

## **OIL ANALYSIS REPORT**

Sample Rating Trend



 $\checkmark$ 

NORMAL

Machine Id **30059** Component **Diesel En** Fluid **PETRO C** 

Diesel Engine

## PETRO CANADA DURON SHP 15W40 (9 GAL)

## 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.

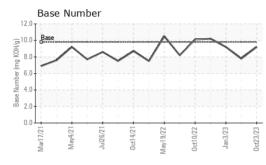
### Fluid Condition

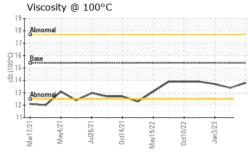
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Glycol     WC Method     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >20     0     <1     0       Nickel     ppm     ASTM D5185m     >20     0     <1     0       Nickel     ppm     ASTM D5185m     >2     0     0     0       Aluminum     ppm     ASTM D5185m     >2     2     2     2       Lead     ppm     ASTM D5185m     >20     2     2     2       Lead     ppm     ASTM D5185m     >20     2     1     0     0       Vanadium     ppm     ASTM D5185m     >1     0     0     0       Vanadium     ppm     ASTM D5185m     0     2     1     0       Cadmium     ppm     ASTM D5185m     0     4     0     0     0       AstM D5185m     0     2     1     0     0     0     <	Sample Number		Client Info		PCA0105997	PCA0095336	PCA0088027
Oil Age     Ins     Client Info     379     614     179       Oil Changed     Client Info     Not Changed     Not Changed     Not Changed       Sample Status     Imit Method     Imit Moase     euront     history1     history2       Fuel     WC Method     >3.0     <1.0     <1.0     <1.0       Glycol     WC Method     >3.0     <1.0     <1.0     <1.0       Chromium     ppm     ASTM 05185m     >120     4     4     4       Chromium     ppm     ASTM 05185m     >20     0     <1     0       Nickel     ppm     ASTM 05185m     >22     2     2     2       Lead     ppm     ASTM 05185m     >20     0     0     0       Adminum     ppm     ASTM 05185m     >20     2     2     2       Lead     ppm     ASTM 05185m     >20     2     2     2       Lead     ppm     ASTM 05185m     0     0     0     0       ASTM 0518							
Oli Changed Sample Status Client Info Not Changed NORMAL Not Changed NEG Not Changed NEG Not Changed NEG Not Changed NEG Not Changed NEG Not Changed NEG Not Change <n< th=""> Not Change<nd< th=""> Not Change<nic< th=""> Not Site Not Site Not Site Not Site Not Site Not Site</nic<></nic<></nic<></nic<></nic<></nic<></nic<></nic<></nic<></nic<></nic<></nic<></nic<></nd<></n<>	0						
Sample Status     NORMAL     NORMAL     NORMAL     NORMAL       CONTAMINATION     method     limit/base     current     history1     history2       Fuel     WC Method     >3.0     <1.0     <1.0     <1.0       Glycol     WC Method     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >120     4     4     4       Chromium     ppm     ASTM D5185m     >20     0     <1     0       Nickel     ppm     ASTM D5185m     >20     2     2     2       Lead     ppm     ASTM D5185m     >20     2     2     2       Lead     ppm     ASTM D5185m     >40     <1     0     0       Copper     ppm     ASTM D5185m     >15     <1     0     0       Cadmium     ppm     ASTM D5185m     0     4     0     0       Barium     ppm	-	hrs					
CONTAMINATION     method     limit/base     current     history1     history2       Fuel     WC Method     >3.0     <1.0     <1.0     <1.0       Glycol     WC Method     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >20     0     <1     0       Nickel     ppm     ASTM D5185m     >2     0     0     0       Silver     ppm     ASTM D5185m     >2     1     0     0       Copper     ppm     ASTM D5185m     >20     2     2     2       Lead     ppm     ASTM D5185m     >40     <1     0     0       Cadmium     ppm     ASTM D5185m     >15     <1     0     0       Vanadium     ppm     ASTM D5185m     >1     0     0     0       Cadmium     ppm     ASTM D5185m     0     2     1     0       Bariump	-		Client Info		-	U	0
Fuel     WC Method     >3.0     <1.0	Sample Status				NORMAL	NORMAL	NORMAL
Glycol     WC Method     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >20     0     <1     0       Nickel     ppm     ASTM D5185m     >20     0     <1     0       Nickel     ppm     ASTM D5185m     >2     0     0     0       Aluminum     ppm     ASTM D5185m     >2     2     2     2       Lead     ppm     ASTM D5185m     >20     2     2     2       Lead     ppm     ASTM D5185m     >20     2     1     0     0       Vanadium     ppm     ASTM D5185m     >1     0     0     0       Vanadium     ppm     ASTM D5185m     0     2     1     0       Cadmium     ppm     ASTM D5185m     0     4     0     0     0       AstM D5185m     0     2     1     0     0     0     <	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >120     4     4     4       Chromium     ppm     ASTM D5185m     >20     0     <1     0       Nickel     ppm     ASTM D5185m     >2     0     0     0       Silver     ppm     ASTM D5185m     >2     1     0     0       Aluminum     ppm     ASTM D5185m     >2     1     0     0       Copper     ppm     ASTM D5185m     >20     2     2     2     2       Lead     ppm     ASTM D5185m     >20     2     1     0     0       Copper     ppm     ASTM D5185m     >15     <1     0     0     0       Cadmium     ppm     ASTM D5185m     0     2     1     0     0       Barium     ppm     ASTM D5185m     0     2     1     0     0       Maganese     ppm     <	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Iron     ppm     ASTM D5185m     >120     4     4     4       Chromium     ppm     ASTM D5185m     >20     0     <1	Glycol		WC Method		NEG	NEG	NEG
Chromium     ppm     ASTM D5185m     >20     0     <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel     ppm     ASTM D5185m     >5     <1	Iron	ppm	ASTM D5185m	>120	4	4	4
Titanium     ppm     ASTM D5185m     >2     0     0     0       Silver     ppm     ASTM D5185m     >20     2     2     2       Lead     ppm     ASTM D5185m     >40     <1     0     0       Copper     ppm     ASTM D5185m     >40     <1     0     0       Vanadium     ppm     ASTM D5185m     >330     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     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <	Chromium	ppm	ASTM D5185m	>20	0	<1	0
Silver     ppm     ASTM D5185m     >2     <1	Nickel	ppm	ASTM D5185m	>5	<1	0	0
Aluminum     ppm     ASTM D5185m     >20     2     2     2       Lead     ppm     ASTM D5185m     >40     <1     0     0       Copper     ppm     ASTM D5185m     >330     1     <1     <1       Tin     ppm     ASTM D5185m     >15     <1     0     0       Vanadium     ppm     ASTM D5185m     >15     <1     0     0       Cadmium     ppm     ASTM D5185m     0     2     1     0     0       ADDITIVES     method     imit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     2     1     0       Magnesium     ppm     ASTM D5185m     0     4     0     0       Calcium     ppm     ASTM D5185m     0     4     0     0       Phosphorus     ppm     ASTM D5185m     1070     1056     1024     1063       Phosphorus     ppm     ASTM D5185m     1270     1196<	Titanium	ppm	ASTM D5185m	>2	0	0	0
Lead     ppm     ASTM D5185m     >40     <1	Silver	ppm	ASTM D5185m	>2	<1	0	0
Copper     ppm     ASTM D5185m     >330     1     <1	Aluminum	ppm	ASTM D5185m	>20	_	2	2
Tin     ppm     ASTM D5185m<>15     <1	Lead	ppm	ASTM D5185m	>40	<1	0	0
Vanadium     ppm     ASTM D5185m     0     0     0     0       Cadmium     ppm     ASTM D5185m     <1     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     2     1     0       Barium     ppm     ASTM D5185m     0     4     0     0       Magnesium     ppm     ASTM D5185m     0     4     0     0       Calcium     ppm     ASTM D5185m     0     0     <1     <1       Magnesium     ppm     ASTM D5185m     1010     910     962     936       Calcium     ppm     ASTM D5185m     1070     1056     1024     1063       Phosphorus     ppm     ASTM D5185m     1070     1056     1024     1011       Zinc     ppm     ASTM D5185m     1270     1196     1240     1194       Sulfur     ppm     ASTM D5185m     2060     3405 <td< th=""><th>Copper</th><th>ppm</th><th>ASTM D5185m</th><th>&gt;330</th><th>1</th><th>&lt;1</th><th>&lt;1</th></td<>	Copper	ppm	ASTM D5185m	>330	1	<1	<1
Cadmium     ppm     ASTM D5185m     <1	Tin	ppm	ASTM D5185m	>15	<1	0	0
ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     2     1     0       Barium     ppm     ASTM D5185m     0     4     0     0       Malganese     ppm     ASTM D5185m     60     63     58     64       Magnesium     ppm     ASTM D5185m     0     0     <1     <1       Magnesium     ppm     ASTM D5185m     1010     910     962     936       Calcium     ppm     ASTM D5185m     1070     1056     1024     1063       Phosphorus     ppm     ASTM D5185m     1270     1196     1240     1194       Sulfur     ppm     ASTM D5185m     2060     3405     3734     3600       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     2     0     0       INFRA-RED     Method     limit/base     cur	Vanadium	ppm	ASTM D5185m		0	0	0
Boron     ppm     ASTM D5185m     0     2     1     0       Barium     ppm     ASTM D5185m     0     4     0     0       Molybdenum     ppm     ASTM D5185m     60     63     58     64       Manganese     ppm     ASTM D5185m     0     0     <1     <1       Magnesium     ppm     ASTM D5185m     1010     910     962     936       Calcium     ppm     ASTM D5185m     1010     910     962     936       Calcium     ppm     ASTM D5185m     1070     1056     1024     1063       Phosphorus     ppm     ASTM D5185m     1270     1196     1240     1194       Sulfur     ppm     ASTM D5185m     1270     1196     1240     1194       Sulfur     ppm     ASTM D5185m     2060     3405     3734     3600       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium     ppm     ASTM D5185m     0     4     0     0       Molybdenum     ppm     ASTM D5185m     60     63     58     64       Manganese     ppm     ASTM D5185m     0     0     <1     <1       Magnesium     ppm     ASTM D5185m     1010     910     962     936       Calcium     ppm     ASTM D5185m     1010     910     962     936       Calcium     ppm     ASTM D5185m     1070     1056     1024     1063       Phosphorus     ppm     ASTM D5185m     1150     1079     1021     1011       Zinc     ppm     ASTM D5185m     1270     1196     1240     1194       Sulfur     ppm     ASTM D5185m     2060     3405     3734     3600       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     2     0     0       INFRA-RED     method     limit/base	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum     ppm     ASTM D5185m     60     63     58     64       Manganese     ppm     ASTM D5185m     0     0     <1	Boron	ppm		0	2	1	0
Manganese     ppm     ASTM D5185m     0     0     <1	Barium	ppm	ASTM D5185m	0	4	0	0
Magnesium     ppm     ASTM D5185m     1010     910     962     936       Calcium     ppm     ASTM D5185m     1070     1056     1024     1063       Phosphorus     ppm     ASTM D5185m     1150     1079     1021     1011       Zinc     ppm     ASTM D5185m     1270     1196     1240     1194       Sulfur     ppm     ASTM D5185m     2060     3405     3734     3600       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     7     6     8       Sodium     ppm     ASTM D5185m     >20     2     0     0       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.1     0.1     0.1       Nitration     Abs/.1mm     *ASTM D7624     >20     5.8     6.1     6.2       Sulfation     Abs/.1mm     *ASTM D	Molybdenum	ppm		60	63	58	64
Calcium     ppm     ASTM D5185m     1070     1056     1024     1063       Phosphorus     ppm     ASTM D5185m     1150     1079     1021     1011       Zinc     ppm     ASTM D5185m     1270     1196     1240     1194       Sulfur     ppm     ASTM D5185m     2060     3405     3734     3600       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     7     6     8       Sodium     ppm     ASTM D5185m     >20     2     0     0       Potassium     ppm     ASTM D5185m     >20     2     0     0       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.1     0.1     0.1       Nitration     Abs/(mm     *ASTM D7624     >20     5.8     6.1     6.2       Sulfation     Abs/.1mm     *ASTM D7415 <th>Manganese</th> <th>ppm</th> <th>ASTM D5185m</th> <th>0</th> <th>0</th> <th>&lt;1</th> <th>&lt;1</th>	Manganese	ppm	ASTM D5185m	0	0	<1	<1
Phosphorus     ppm     ASTM D5185m     1150     1079     1021     1011       Zinc     ppm     ASTM D5185m     1270     1196     1240     1194       Sulfur     ppm     ASTM D5185m     2060     3405     3734     3600       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     7     6     8       Sodium     ppm     ASTM D5185m     >25     7     6     8       Sodium     ppm     ASTM D5185m     >20     2     0     0       Potassium     ppm     ASTM D5185m     >20     2     0     0       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.1     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     >20     5.8     6.1     6.2       Sulfation     Abs/.1mm     *ASTM D7415 <t< th=""><th>•</th><th>ppm</th><th>ASTM D5185m</th><th></th><th>910</th><th></th><th></th></t<>	•	ppm	ASTM D5185m		910		
Zinc     ppm     ASTM D5185m     1270     1196     1240     1194       Sulfur     ppm     ASTM D5185m     2060     3405     3734     3600       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     7     6     8       Sodium     ppm     ASTM D5185m     >20     2     0     0       Potassium     ppm     ASTM D5185m     >20     2     0     0       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.1     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     >20     5.8     6.1     6.2       Sulfation     Abs/.1mm     *ASTM D7624     >20     5.8     6.1     6.2       Sulfation     Abs/.1mm     *ASTM D7644     >30     17.6     16.3     17.3       FLUID DEGRADATION     method     limi	Calcium	ppm	ASTM D5185m	1070	1056	1024	1063
Sulfur     ppm     ASTM D5185m     2060     3405     3734     3600       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     7     6     8       Sodium     ppm     ASTM D5185m     >20     2     0     0       Potassium     ppm     ASTM D5185m     >20     2     0     0       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.1     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     >20     5.8     6.1     6.2       Sulfation     Abs/.1mm     *ASTM D7615     >30     17.6     16.3     17.3       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.5     13.2     13.4	Phosphorus	ppm	ASTM D5185m			1021	
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m<>25768SodiumppmASTM D5185m2032PotassiumppmASTM D5185m>20200INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.10.10.1NitrationAbs/cm*ASTM D7624>205.86.16.2SulfationAbs/1mm*ASTM D7415>3017.616.317.3FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2513.513.213.4		ppm			1196		
Silicon     ppm     ASTM D5185m     >25     7     6     8       Sodium     ppm     ASTM D5185m     O     3     2       Potassium     ppm     ASTM D5185m     >20     2     0     0       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.1     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     >20     5.8     6.1     6.2       Sulfation     Abs/.1mm     *ASTM D7624     >20     5.8     6.1     6.3     17.3       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     <			ASTM D5185m	2060	3405	3734	3600
Sodium     ppm     ASTM D5185m     0     3     2       Potassium     ppm     ASTM D5185m     >20     2     0     0       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.1     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     >20     5.8     6.1     6.2       Sulfation     Abs/.1mm     *ASTM D7624     >30     17.6     16.3     17.3       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.5     13.2     13.4		TS	method	limit/base	current	history1	
Potassium     ppm     ASTM D5185m     >20     2     0     0       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.1     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     >20     5.8     6.1     6.2       Sulfation     Abs/.1mm     *ASTM D7415     >30     17.6     16.3     17.3       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.5     13.2     13.4	Silicon	ppm		>25			
INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >4     0.1     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     >20     5.8     6.1     6.2       Sulfation     Abs/.1mm     *ASTM D7415     >30     17.6     16.3     17.3       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.5     13.2     13.4	Sodium	ppm					
Soot %     %     *ASTM D7844     >4     0.1     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     >20     5.8     6.1     6.2       Sulfation     Abs/.1mm     *ASTM D7415     >30     17.6     16.3     17.3       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.5     13.2     13.4	Potassium	ppm	ASTM D5185m	>20	2	0	0
Nitration     Abs/cm     *ASTM D7624     >20     5.8     6.1     6.2       Sulfation     Abs/.1mm     *ASTM D7415     >30     17.6     16.3     17.3       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.5     13.2     13.4	INFRA-RED		method	limit/base	current	history1	history2
Sulfation     Abs/.1mm     *ASTM D7415     >30     17.6     16.3     17.3       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.5     13.2     13.4	Soot %	%	*ASTM D7844	>4	0.1	0.1	0.1
FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 13.5 13.2 13.4	Nitration	Abs/cm	*ASTM D7624	>20	5.8	6.1	6.2
Oxidation Abs/.1mm *ASTM D7414 >25 13.5 13.2 13.4	Sulfation	Abs/.1mm	*ASTM D7415	>30	17.6	16.3	17.3
	FLUID DEGRAD	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.5	13.2	13.4
Base Number (BN)     mg K0H/g     ASTM D2896     9.8     9.2     7.8     9.2	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	9.2	7.8	9.2



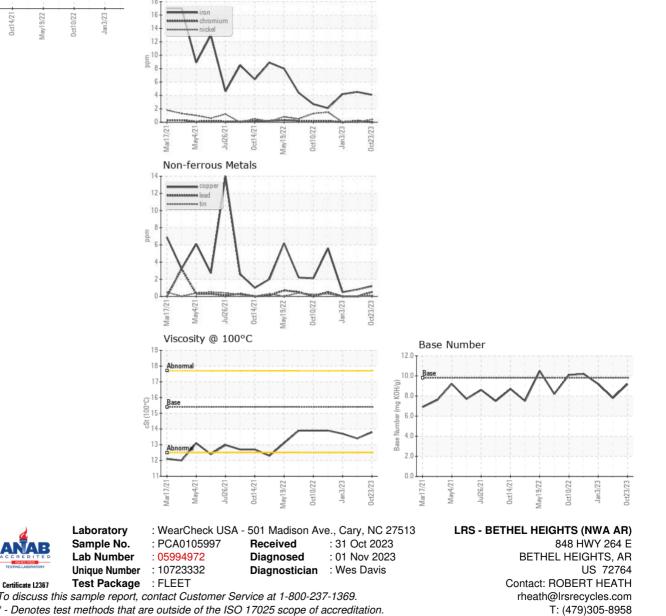
# **OIL ANALYSIS REPORT**





VISUAL		method	limit/base	current	history1	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	>0.2	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	15.4	13.8	13.4	13.7
GRAPHS						

Ferrous Alloys





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)

Submitted By: ALSO ORIVANAR ORIHAR ORITOP - JAMIE HAYWORTH

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