



# OIL ANALYSIS REPORT

Sample Rating Trend

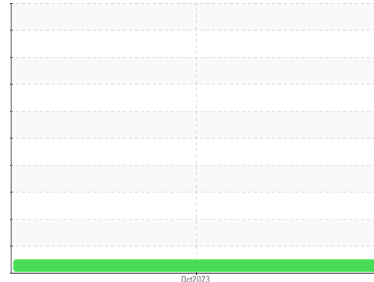
**NORMAL**



Machine Id  
**401 CRANE MAIN HOIST E**

Component  
**Gearbox**

Fluid  
**SHELL OMALA S4 GX 220 (--- GAL)**



## DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.  
NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

### Wear

All component wear rates are normal.

### Contamination

There is no indication of any contamination 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 | current            | history1 | history2 |
|--------------------|-------------|-------------|------------|--------------------|----------|----------|
| Sample Number      | Client Info |             |            | <b>WC0811783</b>   | ---      | ---      |
| Sample Date        | Client Info |             |            | <b>13 Oct 2023</b> | ---      | ---      |
| Machine Age        | hrs         | Client Info |            | <b>0</b>           | ---      | ---      |
| Oil Age            | hrs         | Client Info |            | <b>0</b>           | ---      | ---      |
| Oil Changed        | Client Info |             |            | <b>Not Chngd</b>   | ---      | ---      |
| Sample Status      |             |             |            | <b>NORMAL</b>      | ---      | ---      |

| WEAR METALS |     | method        | limit/base | current      | history1 | history2 |
|-------------|-----|---------------|------------|--------------|----------|----------|
| PQ          |     | ASTM D8184*   |            | <b>0</b>     | ---      | ---      |
| Iron        | ppm | ASTM D5185(m) | >200       | <b>4</b>     | ---      | ---      |
| Chromium    | ppm | ASTM D5185(m) | >15        | <b>0</b>     | ---      | ---      |
| Nickel      | ppm | ASTM D5185(m) | >15        | <b>&lt;1</b> | ---      | ---      |
| Titanium    | ppm | ASTM D5185(m) |            | <b>0</b>     | ---      | ---      |
| Silver      | ppm | ASTM D5185(m) |            | <b>&lt;1</b> | ---      | ---      |
| Aluminum    | ppm | ASTM D5185(m) | >25        | <b>0</b>     | ---      | ---      |
| Lead        | ppm | ASTM D5185(m) | >100       | <b>&lt;1</b> | ---      | ---      |
| Copper      | ppm | ASTM D5185(m) | >200       | <b>&lt;1</b> | ---      | ---      |
| Tin         | ppm | ASTM D5185(m) | >25        | <b>0</b>     | ---      | ---      |
| Antimony    | ppm | ASTM D5185(m) | >5         | <b>0</b>     | ---      | ---      |
| Vanadium    | ppm | ASTM D5185(m) |            | <b>0</b>     | ---      | ---      |
| Beryllium   | ppm | ASTM D5185(m) |            | <b>0</b>     | ---      | ---      |
| Cadmium     | ppm | ASTM D5185(m) |            | <b>0</b>     | ---      | ---      |

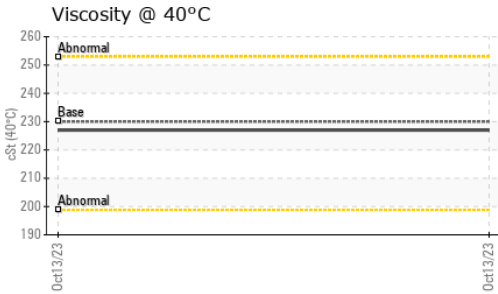
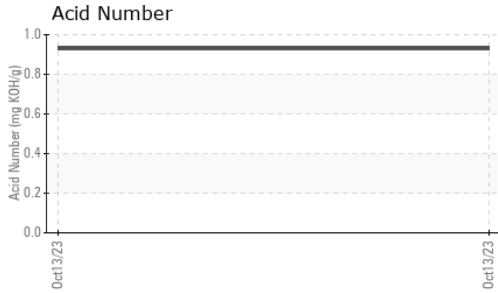
| ADDITIVES  |     | method        | limit/base | current      | history1 | history2 |
|------------|-----|---------------|------------|--------------|----------|----------|
| Boron      | ppm | ASTM D5185(m) |            | <b>22</b>    | ---      | ---      |
| Barium     | ppm | ASTM D5185(m) |            | <b>&lt;1</b> | ---      | ---      |
| Molybdenum | ppm | ASTM D5185(m) |            | <b>0</b>     | ---      | ---      |
| Manganese  | ppm | ASTM D5185(m) |            | <b>0</b>     | ---      | ---      |
| Magnesium  | ppm | ASTM D5185(m) |            | <b>&lt;1</b> | ---      | ---      |
| Calcium    | ppm | ASTM D5185(m) |            | <b>4</b>     | ---      | ---      |
| Phosphorus | ppm | ASTM D5185(m) |            | <b>412</b>   | ---      | ---      |
| Zinc       | ppm | ASTM D5185(m) |            | <b>4</b>     | ---      | ---      |
| Sulfur     | ppm | ASTM D5185(m) |            | <b>4959</b>  | ---      | ---      |
| Lithium    | ppm | ASTM D5185(m) |            | <b>&lt;1</b> | ---      | ---      |

| CONTAMINANTS |     | method        | limit/base | current      | history1 | history2 |
|--------------|-----|---------------|------------|--------------|----------|----------|
| Silicon      | ppm | ASTM D5185(m) | >50        | <b>8</b>     | ---      | ---      |
| Sodium       | ppm | ASTM D5185(m) |            | <b>&lt;1</b> | ---      | ---      |
| Potassium    | ppm | ASTM D5185(m) | >20        | <b>&lt;1</b> | ---      | ---      |

| FLUID DEGRADATION |          | method     | limit/base | current     | history1 | history2 |
|-------------------|----------|------------|------------|-------------|----------|----------|
| Acid Number (AN)  | mg KOH/g | ASTM D974* |            | <b>0.93</b> | ---      | ---      |



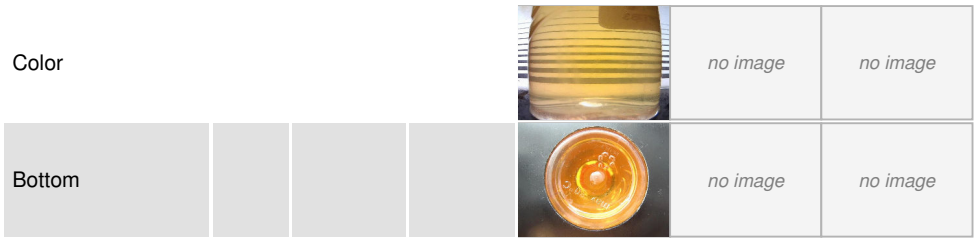
# OIL ANALYSIS REPORT



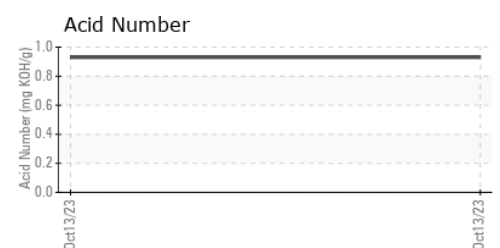
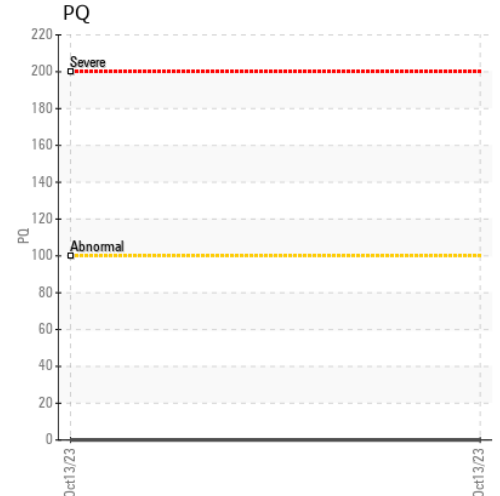
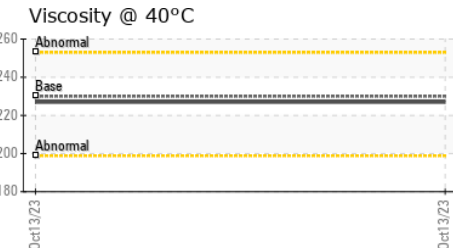
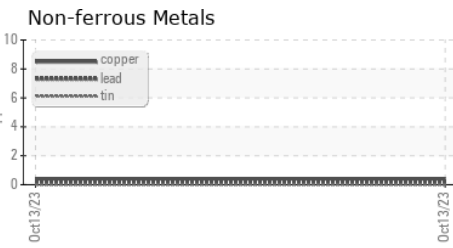
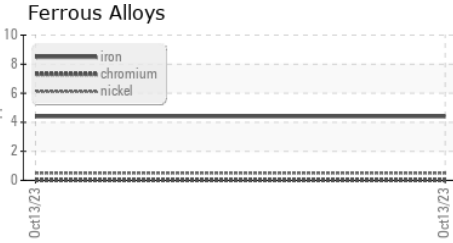
| VISUAL           | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| White Metal      | scalar | Visual*    | NONE    | NONE     | ---      |
| Yellow Metal     | scalar | Visual*    | NONE    | NONE     | ---      |
| Precipitate      | scalar | Visual*    | NONE    | NONE     | ---      |
| Silt             | scalar | Visual*    | NONE    | VLITE    | ---      |
| Debris           | scalar | Visual*    | NONE    | NONE     | ---      |
| Sand/Dirt        | scalar | Visual*    | NONE    | NONE     | ---      |
| Appearance       | scalar | Visual*    | NORML   | NORML    | ---      |
| Odor             | scalar | Visual*    | NORML   | NORML    | ---      |
| Emulsified Water | scalar | Visual*    | >0.2    | NEG      | ---      |
| Free Water       | scalar | Visual*    |         | NEG      | ---      |

| FLUID PROPERTIES | method | limit/base    | current | history1 | history2 |
|------------------|--------|---------------|---------|----------|----------|
| Visc @ 40°C      | cSt    | ASTM D7279(m) | 230     | 227      | ---      |

| SAMPLE IMAGES | method | limit/base | current | history1 | history2 |
|---------------|--------|------------|---------|----------|----------|
|---------------|--------|------------|---------|----------|----------|



## GRAPHS



**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9  
**Sample No.** : WC0811783  
**Lab Number** : 02591183  
**Unique Number** : 5668262  
**Test Package** : IND 2

**Vale - Copper Cliff Smelter**  
 COPPER CLIFF SMELTER WAREHOUSE, 155 BALSAM ST.  
 COPPER CLIFF, ON  
 CA P0M 1N0  
 Contact: Jacynthe Gelinat  
 jacynthe.gelinat@vale.com  
 T: (705)682-5980  
 F: (705)682-6535

Received : 23 Oct 2023  
 Diagnosed : 25 Oct 2023  
 Diagnostician : Wes Davis  
 To discuss this sample report, contact Customer Service at 1-800-268-2131.  
 Test denoted (\*) outside scope of accreditation, (m) method modified, (e) tested at external lab.  
 Validity of results and interpretation are based on the sample and information as supplied.