

## **OIL ANALYSIS REPORT**

Sample Rating Trend





# Machine Id 940009-192504

Component Natural Gas Engine

PETRO CANADA DURON GEO LD 15W40 (8 GAL)

Sample Date     Client Info     26 Mar 2024     12 Jan 2024     01 Dec 2023       Machine Age     hrs     Client Info     11191     10635     10381       Oil Age     hrs     Client Info     600     600     600     600       Sample Status     Client Info     Changed     Chan	N GEO LD 15W40 (8 GAL)								
Sample Date     Client Info     26 Mar 2024     12 Jan 2024     01 Dec 2023       Machine Age     hrs     Client Info     11191     10635     10381       Oil Age     hrs     Client Info     600     600     600       Oil Changed     Client Info     Changed     Changed     Changed     Changed       Sample Status     Client Info     Changed     Changed     Changed     Changed       CONTAMINATION     method     imilibase     current     history1     history2       Water     WC Method     >0.1     NEG     NEG     NEG       WEAR METALS     method     imilibase     current     history1     history2       Iron     ppm     ASTM D5185m     >50     24     9     17       Chromium     ppm     ASTM D5185m     >4     1     0     0       Iron     ppm     ASTM D5185m     >5     <1     0     0       Itanium     ppm     ASTM D5185m     >4     1     0     0	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2		
Machine Age     hrs     Client Info     11191     10635     10381       Oil Age     hrs     Client Info     600     600     600       Oil Changed     Client Info     Changed     Changed     Changed     Changed       Sample Status     Imitibase     current     history1     history2       Water     WC Method     >0.1     NEG     NEG     NEG       WEAR METALS     method     imitibase     current     history1     history2       Iron     ppm     ASTM 05165m     >50     24     9     17       Chromium     ppm     ASTM 05165m     >55     1     <1     <1     <1       Nickel     ppm     ASTM 05165m     >52     10     3     2     Lead     0     0     0       Aluminum     ppm     ASTM 05165m     >40     1     0     0     0     0     0     0     0     0     0     1     <1     0     0     1     1     1	Sample Number		Client Info		GFL0110808	GFL0088464	GFL0088458		
Oil Age   hrs   Client Info   600   600   600   600     Oil Changed   Client Info   Changed   Chad   Changed   Chad </td <td>Sample Date</td> <td></td> <td>Client Info</td> <td></td> <th>26 Mar 2024</th> <td>12 Jan 2024</td> <td>01 Dec 2023</td>	Sample Date		Client Info		26 Mar 2024	12 Jan 2024	01 Dec 2023		
Oil Changed Sample StatusClient InfoChanged NORMALChanged NORMALChanged ABNORMALCONTAMINATIONmethodimil/basecurrenthistory1history2WaterWC Method>0.1NEGNEGNEGWEAR METALSmethodimil/basecurrenthistory1history2IronppmASTM D5185m>5024917ChromiumppmASTM D5185m>551<1	Machine Age	hrs	Client Info		11191	10635	10381		
Sample Status     NORMAL     NORMAL     NORMAL     ABNORMAL       CONTAMINATION     method     limit/base     current     history1     history2       Water     WC Method     >0.1     NEG     NEG     NEG       Wear     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >50     24     9     17       Chromium     ppm     ASTM D5185m     >55     1     <1	Oil Age	hrs	Client Info		600	600	600		
CONTAMINATION     method     limit/base     current     history1     history2       Water     WC Method     >0.1     NEG     NEG     NEG       Wear     WC Method     >0.1     NEG     NEG     NEG       Wear     ppm     ASTM D5185m     >50     24     9     17       Chromium     ppm     ASTM D5185m     >55     1     <1	Oil Changed		Client Info		Changed	Changed	Changed		
Water     WC Method     >0.1     NEG     NEG     NEG       WEAR METALS     method     imil/base     current     history1     history2       Iron     ppm     ASTM D5185m     >50     24     9     17       Chromium     ppm     ASTM D5185m     >50     1     <1	Sample Status				NORMAL	NORMAL	ABNORMAL		
WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >50     24     9     17       Chromium     ppm     ASTM D5185m     >5     1     <1	CONTAMINATI	ON	method	limit/base	current	history1	history2		
Iron     ppm     ASTM D5185m     >50     24     9     17       Chromium     ppm     ASTM D5185m     >5     1     <1     <1     <1       Nickel     ppm     ASTM D5185m     >4     1     0     0       Titanium     ppm     ASTM D5185m     >5     <1     0     8       Silver     ppm     ASTM D5185m     >2     10     3     2       Lead     ppm     ASTM D5185m     >3     0     0     0       Auminum     ppm     ASTM D5185m     >40     1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     1	Water		WC Method	>0.1	NEG	NEG	NEG		
Chromium     ppm     ASTM D5185m     >5     1     <1     <1     <1       Nickel     ppm     ASTM D5185m     >4     1     0     0       Titanium     ppm     ASTM D5185m     >5     <1	WEAR METAL	S	method	limit/base	current	history1	history2		
Nickel     ppm     ASTM D5185m     >4     1     0     0       Titanium     ppm     ASTM D5185m     >5     <1	Iron	ppm	ASTM D5185m	>50	24	9	17		
Titanium     ppm     ASTM D5185m     >5     <1     0     8       Silver     ppm     ASTM D5185m     >3     0     0     0       Aluminum     ppm     ASTM D5185m     >25     10     3     2       Lead     ppm     ASTM D5185m     >40     1     <1	Chromium	ppm	ASTM D5185m	>5	1	<1	<1		
Silver     ppm     ASTM D5185m     >3     0     0     0       Aluminum     ppm     ASTM D5185m     >25     10     3     2       Lead     ppm     ASTM D5185m     >40     1     <1     <1     <1       Copper     ppm     ASTM D5185m     >150     2     <1     0     0       Vanadium     ppm     ASTM D5185m     >4     1     0     0     0       Vanadium     ppm     ASTM D5185m     >4     1     0     0     0       Vanadium     ppm     ASTM D5185m     50     7     20     9       Boron     ppm     ASTM D5185m     50     65     59     52       Magnesium     ppm     ASTM D5185m     50     65     59     52       Magnesium     ppm     ASTM D5185m     50     65     57     548     847       Calcium     ppm     ASTM D5185m     1510     1705     1513     1126       Phosphorus <td>Nickel</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;4</td> <th>1</th> <td>0</td> <td>0</td>	Nickel	ppm	ASTM D5185m	>4	1	0	0		
Aluminum     ppm     ASTM D5185m     >25     10     3     2       Lead     ppm     ASTM D5185m     >40     1     <1	Titanium	ppm	ASTM D5185m	>5	<1	0	8		
Lead     ppm     ASTM D5185m     >40     1     <1     <1     <1       Copper     ppm     ASTM D5185m     >150     2     <1	Silver	ppm	ASTM D5185m	>3	0	0	0		
Lead     ppm     ASTM D5185m     >40     1     <1     <1     <1       Copper     ppm     ASTM D5185m     >150     2     <1	Aluminum		ASTM D5185m	>25	10	3	2		
Tin     ppm     ASTM D5185m     >4     1     0     0       Vanadium     ppm     ASTM D5185m     0     0     0     0       Cadmium     ppm     ASTM D5185m     0     0     0     <1       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     50     7     20     9       Barium     ppm     ASTM D5185m     50     65     59     52       Magnesium     ppm     ASTM D5185m     50     655     59     52       Magnesium     ppm     ASTM D5185m     50     655     57     548     847       Calcium     ppm     ASTM D5185m     780     666     781     1056       Zinc     ppm     ASTM D5185m     780     666     781     1056       Sulfur     ppm     ASTM D5185m     2040     2429     2309     3644       CONTAMINANTS     method     limit/base     c	Lead		ASTM D5185m	>40	1	<1	<1		
Tin     ppm     ASTM D5185m     >4     1     0     0       Vanadium     ppm     ASTM D5185m     0     0     0     <1	Copper	ppm	ASTM D5185m	>150	2	<1	2		
Vanadium     ppm     ASTM D5185m     0     0     0     0       Cadmium     ppm     ASTM D5185m     0     0     0     <1       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     50     7     20     9       Barium     ppm     ASTM D5185m     50     65     59     52       Manganese     ppm     ASTM D5185m     50     65     59     52       Magnesium     ppm     ASTM D5185m     50     65     57     548     847       Calcium     ppm     ASTM D5185m     560     557     548     847       Calcium     ppm     ASTM D5185m     780     666     781     1056       Zinc     ppm     ASTM D5185m     780     980     926     1206       Sulfur     ppm     ASTM D5185m     >2040     2429     2309     3644       CONTAMINANTS     method     limit/base			ASTM D5185m	>4	1	0	0		
Cadmium     ppm     ASTM D5185m     0     0     <1       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     50     7     20     9       Barium     ppm     ASTM D5185m     50     7     20     9       Barium     ppm     ASTM D5185m     50     65     59     52       Manganese     ppm     ASTM D5185m     50     65     59     52       Magnesium     ppm     ASTM D5185m     560     557     548     847       Calcium     ppm     ASTM D5185m     780     666     781     1056       Zinc     ppm     ASTM D5185m     780     980     926     1206       Sulfur     ppm     ASTM D5185m     2040     2429     2309     3644       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     2     <	Vanadium		ASTM D5185m		0	0	0		
Boron     ppm     ASTM D5185m     50     7     20     9       Barium     ppm     ASTM D5185m     5     0     0     0       Molybdenum     ppm     ASTM D5185m     50     65     59     52       Manganese     ppm     ASTM D5185m     0     1     <1			ASTM D5185m		0		<1		
Barium     ppm     ASTM D5185m     5     0     0     0       Molybdenum     ppm     ASTM D5185m     50     65     59     52       Manganese     ppm     ASTM D5185m     0     1     <1     0       Magnesium     ppm     ASTM D5185m     560     557     548     847       Calcium     ppm     ASTM D5185m     1510     1705     1513     1126       Phosphorus     ppm     ASTM D5185m     780     6666     781     1056       Zinc     ppm     ASTM D5185m     870     980     926     1206       Sulfur     ppm     ASTM D5185m     2040     2429     2309     3644       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     6     4     5       Sodium     ppm     ASTM D5185m     >20     2     0     4       INFRA-RED     method     limit/base     cu	ADDITIVES		method	limit/base	current	history1	history2		
Molybdenum     ppm     ASTM D5185m     50     65     59     52       Manganese     ppm     ASTM D5185m     0     1     <1	Boron	ppm	ASTM D5185m	50	7	20	9		
Manganese     ppm     ASTM D5185m     0     1     <1     0       Magnesium     ppm     ASTM D5185m     560     557     548     847       Calcium     ppm     ASTM D5185m     1510     1705     1513     1126       Phosphorus     ppm     ASTM D5185m     780     666     781     1056       Zinc     ppm     ASTM D5185m     870     980     926     1206       Sulfur     ppm     ASTM D5185m     2040     2429     2309     3644       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     2     0     4       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     0     0     0       Nitration     Abs/cm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/cm     *ASTM D7415     >30	Barium	ppm	ASTM D5185m	5	0	0	0		
Magnesium     ppm     ASTM D5185m     560     557     548     847       Calcium     ppm     ASTM D5185m     1510     1705     1513     1126       Phosphorus     ppm     ASTM D5185m     780     6666     781     1056       Zinc     ppm     ASTM D5185m     870     980     926     1206       Sulfur     ppm     ASTM D5185m     2040     2429     2309     3644       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     6     4     5       Sodium     ppm     ASTM D5185m     >20     2     0     4       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     0     0     0       Nitration     Abs/.mm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.hmm     *ASTM D7415     >30	Molybdenum	ppm	ASTM D5185m	50	65	59	52		
Calcium     ppm     ASTM D5185m     1510     1705     1513     1126       Phosphorus     ppm     ASTM D5185m     780     666     781     1056       Zinc     ppm     ASTM D5185m     870     980     926     1206       Sulfur     ppm     ASTM D5185m     2040     2429     2309     3644       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     6     4     5       Sodium     ppm     ASTM D5185m     >20     2     0     4       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     0     0     0       Nitration     Abs/cm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.tmm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.tmm     *ASTM D7415     >30<	Manganese	ppm	ASTM D5185m	0	1	<1	0		
Phosphorus     ppm     ASTM D5185m     780     666     781     1056       Zinc     ppm     ASTM D5185m     870     980     926     1206       Sulfur     ppm     ASTM D5185m     2040     2429     2309     3644       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     6     4     5       Sodium     ppm     ASTM D5185m     >20     2     0     4       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D784     0     0     0       Nitration     Abs/cm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.1mm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.1mm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.1mm     *ASTM D7415	Magnesium	ppm	ASTM D5185m	560	557	548	847		
Zinc     ppm     ASTM D5185m     870     980     926     1206       Sulfur     ppm     ASTM D5185m     2040     2429     2309     3644       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     6     4     5       Sodium     ppm     ASTM D5185m     >20     2     0     4       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     0     0     0       Nitration     Abs/cm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.1mm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.1mm     *ASTM D7415     >30     22.7     18.8     21.9       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     <	Calcium	ppm	ASTM D5185m	1510	1705	1513	1126		
SulfurppmASTM D5185m2040242923093644CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25645SodiumppmASTM D5185m>20960PotassiumppmASTM D5185m>20204INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844000NitrationAbs/cm*ASTM D7624>2011.69.110.7SulfationAbs/.1mm*ASTM D7415>3022.718.821.9FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2518.715.817.5	Phosphorus	ppm	ASTM D5185m	780	666	781	1056		
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25645SodiumppmASTM D5185m960PotassiumppmASTM D5185m>20204INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D78440000NitrationAbs/cm*ASTM D7624>2011.69.110.7SulfationAbs/.1mm*ASTM D7415>3022.718.821.9FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2518.715.817.5	Zinc	ppm	ASTM D5185m	870	980	926	1206		
Silicon     ppm     ASTM D5185m     >25     6     4     5       Sodium     ppm     ASTM D5185m     >20     9     6     0       Potassium     ppm     ASTM D5185m     >20     2     0     4       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     0     0     0     0       Nitration     Abs/cm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.1mm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.1mm     *ASTM D7415     >30     22.7     18.8     21.9       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     18.7     15.8     17.5	Sulfur	ppm	ASTM D5185m	2040	2429	2309	3644		
Sodium     ppm     ASTM D5185m     9     6     0       Potassium     ppm     ASTM D5185m<>20     2     0     4       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     0     0     0     0       Nitration     Abs/cm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.1mm     *ASTM D7415     >30     22.7     18.8     21.9       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     18.7     15.8     17.5	CONTAMINAN	TS	method	limit/base	current	history1	history2		
Potassium     ppm     ASTM D5185m     >20     2     0     4       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     0     0     0       Nitration     Abs/cm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.1mm     *ASTM D7415     >30     22.7     18.8     21.9       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     18.7     15.8     17.5	Silicon	ppm	ASTM D5185m	>25	6	4	5		
Potassium     ppm     ASTM D5185m     >20     2     0     4       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     0     0     0       Nitration     Abs/cm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.1mm     *ASTM D7415     >30     22.7     18.8     21.9       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     18.7     15.8     17.5	Sodium		ASTM D5185m		9	6	0		
Soot %     %     *ASTM D7844     0     0     0       Nitration     Abs/cm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.1mm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.1mm     *ASTM D7415     >30     22.7     18.8     21.9       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     18.7     15.8     17.5	Potassium	ppm	ASTM D5185m	>20	2	0	4		
Nitration     Abs/cm     *ASTM D7624     >20     11.6     9.1     10.7       Sulfation     Abs/.1mm     *ASTM D7415     >30     22.7     18.8     21.9       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     18.7     15.8     17.5	INFRA-RED		method	limit/base	current	history1	history2		
Sulfation     Abs/.1mm     *ASTM D7415     >30     22.7     18.8     21.9       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     18.7     15.8     17.5	Soot %	%	*ASTM D7844		0	0	0		
FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 18.7 15.8 17.5	Nitration	Abs/cm	*ASTM D7624	>20	11.6	9.1	10.7		
Oxidation Abs/.1mm *ASTM D7414 >25 18.7 15.8 17.5	Sulfation	Abs/.1mm	*ASTM D7415	>30	22.7	18.8	21.9		
	FLUID DEGRAD	DATION	method	limit/base	current	history1	history2		
Base Number (BN) mg KOH/g ASTM D2896 10.2 4.0 6.2 🔺 3.7	Oxidation	Abs/.1mm	*ASTM D7414	>25	18.7	15.8	17.5		
	Base Number (BN)	mg KOH/g	ASTM D2896	10.2	4.0	6.2	▲ 3.7		

### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

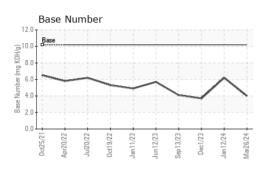
There is no indication of any contamination in the oil.

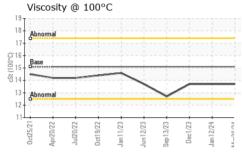
#### Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

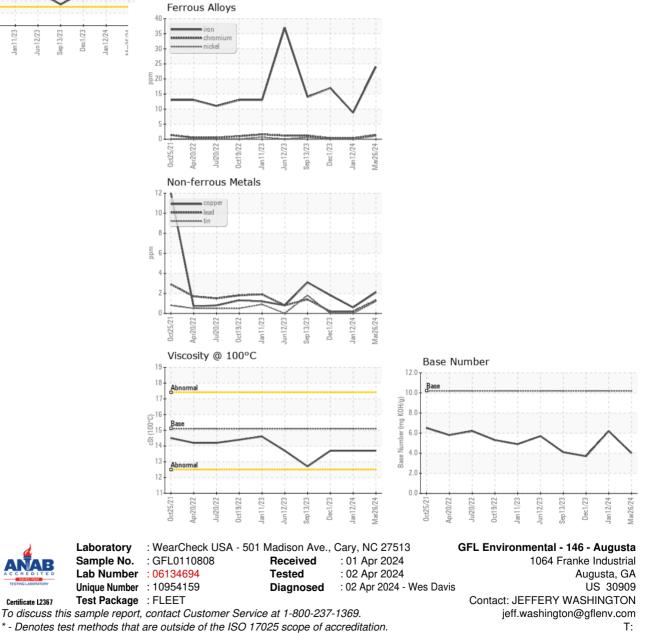


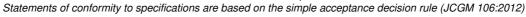
# **OIL ANALYSIS REPORT**





VISUAL		method				history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.1	13.7	13.7	13.7
GRAPHS						





Certificate L2367

Submitted By: CHRISTOPHER FARRER

F: