

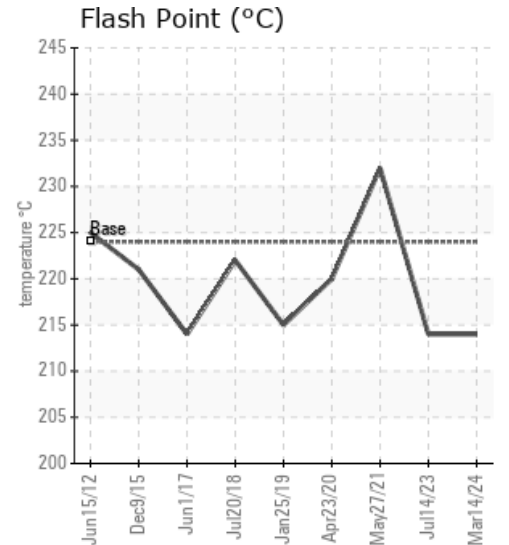
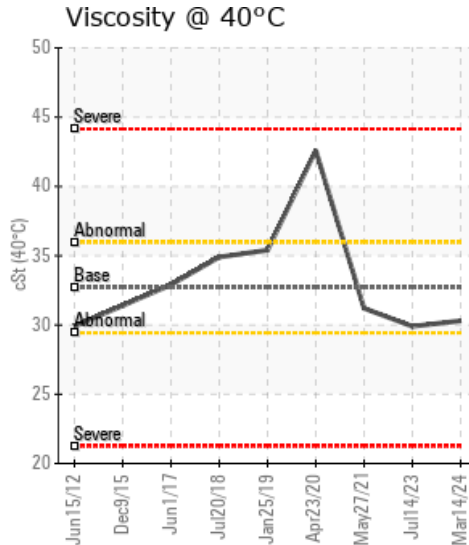
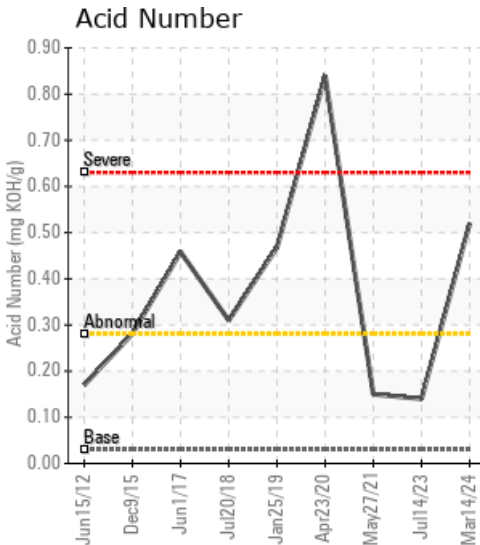
## PASTE PLANT 2 HTF

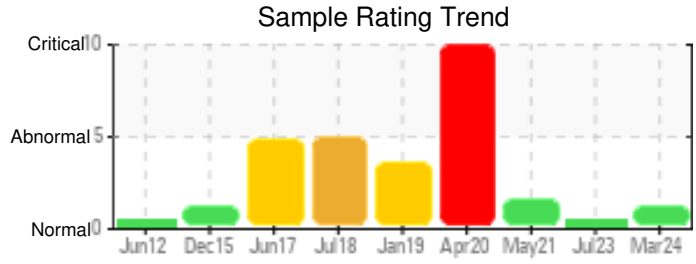
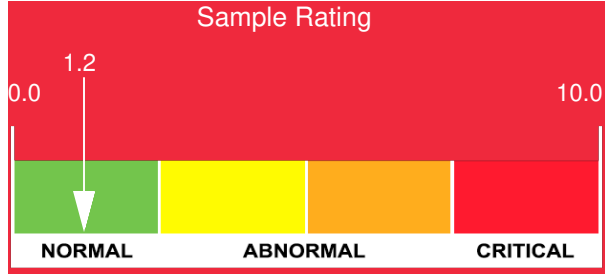
Customer: PTRHTF60012	System Information	Sample Information
TOMAGO ALUMINIUM COMPANY 638 TAMAGO ROAD, TOMAGO NEW SOUTH WALES NEWCASTLE, 2324 AU Attn: Julien Maugain Tel: (040)584-3717 E-Mail: julien.maugain@tomago.com.au	System Volume: 15000 ltr Bulk Operating Temp: 414F / 212C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make: GKSS INDUSTRIAL HEAT	Lab No: 02625469 Analyst: Bill Quesnel CLS,OMA II,MLA-III,LLA-I Sample Date: 03/14/24 Received Date: 03/28/24 Completed: 04/08/24 Bill Quesnel CLS,OMA II,MLA-III,LLA-I

Recommendation: The Acid Number has increased since the previous sample. All other fluid properties are acceptable. Resample at the next service interval to monitor.

Comments: Acid Number (AN) is abnormally high.

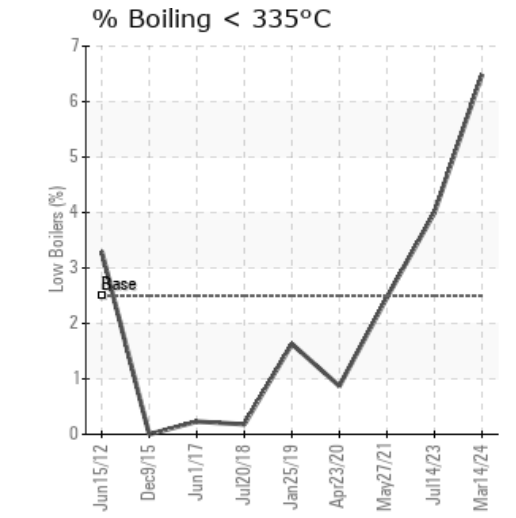
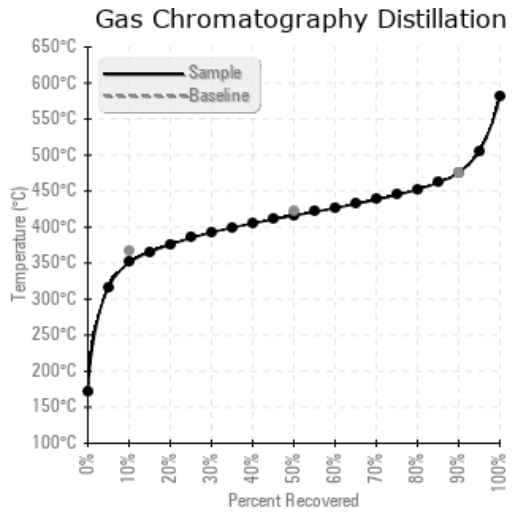
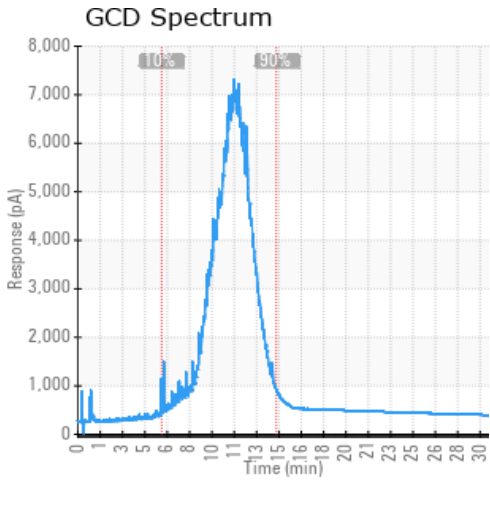
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
03/14/24	03/28/24	3.0y		417 / 214	215	30.3	0.52	0.266	663 / 351	781 / 416	888 / 475	6.49
07/14/23	08/14/23	2.0y		417 / 214	20.2	29.9	0.14	0.164	684 / 362	797 / 425	899 / 482	4.00
05/27/21	08/13/21	0.0y	SAMPLE 1	450 / 232	12.7	31.2	0.15	0.680	696 / 369	801 / 427	895 / 480	2.47
04/23/20	08/14/20	9.0y	PP2 BUSS COOLER	428 / 220	153.4	42.6	0.84	1.22	707 / 375	801 / 427	906 / 486	0.87
01/25/19	04/01/19	0.0y		419 / 215	26.9	35.4	0.468	0.583	696 / 369	795 / 424	900 / 482	1.63
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5





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
03/14/24	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	169	2
07/14/23	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	149	2
05/27/21	57	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	240	1
04/23/20	496	0	0	0	0	0	3	0	0	0	2	0	0	0	0	0	6	0	0	0	0	0	228	2
01/25/19	186	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	203	1
Baseline Data			0	0						0			0	0					0				270	

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



### Historical Comments

07/14/23	The fluid is suitable for further service. Resample at the next service interval to monitor.
05/27/21	All parameters meet expected limits except the pentane insolubles. This is likely some carryover from the previous oil charge, despite the clean and flush. Please monitor the levels and if it can be done safely, consider filtration to remove Pentane Insolubles levels are severely high.
04/23/20	Several parameters show great concern regarding the condition of the fluid. Iron levels are severely high, and looking at previous reports, has there been some change in service that has potentially introduced this? Acid number is high, insoluble are high and the viscosity is very high and out of range. This translates to the oil being oxidized and with the increase in viscosity for example, to achieve the same effect, you need to put more heat into the system, which will have an accelerated effect on the degradation. Recommend that you look to change the fluid, including a clean and flush as suspect there will be degraded product that needs to be removed at the next convenient opportunity. Iron ppm levels are severe. Pentane Insolubles levels are severely high. Acid Number (AN) is severely high. (GCD) 90% Distillation Point is marginally high.
01/25/19	Please send one email to Yutong Gao to inform the current fluid working hours (or months, years). The current fluid has adequate viscosity, flash point and distillation points. It is suitable for the further operation. The elevated Acid Number and Solid content all indicate the fluid has minor oxidation. The Fe level is extremely high, but I think it is because of the contamination during the sampling process, or the Fe particles are accumulating in the fluid through the system opening areas after years operation. Please take one sample in 12 months to monitor the oil conditions. Extremely high Iron ppm levels are noted. Solid content is high. Acid Number (AN) is high.

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