

OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL

Area **THUNDER SPIRIT [700404925]** Machine Id **T041 (S/N 20111455396)** Component

Transformer Oil Fluid NOT GIVEN (658 GAL)

DIAGNOSIS

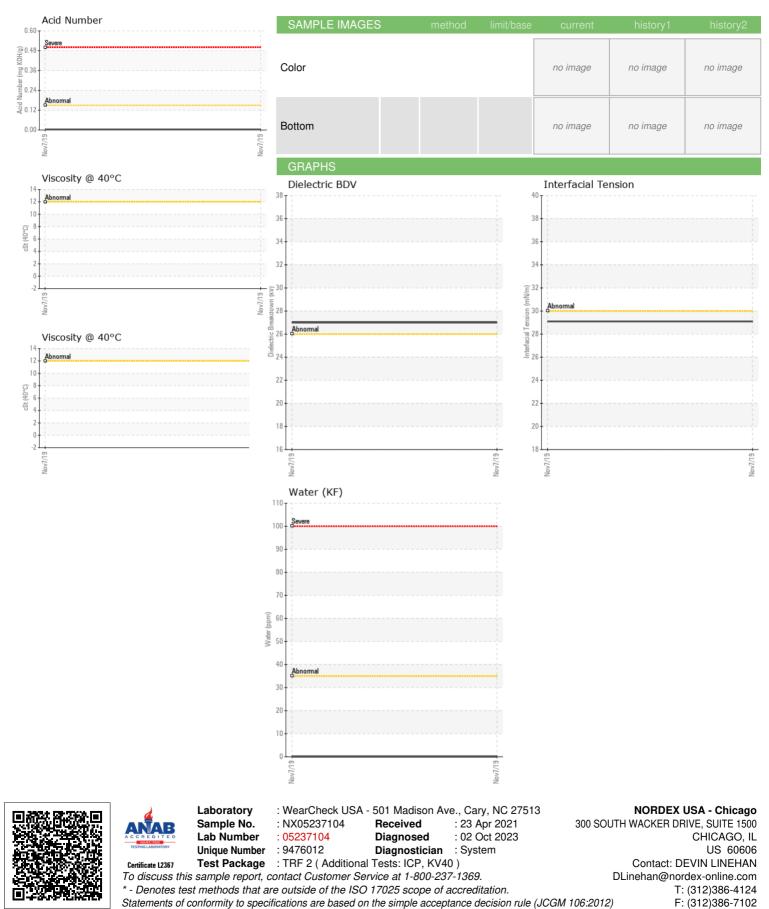
Recommendation

This is a baseline read-out on the submitted sample. All tests and evaluation performed at subcontracted ISO 17025 laboratory.

Sample Date Client Info 15 Apr 2021 07 Nov 2019 Machine Age hrs Client Info 0 0 Oil Age hrs Client Info 0 0 Oil Changed Client Info N/A N/A Sample Status nethod imit/base current history1 history2 ppm Water ppm ASTM D63/24 >35 0 DISSOLVED GAS ANALYSIS (DGA) method imit/base current history1 history2 DGA - 12 ppm 'NSTM 058/26 4/430/8 DGA - C2 ppm 'NSTM 058/26 386 DGA - CO2 ppm<'/STM 058/26 386 DGA - CO2 ppm<'/sTM 058/26 4 DGA - Acetylene ppm<'/sTM 058/26 4 DGA - Acetylene ppm<'/sTM 058/26 4				Nov2019	Apr2021		
Sample Date Client Info 15 Apr 2021 07 Nov 2019 Machine Age hrs Client Info 0 0 Oil Age hrs Client Info 0 0 Oil Changed Client Info N/A N/A Sample Status method limit/base current history1 history2 ppm Water ppm ASTM D6304<>35 0 DISSOLVED CAS ANALYSIS (DGA) method limit/base current history1 history2 DGA 12 ppm 'XSTM 056/2(e) 4 43298 DGA CO ppm 'XSTM 056/2(e) 386 DGA CO ppm 'XSTM 056/2(e) 4 DGA Accetylene ppm<'/td> 'XSTM 056/2(e) 4 DGA Accetylene ppm<'/td> 'XSTM 056/2(e) 4	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
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Oil Age hrs Client Info 0 0 Oll Changed Client Info N/A N/A N/A Sample Status Imit base NORMAL SEVERE CONTAMINANTS method limit/base current history1 history2 ppm Water ppm ASTM D6304 >35 0 DISSOLVED GAS ANALYSIS (DGA) method limit/base current history1 history2 DGA - O2 ppm 'ASTM D6302(e) 4 43298 DGA - C0 ppm 'ASTM D6302(e) 51 DGA - C02 ppm 'ASTM D6302(e) 386 DGA - C02 ppm 'ASTM D6302(e) 4 DGA - C02 ppm 'ASTM D6302(e) 4 DGA - C02 ppm 'ASTM D6302(e) 4 DGA - Ethylene ppm<'ASTM D6302(e)	Sample Date		Client Info		15 Apr 2021	07 Nov 2019	
Oil Changed Sample Status Client Info N/A N/A N/A Sample Status method limit/base current history1 history2 ppm Water ppm ASTM D6304 >35 0 DISOLVED GAS ANALYSIS (DGA) method limit/base current history1 history2 DGA - O2 ppm 'ASTM D6312(e) 494 DGA - O2 ppm 'ASTM D6312(e) 51 DGA - CO ppm 'ASTM D6312(e) 366 DGA - CO2 ppm 'ASTM D6312(e) 386 DGA - CO2 ppm 'ASTM D6312(e) 4 DGA - CO2 ppm 'ASTM D6312(e) 4 290	Machine Age	hrs	Client Info		0	0	
Sample Status NORMAL SEVERE CONTAMINANTS method limit/base current history1 history2 ppm Water ppm ASTM D6304 >35 0 DISSOLVED GAS ANALYSIS (DGA) method limit/base current history1 history2 DGA - O2 ppm 'ASTM 05812(e) 4944 DGA - O2 ppm 'ASTM 05812(e) 10748 DGA - CO2 ppm 'ASTM 05812(e) 386 DGA - CO2 ppm 'ASTM 05812(e) 4 DGA - CO2 ppm 'ASTM 05812(e) 4 DGA - Acetylene ppm 'ASTM 05812(e) 4 DGA - Ethane ppm 'ASTM 05812(e) 4 DGA - Total Gas Content % 'ASTM 05812(e) 63129 DGA - Total Gas Content % Yistm 03812(e) 63129 DGA - Total	Oil Age	hrs	Client Info		0	0	
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DGA - H2 ppm 'ASTM D3612(e) ▲ 43298 DGA - O2 ppm 'ASTM D3612(e) 494 DGA - N2 ppm 'ASTM D3612(e) 10748 DGA - CO ppm 'ASTM D3612(e) 51 DGA - CO2 ppm 'ASTM D3612(e) 386 DGA - CO2 ppm 'ASTM D3612(e) 386 DGA - Acetylene ppm 'ASTM D3612(e) 4 DGA - Total Gas Content %ASTM D3612(e) 4290 DGA - Total Gas Content %ASTM D3612(e) 63129 DGA - Total Gas Content %ASTM D3612(e) 0.003 FLUID DEGRADATION method limit/base current history1 history2 Moite Metal scalar *Visual NONE VLITE Yellow Metal scalar *Visual NONE VLITE Yellow Me	ppm Water	ppm	ASTM D6304	>35		0	
DGA - O2 ppm /ASTM D3612(e) 494 DGA - O2 ppm 'ASTM D3612(e) 10748 DGA - CO ppm 'ASTM D3612(e) 51 DGA - CO2 ppm 'ASTM D3612(e) 386 DGA - Methane ppm 'ASTM D3612(e) 4 DGA - Acetylene ppm 'ASTM D3612(e) 4 DGA - Acetylene ppm 'ASTM D3612(e) 4290 DGA - Ethylene ppm 'ASTM D3612(e) 4290 DGA - Total Gas Content '% ASTM D3612(e) 63129 DGA - Total Gas Content '% ASTM D3612(e) 0.003 FLUID DEGRADATION method limit/base current history1 history2 Mkite Metal scalar 'Visual NONE VLITE Yellow Metal scalar 'Visual NONE VLITE	DISSOLVED GAS ANAL	YSIS (DGA) method	limit/base	current	history1	history2
DGA - N2 ppm 'ASTM D3612(e) 10748 DGA - CO ppm 'ASTM D3612(e) 51 DGA - CO2 ppm 'ASTM D3612(e) 386 DGA - CO2 ppm 'ASTM D3612(e) 386 DGA - Methane ppm 'ASTM D3612(e) 4 DGA - Schylene ppm 'ASTM D3612(e) 4 DGA - Ethane ppm 'ASTM D3612(e) 63129 DGA - Total Gas Content % 'ASTM D3612(e) 63129 DGA - Total Gas Content % 'ASTM D3612(e) 63129 DGA - Total Combustible Gas ppm 'ASTM D3612(e) 0.003 FLUID DEGRADATION mg KOHg ASTM D3612(e) 0.003 VISUAL method limit/base current history1 history2 White Metal scalar 'Visual NONE VLITE	DGA - H2	ppm	*ASTM D3612(e)			43298	
DGA - N2 ppm 'ASTM D3612(e) 10748 DGA - CO ppm 'ASTM D3612(e) 386 DGA - CO2 ppm 'ASTM D3612(e) 386 DGA - CO2 ppm 'ASTM D3612(e) 386 DGA - CO2 ppm 'ASTM D3612(e) 4 DGA - Acetylene ppm 'ASTM D3612(e) 4 DGA - Ethane ppm 'ASTM D3612(e) 4290 DGA - Total Gas Content % 'ASTM D3612(e) 63129 DGA - Total Combustible Gas ppm 'ASTM D3612(e) 0.003 FLUID DEGRADATION method limit/base current history1 history2 White Metal scalar 'Visual NONE VLITE Yellow Metal scalar 'Visual NONE VLITE Silt scalar 'Visual NONE VLITE <td>DGA - 02</td> <td></td> <td>*ASTM D3612(e)</td> <td></td> <td></td> <td>494</td> <td></td>	DGA - 02		*ASTM D3612(e)			494	
DGA - COppm'ASTM D3612(e)51DGA - CO2ppm'ASTM D3612(e)386DGA - CO2ppm'ASTM D3612(e)15483DGA - Methaneppm'ASTM D3612(e)4DGA - Acetyleneppm'ASTM D3612(e)4DGA - Ethyleneppm'ASTM D3612(e)4DGA - Ethaneppm'ASTM D3612(e)63129DGA - Total Gas Content%'ASTM D3612(e)63129DGA - Total Combustible Gasppm'ASTM D3612(e)0.003FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOHgASTM D80450.003YISUALmethodlimit/basecurrenthistory1history2White Metalscalar'VisualNONEVLITEYellow Metalscalar'VisualNONEVLITESiltscalar'VisualNONEVLITEDebrisscalar'VisualNONEVLITEAppearancescalar'VisualNORMLAMMONGodoscalar'VisualNORMLAMMONFree Waterscalar'VisualNORMLAMMONFree	DGA - N2		*ASTM D3612(e)			10748	
DGA - CO2 ppm *ASTM D3612(e) 386 DGA - Methane ppm *ASTM D3612(e) ▲ 3 DGA - Acetylene ppm *ASTM D3612(e) ▲ 3 DGA - Ethylene ppm *ASTM D3612(e) 4 DGA - Ethylene ppm *ASTM D3612(e) 4 DGA - Ethylene ppm *ASTM D3612(e) € 4290 DGA - Total Gas Content % *ASTM D3612(e) € 63129 DGA - Total Combustible Gas ppm *ASTM D3612(e) € 63129 FLUID DEGRADATION method limit/base current history1 history2 Acid Number (AN) mg KOH/g ASTM D8045 0.003 YISUAL method limit/base current history1 history2 White Metal scalar *Visual NONE VLITE Yellow Metal scalar *Visual NONE <t< td=""><td>DGA - CO</td><td></td><td>*ASTM D3612(e)</td><td></td><td></td><td>51</td><td></td></t<>	DGA - CO		*ASTM D3612(e)			51	
DGA - Acetyleneppm*ASTM D3612(e)A 3DGA - Ethyleneppm*ASTM D3612(e)4DGA - Ethaneppm*ASTM D3612(e)4290DGA - Total Gas Content%*ASTM D3612(e)63129DGA - Total Combustible Gasppm*ASTM D3612(e)63129FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOHgASTM D80450.003VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONEVLITEYellow Metalscalar*VisualNONEVLITESiltscalar*VisualNONEVLITEDebrisscalar*VisualNONEVLITEAppearancescalar*VisualNORMLLAYRDAppearancescalar*VisualNORMLAMMONGodrscalar*VisualNORMLAMMONFree Waterscalar*VisualNORMLAMMONFree Waterscalar*VisualSo035.1%Free Waterscalar*VisualSo035.1%Free Waterscalar*VisualSo035.1%	DGA - CO2	ppm	*ASTM D3612(e)			386	
DGA - Ethyleneppm*ASTM D3612(e)4DGA - Ethaneppm*ASTM D3612(e)4290DGA - Total Gas Content%*ASTM D3612(e)63129DGA - Total Combustible Gasppm*ASTM D3612(e)63129FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOH/gASTM D3012(e)0.003VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONEVLITEYellow Metalscalar*VisualNONEVLITEPrecipitatescalar*VisualNONEVLITESiltscalar*VisualNONEVLITEDebrisscalar*VisualNONEVLITEAppearancescalar*VisualNOREVLITEQdorscalar*VisualNORMLLAYRDCodorscalar*VisualNORMLAMMONEmulsified Waterscalar*Visual>0.0035.1%Free Waterscalar*Visual>0.0035.1%FLUID PROPERTIESmethodlimit/basecurrenthistory1history2Specific GravityASTM D4052(e) <td>DGA - Methane</td> <td>ppm</td> <td>*ASTM D3612(e)</td> <td></td> <td></td> <td>• 15483</td> <td></td>	DGA - Methane	ppm	*ASTM D3612(e)			• 15483	
DGA - Ethaneppm*ASTM D3612(e)4290DGA - Total Gas Content%*ASTM D3612(e)74757DGA - Total Combustible Gasppm*ASTM D3612(e)63129FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOHlgASTM D80450.003VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONEVLITEYellow Metalscalar*VisualNONEVLITEPrecipitatescalar*VisualNONEVLITESiltscalar*VisualNONEVLITEDebrisscalar*VisualNONEVLITEAppearancescalar*VisualNOREVLITEQdorscalar*VisualNORMLLAYRDAppearancescalar*VisualNORMLAMMONEmulsified Waterscalar*VisualNORMLAMMONFree Waterscalar*VisualNORMLAMMONFLUID PROPERTIESmethodlimit/basecurrenthistory1history2Specific GravityASTM D4052(e)0.878Dielectric BreakdownkVA	DGA - Acetylene	ppm	*ASTM D3612(e)			A 3	
DGA - Total Gas Content%*ASTM D3612(e)74757DGA - Total Combustible Gasppm*ASTM D3612(e)63129FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOH/gASTM D80450.003VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONEVLITEYellow Metalscalar*VisualNONEVLITEPrecipitatescalar*VisualNONEVLITESiltscalar*VisualNONEVLITESand/Dirtscalar*VisualNONEVLITEAppearancescalar*VisualNORMLLAYRDOdorscalar*VisualNORMLAMMONCodorscalar*VisualNORMLAMMONFree Waterscalar*Visual>0.0035.1%FLUID PROPERTIESmethodlimit/basecurrenthistory1history2Specific GravityASTM D4052(e)0.878Dielectric BreakdownkVASTM D1816(e)29.1Interfacial TensionmN/mASTM D971(e)29.1	DGA - Ethylene	ppm	*ASTM D3612(e)			4	
DGA - Total Combustible Gasppm*ASTM D3812(e)63129FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2Acid Number (AN)mg KOH/gASTM D80450.003VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONEVLITEYellow Metalscalar*VisualNONEVLITEPrecipitatescalar*VisualNONEVLITESiltscalar*VisualNONEVLITEDebrisscalar*VisualNONEVLITESand/Dirtscalar*VisualNONEVLITEAppearancescalar*VisualNORMLLAYRDOdorscalar*Visual>0.0035.1%Free Waterscalar*Visual>0.0035.1%FLUID PROPERTIESmethodlimit/basecurrenthistory1history2Specific GravityASTM D4052(e)0.878Dielectric BreakdownkVASTM D1816(e)29.1Interfacial TensionmN/mASTM D971(e)29.1	DGA - Ethane	ppm	*ASTM D3612(e)			4290	
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Acid Number (AN)mg KOH/gASTM D80450.003VISUALmethodlimit/basecurrenthistory1history2White Metalscalar*VisualNONEVLITEYellow Metalscalar*VisualNONEVLITEPrecipitatescalar*VisualNONEVLITESiltscalar*VisualNONEVLITEDebrisscalar*VisualNONEVLITESand/Dirtscalar*VisualNONEVLITEAppearancescalar*VisualNORMLLAYRDOdorscalar*VisualNORMLAMMONEmulsified Waterscalar*Visual>0.0035.1%Free Waterscalar*Visual>0.0035.1%Fulid PROPERTIESmethodlimit/basecurrenthistory1history2Specific GravityASTM D4052(e)0.878Interfacial TensionmN/mASTM D971(e)29.1	DGA - Total Combustible Gas	ppm	*ASTM D3612(e)			63129	
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White Metalscalar*VisualNONEVLITEYellow Metalscalar*VisualNONEVLITEPrecipitatescalar*VisualNONEVLITESiltscalar*VisualNONEVLITEDebrisscalar*VisualNONEVLITESand/Dirtscalar*VisualNONEVLITEAppearancescalar*VisualNORMLLAYRDOdorscalar*VisualNORMLAMMONEmulsified Waterscalar*Visual>0.0035.1%Free Waterscalar*Visual5%FLUID PROPERTIESmethodlimit/basecurrenthistory1history2Specific GravityASTM D4052(e)0.878Interfacial TensionmN/mASTM D971(e)29.1	Acid Number (AN)	mg KOH/g	ASTM D8045			0.003	
Yellow Metalscalar*VisualNONEVLITEPrecipitatescalar*VisualNONEVLITESiltscalar*VisualNONEVLITEDebrisscalar*VisualNONEVLITESand/Dirtscalar*VisualNONEVLITEAppearancescalar*VisualNORMLLAYRDOdorscalar*VisualNORMLAMMONEmulsified Waterscalar*Visual>0.0035.1%Free Waterscalar*Visual5%FLUID PROPERTIESmethodlimit/basecurrenthistory1history2Specific GravityASTM D4052(e)0.878Dielectric BreakdownkVASTM D1816(e)427Interfacial TensionmN/mASTM D971(e)429.1	VISUAL		method	limit/base	current	history1	history2
Precipitatescalar*VisualNONEVLITESiltscalar*VisualNONEVLITEDebrisscalar*VisualNONEVLITESand/Dirtscalar*VisualNONEVLITEAppearancescalar*VisualNORMLLAYRDOdorscalar*VisualNORMLAMMONEmulsified Waterscalar*Visual>0.0035.1%Free Waterscalar*Visual>0.0035.1%Free Waterscalar*VisualSolo35.1%FLUID PROPERTIESmethodlimit/basecurrenthistory1history2Specific GravityASTM D4052(e)0.878Dielectric BreakdownkVASTM D1816(e)427Interfacial TensionmN/mASTM D971(e)429.1	White Metal	scalar	*Visual	NONE	VLITE		
Siltscalar*VisualNONEVLITEDebrisscalar*VisualNONEVLITESand/Dirtscalar*VisualNONEVLITEAppearancescalar*VisualNORMLLAYRDOdorscalar*VisualNORMLAMMONEmulsified Waterscalar*Visual>0.0035.1%Free Waterscalar*Visual>0.0035.1%Free Waterscalar*Visual5%FLUID PROPERTIESmethodlimit/basecurrenthistory1history2Specific GravityASTM D4052(e)0.878Dielectric BreakdownkVASTM D1816(e)427Interfacial TensionmN/mASTM D971(e)429.1	Yellow Metal	scalar	*Visual	NONE	VLITE		
Debrisscalar*VisualNONEVLITESand/Dirtscalar*VisualNONEVLITEAppearancescalar*VisualNORMLLAYRDOdorscalar*VisualNORMLAMMONEmulsified Waterscalar*Visual>0.0035.1%Free Waterscalar*Visual>0.0035.1%Free Waterscalar*Visual5%FLUID PROPERTIESmethodlimit/basecurrenthistory1history2Specific GravityASTM D4052(e)0.878Dielectric BreakdownkVASTM D1816(e)427Interfacial TensionmN/mASTM D971(e)429.1	Precipitate	scalar	*Visual	NONE	VLITE		
Sand/Dirt scalar *Visual NONE VLITE Appearance scalar *Visual NORML LAYRD Odor scalar *Visual NORML AMMON Emulsified Water scalar *Visual >0.0035 .1% Free Water scalar *Visual >0.0035 .1% Fluid PROPERTIES method limit/base current history1 history2 Specific Gravity ASTM D4052(e) 0.878 Dielectric Breakdown kV ASTM D1816(e) 4 27 Interfacial Tension mN/m ASTM D971(e) 4 29.1	Silt	scalar	*Visual	NONE	VLITE		
Appearancescalar*VisualNORMLLAYRDOdorscalar*VisualNORMLAMMONEmulsified Waterscalar*Visual>0.0035.1%Free Waterscalar*Visual5%FLUID PROPERTIESmethodlimit/basecurrenthistory1history2Specific GravityASTM D4052(e)0.878Dielectric BreakdownkVASTM D1816(e)27Interfacial TensionmN/mASTM D971(e)29.1	Debris	scalar	*Visual	NONE	VLITE		
Odor scalar *Visual NORML AMMON Emulsified Water scalar *Visual >0.0035 .1% Free Water scalar *Visual >0.0035 .1% FLUID PROPERTIES method limit/base current history1 history2 Specific Gravity ASTM D4052(e) 0.878 Dielectric Breakdown kV ASTM D1816(e) 27 Interfacial Tension mN/m ASTM D971(e) 29.1	Sand/Dirt	scalar	*Visual	NONE	VLITE		
Emulsified Water scalar *Visual >0.0035 .1% Free Water scalar *Visual 5% FLUID PROPERTIES method limit/base current history1 history2 Specific Gravity ASTM D4052(e) 0.878 Dielectric Breakdown kV ASTM D1816(e) 27 Interfacial Tension mN/m ASTM D971(e) 29.1	Appearance	scalar	*Visual	NORML	LAYRD		
Free Water scalar *Visual 5% FLUID PROPERTIES method limit/base current history1 history2 Specific Gravity ASTM D4052(e) 0.878 Dielectric Breakdown kV ASTM D1816(e) 27 Interfacial Tension mN/m ASTM D971(e) 29.1	Odor	scalar	*Visual	NORML	AMMON		
FLUID PROPERTIES method limit/base current history1 history2 Specific Gravity ASTM D4052(e) 0.878 Dielectric Breakdown kV ASTM D1816(e) 27 Interfacial Tension mN/m ASTM D971(e) 29.1	Emulsified Water	scalar	*Visual	>0.0035	.1%		
Specific Gravity ASTM D4052(e) 0.878 Dielectric Breakdown kV ASTM D1816(e) 27 Interfacial Tension mN/m ASTM D971(e) 29.1	Free Water	scalar	*Visual		5%		
Dielectric Breakdown kV ASTM D1816(e) 27 Interfacial Tension mN/m ASTM D971(e) 29.1	FLUID PROPERT	IES	method	limit/base	current	history1	history2
Interfacial Tension mN/m ASTM D971(e)	Specific Gravity		ASTM D4052(e)			0.878	
	Dielectric Breakdown	kV	ASTM D1816(e)			2 7	
ASTM Color scalar ASTM D1500(e) L1.0	Interfacial Tension	mN/m	ASTM D971(e)			2 9.1	
	ASTM Color	scalar	ASTM D1500(e)			L1.0	



OIL ANALYSIS REPORT



Contact/Location: DEVIN LINEHAN - NORDEX