

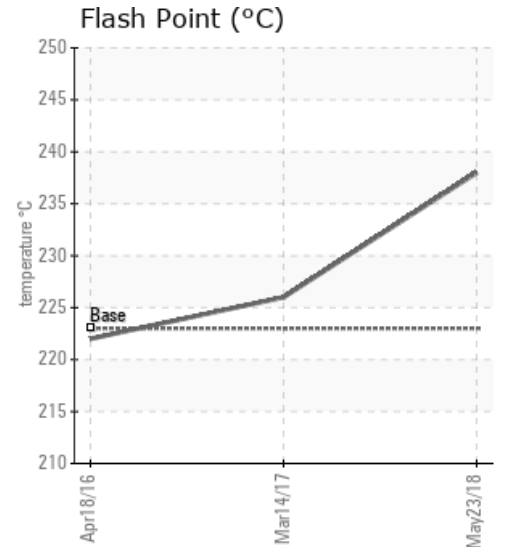
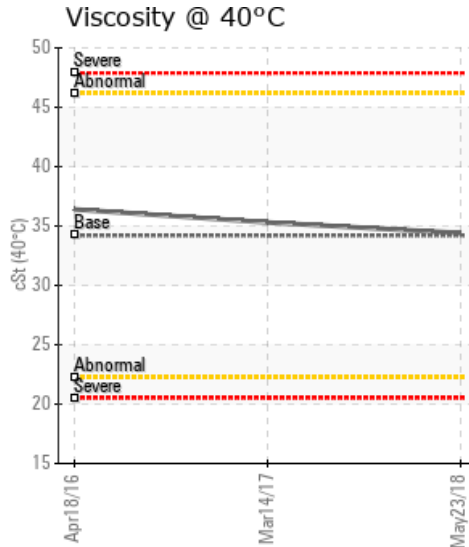
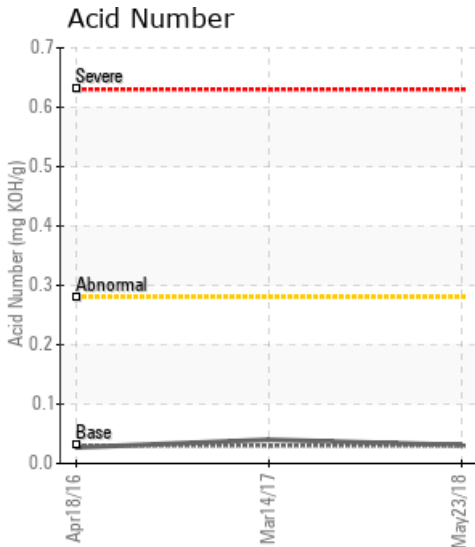
## TOURMALINE COLUMBIA 16-36-44-15W5

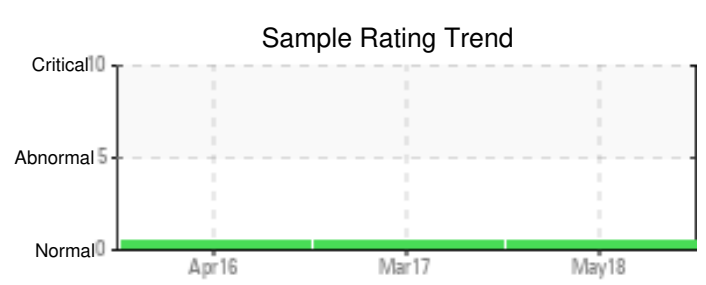
Customer: PTRHTF20046	System Information	Sample Information
QUADRA CHEMICALS 12925 146TH STREET EDMONTON, AB T5L 2H6 CANADA Attn: Ada Aponte Tel: E-Mail: Ada_Aponte@quadra.ca	System Volume: 20000 ltr Bulk Operating Temp: 428F / 220C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make:	Lab No: 02218641 Analyst: Peter Harteveld Sample Date: 05/23/18 Received Date: 05/28/18 Completed: 05/29/18 To discuss this report contact Peter Harteveld at (780)967-4234

Recommendation: The fluid is in excellent condition and suitable for further use. Please re-sample in 12 months.

Comments:

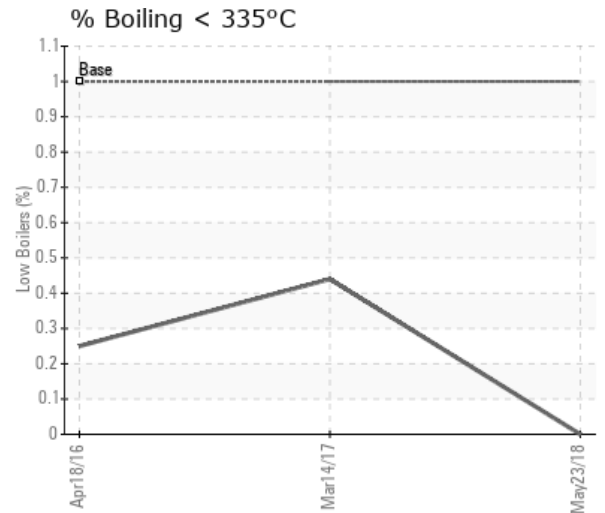
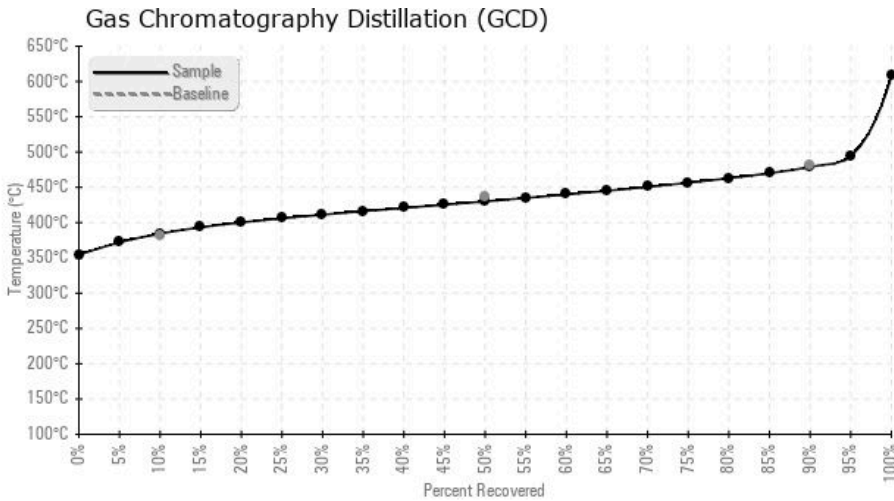
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
05/23/18	05/28/18	0y	15-36-44-15W5	460 / 238	84.5	34.4	0.031	0.040	724 / 384	806 / 430	894 / 479	0.00
03/14/17	03/21/17	2y	PUMP	439 / 226	212.7	35.3	0.04	0.214	722 / 383	814 / 434	914 / 490	0.44
04/18/16	04/20/16	2y		432 / 222	166.5	36.4	0.027	0.041	722 / 383	811 / 433	909 / 487	0.25
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00





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
05/23/18	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	1	0	0	0	0	0
03/14/17	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
04/18/16	12	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	1	0	0	0	1	1
Baseline Data			0	0						0			0	0					0				0	

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



### Historical Comments

03/14/17	The fluid is in good condition and suitable for further use. Please re-sample in 12 months.
04/18/16	The condition of the fluid is like fresh Petro-Therm. This is to be expected after two weeks of service. The analysis can be used as base line reference for future analysis. For the record: Vaporization problems were reported. Blanket gas (natural gas) pressure was initially set at 25 psi. This is too high and can related to the experienced vaporization problems. Recommended blanket gas pressure is 2-3 psig. Nitrogen preferred.

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