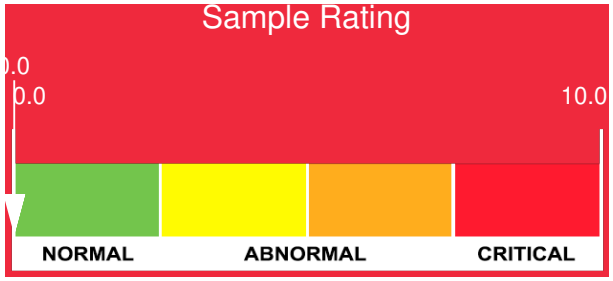
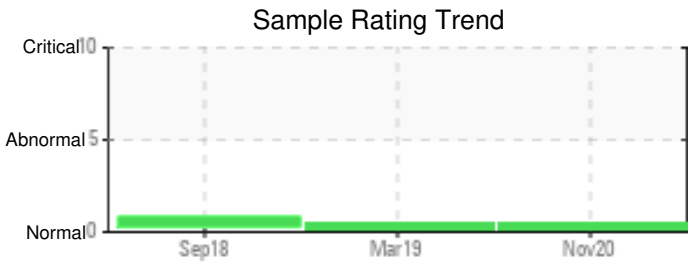


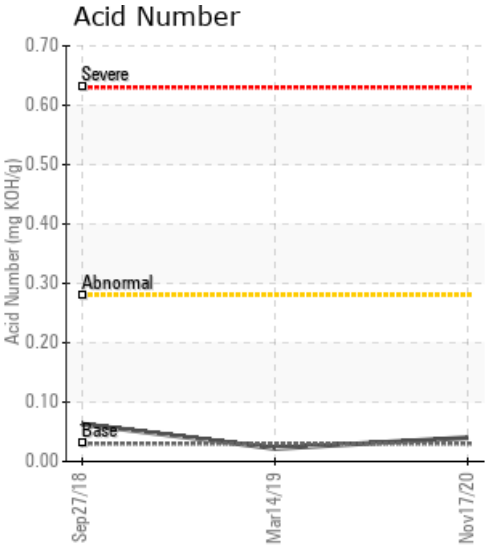

# [BONAVISTA ENERGY / LSD:5-29-55-19W5] HOT OIL BURNER

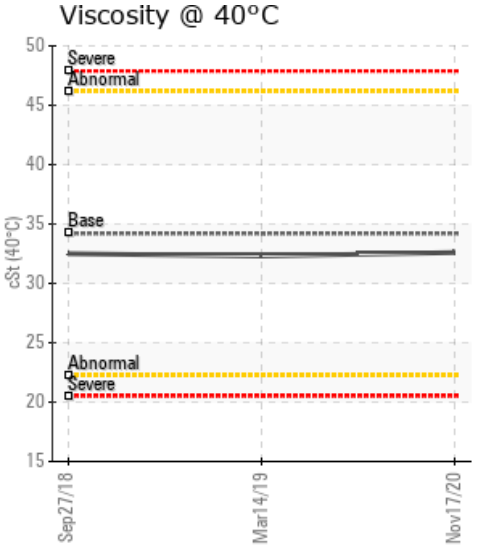
| Customer: PTRHTF20039 | System Information | Sample Information |
|---|---|---|
| BRENNTAG CANADA INC<br>3124-54TH AVENUE SE<br>CALGARY, AB T2C 0A8 Canada<br>Attn: Matthew Kryska<br>Tel:<br>E-Mail: mkryska@brenntag.ca | System Volume: 2000 ltr<br>Bulk Operating Temp: 329F / 165C<br>Heating Source:<br>Blanket:<br>Fluid: PETRO CANADA PETRO-THERM<br>Make: PETRO-TECH | Lab No: 02393764<br>Analyst: Kevin McDermott<br>Sample Date: 11/17/20<br>Received Date: 12/18/20<br>Completed: 12/21/20<br>Kevin McDermott<br>kevin.mcdermott@hollyfrontier.com |

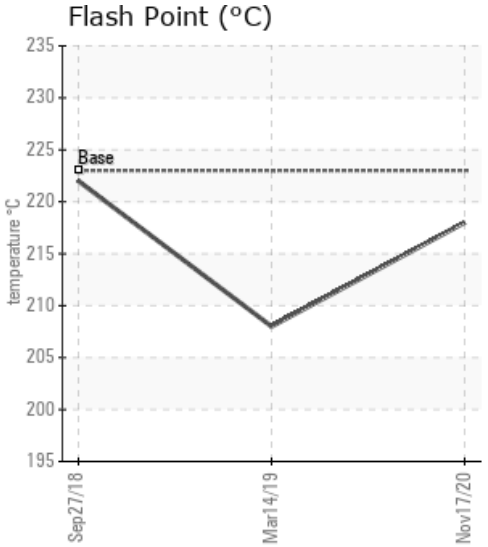
Recommendation: Fluid condition is excellent. Please continue to submit samples annual to proactively monitor fluid condition.

Comments:

| Sample Date | Received Date | Fluid Age | Sample Location | Flash Point (COC) | Water (KF) | Viscosity (40°C) | Acid Number | Solids | GCD 10% | GCD 50% | GCD 90% | GCD % < 335°C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm/dd/yy | | | °F/°C | ppm | cSt | mg/KOH/g | %wt | °F/°C | °F/°C | °F/°C | % |
| 11/17/20 | 12/18/20 | 9.0y | Hot oil filter | 424 / 218 | 48.5 | 32.6 | 0.04 | 0.020 | 706 / 375 | 811 / 433 | 917 / 491 | 1.40 |
| 03/14/19 | 03/26/19 | 7.5y | | 406 / 208 | 231.6 | 32.3 | 0.022 | 0.020 | 688 / 364 | 800 / 427 | 908 / 487 | 3.17 |
| 09/27/18 | 10/04/18 | 7.0y | | 432 / 222 | 262.6 | 32.5 | 0.063 | 0.072 | 718 / 381 | 791 / 422 | 869 / 465 | 0.00 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Baseline Data | | | | 433 / 223 | | 34.2 | 0.03 | | 720 / 382 | 817 / 436 | 900 / 482 | 1.00 |

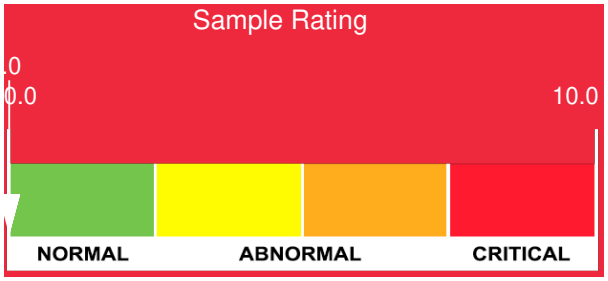


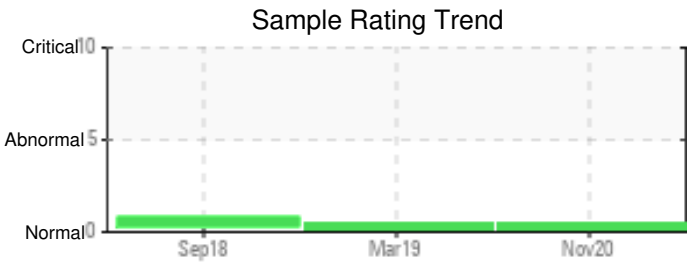



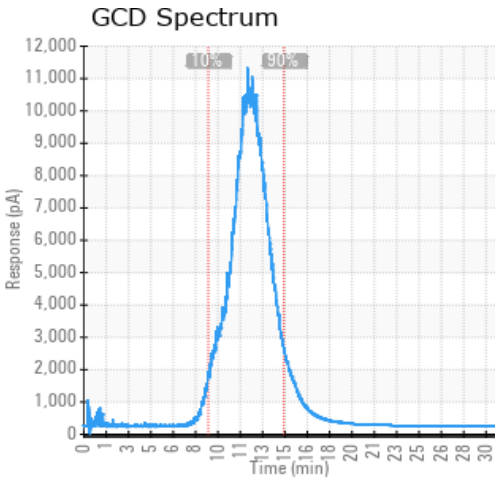
PETRO-CANADA LUBRICANTS

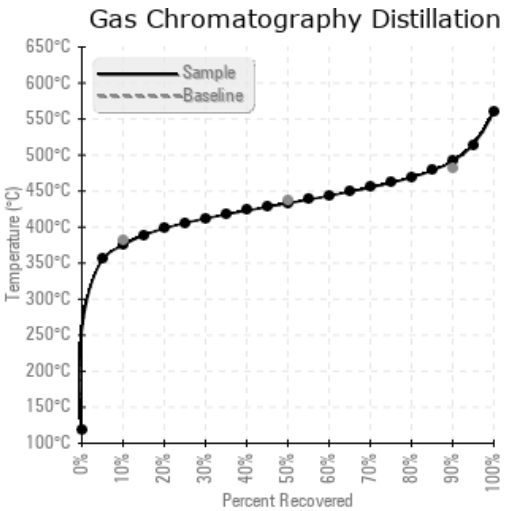


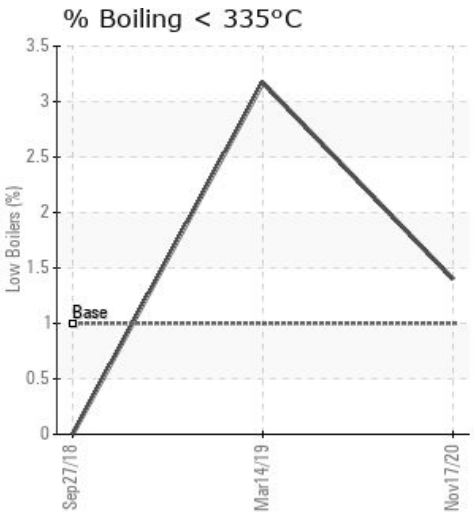




| Sample Date | Iron | Chromium | Nickel | Aluminum | Copper | Lead | Tin | Cadmium | Silver | Vanadium | Silicon | Sodium | Potassium | Titanium | Molybdenum | Antimony | Manganese | Lithium | Boron | Magnesium | Calcium | Barium | Phosphorus | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11/17/20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03/14/19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 09/27/18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Baseline Data | | | 0 | 0 | | | | | | 0 | | | 0 | 0 | | | | | 0 | | | | 0 | |

Elemental anaysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]




## Historical Comments

| | |
|---|---|
| 03/14/19 | The fluid is in good condition and suitable for further use. A combination of decreasing Flash Point, 10% GCD temperature and increasing low boiler vapor content indicates either minor thermal degradation of the fluid but more likely ingress of blanket gas if the blanket gas pressure is higher than 5 psig. In that case venting of low boiler vapors (light ends) to atmosphere is recommended to lower the 3.17%. Please re-sample in 6 months. |
| 09/27/18 | The fluid is in good condition and suitable for further use. The 90% GCD temperature is low. This is not an issue for fluid/system performance at this time and may be caused by nitrogen ingress if N2 blanket gas pressure is higher than 2-3 psig. Please vent off to atmosphere and re-sample in 12 months. (GCD) 90% Distillation Point is abnormally low. |
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