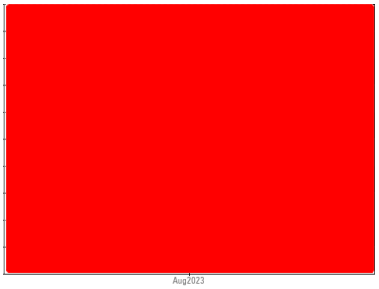
PROBLEM SUMMARY

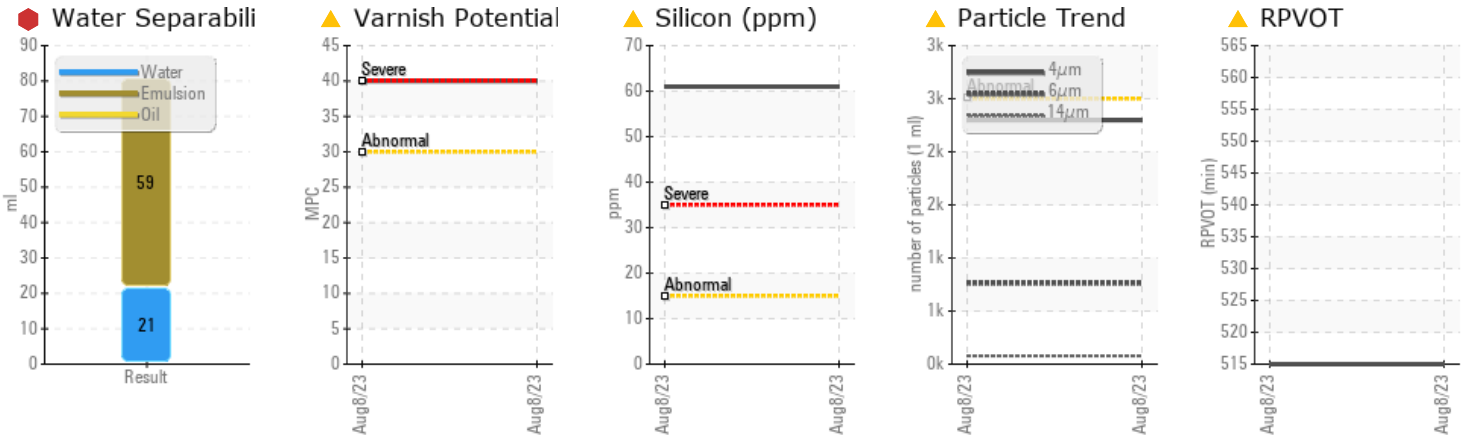
Sample Rating Trend



CONTAMINANT

Machine Id
GT1 (S/N H14092/01)
Component
Turbine
Fluid
PHILLIPS 66 Diamond Class® Turbine Oil AW 46 (--- GAL)

COMPONENT CONDITION SUMMARY



RECOMMENDATION

We advise that you check all areas where dirt can enter the system. We recommend that you use electrostatic filtration or depth media filtration to remove insolubles from the oil and to reduce the levels of varnish in the system. Alternatively draining a percentage of the oil and topping up with fresh oil (sweetening the oil) may provide a reduction in the varnish potential level. We recommend an early resample to monitor this condition. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample. Silicon may be an antifoamant additive. RPVOT result is in range but nearing 1/4 of starting value for this fluid type, consider budgeting for a fluid change or significant re-additization if that is an option in the near future Water separability, air release, RPVOT, and foaming testing was performed at our lab in Canada. Analytical Ferrography: Results show typical amounts of ferrous rubbing wear and environmental contamination, suggesting the lubricant deficiencies are not yet affecting wear patterns on this system.

PROBLEMATIC TEST RESULTS

Sample Status				**SEVERE**	---	---
Silicon	ppm	ASTM D5185m	>15	▲ **61**	---	---
Particles >6µm		ASTM D7647	>640	▲ **763**	---	---
Oil Cleanliness		ISO 4406 (c)	>18/16/13	▲ **18/17/13**	---	---
MPC Varnish Potential	Scale	ASTM D7843	>15	▲ **40**	---	---
Separability	oil/h2o/em	*ASTM D1401	//	⬢ **0/21/59 (30)**	---	---
Oxidation Test (RPVOT)	minutes	*ASTM D2272		▲ **515**	---	---

Customer Id: LEPGRE
Sample No.: WC0835984
Lab Number: 05926135
Test Package: AOM 3

To manage this report scan the QR code

To discuss the diagnosis or test data:
Aaron Black +1
aaron.black@wearcheck.com

To change component or sample information:
Customer Service +1 1-800-237-1369
customerservice@wearcheck.com

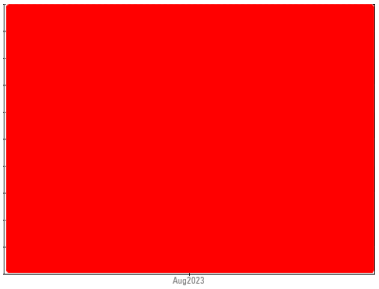
RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Resample	---	---	?	We recommend an early resample to monitor this condition.
Information Required	---	---	?	NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.
Check Dirt Access	---	---	?	We advise that you check all areas where dirt can enter the system.
Filter Fluid	---	---	?	We recommend that you use electrostatic filtration to remove insolubles from the oil and to reduce the levels of varnish in the system. Alternatively draining a percentage of the oil and topping up with fresh oil (sweetening the oil) may provide a reduction in the varnish potential level.

HISTORICAL DIAGNOSIS

OIL ANALYSIS REPORT

Sample Rating Trend



CONTAMINANT

Machine Id
GT1 (S/N H14092/01)
Component
Turbine
Fluid
PHILLIPS 66 Diamond Class® Turbine Oil AW 46 (--- GAL)

DIAGNOSIS

Recommendation

We advise that you check all areas where dirt can enter the system. We recommend that you use electrostatic filtration or depth media filtration to remove insolubles from the oil and to reduce the levels of varnish in the system. Alternatively draining a percentage of the oil and topping up with fresh oil (sweetening the oil) may provide a reduction in the varnish potential level. We recommend an early resample to monitor this condition. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample. Silicon may be an antifoamant additive. RPVOT result is in range but nearing 1/4 of starting value for this fluid type, consider budgeting for a fluid change or significant re-additization if that is an option in the near future Water separability, air release, RPVOT, and foaming testing was performed at our lab in Canada. Analytical Ferrography: Results show typical amounts of ferrous rubbing wear and environmental contamination, suggesting the lubricant deficiencies are not yet affecting wear patterns on this system.

Wear

All component wear rates are normal. The analytical ferrographic results are normal indicating no abnormal wear in the system.

Contaminants

There is a light amount of silt (particulates < 14 microns in size) present in the oil. MPC (Membrane Patch Colorimetry) test indicates a high concentration of varnish present. Water Separability results (ASTM D1401) are poor and indicate that the oil will form emulsions with water. There is a moderate concentration of dirt present in the oil. The water content is negligible.

Oil Condition

The AN level is acceptable for this fluid. Linear Sweep Voltammetry (RULER – ASTM D6971) testing indicates normal levels of anti-oxidants present in the oil.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC0835984**	---	---
Sample Date		Client Info		**08 Aug 2023**	---	---
Machine Age	hrs	Client Info		**36955**	---	---
Oil Age	hrs	Client Info		**36955**	---	---
Oil Changed		Client Info		**N/A**	---	---
Sample Status				**SEVERE**	---	---

WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184		**12**	---	---
Iron	ppm	ASTM D5185m	>15	**0**	---	---
Chromium	ppm	ASTM D5185m	>4	**0**	---	---
Nickel	ppm	ASTM D5185m	>2	**<1**	---	---
Titanium	ppm	ASTM D5185m		**0**	---	---
Silver	ppm	ASTM D5185m		**0**	---	---
Aluminum	ppm	ASTM D5185m	>10	**0**	---	---
Lead	ppm	ASTM D5185m		**0**	---	---
Copper	ppm	ASTM D5185m	>5	**0**	---	---
Tin	ppm	ASTM D5185m	>5	**0**	---	---
Antimony	ppm	ASTM D5185m		**0**	---	---
Vanadium	ppm	ASTM D5185m		**0**	---	---
Beryllium	ppm	ASTM D5185m		**0**	---	---
Cadmium	ppm	ASTM D5185m		**0**	---	---

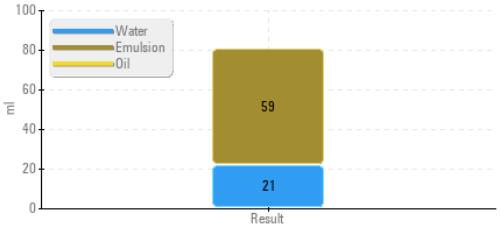
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**<1**	---	---
Barium	ppm	ASTM D5185m		**0**	---	---
Molybdenum	ppm	ASTM D5185m		**0**	---	---
Manganese	ppm	ASTM D5185m		**0**	---	---
Magnesium	ppm	ASTM D5185m		**<1**	---	---
Calcium	ppm	ASTM D5185m		**2**	---	---
Phosphorus	ppm	ASTM D5185m		**38**	---	---
Zinc	ppm	ASTM D5185m		**2**	---	---
Sulfur	ppm	ASTM D5185m		**114**	---	---
Lithium	ppm	ASTM D5185m		**<1**	---	---

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>15	▲ **61**	---	---
Sodium	ppm	ASTM D5185m		**2**	---	---
Potassium	ppm	ASTM D5185m	>20	**<1**	---	---
Water	%	ASTM D6304	>0.03	**0.001**	---	---
ppm Water	ppm	ASTM D6304	>300	**8.1**	---	---

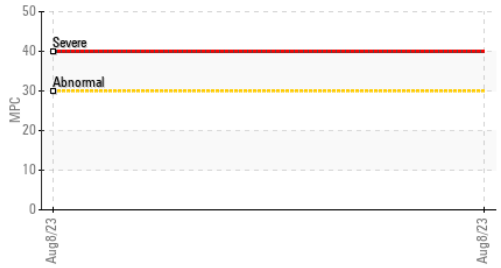
FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647	>2500	**2298**	---	---
Particles >6µm		ASTM D7647	>640	▲ **763**	---	---
Particles >14µm		ASTM D7647	>80	**78**	---	---
Particles >21µm		ASTM D7647	>20	**21**	---	---
Particles >38µm		ASTM D7647	>4	**1**	---	---
Particles >71µm		ASTM D7647	>3	**0**	---	---
Oil Cleanliness		ISO 4406 (c)	>18/16/13	▲ **18/17/13**	---	---

OIL ANALYSIS REPORT

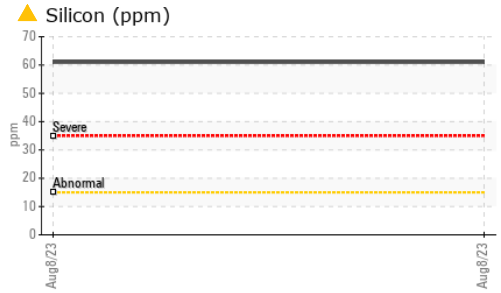
Water Separability



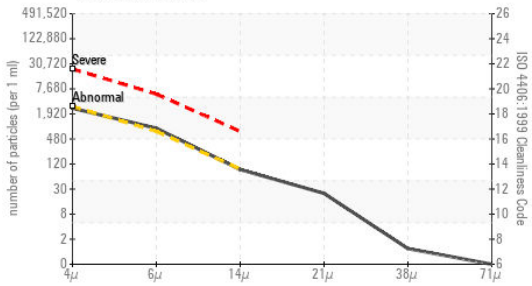
Varnish Potential



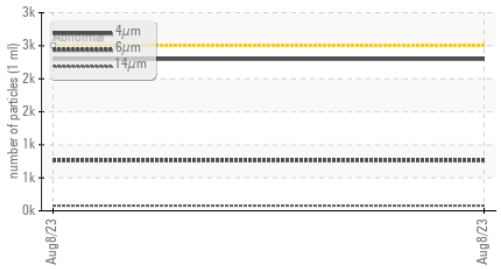
Silicon (ppm)



Particle Count



Particle Trend

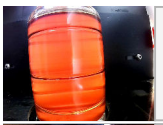
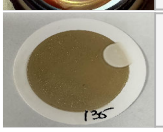


FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045	0.04	**0.15**	---	---
Anti-Oxidant 1	%	ASTM D6971	<25	**69**	---	---
Anti-Oxidant 2	%	ASTM D6971	<25	**47**	---	---
MPC Varnish Potential	Scale	ASTM D7843	>15	▲ **40**	---	---

VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	---	---
Yellow Metal	scalar	*Visual	NONE	**NONE**	---	---
Precipitate	scalar	*Visual	NONE	**NONE**	---	---
Silt	scalar	*Visual	NONE	**NONE**	---	---
Debris	scalar	*Visual	NONE	**LIGHT**	---	---
Sand/Dirt	scalar	*Visual	NONE	**NONE**	---	---
Appearance	scalar	*Visual	NORML	**NORML**	---	---
Odor	scalar	*Visual	NORML	**NORML**	---	---
Emulsified Water	scalar	*Visual	>0.03	**NEG**	---	---
Free Water	scalar	*Visual		**NEG**	---	---

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	47.3	**46.8**	---	---
Visc @ 100°C	cSt	ASTM D445	6.9	**7.1**	---	---
Viscosity Index (VI)	Scale	ASTM D2270	101	**109**	---	---
Separability	oil/h2o/em	*ASTM D1401	//	⬢ **0/21/59 (30)**	---	---
Air Release Time	min	*ASTM D3427		**8.20**	---	---
Foam Tendency	I/II/III	*ASTM D892		**30/20/40**	---	---
Foam Stability	I/II/III	*ASTM D892		**0/0/0**	---	---
ASTM Color	scalar	*ASTM D1500	0.5	**5.0**	---	---
Rust Prevention	PASS/FAIL	ASTM D665		**PASS**	---	---
Oxidation Test (RPVOT)	minutes	*ASTM D2272		▲ **515**	---	---

SEDIMENT		method	limit/base	current	history1	history2
Pentane Insolubles	%	*ASTM D893		**0.042**	---	---

SAMPLE IMAGES	method	limit/base	current	history1	history2
Color				*no image*	*no image*
Bottom				*no image*	*no image*
MPC				*no image*	*no image*

Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0835984 **Received** : 16 Aug 2023
Lab Number : 05926135 **Diagnosed** : 31 Aug 2023
Unique Number : 10606082 **Diagnostician** : Aaron Black
Test Package : AOM 3 (Additional Tests: PntInsol)

To discuss this sample report, contact Customer Service at 1-800-237-1369.
** - Denotes test methods that are outside of the ISO 17025 scope of accreditation.*
Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

LEPRINO FOODS-GREELEY
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GREELEY, CO
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EKLINE@LEPRINOFOODS.COM
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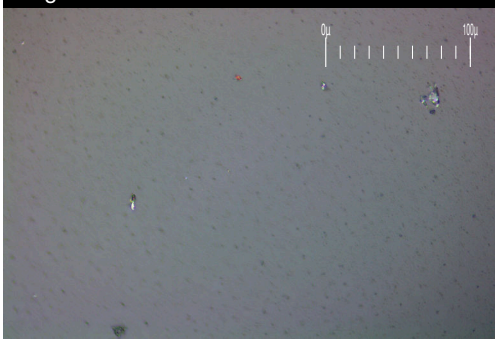
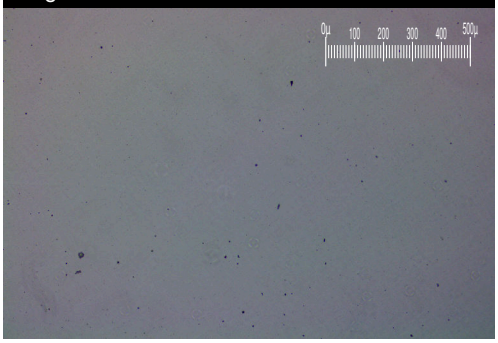
FERROGRAPHY REPORT

Machine Id
GT1 (S/N H14092/01)
Component
Turbine
Fluid
PHILLIPS 66 Diamond Class® Turbine Oil AW 46 (--- GAL)

Magn: 500x Illum: RW



Magn: 100x Illum: RW



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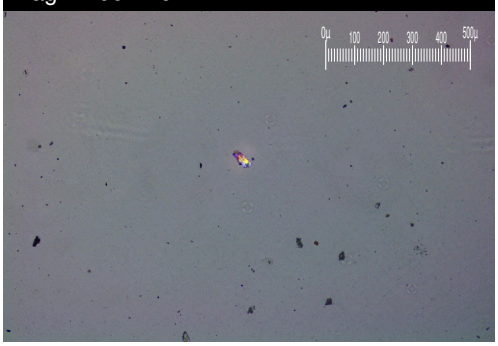
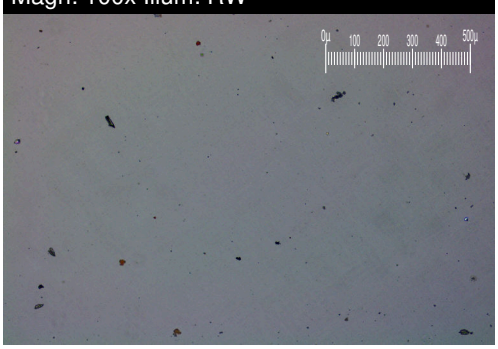


Magn: 100x Illum: RW

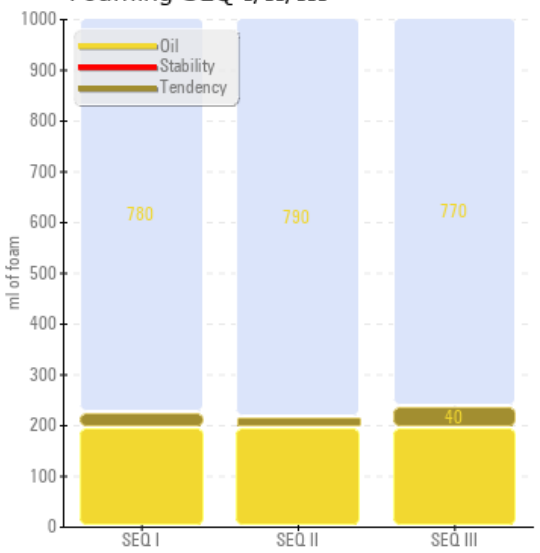


FERROGRAPHY		method	limit/base	current	history1	history2
Ferrous Rubbing	Scale 0-10	*ASTM D7684		1		
Ferrous Sliding	Scale 0-10	*ASTM D7684				
Ferrous Cutting	Scale 0-10	*ASTM D7684				
Ferrous Rolling	Scale 0-10	*ASTM D7684				
Ferrous Break-in	Scale 0-10	*ASTM D7684				
Ferrous Spheres	Scale 0-10	*ASTM D7684				
Ferrous Black Oxides	Scale 0-10	*ASTM D7684				
Ferrous Red Oxides	Scale 0-10	*ASTM D7684				
Ferrous Corrosive	Scale 0-10	*ASTM D7684				
Ferrous Other	Scale 0-10	*ASTM D7684				
Nonferrous Rubbing	Scale 0-10	*ASTM D7684				
Nonferrous Sliding	Scale 0-10	*ASTM D7684				
Nonferrous Cutting	Scale 0-10	*ASTM D7684				
Nonferrous Rolling	Scale 0-10	*ASTM D7684				
Nonferrous Other	Scale 0-10	*ASTM D7684				
Carbonaceous Material	Scale 0-10	*ASTM D7684				
Lubricant Degradation	Scale 0-10	*ASTM D7684				
Sand/Dirt	Scale 0-10	ASTM D7684				
Fibres	Scale 0-10	*ASTM D7684				
Spheres	Scale 0-10	*ASTM D7684				
Other	Scale 0-10	*ASTM D7684		2		

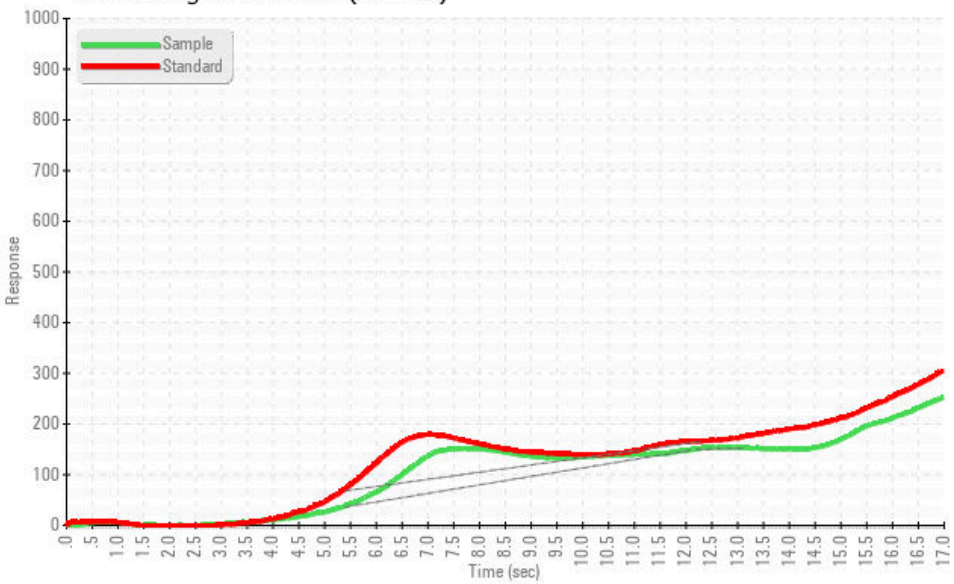
WEAR

All component wear rates are normal. The analytical ferrographic results are normal indicating no abnormal wear in the system.

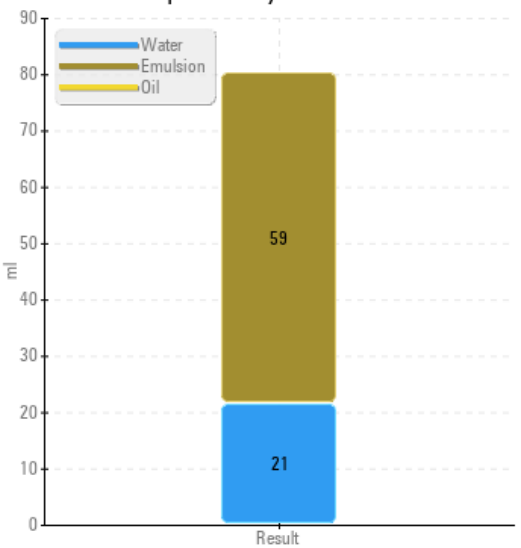
Foaming SEQ I/II/III



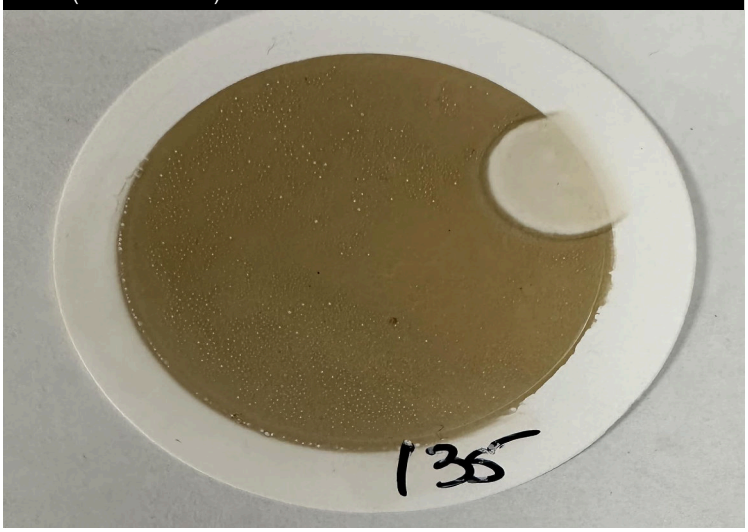
Remaining Useful Life (RULER)



Water Separability



MPC (Varnish Test)



Sample Color & Clarity