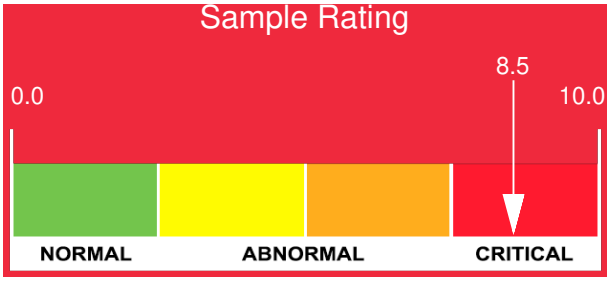
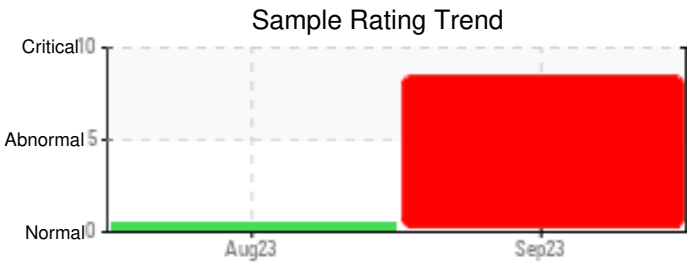




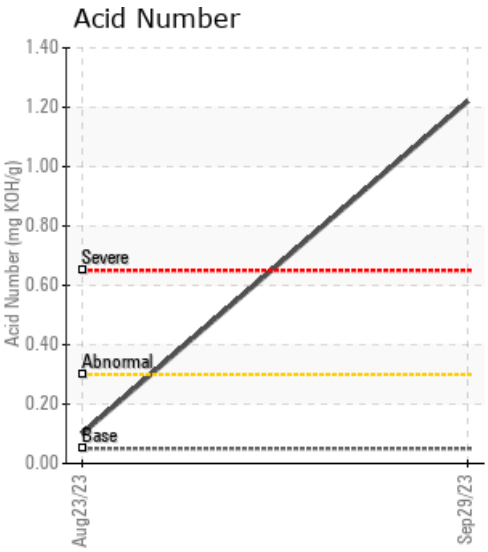
OH-1

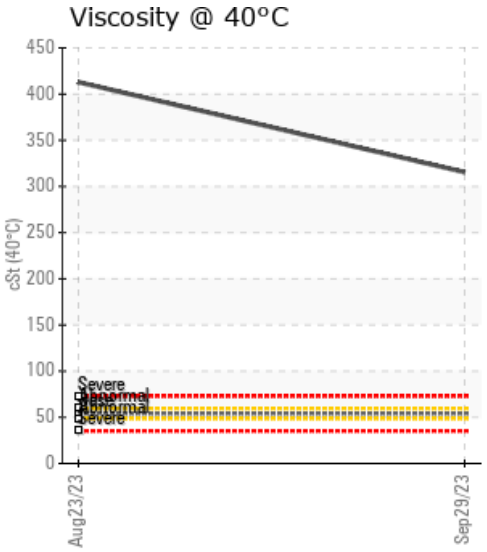
Customer:	System Information	Sample Information
ERGON - KNOXVILLE 3111 MCCLURE LN KNOXVILLE, TN 37920 US Attn: CHARLES LYNCH Tel: E-Mail: Charles.Lynch@ergon.com	System Volume: 3000 gal Bulk Operating Temp: Not Specified Heating Source: Blanket: Fluid: SHELL HEAT TRANSFER OIL S2 X Make: HEATEC	Lab No: 05968347 Analyst: Bill Quesnel CLS,OMA II,MLA-III,LLA-I Sample Date: 09/29/23 Received Date: 10/03/23 Completed: 11/14/23 Bill Quesnel CLS,OMA II,MLA-III,LLA-I

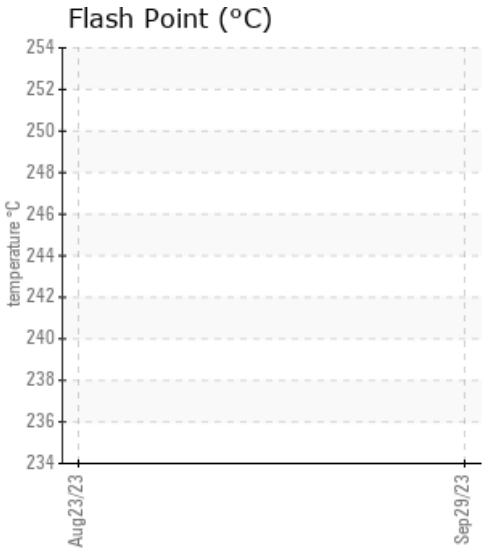
Recommendation: We recommend that you drain the fluid from the component if this has not already been done. Re-sampling is suggested to confirm test results prior to significant maintenance activities being performed. Please indicate that this is a resample on your Sample Information Form (SIF). Diagnostician's Note: The extremely high viscosity dramatically lowers the heat transfer efficiency. Suggest scheduling a change out of the thermal fluid.

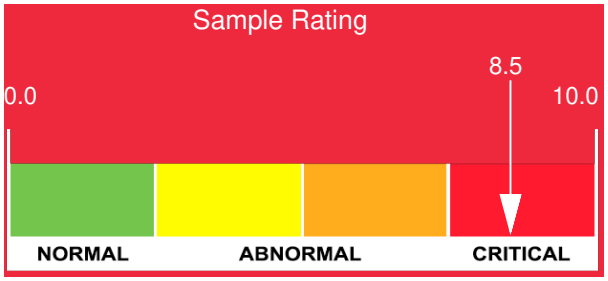
Comments: Iron ppm levels are severe. There is a moderate amount of visible silt present in the sample. The water content is negligible. The fluid viscosity is higher than normal. The high AN level of the fluid indicates the presence of oxi-polymerized products. The AN level is much higher than the recommended limit. Viscosity of sample indicates oil is within ISO 320 range, advise investigate. The fluid is no longer serviceable.

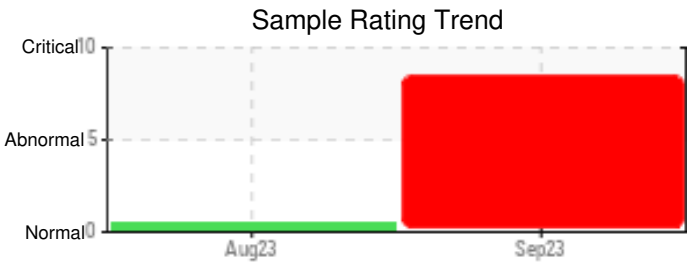
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
09/29/23	10/03/23	0.0h	20249183/TN20	471 / 244	103.8	315.4	1.22	4.42	749 / 399	853 / 456	947 / 508	1.11
08/23/23	08/25/23	0.0h	20249183		126.7	412.9	0.10					
Baseline Data				500 / 260		54	0.05		743 / 395	849 / 454	952 / 511	1.6







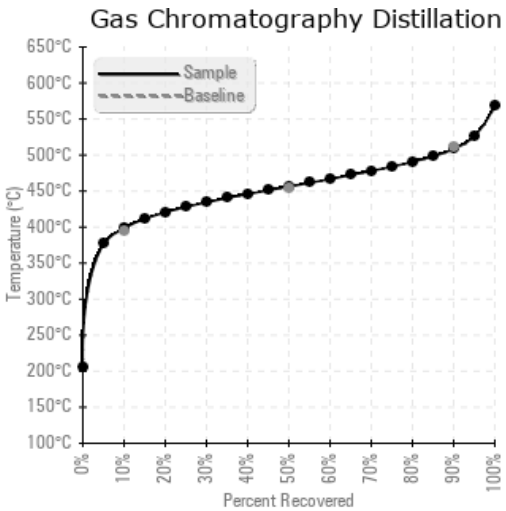


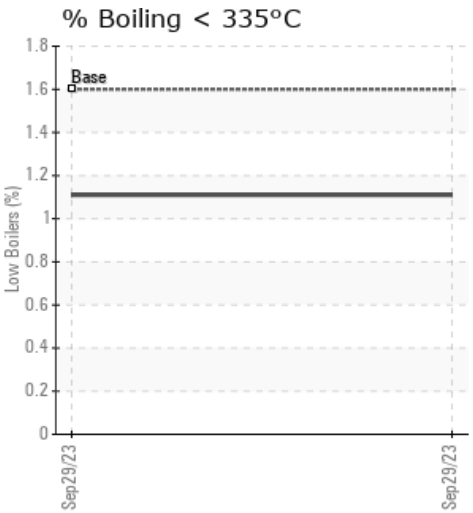


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
09/29/23	442	0	0	0	0	0	0	0	0	0	3	0	0	0	0		5		0	2	0	0	8	0
08/23/23	307	0	0	0	0	0	0	0	0	0	0	1	0	0	0		3		0	0	9	0	1	0
Baseline Data			0	0						0			0	0				0	0				0	

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

GCD Spectrum





Historical Comments

08/23/23	We advise an early resample to confirm this situation.All metal levels are normal indicating no corrosion in the system. The water content is negligible. There is no indication of any contamination in the fluid. The amount and size of particulates present in the system are acceptable. The fluid viscosity is higher than normal. Confirm oil type. The AN level is acceptable for this fluid.

