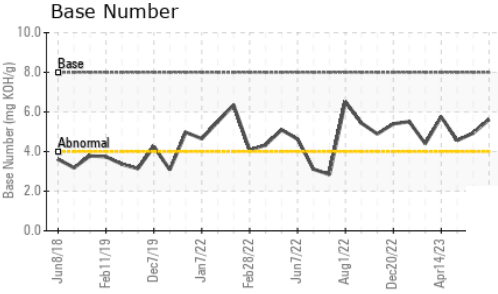
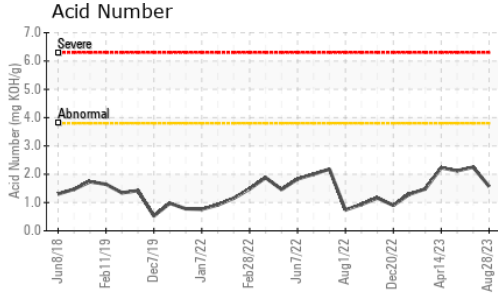
|           | method   | limit/base  | current | history1    | history2 |
|-----------|----------|-------------|---------|-------------|----------|
| Soot %    | %        | *ASTM D7844 | >2      | <b>0</b>    | 0        |
| Nitration | Abs/cm   | *ASTM D7624 | >20     | <b>7.3</b>  | 7.5      |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30     | <b>21.5</b> | 23.9     |

## FLUID DEGRADATION

|                  | method   | limit/base  | current | history1    | history2 |
|------------------|----------|-------------|---------|-------------|----------|
| Oxidation        | Abs/.1mm | *ASTM D7414 | >25     | <b>12.8</b> | 14.9     |
| Acid Number (AN) | mg KOH/g | ASTM D8045  |         | <b>1.57</b> | 2.25     |
| Base Number (BN) | mg KOH/g | ASTM D2896  | 8       | <b>5.61</b> | 4.93     |



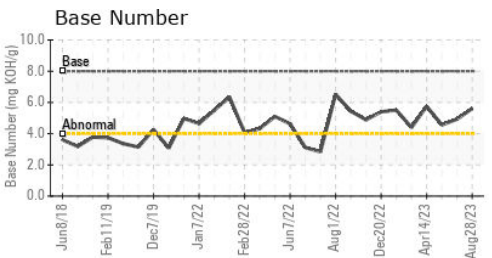
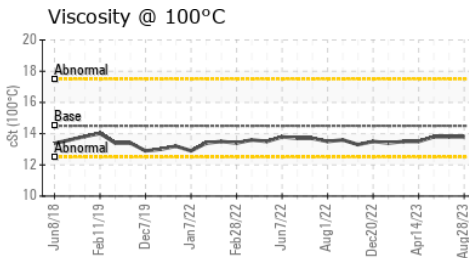
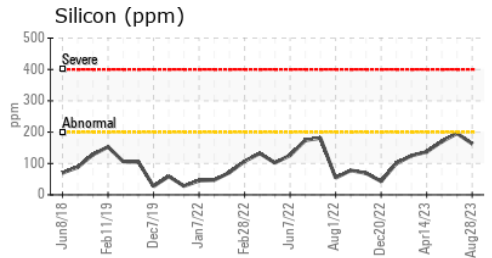
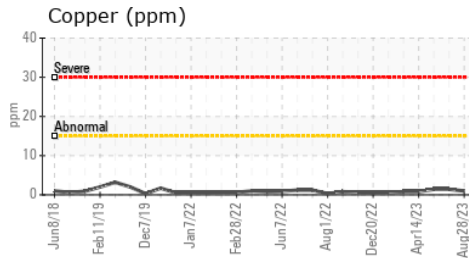
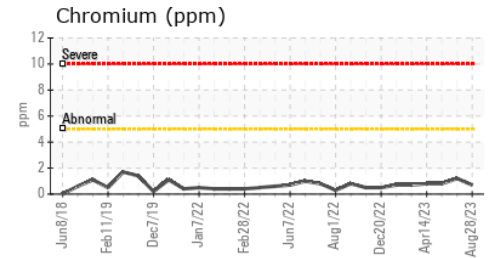
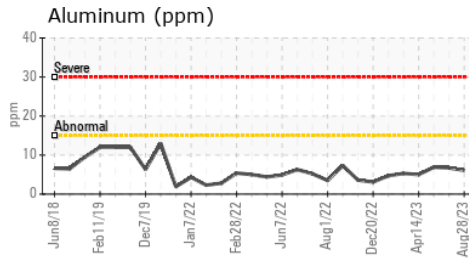
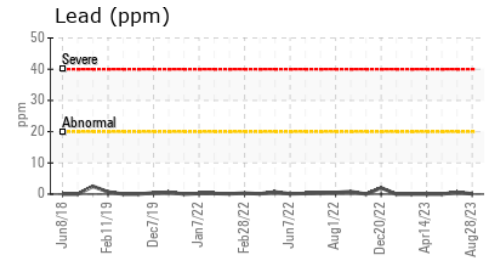
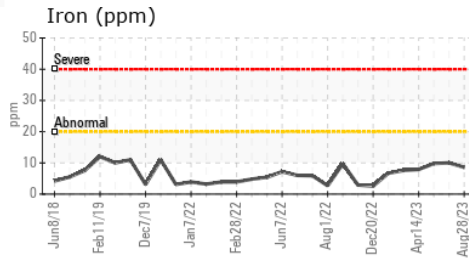
# OIL ANALYSIS REPORT



| VISUAL           | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| 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     |
| Debris           | scalar | *Visual    | NONE    | NONE     | NONE     |
| Sand/Dirt        | scalar | *Visual    | NONE    | NONE     | NONE     |
| Appearance       | scalar | *Visual    | NORML   | NORML    | NORML    |
| Odor             | scalar | *Visual    | NORML   | NORML    | NORML    |
| Emulsified Water | scalar | *Visual    | >.2     | NEG      | NEG      |
| Free Water       | scalar | *Visual    |         | NEG      | NEG      |

| FLUID PROPERTIES | method | limit/base | current | history1    | history2 |
|------------------|--------|------------|---------|-------------|----------|
| Visc @ 100°C     | cSt    | ASTM D445  | 14.5    | <b>13.8</b> | 13.8     |

## GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
 Sample No. : WCM2249772 Received : 29 Aug 2023  
 Lab Number : 05937444 Diagnosed : 30 Aug 2023  
 Unique Number : 10622715 Diagnostician : Sean Felton  
 Test Package : MOB 2

**METHANE POWER DURHAM - MAS ENERGY**  
 2115 EAST CLUB BLVD  
 DURHAM, NC  
 US 27704  
 Contact: KAYLA LEHMANN  
 KLEHMANN@MAS-ENERGY.COM  
 T: (504)228-6289  
 F:

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.

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