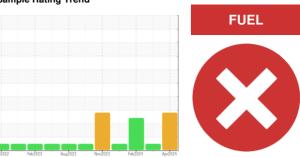


PROBLEM SUMMARY

Sample Rating Trend

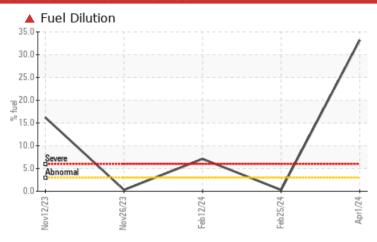


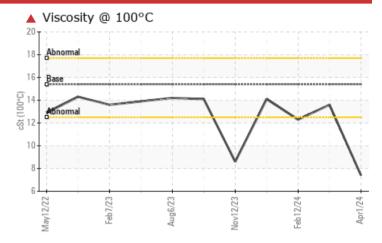


Machine Id
4552M
Component
Diesel Engine
Fluid

PETRO CANADA DURON SHP 15W40 (5 GAL)

COMPONENT CONDITION SUMMARY





RECOMMENDATION

We advise that you check the fuel injection system. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

PROBLEMATIC TEST RESULTS										
Sample Status				SEVERE	NORMAL	SEVERE				
Fuel	%	ASTM D3524	>3.0	▲ 33.2	0.3	▲ 7.1				
Visc @ 100°C	cSt	ASTM D445	15.4	7.4	13.6	▲ 12.3				

Customer Id: GFL405 Sample No.: GFL0115144 Lab Number: 06138308 Test Package: FLEET



To manage this report scan the QR code

To discuss the diagnosis or test data: Wes Davis +1 905-569-8600 x223 wesd@wearcheck.ca

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

RECOMMENDE	D ACTIONS			
Action	Status	Date	Done By	Description
Resample			?	We recommend an early resample to monitor this condition.
Check Fuel/injector System			?	We advise that you check the fuel injection system.

HISTORICAL DIAGNOSIS

25 Feb 2024 Diag: Don Baldridge

NORMAL



Resample at the next service interval to monitor. All component wear rates are normal. Fuel content negligible. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.



FUEL



12 Feb 2024 Diag: Wes Davis

We advise that you check the fuel injection system. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.All component wear rates are normal. There is a high amount of fuel present in the oil. Tests confirm the presence of fuel in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.





26 Nov 2023 Diag: Jonathan Hester

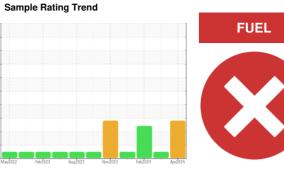
Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.All component wear rates are normal. Fuel content negligible. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.





OIL ANALYSIS REPORT





DIAGNOSIS

Recommendation

We advise that you check the fuel injection system. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal.

Contamination

There is a high amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

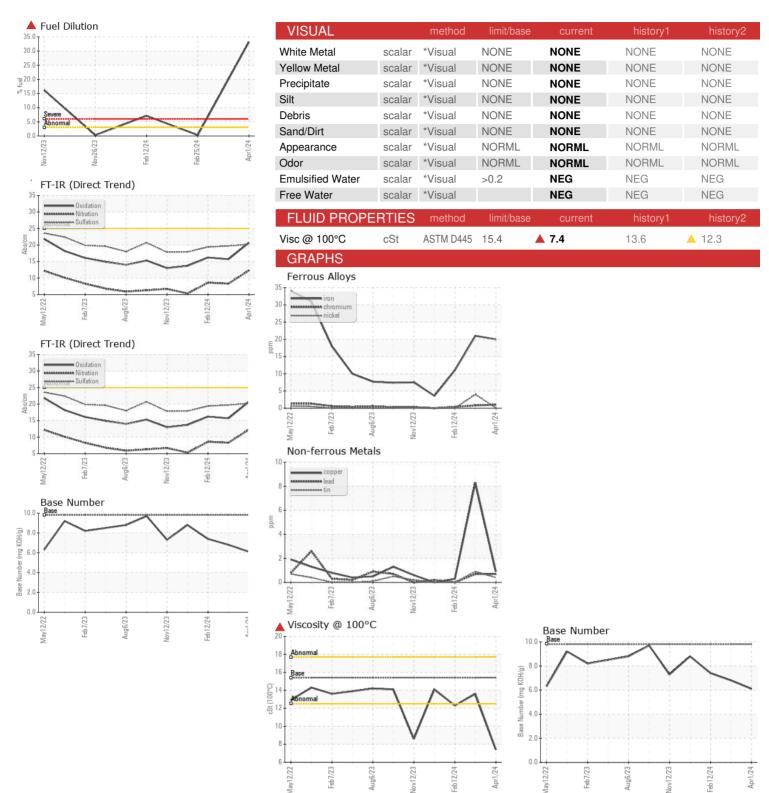
▲ Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

Sample Date Client Info 21563 21304 21216	N SHP 15W4U (5 GAL)	May2022				
Sample Date Client Info 21563 21304 21216	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 21563 21304 21216 Dil Age hrs Client Info 347 88 506 Dil Changed Client Info Changed Not Changed Changed Sample Status VE SEVERE NORMAL SEVERE CONTAMINATION method limit/base current history1 history2 Water WC Method >0.2 NEG NEG NEG ONEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 ron ppm ASTM D5185m >90 20 21 11 Chromium ppm ASTM D5185m >20 1 <1	Sample Number		Client Info		GFL0115144	GFL0115049	GFL0106675
Dil Changed	Sample Date		Client Info		01 Apr 2024	25 Feb 2024	12 Feb 2024
Client Info	•	hrs	Client Info		-	21304	21216
Sever Normal Sever Normal Sever Normal Sever	Oil Age	hrs	Client Info		347	88	506
Sever Normal Sever Normal Sever Normal Sever	Oil Changed		Client Info		Changed	Not Changd	Changed
Water WC Method >0.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 ron ppm ASTM D5185m >90 20 21 11 Chromium ppm ASTM D5185m >20 1 <1 <1 Ukickel ppm ASTM D5185m >2 <1 4 0 Titanium ppm ASTM D5185m >2 <1 4 0 Silver ppm ASTM D5185m >2 <1 0 0 Aluminum ppm ASTM D5185m >20 2 <1 2 Copper ppm ASTM D5185m >30 <1 8 <1 Cinn ppm ASTM D5185m >30 <1 <1 <1 <1 Quandium ppm ASTM D5185m 0 0 0 0 0 ADDITIVES method limit/base	Sample Status				SEVERE	NORMAL	SEVERE
WEAR METALS	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 ron ppm ASTM D5185m >90 20 21 11 Chromium ppm ASTM D5185m >20 1 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Port	Glycol		WC Method		NEG	NEG	NEG
Description	WEAR METAL	S	method	limit/base	current	history1	history2
Sickel	ron	ppm	ASTM D5185m	>90	20	21	11
Description	Chromium	ppm	ASTM D5185m	>20	1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>2	<1	4	0
Aluminum ppm ASTM D5185m >20 2 <1 2 Lead ppm ASTM D5185m >40 <1 <1 0 Copper ppm ASTM D5185m >330 <1 8 <1 Copper ppm ASTM D5185m >15 <1 <1 0 Codmin ppm ASTM D5185m >15 <1 <1 <1 0 Codmin ppm ASTM D5185m >15 <1 <1 <1 0 Codmin ppm ASTM D5185m >15 <1 <1 <1 0 Codmin ppm ASTM D5185m 0 0 0 0 Codmin ppm ASTM D5185m 0 1 2 3 Coron ppm ASTM D5185m 0 0 0 0 Codmin ppm ASTM D5185m 0 0 0 0 Codmin ppm ASTM D5185m 0 0 0 0 0 Codmin ppm ASTM D5185m 0 0 0 0 0 Codmin ppm ASTM D5185m 0 0 0 0 0 Codmin ppm ASTM D5185m 0 0 0 0 0 Codmin ppm ASTM D5185m 0 0 0 0 0 Codmin ppm ASTM D5185m 0 0 0 0 0 Codmin ppm ASTM D5185m 0 0 0 0 0 Codmin ppm ASTM D5185m 0 0 0 0 0 Codmin ppm ASTM D5185m 0 0 0 0 0 Codmin ppm ASTM D5185m 1010 0 582 1135 915 Codecium ppm ASTM D5185m 1070 671 1242 959 Codmin ppm ASTM D5185m 1270 769 1518 1231 Codmin ppm ASTM D5185m 1270 769 1518 1231 Codmin ppm ASTM D5185m 2060 1860 3344 2966 CONTAMINANTS method limit/base current history1 history2 Codmin ppm ASTM D5185m >20 2 2 <1 <1 CONTAMINANTS method limit/base current history1 history2 Codmin Abs/Lmm *ASTM D7844 >6 0.3 0.6 0.3 Codmin Abs/Lmm *ASTM D7845 >30 20.2 19.7 19.4 FLUID DEGRADATION method limit/base current history1 history2 Codmin Abs/Lmm *ASTM D7844 >20 12.3 8.3 8.6 Codmin Abs/Lmm *ASTM D7844 >20 12.3 8.3 8.6 Codmin Abs/Lmm *ASTM D7845 >30 20.2 19.7 19.4 FLUID DEGRADATION method limit/base current history1 history2 Codmin Abs/Lmm *ASTM D7844 >20 12.3 8.3 8.6	Titanium	ppm	ASTM D5185m	>2	<1	0	1
December	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper	Aluminum	ppm	ASTM D5185m	>20	2	<1	2
Fin	_ead	ppm	ASTM D5185m	>40	<1	<1	0
Anadium ppm ASTM D5185m <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 <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	Copper	ppm	ASTM D5185m	>330	<1	8	<1
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 1 2 3 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 41 62 53 Manganese ppm ASTM D5185m 0 <1	Γin	ppm	ASTM D5185m	>15	<1	<1	0
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 1 2 3 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 41 62 53 Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 582 1135 916 Calcium ppm ASTM D5185m 1070 671 1242 959 Phosphorus ppm ASTM D5185m 1150 618 1129 1013 Pinc ppm ASTM D5185m 1270 769 1518 1231 Bulfur ppm ASTM D5185m 2060 1860 3344 2966 CONTAMINANTS method limit/base current history1 history2 Bilicon ppm ASTM D5185m >25 4 4 4 Codium ppm ASTM D5185m 51 2 21 Cotassium ppm ASTM D5185m >20 2 <1 <1 Fuel % ASTM D5185m >20 2 <1 <1 Cotassium ppm ASTM D5185m >20 2 <1 Cotassium ppm ASTM D5185m >20	/anadium	ppm	ASTM D5185m		<1	<1	<1
Soron ppm ASTM D5185m 0 1 2 3	Cadmium	ppm	ASTM D5185m		0	0	0
Sarium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 41 62 53 Manganese ppm ASTM D5185m 0 <1	Boron	ppm	ASTM D5185m	0	1	2	3
Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 582 1135 916 Calcium ppm ASTM D5185m 1070 671 1242 959 Phosphorus ppm ASTM D5185m 1150 618 1129 1013 Zinc ppm ASTM D5185m 1270 769 1518 1231 Sulfur ppm ASTM D5185m 2060 1860 3344 2966 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 4 Godium ppm ASTM D5185m >20 2 <1 <1 Potassium ppm ASTM D5185m >20 2 <1 <1 Fuel % ASTM D5185m >20 2 <1 <1 Potassium ppm ASTM D5185m <t< td=""><td>Barium</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><td>0</td><td>0</td><td>0</td></t<>	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 582 1135 916 Calcium ppm ASTM D5185m 1070 671 1242 959 Phosphorus ppm ASTM D5185m 1150 618 1129 1013 Zinc ppm ASTM D5185m 1270 769 1518 1231 Sulfur ppm ASTM D5185m 2060 1860 3344 2966 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 4 Potassium ppm ASTM D5185m >20 2 <1 <1 Potassium ppm ASTM D5185m >20 2 <1 <1 Fuel % ASTM D3524 >3.0 33.2 0.3 <1 <1 Soot % *ASTM D7844 >6 0.3 0.6 0.3 Nitration Abs/cm *AST	Molybdenum	ppm	ASTM D5185m	60	41	62	53
Calcium ppm ASTM D5185m 1070 671 1242 959 Phosphorus ppm ASTM D5185m 1150 618 1129 1013 Zinc ppm ASTM D5185m 1270 769 1518 1231 Sulfur ppm ASTM D5185m 2060 1860 3344 2966 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 4 Sodium ppm ASTM D5185m >20 2 <1	Manganese	ppm	ASTM D5185m	0	<1	<1	0
Phosphorus ppm ASTM D5185m 1150 618 1129 1013 Zinc ppm ASTM D5185m 1270 769 1518 1231 Sulfur ppm ASTM D5185m 2060 1860 3344 2966 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 4 Sodium ppm ASTM D5185m >20 2 <1	Magnesium	ppm	ASTM D5185m	1010	582	1135	916
Zinc ppm ASTM D5185m 1270 769 1518 1231 Sulfur ppm ASTM D5185m 2060 1860 3344 2966 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 4 Sodium ppm ASTM D5185m >20 2 <1	Calcium	ppm	ASTM D5185m	1070	671	1242	959
Sulfur ppm ASTM D5185m 2060 1860 3344 2966 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 4 Bodium ppm ASTM D5185m >20 2 <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 <1 <1 <1 <1 <1 <1 <1 <	Phosphorus	ppm	ASTM D5185m	1150	618	1129	1013
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 4 Sodium ppm ASTM D5185m 51 2 21 Potassium ppm ASTM D5185m >20 2 <1	Zinc	ppm	ASTM D5185m	1270	769	1518	1231
Solition ppm ASTM D5185m >25 4 4 4 4 4 4 4 4 4	Sulfur	ppm	ASTM D5185m	2060	1860	3344	2966
Sodium ppm ASTM D5185m 51 2 21 Potassium ppm ASTM D5185m >20 2 <1 <1 Fuel % ASTM D3524 >3.0 ▲ 33.2 0.3 ▲ 7.1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.6 0.3 Nitration Abs/cm *ASTM D7624 >20 12.3 8.3 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.2 19.7 19.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 20.7 15.7 16.2	CONTAMINAN	ITS	method	limit/bass		1111	history2
Potassium ppm ASTM D5185m >20 2 <1 <1 Fuel % ASTM D3524 >3.0 ▲ 33.2 0.3 ▲ 7.1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.6 0.3 Nitration Abs/cm *ASTM D7624 >20 12.3 8.3 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.2 19.7 19.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 20.7 15.7 16.2			momod	IIIIIIIIIIIIII	current	history1	111010192
Fuel % ASTM D3524 >3.0 ▲ 33.2 0.3 ▲ 7.1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.6 0.3 Nitration Abs/cm *ASTM D7624 >20 12.3 8.3 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.2 19.7 19.4 FLUID DEGRADATION method limit/base current history1 history2 Dxidation Abs/.1mm *ASTM D7414 >25 20.7 15.7 16.2	Silicon	ppm				,	
INFRA-RED			ASTM D5185m		4	4	4
Soot % % *ASTM D7844 > 6 0.3 0.6 0.3 Nitration Abs/cm *ASTM D7624 > 20 12.3 8.3 8.6 Sulfation Abs/.1mm *ASTM D7415 > 30 20.2 19.7 19.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 > 25 20.7 15.7 16.2	Sodium	ppm	ASTM D5185m ASTM D5185m	>25	4 51	4 2	4 21
Nitration Abs/cm *ASTM D7624 >20 12.3 8.3 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.2 19.7 19.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 20.7 15.7 16.2	Sodium Potassium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	>25 >20	4 51 2	4 2 <1	4 21 <1
Nitration Abs/cm *ASTM D7624 >20 12.3 8.3 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.2 19.7 19.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 20.7 15.7 16.2	Sodium Potassium Fuel	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524	>25 >20 >3.0	4 51 2 ▲ 33.2	4 2 <1 0.3	4 21 <1 • 7.1
Sulfation Abs/.1mm *ASTM D7415 >30 20.2 19.7 19.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 20.7 15.7 16.2	Sodium Potassium Fuel INFRA-RED	ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 method	>25 >20 >3.0 limit/base	4 51 2 ▲ 33.2 current	4 2 <1 0.3 history1	4 21 <1 ▲ 7.1 history2
Dxidation Abs/.1mm *ASTM D7414 >25 20.7 15.7 16.2	Sodium Potassium Fuel INFRA-RED Goot %	ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 method *ASTM D7844	>25 >20 >3.0 limit/base >6	4 51 2 ▲ 33.2 current 0.3	4 2 <1 0.3 history1	4 21 <1 ▲ 7.1 history2 0.3
	Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm % % Abs/cm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 method *ASTM D7844 *ASTM D7624	>25 >20 >3.0 limit/base >6 >20	4 51 2 ▲ 33.2 current 0.3 12.3	4 2 <1 0.3 history1 0.6 8.3	4 21 <1 ▲ 7.1 history2 0.3 8.6
	Sodium Potassium Fuel INFRA-RED Soot % Vitration Sulfation	ppm ppm % % Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 method *ASTM D7844 *ASTM D7624 *ASTM D7415	>25 >20 >3.0 limit/base >6 >20 >30	4 51 2 ▲ 33.2 current 0.3 12.3 20.2	4 2 <1 0.3 history1 0.6 8.3 19.7	4 21 <1 ▲ 7.1 history2 0.3 8.6 19.4
	Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm % % Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 method *ASTM D7844 *ASTM D7624 *ASTM D7415 method	>25 >20 >3.0 limit/base >6 >20 >30 limit/base	4 51 2 ▲ 33.2 current 0.3 12.3 20.2 current	4 2 <1 0.3 history1 0.6 8.3 19.7 history1	4 21 <1 ▲ 7.1 history2 0.3 8.6 19.4 history2



OIL ANALYSIS REPORT







Certificate 12367

Laboratory Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513

: GFL0115144 Lab Number : 06138308 Unique Number : 10963116

Received : 04 Apr 2024 Tested

Diagnosed

: 08 Apr 2024 : 08 Apr 2024 - Wes Davis

Test Package: FLEET (Additional Tests: FuelDilution, PercentFuel)

7811 Chubb Rd NORTHVILLE, MI US 48168 Contact: John Nahal jnahal@gflenv.com

To discuss this sample report, contact Customer Service at 1-800-237-1369. st - 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)

GFL Environmental - 405 - Arbor Hills

T:

F: