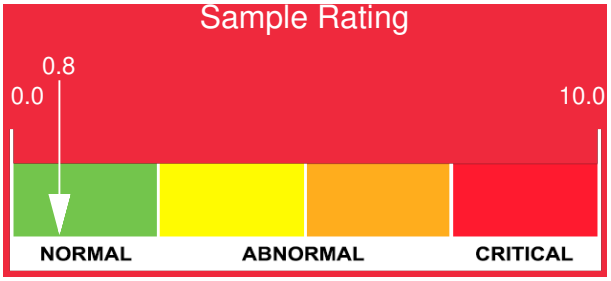
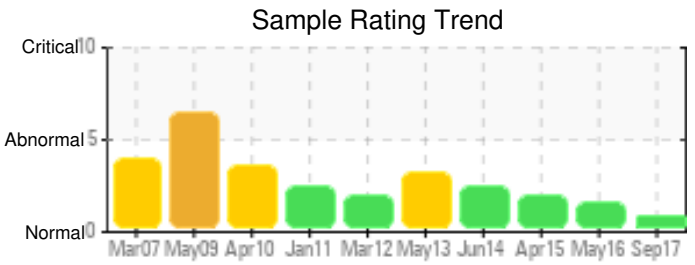


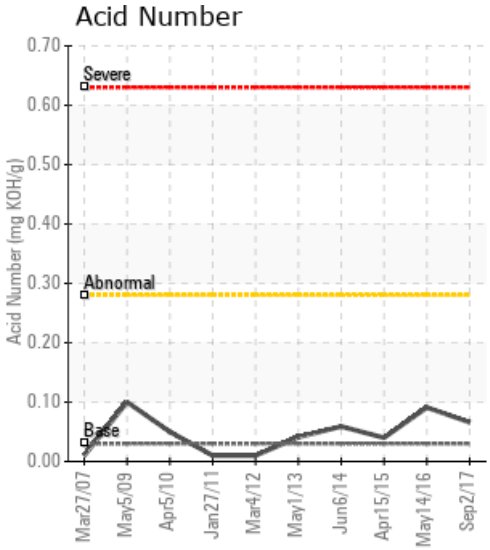

# LINE 2 FILLED COATING CHROMALOX

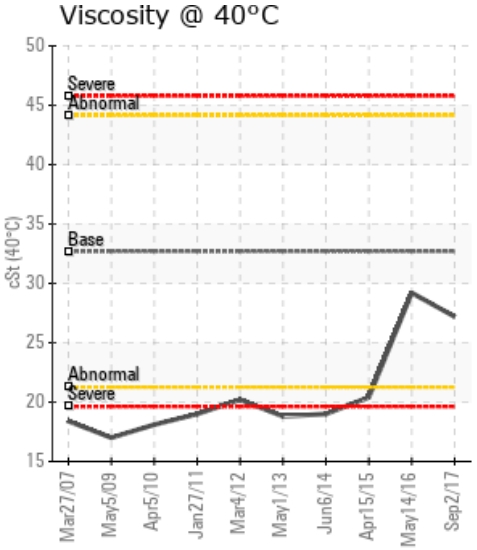
| Customer: PTRHTF10069 | System Information | Sample Information |
|---|---|---|
| CERTAINTEED - SAINT GOBAIN<br>3303 EAST 4TH AVENUE<br>SHAKOPEE, MN 55379 USA<br>Attn: Patrick Wallace<br>Tel:<br>E-Mail: patrick.wallace@saint-gobain.com | System Volume: 1890 gal<br>Bulk Operating Temp: 474F / 246C<br>Heating Source:<br>Blanket:<br>Fluid: PETRO CANADA CALFLO AF<br>Make: CHROMALOX | Lab No: 02168851<br>Analyst: Gaston Arseneault<br>Sample Date: 09/02/17<br>Received Date: 09/12/17<br>Completed: 09/13/17<br>Gaston Arseneault<br>gaston.arseneault@hollyfrontier.com |

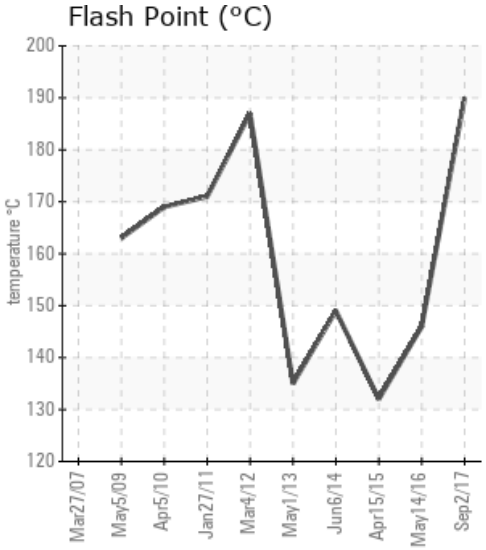
Recommendation: The oil condition has improved over previous samples. The viscosity remains a little bit low. No immediate action is required at this time but you can vent the low boilers out and replace the lost volume with fresh oil as preventative measure. Re-sample at next normal interval.

Comments: COC Flash Point is marginally low.

| 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 | % |
| 09/02/17 | 09/12/17 | 4.0y | MAIN SYSTEM FLOW | 374 / 190 | 7.2 | 27.2 | 0.066 | 0.054 | 684 / 362 | 790 / 421 | 891 / 477 | 3.43 |
| 05/14/16 | 05/24/16 | 0.0y | MAIN SYSTEM FLOW | 295 / 146 | 14.1 | 29.2 | 0.091 | 0.048 | 668 / 354 | 780 / 416 | 873 / 467 | 5.82 |
| 04/15/15 | 05/07/15 | 0.0y | MN FLOW/MN SYS PUMP | 270 / 132 | 18.8 | 20.4 | 0.04 | 0.031 | 683 / 362 | 782 / 417 | 884 / 474 | 2.96 |
| 06/06/14 | 06/17/14 | 0.0y | MAIN FLOW NEAR PUMP | 300 / 149 | 11.0 | 19.0 | 0.059 | 0.016 | 654 / 346 | 777 / 414 | 877 / 469 | 7.70 |
| 05/01/13 | 05/15/13 | 0.0y | MAIN SYSTEM FLOW | 275 / 135 | 53.2 | 18.8 | 0.041 | 0.032 | 699 / 371 | 775 / 413 | 861 / 461 | 0.00 |
| | | | | | | | | | | | | |
| Baseline Data | | | | 435 / 224 | | 32.7 | 0.03 | | 693 / 367 | 790 / 421 | 887 / 475 | 2.5 |

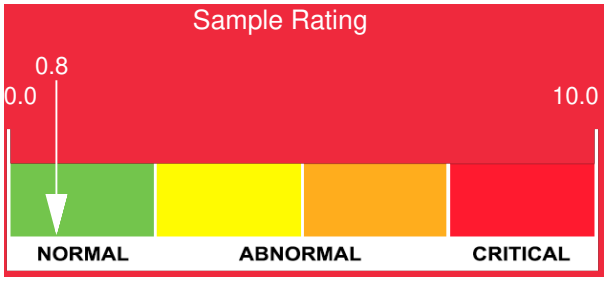


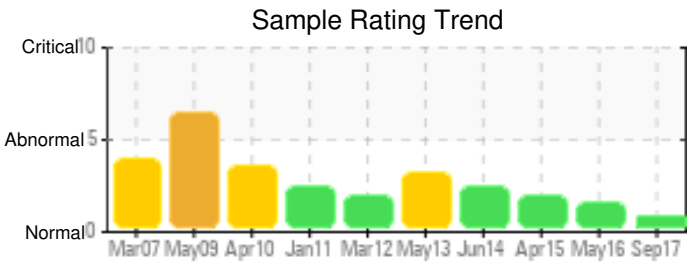



PETRO-CANADA LUBRICANTS

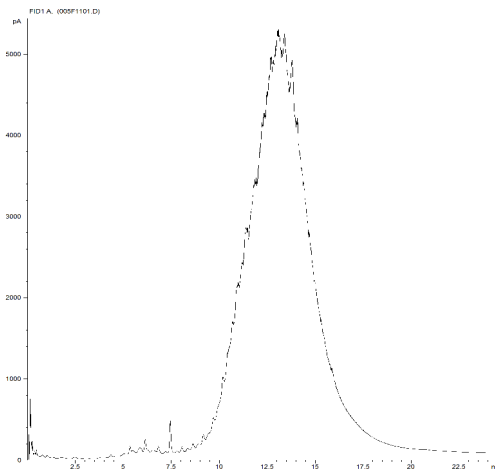


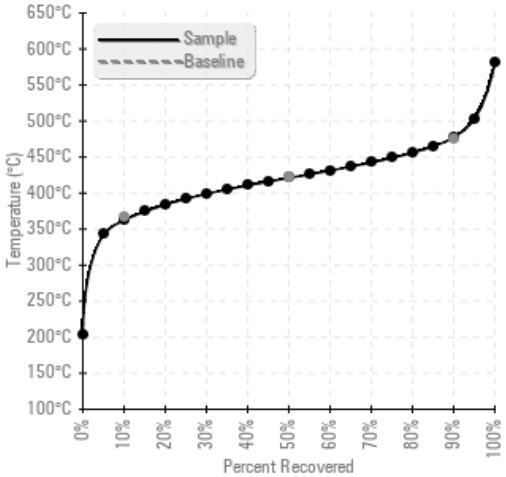

| Sample Date | Iron | Chromium | Nickel | Aluminum | Copper | Lead | Tin | Cadmium | Silver | Vanadium | Silicon | Sodium | Potassium | Titanium | Molybdenum | Antimony | Manganese | Lithium | Boron | Magnesium | Calcium | Barium | Phosphorus | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09/02/17 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 90 | 0 |
| 05/14/16 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 115 | 0 |
| 04/15/15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 0 |
| 06/06/14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 |
| 05/01/13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 0 |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| Baseline Data | | | 0 | 0 | | | | | | 0 | | | 0 | 0 | | | | | 0 | | | | 270 | |

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

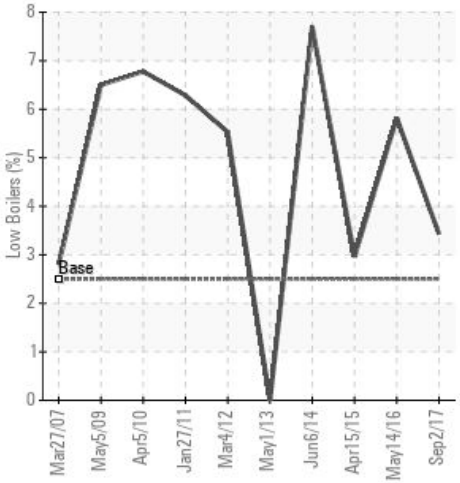
GCD Spectrum



Gas Chromatography Distillation




% Boiling < 335°C




## Historical Comments

| | |
|---|---|
| 05/14/16 | COC Flash Point is severely low. GCD % at <335C has increased to 5.8% and the presence of light ends can be seen in the GCD. IBP has also decreased to 164C. Recommend venting the system. |
| 04/15/15 | Flash point is severely low and system should be vented or fluid changed. Viscosity at 40C is substantially lower than new Calflo AF - investigate source. NOTE: Sample is more than 1 year old and was never completed. Closing out in LIMS system. COC Flash Point is severely low. Visc @ 40°C is abnormally low. |
| 06/06/14 | Flash point is severely low and system should be vented or fluid changed. Viscosity at 40C is substantially lower than new Calflo AF - investigate source. COC Flash Point is severely low. Visc @ 40°C is severely low. |
| 05/01/13 | The accuracy of the results is questionable, specially the low flash point and strange GCD results. We will have a discussion with the lab about this. The oil shows 0 low boilers, 5.5% less that the last sample yet the viscosity dropped by another 10%. The flash point dropped by 50 deg C which is too much of a drop since the last sample was at 170-180C. We are releasing the report but have trust issues with the flash point and GCD data. Regardless of the above, one thing is sure is the system needs venting to get the viscosity back up and and low boilers under control. COC Flash Point is severely low. Visc @ 40°C is severely low. (GCD) 90% Distillation Point is marginally low. |
| | |