

# HEAT TRANSFER SYSTEM

**Customer: PTRHTF30062**  
 ARBEC FOREST GROUP  
 1101 WATER STREET  
 MIRAMICHI, NB E1N 4C6 CANADA  
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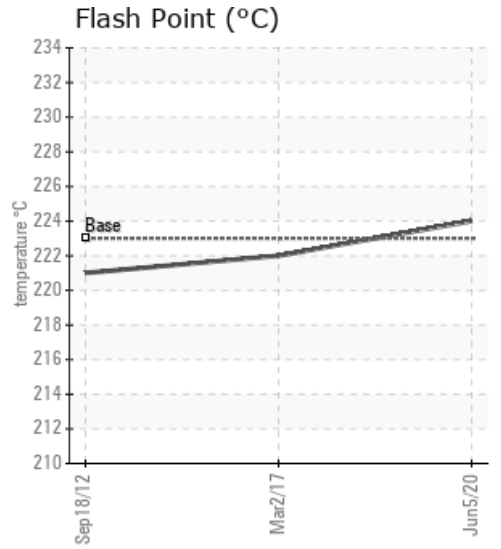
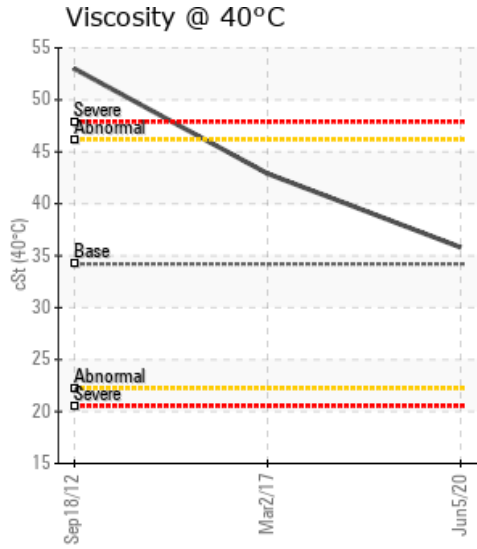
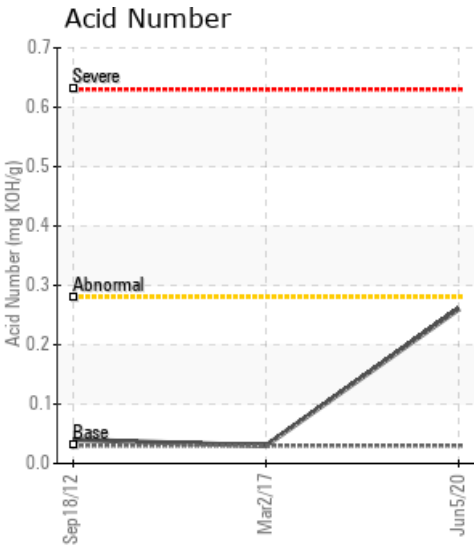
**System Information**  
 System Volume: 12000 ltr  
 Bulk Operating Temp: 491F / 255C  
 Heating Source:  
 Blanket:  
 Fluid: PETRO CANADA PETRO-THERM  
 Make: GTS

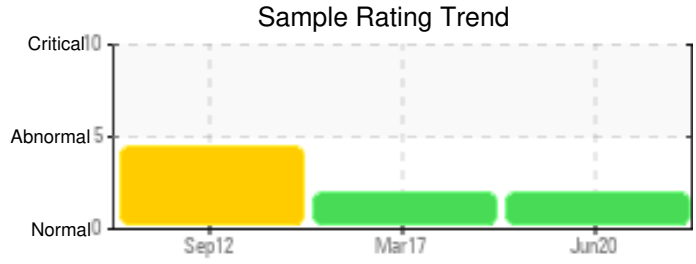
**Sample Information**  
 Lab No: 02359482  
 Analyst: Jean Lacharite  
 Sample Date: 06/05/20  
 Received Date: 06/15/20  
 Completed: 07/15/20  
 Jean Lacharite  
 jean.lacharite@petrocanadalsp.com

Recommendation: the Iron is in warning level, at 156, it can indicate a possible presence of corrosion at a low level. the AN Level is 0.26 and it is acceptable up to 0.4. it is to watch. the GCD graph is good and the GCD 10%, 50% and 90% are all normal. The sodium is marginal could be provide by external source. If it is a departure after a shutdown period there may have been an accumulation of moisture which caused corrosion. Continue operations redo analysis in 6 monthsle fer est au niveau d'avertissement, à 156, il peut indiquer une présence possible de corrosion à un niveau bas. le niveau AN est de 0,26 et il est acceptable jusqu'à 0,4. c'est regarder. le graphique GCD est bon et les GCD 10%, 50% et 90% sont tous normaux. Le sodium pourrait provenir d'une présence extérieure. Le sodium est marginal il peut provenir d'une source externe. S'il s'agit d'un départ après une période d'arrêt, il peut y avoir eu une accumulation d'humidité qui a provoqué la corrosion. Poursuivre l'analyse des opérations dans 6 mois

Comments: Iron ppm levels are marginal. Sodium ppm levels are abnormally high.

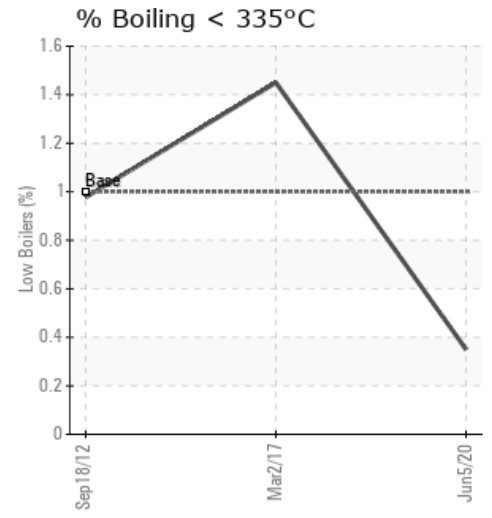
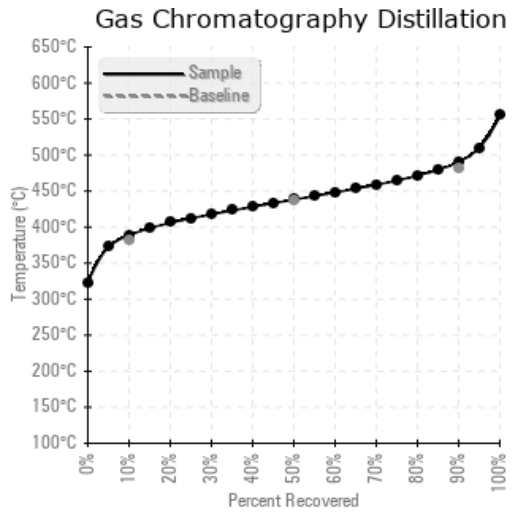
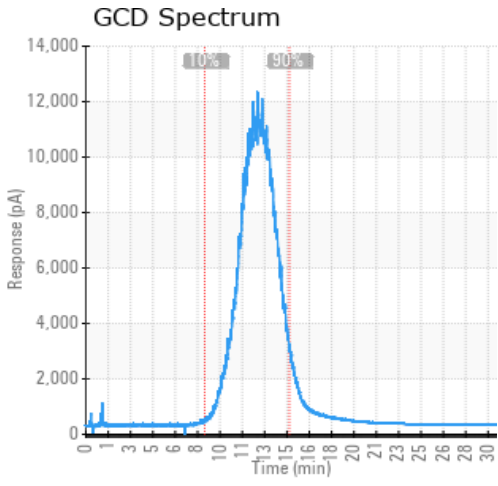
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
06/05/20	06/15/20	8y	WESP HEATING LOOP	435 / 224	29.4	35.8	0.26	0.222	731 / 389	821 / 438	915 / 490	0.35
03/02/17	03/09/17	0y	HOT POND THRML LOOP	432 / 222	27.5	42.9	0.03	0.195	731 / 389	840 / 449	927 / 497	1.45
09/18/12	09/19/12	132y	OVERHEAD A PUMP	430 / 221	63	53	0.04	0.021	790 / 421	849 / 454	917 / 492	0.977
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
06/05/20	156	0	0	0	10	0	0	0	0	0	1	37	0	0	0	0	2	0	0	0	12	0	4	6
03/02/17	38	0	0	0	1	0	0	0	0	0	0	22	0	0	0	0	0	0	0	0	9	0	2	2
09/18/12	27	0	0	0	0	0	0	0	0	0	1	7	0	0	0	0	0	0	0	0	3	0	2	0
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

03/02/17	We notice traces of sodium (Na= 22ppm) in the sample. This could indicate contamination from another type of lubricant. The GCD 90% Distillation Point is abnormally high and potentially related to presence of sodium in the Petro-Therm. All other parameters are normal. Your Petro-Therm is in good condition and can stay in service until next sampling. We recommend a new sample in 12 months. Sodium ppm levels are abnormally high. (GCD) 90% Distillation Point is abnormally high.
09/18/12	The oil is in acceptable condition for further use. The viscosity is heavier than Petro-Therm but still considered normal because Petro-Therm was a higher viscosity oil before 2006. Plus this system may have been topped-up with competitive oils of higher viscosity. Please re-sample every 9-12 months to take advantage of this free service and keep monitoring the fluid and system condition.

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