

# **OIL ANALYSIS REPORT**

# Sample Rating Trend

# NORMAL



Machine Id 934037 Component Natural Gas Engine Fluid PETRO CANADA 15W40 (

# DIAGNOSIS

### Recommendation

Oil and filter change at the time of sampling has been noted. 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.

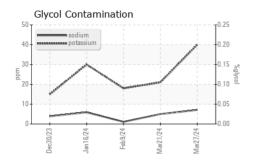
### **Fluid Condition**

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

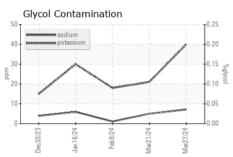
SAMPLE INFORMATION         method         limit/base         current         history1         history2           Sample Number         Client Info         GFL0111868         GFL0111814         GFL0108254           Sample Date         Client Info         884         836         538           Oil Age         hrs         Client Info         884         836         538           Oil Changed         Not Client Info         Changed         Not Changd         Not Changd           Sample Status         MORMAL         ABNORMAL         ABNORMAL         ABNORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG         NEG           WEAR METALS         method         limit/base         current </th <th>40 ( GAL)</th> <th></th> <th>Dec2023</th> <th>Jan 2024</th> <th>Feb 2024 Mar 2024</th> <th>Mar2024</th> <th></th>	40 ( GAL)		Dec2023	Jan 2024	Feb 2024 Mar 2024	Mar2024	
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         884         836         538           Oil Age         hrs         Client Info         Changed         Not Changd         Not Changd           Sample Status         Client Info         Changed         Not Changd         Not Changd           Sample Status         method         limit/base         current         history           WEAR METALS         method         limit/base         current         history           Iron         ppm         ASTM D5185m         >50         66         65         47           Chromium         ppm         ASTM D5185m         >50         66         65         47           Chromium         ppm         ASTM D5185m         >4         2         1         <1           Nickel         ppm         ASTM D5185m         >3         <1         <1         <1           Silver         ppm         ASTM D5185m         >3         <1         <1         <1           Aluminum         ppm         ASTM D5185m         >3         <2         1         <2           Coopper         ppm         ASTM D5185m         >4         2         2         2           T	Sample Number		Client Info		GFL0111868	GFL0111814	GFL0108254
Machine Age         hrs         Client Info         884         836         538           Oil Age         hrs         Client Info         Changed         Not Changd         Not Changd           Sample Status         Client Info         Changed         Not Changd         Not Changd           Sample Status         method         limit/base         current         history           WEAR METALS         method         limit/base         current         history           Iron         ppm         ASTM D5185m         >50         66         65         47           Chromium         ppm         ASTM D5185m         >50         66         65         47           Chromium         ppm         ASTM D5185m         >4         2         1         <1           Nickel         ppm         ASTM D5185m         >3         <1         <1         <1           Silver         ppm         ASTM D5185m         >3         <1         <1         <1           Aluminum         ppm         ASTM D5185m         >3         <2         1         <2           Coopper         ppm         ASTM D5185m         >4         2         2         2           T	Sample Date		Client Info		27 Mar 2024	21 Mar 2024	09 Feb 2024
Oil Changed Sample Status         Client Info         Changed NORMAL         Not Changd ABNORMAL CONTAMINATION         Current Instory1         history2           Water         WC Method         >0.1         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         66         65         47           Chromium         ppm         ASTM D5185m         >44         2         1         -1           Nickel         ppm         ASTM D5185m         >2         2         1         -2           Titanium         ppm         ASTM D5185m         >3         <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         <	•	hrs	Client Info		884	836	538
NORMAL   ABNORMAL   ABNORMAL   CONTAMINATION   method   limit/base   current   history1   history2	Oil Age	hrs	Client Info		884	836	538
CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         66         65         47           Chromium         ppm         ASTM D5185m         >4         2         1         <1           Nickel         ppm         ASTM D5185m         >3         <1         <1         <1         <1           Nicver         ppm         ASTM D5185m         >3         <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	Oil Changed		Client Info		Changed	Not Changd	Not Changd
Water         WC Method         >0.1         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         66         65         47           Chromium         ppm         ASTM D5185m         >2         2         1         <1	Sample Status				NORMAL	ABNORMAL	ABNORMAL
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         66         65         47           Chromium         ppm         ASTM D5185m         >4         2         1         <1           Nickel         ppm         ASTM D5185m         >2         2         1         2           Titanium         ppm         ASTM D5185m         >3         <1         <1         <1           Sliver         ppm         ASTM D5185m         >3         <1         <1         <1           Aluminum         ppm         ASTM D5185m         >30         2         1         2           Lead         ppm         ASTM D5185m         >30         2         1         2           Copper         ppm         ASTM D5185m         >4         2         2         2           Vanadium         ppm         ASTM D5185m         <1         0         <1         0           Cadmium         ppm         ASTM D5185m         <6         6         6         6           Barium         ppm         ASTM D5185m         65         56         50	CONTAMINAT	ION	method	limit/base	current	history1	history2
Iron	Water		WC Method	>0.1	NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >4         2         1         <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >2         2         1         2           Titanium         ppm         ASTM D5185m         <1	Iron	ppm	ASTM D5185m	>50	66	65	47
Titanium         ppm         ASTM D5185m         <1         0         <1           Silver         ppm         ASTM D5185m         >3         <1	Chromium	ppm	ASTM D5185m	>4	2	1	<1
Silver         ppm         ASTM D5185m         >3         <1         <1         <1         <1         Aluminum         ppm         ASTM D5185m         >9         9         9         5           Lead         ppm         ASTM D5185m         >30         2         1         2           Copper         ppm         ASTM D5185m         >4         2         2         2           Vanadium         ppm         ASTM D5185m         <1	Nickel	ppm	ASTM D5185m	>2	2	1	2
Aluminum	Titanium	ppm	ASTM D5185m		<1	0	<1
Lead         ppm         ASTM D5185m         >30         2         1         2           Copper         ppm         ASTM D5185m         >35         17         15         16           Tin         ppm         ASTM D5185m         >4         2         2         2           Vanadium         ppm         ASTM D5185m         <1	Silver	ppm	ASTM D5185m	>3	<1	<1	<1
Copper         ppm         ASTM D5185m         >35         17         15         16           Tin         ppm         ASTM D5185m         >4         2         2         2           Vanadium         ppm         ASTM D5185m         <1	Aluminum	ppm	ASTM D5185m	>9	9	9	5
Tin         ppm         ASTM D5185m         >4         2         2         2           Vanadium         ppm         ASTM D5185m         <1	Lead	ppm	ASTM D5185m	>30	2	1	2
Vanadium         ppm         ASTM D5185m         <1         0         <1           Cadmium         ppm         ASTM D5185m         <1         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         8         6         6         6           Barium         ppm         ASTM D5185m         2         3         17           Molybdenum         ppm         ASTM D5185m         65         56         50           Manganese         ppm         ASTM D5185m         16         16         14         14           Magnesium         ppm         ASTM D5185m         766         799         639	Copper	ppm	ASTM D5185m	>35	17	15	16
Cadmium         ppm         ASTM D5185m         <1         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         8         6         6           Barium         ppm         ASTM D5185m         2         3         17           Molybdenum         ppm         ASTM D5185m         65         56         50           Manganese         ppm         ASTM D5185m         16         16         14           Magnesium         ppm         ASTM D5185m         766         799         639           Calcium         ppm         ASTM D5185m         1347         1220         1090           Phosphorus         ppm         ASTM D5185m         772         751         690           Zinc         ppm         ASTM D5185m         2367         2592         2532           Sulfur         ppm         ASTM D5185m         >+100         987         822           Sulfur         ppm         ASTM D5185m         >+100         29         29         28           Sodium         ppm         ASTM D5185m         >20         40	Tin	ppm	ASTM D5185m	>4	2	2	2
ADDITIVES	Vanadium	ppm	ASTM D5185m		<1	0	<1
Boron         ppm         ASTM D5185m         8         6         6           Barium         ppm         ASTM D5185m         2         3         17           Molybdenum         ppm         ASTM D5185m         65         56         50           Manganese         ppm         ASTM D5185m         16         16         14           Magnesium         ppm         ASTM D5185m         766         799         639           Calcium         ppm         ASTM D5185m         772         751         690           Phosphorus         ppm         ASTM D5185m         1000         987         822           Sulfur         ppm         ASTM D5185m         2367         2592         2532           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         29         29         28           Sodium         ppm         ASTM D5185m         7         5         1           Potassium         ppm         ASTM D5185m         20         40         21         18           INFRA-RED         method         limit/base         current	Cadmium	ppm	ASTM D5185m		<1	0	<1
Barium         ppm         ASTM D5185m         2         3         17           Molybdenum         ppm         ASTM D5185m         65         56         50           Manganese         ppm         ASTM D5185m         16         16         14           Magnesium         ppm         ASTM D5185m         766         799         639           Calcium         ppm         ASTM D5185m         1347         1220         1090           Phosphorus         ppm         ASTM D5185m         772         751         690           Zinc         ppm         ASTM D5185m         1000         987         822           Sulfur         ppm         ASTM D5185m         2367         2592         2532           CONTAMINANTS         method         limit/base         current         history1         history2           Soliicon         ppm         ASTM D5185m         >+100         29         29         28           Sodium         ppm         ASTM D5185m         7         5         1           Potassium         ppm         ASTM D5185m         20         40         21         18           INFRA-RED         method         limit/bas	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         65         56         50           Manganese         ppm         ASTM D5185m         16         16         14           Magnesium         ppm         ASTM D5185m         766         799         639           Calcium         ppm         ASTM D5185m         1347         1220         1090           Phosphorus         ppm         ASTM D5185m         772         751         690           Zinc         ppm         ASTM D5185m         1000         987         822           Sulfur         ppm         ASTM D5185m         2367         2592         2532           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         29         29         28           Sodium         ppm         ASTM D5185m         7         5         1           Potassium         ppm         ASTM D5185m         20         40         21         18           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7624	Boron	ppm	ASTM D5185m		8	6	6
Manganese         ppm         ASTM D5185m         16         16         14           Magnesium         ppm         ASTM D5185m         766         799         639           Calcium         ppm         ASTM D5185m         1347         1220         1090           Phosphorus         ppm         ASTM D5185m         772         751         690           Zinc         ppm         ASTM D5185m         1000         987         822           Sulfur         ppm         ASTM D5185m         2367         2592         2532           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         29         29         28           Sodium         ppm         ASTM D5185m         >20         40         21         18           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0           Nitration         Abs/cmm         *ASTM D7415         >30         25.5         26.8         23.2           FLUID DEGRA	Barium	ppm	ASTM D5185m		2	3	17
Magnesium         ppm         ASTM D5185m         766         799         639           Calcium         ppm         ASTM D5185m         1347         1220         1090           Phosphorus         ppm         ASTM D5185m         772         751         690           Zinc         ppm         ASTM D5185m         1000         987         822           Sulfur         ppm         ASTM D5185m         2367         2592         2532           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         29         29         28           Sodium         ppm         ASTM D5185m         7         5         1           Potassium         ppm         ASTM D5185m         >20         40         21         18           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         0         0         0           Nitration         Abs/cm         *ASTM D7415         >30         25.5         26.8         23.2           FLUID DEGRADATION <td< td=""><td>Molybdenum</td><td>ppm</td><td>ASTM D5185m</td><td></td><th>65</th><td>56</td><td>50</td></td<>	Molybdenum	ppm	ASTM D5185m		65	56	50
Calcium         ppm         ASTM D5185m         1347         1220         1090           Phosphorus         ppm         ASTM D5185m         772         751         690           Zinc         ppm         ASTM D5185m         1000         987         822           Sulfur         ppm         ASTM D5185m         2367         2592         2532           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         29         29         28           Sodium         ppm         ASTM D5185m         7         5         1           Potassium         ppm         ASTM D5185m         >20         40         21         18           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         12.5         12.7         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         26.8         23.2    FLUID DEGRADATION  **ASTM D7	Manganese	ppm	ASTM D5185m		16	16	14
Phosphorus         ppm         ASTM D5185m         772         751         690           Zinc         ppm         ASTM D5185m         1000         987         822           Sulfur         ppm         ASTM D5185m         2367         2592         2532           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         29         29         28           Sodium         ppm         ASTM D5185m         7         5         1           Potassium         ppm         ASTM D5185m         >20         40         21         18           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         12.5         12.7         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         26.8         23.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.6         25.0 </td <td>Magnesium</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th>766</th> <td>799</td> <td>639</td>	Magnesium	ppm	ASTM D5185m		766	799	639
Zinc         ppm         ASTM D5185m         1000         987         822           Sulfur         ppm         ASTM D5185m         2367         2592         2532           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         29         29         28           Sodium         ppm         ASTM D5185m         >20         40         21         18           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         12.5         12.7         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         26.8         23.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.6         25.0         20.8	Calcium	ppm	ASTM D5185m		1347	1220	1090
Sulfur         ppm         ASTM D5185m         2367         2592         2532           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         29         29         28           Sodium         ppm         ASTM D5185m         7         5         1           Potassium         ppm         ASTM D5185m         >20         40         21         18           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         12.5         12.7         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         26.8         23.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.6         25.0         20.8	Phosphorus	ppm	ASTM D5185m		772	751	690
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         29         29         28           Sodium         ppm         ASTM D5185m         7         5         1           Potassium         ppm         ASTM D5185m         >20         40         21         18           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         12.5         12.7         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         26.8         23.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.6         25.0         20.8	Zinc	ppm	ASTM D5185m		1000	987	822
Silicon         ppm         ASTM D5185m         >+100         29         29         28           Sodium         ppm         ASTM D5185m         7         5         1           Potassium         ppm         ASTM D5185m         >20         40         21         18           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         12.5         12.7         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         26.8         23.2           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.6         25.0         20.8	Sulfur	ppm	ASTM D5185m		2367	2592	2532
Sodium         ppm         ASTM D5185m         7         5         1           Potassium         ppm         ASTM D5185m         >20         40         21         18           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         12.5         12.7         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         26.8         23.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.6         25.0         20.8	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         40         21         18           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         12.5         12.7         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         26.8         23.2           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.6         25.0         20.8	Silicon	ppm	ASTM D5185m	>+100	29	29	28
INFRA-RED	Sodium	ppm	ASTM D5185m		7	5	1
Soot %         %         *ASTM D7844         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         12.5         12.7         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         26.8         23.2           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.6         25.0         20.8	Potassium	ppm	ASTM D5185m	>20	40	21	18
Nitration         Abs/cm         *ASTM D7624         >20         12.5         12.7         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         26.8         23.2           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.6         25.0         20.8	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         25.5         26.8         23.2           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.6         25.0         20.8	Soot %	%	*ASTM D7844		0	0	0
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     23.6     25.0     20.8	Nitration	Abs/cm	*ASTM D7624	>20	12.5	12.7	11.7
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30	25.5	26.8	23.2
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	23.6	25.0	20.8
	Base Number (BN)	mg KOH/g	ASTM D2896			<u>^</u> 2.8	<b>△</b> 3.4



# **OIL ANALYSIS REPORT**



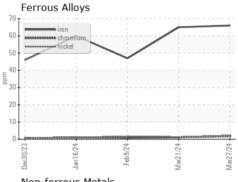
y @ 100°	C		
an 16/24	Feb9/24	lar21/24	ימרכה

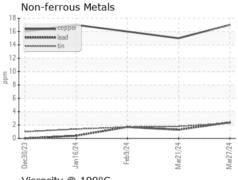


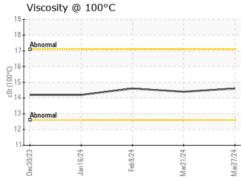
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

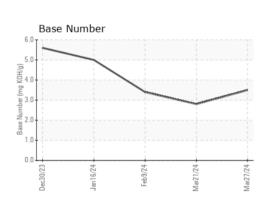
FLUID PROP	ERHES	method		history1	history2
Visc @ 100°C	cSt	ASTM D445	14.6	14.4	14.6

## **GRAPHS**













Laboratory Sample No. Lab Number : 06131789 Unique Number : 10951254

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0111868

Received : 28 Mar 2024 **Tested** Diagnosed

: 02 Apr 2024

: 02 Apr 2024 - Don Baldridge

GFL Environmental - 652 - Fredericksburg Hauling 10954 Houser Drive

Fredericksburg, VA US 22408

Contact: WILLIAM MILO wmilo@gflenv.com

Test Package: FLEET (Additional Tests: Glycol) 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)

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