OIL PT

Oils and Fuels Analysis Proficiency Testing Scheme

Scheme Description

LGC
Proficiency Testing
1 Chamberhall Business Park
Chamberhall Green
Bury, BL9 0AP
UK.

Telephone: +44 (0) 161 762 2500
Email: axiopt@lgcgroup.com
Website: www.lgcstandards.com

LGC is the PT provider of this scheme

Record of issue status and modifications

ISSUE	ISSUE DATE	DETAILS	AUTHORISED BY
3	April 2015	Information for samples 1 and 3 removed. New methods included.	M. Whetton
4	Sept 2015	New methods and fixed fit for purpose SDPA values added to a number of parameters. Inclusion of metals (Ag, Al, Cd, Mn, Sb, Ti and V) to sample 6. Removed Hard copy Report information.	M. Whetton A.McCarthy
5	June 2016	New methods added to a number of parameters. Inclusion of demulsibility test to sample 5.	K. Baryla
6	Sept 2016	New methods added.	K. Baryla
7	Feb 2017	New methods added.	K. Baryla
8	Sept 2017	Temperature specified for density. New methods added. SDPA for metals in sample 6 updated.	K. Baryla
9	Nov 2018	New method for Sample 5 Acid number (potentiometric) added PN-ISO 6618:2011 Minor change in spelling of color to colour Added website information to page 3	F. Bury A McCarthy
10	Dec 2018	Temperature for measuring lubricity in Sample 2 amended to 60°C	F. Bury
11	May 2019	Additional analytes added to 'distillation'. FAMES analysis added. Additional units/clarification for density, sulphur and water content.	M. Whetton
12	Aug 2019	Removed 'standards' from page 1 Amended the DP for Sulfur in sample 4 from 2 to 0	A.McCarthy
13	Sep 2020	Removed fax number and hard copy report info. Removed 14 unpopular analytes across all 4 samples	A McCarthy R. Connolly
14	July 2021	Updated units for Carbon Residue in sample 2 Updated units for FTIR, Nitration in sample 6 Updated email address	R. Connolly A Collins
15	Sept 2022	Minor formatting changes	A Collins
16	Sept 2023	Removal of unpopular analytes	R. Connolly

Notes:
Where this document has been translated, the English version shall remain the definitive version.

Scheme Aims and Organisation

The primary aim of the Oils and Fuels Analysis Proficiency Testing Scheme (OIL PT) is to enable laboratories performing the analysis of fuels and oils to monitor their performance and compare it with that of their peers. OIL PT also aims to provide information to participants on technical issues and methodologies relating to testing of fuels and oils.

The OIL PT scheme year operates from January to December. Further information about the OIL PT scheme, including test material availability, round despatch dates and reporting deadlines, are available on the current OIL PT application form and on the LGC website www.lgcstandards.com.

Test Materials

Details of test materials available in OIL PT are given in Appendix A. The test parameters are continually reviewed to ensure they meet the needs of current laboratory testing and regulatory requirements.

Test material batches are tested for homogeneity for at least one test parameter where it is deemed appropriate. Details of homogeneity tests performed and results are given in the OIL PT Scheme Reports.

Some aspects of the scheme, such as test material production, homogeneity testing and stability assessment, can from time to time be subcontracted. When subcontracting occurs, it is placed with a competent subcontractor and LGC is responsible for this work. The planning of the scheme, the evaluation of performance and the authorisation of the final report will never be subcontracted.

Statistical Analysis

Information on the statistics used in OIL PT can be found in the General Protocol and in the Scheme Report. Methods for determining assigned values and the values for SDPA used for individual samples are given in Appendix A

Methods

Methods are listed in PORTAL. Please select the most appropriate method from the list. If none of the methods are appropriate, then please report your method as 'Other' and record a brief description in the Comments Section in PORTAL.

Results and Reports

OIL PT results are returned through our electronic reporting software, PORTAL, full instructions for which are provided by email.

OIL PT reports will be available on the website within 10 working days of round closure. Participants will be emailed a link to the report when it is available.

APPENDIX A - Description of abbreviations used

Assigned Value (AV)
The assigned value may be derived in the following ways:

- From the robust mean (RMean). This is the median of participant results after the removal of test results that are inappropriate for statistical evaluation, e.g. miscalculations, transpositions and other gross errors. Generally, the assigned value will be set using results from all methods, unless the measurement is considered method-dependant, in which case the assigned value will be set by method as illustrated in the report tables.
  For some analytes, where there is a recognised reference method for that type of measurement, this may be used as the assigned value for a particular analyte i.e. it would be applied to results obtained by any method.

  Traceability: Assigned values which are derived from the participant results, or a sub-set of the results are not traceable to an international measurement standard. The uncertainty of assigned values derived in this way is estimated from the participant results, according to ISO 13528.

- From a formulation value (Formulation). This denotes the use of an assigned value derived from sample preparation details, where known and exact quantities of analyte have been used to prepare the sample.

  Traceability: Assigned values calculated from the formulation of the test sample are traceable, via an unbroken metrological traceability chain, to an international measurement standard. The measurement uncertainty of the assigned value is calculated using the contributions from each calibration in the traceability chain.

- From a qualitative formulation (Qual Form). This applies to qualitative tests where the assigned value is simply based on the presence/absence of the analyte in the test material.

  Traceability: Assigned values calculated from the qualitative formulation of the test sample are traceable to a certified reference standard or a microbiological reference strain.

- From expert labs (Expert). The assigned value for the analyte is provided by an 'expert' laboratory.

  Traceability: Assigned values provided by an 'expert' laboratory may be traceable to an international measurement standard, according to the laboratory and the method used. The uncertainty of measurement for an assigned value produced in this way will be provided by the laboratory undertaking the analysis. Details of traceability and the associated uncertainty will be provided in the report for the scheme/round.

Range
This indicates the concentration range at which the analyte may be present in the test material.

SDPA
SDPA represents the 'standard deviation for proficiency assessment' which is used to assess participant performance for the measurement of each analyte. This may be a fixed value (as stated), a percentage (%) of the assigned value or based on the robust standard deviation of the participant measurement results, either across all methods or by method depending on whether the measurement made is method dependent (see assigned value).

Units
This indicates the units used for the assessment of data. These are the units in which participants should report their results. For some analytes in some schemes participants may have a choice of which units to report their results, however, the units stipulated in this scheme description are the default units to which any results reported using allowable alternative results will be converted to.

DP
This indicates the number of decimal places to which participants should report their measurement results.
.

Sample PT-OL-02   **#2 Diesel fuel**
Supplied as: **1 x 1 USgal (~3750ml) sample of Fuel**

Analyte	Method	AV	Range	SDPA	Units	DP
Cloud Point	D2500, D5771, D5772, D5773, IP 219, ISO 3015, D7683, D7689	RMean	-20 - 20	1	°C	1
Cold Filter Plugging Point	D6371, EN 116	RMean	-20 - 20	3.98	°C	1
Density @ 15°C	D1298, D4052, IP 160, D7777, ISO 3675, EN ISO 12185, D7042	RMean	0.7 - 0.9	0.00052	g/ml	4
			700 - 900	0.52	kg/m^3	
Distillation, 90% off	D86, D7345, IP 123, EN ISO 3405	RMean	150 - 380	Robust SD	°C	1
Distillation, 75% off	D86, D7345, IP 123, EN ISO 3405	RMean	150 - 380	Robust SD	°C	1
Distillation, 50% off	D86, D7345, IP 123, EN ISO 3405	RMean	150 - 380	Robust SD	°C	1
Distillation, 25% off	D86, D7345, IP 123, EN ISO 3405	RMean	150 - 380	Robust SD	°C	1
Distillation, 10% off	D86, D7345, IP 123, EN ISO 3405	RMean	150 - 380	Robust SD	°C	1
Flash Point	D93, EN ISO 2719, D3828, EN ISO 3679, D6450, ISO 3679	RMean	30 - 70	Robust SD	°C	1
Determination of fatty acid methyl esters (FAMES)	EN 14078, D7963, IP 583	RMean	0 - 20	Robust SD	%	1
Pour Point	D97, D5949, D5950, IP 15, ISO 3016, D6749, D7346	RMean	-50 - 20	Robust SD	°C	1
Sulfur Content	D2622, D4294, D5453, D7039, ISO 8754, IP 336, ISO 14596, EN ISO 20846, ICP, EN 15309	RMean	0 - 500	Robust SD	µg/g or mg/kg	1
Viscosity, Kinematic @ 40°C	D445, D7042, ISO 3104	RMean	1 - 5	0.06	cSt	3
Water	D6304, ISO 3734, EN ISO 12937	RMean	0 - 1500	Robust SD	µg/g or mg/kg	0

Sample PT-OL-04   **Crude oil**
Supplied as: **2 x 1000ml sample of Oil**

Analyte	Method	AV	Range	SDPA	Units	DP
Density @ 15°C	D1298, D5002, D287, IP 160, ISO 3675, EN ISO 12185	RMean	All	0.00052	g/ml	4
Reid Vapor Pressure	D323, D6377, D5191	RMean	All	Robust SD	kPa	2
Salt	D3230, D6470, IP 77	RMean	All	Robust SD	mg/kg	1
Sediment	D473, D4807, EN ISO 3735	RMean	All	Robust SD	Mass %	2
Sulfur	D2622, D4294, IP 336, ISO 8754, D7039	RMean	All	Robust SD	mg/kg	0
Viscosity Kinematic @ 40°C	D445, D7042	RMean	All	Robust SD	cSt @ 40°C	3
Water	D4006	RMean	All	0.025	Mass %	3
	D4928, D4377, D4007, IP 386			Robust SD		

Sample PT-OL-05   **Engine oil lubricants**
Supplied as: **1 x ¾ USgal (~2800ml) sample of Oil**

Analyte	Method	AV	Range	SDPA	Units	DP	
Acid Number (potentiometric)	D664, D974, IP 177, PN ISO 6619, PN-ISO 6618:2011	RMean	All	Robust SD	mg KOH/g	2	
Calcium	D4628, D4927, D4951, D5185, D6481, D6443, E-DIN 51399-1, EN ISO 17294, DIN 51399-2, D7751	RMean	All	Robust SD	mg/kg	1	
Magnesium							
Molybdenum							
Phosphorous							
Zinc							
Density @ 15°C	D1298, D4052, IP 160, ISO 3675, EN ISO 12185, D7042, D7777	RMean	All	0.00052	g/ml	4	
Flash Point (Open Cup)	D92, IP 36, EN ISO 2592	RMean	All	Robust SD	°C	0	
Flash Point (Closed Cup)	D93, D6450	RMean	All	Robust SD	°C	0	
Pour Point	D6749, D97, D5949, D5950, D5985, D6892, IP 15, ISO 3016	RMean	All	Robust SD	°C	0	
Sulfur Content	D129, D1552, D5453, IP 336, ISO 8754, D4951, D4927, EN ISO 10304, ICP, D4294, WDXRF, D5185	RMean	All	Robust SD	mg/kg	1	
Viscosity, Kinematic @ 40°C	D445, D7042, D7279, PN-EN ISO 3104, DIN 53015, PN-C-04357, DIN 51562	RMean	All	Robust SD	cSt	3	
Viscosity, Kinematic @ 100°C	D445, D7042, D7279, PN-EN ISO 3104, DIN 51562	RMean	All	Robust SD	cSt	3	
Colour	D1500, D6045, ISO 2049	RMean	0.5 - 8	Robust SD	N/A	1	

Sample PT-OL-06   **Simulated In Service Engine Oil**
Supplied as: **1 x 250 mL sample of Simulated In Service Engine Oil**
    And 1 x 50 mL sample of new oil for FTIR by reference subtraction

Analyte	Method	AV	Range	SDPA	Units	DP
Acid Number	D664, D974, IP 177	RMean	All	Robust SD	mg KOH/g	2
Aluminium						
Antimony						
Boron						
Barium						
Cadmium						
Calcium						
Chromium						
Copper						
Iron						
Potassium						
Magnesium	D4628, D4927, D4951, D5185, D6481, D6595, ISO 17294, ICP-OES, DIN51399-2, D7751	RMean	> 20	Robust SD	mg/kg	1
Manganese						
Molybdenum			≤ 20	2		
Sodium						
Nickel						
Phosphorous						
Lead						
Silicon						
Silver						
Tin						
Titanium						
Vanadium						
Zinc						
Base Number	D2896, D4739, IP 177, DIN 516391, IR	RMean	All	Robust SD	mg KOH/g	2
Viscosity, Kinematic @40°C	D445, D7042, D7279	RMean	All	Robust SD	cSt	2
Viscosity, Kinematic @100°C	D445, D7042, D7279	RMean	All	Robust SD	cSt	2
Water content	D6304, D1744, ASTM E203	RMean	All	Robust SD	mg/kg	0
Fuel Dilution	D3524, GC	RMean	All	Robust SD	Mass %	2
FTIR, Oxidation (procedure A*)	D7414, E2412	RMean	All	Robust SD	Abs/0.100mm	2
FTIR, Oxidation (procedure B**)	D7414, E2412	RMean	All	Robust SD	Abs/cm	2

Oil PT Scheme Description

Analyte	Method	AV	Range	SDPA	Units	DP
FTIR, Nitration (procedure A*)	D7624, E2412	RMean	All	Robust SD	Abs/0.100mm	2
FTIR, Nitration (procedure B**)	D7624, E2412	RMean	All	Robust SD	Abs/cm	2
FTIR, Sulfation (procedure A*)	D7415	RMean	All	Robust SD	Abs/0.100mm	2
FTIR, Sulfation (procedure B**)	D7415	RMean	All	Robust SD	Abs/cm	2
FTIR, Phosphate (procedure A*)	D7412	RMean	All	Robust SD	Abs/0.100mm	2
FTIR, Phosphate (procedure B**)	D7412	RMean	All	Robust SD	Abs/cm	2

*FTIR, procedure A – direct trend analysis   **FTIR, procedure B – differential trend analysis