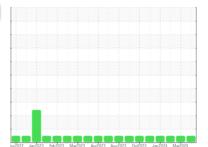


## **OIL ANALYSIS REPORT**

# Sample Rating Trend









Machine Id **425041-402302** Component

Diesel Engine

PETRO CANADA DURON SHP 15W40 (--- 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

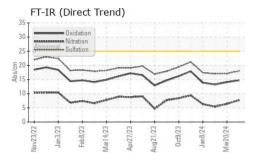
### **Fluid Condition**

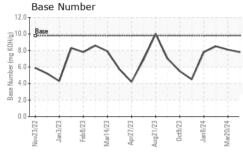
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

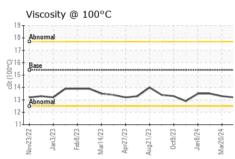
Sample Number	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         18679         18546         18421           Oil Age         hrs         Client Info         258         125         156           Oil Changed         Client Info         N/A         N/A         N/A         Changed           Sample Status         Donath         NORMAL         NORMAL         NORMAL         NORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0         <1.0         <1.0           Water         WC Method         NEG         NEG         NEG           NEG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history2           Iron         ppm         ASTM D5185m         >120         10         8         1           Iron         ppm         ASTM D5185m         >20         <1         0         0           WEAR METALS         method         limit/base         current         history2         history2           Iron         ppm         ASTM D5185m         >20         <1	Sample Number		Client Info		GFL0115838	GFL0113706	GFL0100441
Oil Age         hrs         Client Info         258         125         156           Oil Changed         Client Info         N/A         N/A         N/A         Changed           Sample Status         Client Info         N/A         N/A         N/A         Changed           CONTAMINATION         method         limit/base         current         history2           Euel         WC Method         >3.0         <1.0	Sample Date		Client Info		03 May 2024	20 Mar 2024	25 Jan 2024
Cilichanged   Cilichanged   Cilichanged   Normal   Norm	Machine Age	hrs	Client Info		18679	18546	18421
Sample Status	Oil Age	hrs	Client Info		258	125	156
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0         <1.0         <1.0         <1.0           Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         Imit Masse         Current         history1         history2           Iron         ppm         ASTM D5185m         >120         10         8         1           Chromium         ppm         ASTM D5185m         >120         10         8         1           Nickel         ppm         ASTM D5185m         >5         0         0         <1         0           Nickel         ppm         ASTM D5185m         >2         0         0         0         <1         0           Silver         ppm         ASTM D5185m         >2         0         0         0         <1         0           Silver         ppm         ASTM D5185m         >20         7         4         4         4         Lead         ppm         ASTM D5185m         >20         7         4         4         4         1         2         0 <th>Oil Changed</th> <th></th> <th>Client Info</th> <th></th> <th>N/A</th> <th>N/A</th> <th>Changed</th>	Oil Changed		Client Info		N/A	N/A	Changed
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         Imit/base         current         history1         history2           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         10         8         1           Chromium         ppm         ASTM D5185m         >20         <1         <1         0           Nickel         ppm         ASTM D5185m         >2         0         <1         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         7         4         4           Lead         ppm         ASTM D5185m         >40         0         0         <1           Copper         ppm         ASTM D5185m         >15         <1         0         <1           Vanadium         ppm         ASTM D5185m         0         <1         0         <1           Vanadium         ppm         ASTM D5185m         0         7         7         9	CONTAMINATI	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         <1	WEAR METALS	S	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >5         0         0         <1	Iron	ppm	ASTM D5185m	>120	10	8	1
Titanium         ppm         ASTM D5185m         >2         0         <1	Chromium	ppm	ASTM D5185m	>20	<1	<1	0
Silver	Nickel	ppm	ASTM D5185m	>5	0	0	<1
Aluminum         ppm         ASTM D5185m         >20         7         4         4           Lead         ppm         ASTM D5185m         >40         0         0         <1           Copper         ppm         ASTM D5185m         >330         <1         2         0           Tin         ppm         ASTM D5185m         >15         <1         0         <1         0           Vanadium         ppm         ASTM D5185m         0         0         <1         0         <1         0           Cadmium         ppm         ASTM D5185m         0         7         7         9         0	Titanium	ppm	ASTM D5185m	>2	0	<1	0
Lead         ppm         ASTM D5185m         >40         0         0         <1	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper         ppm         ASTM D5185m         >3330         <1	Aluminum	ppm	ASTM D5185m	>20	7	4	4
Tin         ppm         ASTM D5185m         >15         <1	Lead	ppm	ASTM D5185m	>40	0	0	<1
Vanadium         ppm         ASTM D5185m         0         <1	Copper	ppm	ASTM D5185m	>330	<1	2	0
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         7         9           Barium         ppm         ASTM D5185m         0         7         7         9           Barium         ppm         ASTM D5185m         0         1         0	Tin	ppm	ASTM D5185m	>15	<1	0	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	<1	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         1         0         0           Molybdenum         ppm         ASTM D5185m         60         64         58         60           Manganese         ppm         ASTM D5185m         0         <1         0         <1           Magnesium         ppm         ASTM D5185m         1010         884         874         870           Calcium         ppm         ASTM D5185m         1070         1071         1054         985           Phosphorus         ppm         ASTM D5185m         1150         1059         875         958           Zinc         ppm         ASTM D5185m         1270         1209         1212         1190           Sulfur         ppm         ASTM D5185m         2060         3339         3456         2941           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         21         18         3           Sodium         ppm         ASTM D5185m         >20         <1         2         <1           INFRA-RED         method         limit/base							
Molybdenum         ppm         ASTM D5185m         60         64         58         60           Manganese         ppm         ASTM D5185m         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Manganese         ppm         ASTM D5185m         0         <1		ppm				•	· · · · · · · · · · · · · · · · · · ·
Magnesium         ppm         ASTM D5185m         1010         884         874         870           Calcium         ppm         ASTM D5185m         1070         1071         1054         985           Phosphorus         ppm         ASTM D5185m         1150         1059         875         958           Zinc         ppm         ASTM D5185m         1270         1209         1212         1190           Sulfur         ppm         ASTM D5185m         2060         3339         3456         2941           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         21         18         3           Sodium         ppm         ASTM D5185m         >20         <1         2         <1           Potassium         ppm         ASTM D5185m         >20         <1         2         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         % ASTM D7624         >20         7.7         6.4         5.4           Sulfation         Abs/:mm         *ASTM D7415	Boron		ASTM D5185m	0	7	7	9
Calcium         ppm         ASTM D5185m         1070         1071         1054         985           Phosphorus         ppm         ASTM D5185m         1150         1059         875         958           Zinc         ppm         ASTM D5185m         1270         1209         1212         1190           Sulfur         ppm         ASTM D5185m         2060         3339         3456         2941           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         21         18         3           Sodium         ppm         ASTM D5185m         >20         <1         2         <1           Potassium         ppm         ASTM D5185m         >20         <1         2         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.1         0.1           Nitration         Abs/.1mm         *ASTM D7415         >30         18.0         17.1         17.0           FLUID DEGRADATION         *ASTM D7414 <th>Boron Barium</th> <th>ppm</th> <th>ASTM D5185m ASTM D5185m</th> <th>0</th> <th>7 1</th> <th>7</th> <th>9</th>	Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	7 1	7	9
Phosphorus         ppm         ASTM D5185m         1150         1059         875         958           Zinc         ppm         ASTM D5185m         1270         1209         1212         1190           Sulfur         ppm         ASTM D5185m         2060         3339         3456         2941           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         21         18         3           Sodium         ppm         ASTM D5185m         >20         <1         2         <1           Potassium         ppm         ASTM D5185m         >20         <1         2         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         7.7         6.4         5.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.1         17.0           FLUID DEGRADATION	Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	7 1 64	7 0 58	9 0 60
Zinc         ppm         ASTM D5185m         1270         1209         1212         1190           Sulfur         ppm         ASTM D5185m         2060         3339         3456         2941           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         21         18         3           Sodium         ppm         ASTM D5185m         >20         <1         2         <1           Potassium         ppm         ASTM D5185m         >20         <1         2         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         7.7         6.4         5.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.1         17.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm	Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	7 1 64 <1	7 0 58	9 0 60 <1
Sulfur         ppm         ASTM D5185m         2060         3339         3456         2941           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         21         18         3           Sodium         ppm         ASTM D5185m         >20         4         4         <1           Potassium         ppm         ASTM D5185m         >20         <1         2         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         7.7         6.4         5.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.1         17.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.7         14.1         13.2	Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	7 1 64 <1 884	7 0 58 0 874	9 0 60 <1 870
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         21         18         3           Sodium         ppm         ASTM D5185m         4         4         <1           Potassium         ppm         ASTM D5185m         >20         <1         2         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         7.7         6.4         5.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.1         17.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.7         14.1         13.2	Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	7 1 64 <1 884 1071	7 0 58 0 874 1054	9 0 60 <1 870 985
Silicon         ppm         ASTM D5185m         >25         21         18         3           Sodium         ppm         ASTM D5185m         4         4         4         <1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	7 1 64 <1 884 1071 1059	7 0 58 0 874 1054 875	9 0 60 <1 870 985 958
Sodium         ppm         ASTM D5185m         4         4         <1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	7 1 64 <1 884 1071 1059 1209	7 0 58 0 874 1054 875 1212	9 0 60 <1 870 985 958 1190
Potassium         ppm         ASTM D5185m         >20         <1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	7 1 64 <1 884 1071 1059 1209 3339	7 0 58 0 874 1054 875 1212 3456	9 0 60 <1 870 985 958 1190 2941
INFRA-RED	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	7 1 64 <1 884 1071 1059 1209 3339 current	7 0 58 0 874 1054 875 1212 3456 history1	9 0 60 <1 870 985 958 1190 2941 history2
Soot %         %         *ASTM D7844 >4         0.1         0.1         0.1           Nitration         Abs/cm         *ASTM D7624 >20         7.7         6.4         5.4           Sulfation         Abs/.1mm         *ASTM D7415 >30         18.0         17.1         17.0           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         14.7         14.1         13.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	7 1 64 <1 884 1071 1059 1209 3339 current	7 0 58 0 874 1054 875 1212 3456 history1	9 0 60 <1 870 985 958 1190 2941 history2
Nitration         Abs/cm         *ASTM D7624         >20         7.7         6.4         5.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.1         17.0           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.7         14.1         13.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base	7 1 64 <1 884 1071 1059 1209 3339 current 21	7 0 58 0 874 1054 875 1212 3456 history1	9 0 60 <1 870 985 958 1190 2941 history2 3 <1
Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.1         17.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.7         14.1         13.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	7 1 64 <1 884 1071 1059 1209 3339 current 21 4	7 0 58 0 874 1054 875 1212 3456 history1 18 4	9 0 60 <1 870 985 958 1190 2941 history2 3 <1 <1
FLUID DEGRADATION method limit/base current history1 history2  Oxidation Abs/.1mm *ASTM D7414 >25 14.7 14.1 13.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	7 1 64 <1 884 1071 1059 1209 3339 current 21 4 <1	7 0 58 0 874 1054 875 1212 3456 history1 18 4 2	9 0 60 <1 870 985 958 1190 2941 history2 3 <1 <1
Oxidation Abs/.1mm *ASTM D7414 >25 <b>14.7</b> 14.1 13.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m  method  *ASTM D5185m  ASTM D5185m ASTM D5185m  ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base	7 1 64 <1 884 1071 1059 1209 3339 current 21 4 <1 current	7 0 58 0 874 1054 875 1212 3456 history1 18 4 2 history1 0.1	9 0 60 <1 870 985 958 1190 2941 history2 3 <1 <1 history2 0.1
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m  Method  ASTM D5185m	0 0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base	7 1 64 <1 884 1071 1059 1209 3339 current 21 4 <1 current 0.1 7.7	7 0 58 0 874 1054 875 1212 3456 history1 18 4 2 history1 0.1 6.4	9 0 60 <1 870 985 958 1190 2941 history2 3 <1 <1 history2 0.1 5.4
Base Number (BN)         mg KOH/g         ASTM D2896         9.8         7.8         8.1         8.5	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m  Method ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >4 >20 >30	7 1 64 <1 884 1071 1059 1209 3339	7 0 58 0 874 1054 875 1212 3456 history1 18 4 2 history1 0.1 6.4 17.1	9 0 60 <1 870 985 958 1190 2941 history2 3 <1 <1 history2 0.1 5.4 17.0
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm	ASTM D5185m  Method  ASTM D5185m  Method  *ASTM D7844  *ASTM D7844  *ASTM D7624  *ASTM D7415  Method	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >4 >20 >30 limit/base	7 1 64 <1 884 1071 1059 1209 3339 current 21 4 <1 current 0.1 7.7 18.0 current	7 0 58 0 874 1054 875 1212 3456 history1 18 4 2 history1 0.1 6.4 17.1 history1	9 0 60 <1 870 985 958 1190 2941 history2 3 <1 <1 history2 0.1 5.4 17.0 history2



## **OIL ANALYSIS REPORT**



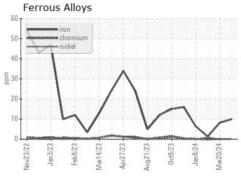


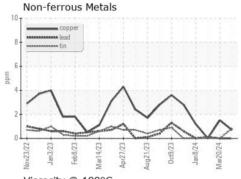


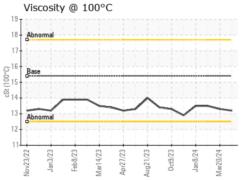
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

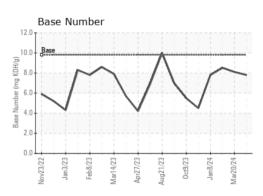
FLUID PROPI	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.2	13.3	13.5

### **GRAPHS**













Laboratory Sample No.

: GFL0115838 Lab Number : 06178381 Unique Number : 11029707

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

: 14 May 2024 : 14 May 2024 Diagnosed : 14 May 2024 - Wes Davis

13737 Plant Rd

GFL Environmental - 868 - Childersburg Fines Hauling (Alpine)

jonathan.williams@gflenv.com

Childersburg, AL US 35044 Contact: JONATHAN WILLIAMS

Test Package : FLEET Certificate 12367 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)

T:

F: