



Institute for
Interlaboratory Studies

Results of Proficiency Test Hydraulic Oil (used) November 2023

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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1 INTRODUCTION

Since 2003 the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for the analysis of Hydraulic Oil (used) every year. During the annual proficiency testing program of 2023 it was decided to continue the round robin for the analysis of Hydraulic Oil (used).

In this interlaboratory study registered for participation:

- 62 laboratories in 38 countries for regular analyzes in Hydraulic Oil (used) iis23L10
- 52 laboratories in 35 countries on the Metal analyzes iis23L10M

In total 68 laboratories in 42 countries registered for participation in one or more proficiency tests, see appendix 2 for the number of participants per country. In this report the results of the Hydraulic Oil (used) proficiency tests are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test (PT). Sample analyzes for fit-for-use and homogeneity testing were subcontracted to a laboratory that has performed the tests in accordance with for ISO/IEC17043 relevant requirements of ISO/IEC17025.

In this proficiency test the participants received, depending on the registration: a 1 L bottle with Hydraulic Oil (used) labelled #23216 for regular analyzes and/or a 50 mL PE bottle labelled #23217 for the analyzes of metals only.

The participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in agreement with ISO/IEC17043:2010 (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This PT falls under the accredited scope. This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentiality of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires.

2.2 PROTOCOL

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of June 2018 (iis-protocol, version 3.5). This protocol is electronically available through the iis website www.iisnl.com, from the FAQ page.

2.3 CONFIDENTIALITY STATEMENT

All data presented in this report must be regarded as confidential and for use by the participating companies only. Disclosure of the information in this report is only allowed by means of the entire report. Use of the contents of this report for third parties is only allowed by written permission of the Institute for Interlaboratory Studies. Disclosure of the identity of one or more of the participating companies will be done only after receipt of a written agreement of the companies involved.

2.4 SAMPLES

For the preparation of the sample for the regular analyzes in Hydraulic Oil (used) a batch of approximately 100 liters of Hydraulic Oil (used) was obtained from a third party. After homogenization 75 amber glass bottles of 1 L were filled and labelled #23216.

The homogeneity of the subsamples was checked by determination of Density at 15 °C in accordance with ISO12185 and by determination of Kinematic Viscosity at 40 °C in accordance with ASTM D445 on 8 stratified randomly selected subsamples.

	Density at 15 °C in kg/L	Kinematic Viscosity at 40 °C in mm ² /s
sample #23216-1	0.87430	39.95
sample #23216-2	0.87430	39.92
sample #23216-3	0.87431	39.96
sample #23216-4	0.87430	39.90
sample #23216-5	0.87430	39.92
sample #23216-6	0.87430	39.95
sample #23216-7	0.87432	39.96
sample #23216-8	0.87430	39.89

Table 1: homogeneity test results of subsamples #23216

From the above test results the repeatabilities were calculated and compared with 0.3 times the corresponding reproducibility of the reference methods in agreement with the procedure of ISO13528, Annex B2 in the next table.

	Density at 15 °C in kg/L	Kinematic Viscosity at 40 °C in mm ² /s
r (observed)	0.00002	0.08
reference method	ISO12185:96	iis memo 1401
0.3 x R (reference method)	0.00015	0.22

Table 2: evaluation of the repeatabilities of subsamples #23216

The calculated repeatabilities are in agreement with 0.3 times the corresponding reproducibility of the reference methods. Therefore, homogeneity of the subsamples was assumed.

For the preparation of the sample for the Metals determination in Hydraulic Oil (used) a batch of approximately 6 liters of Hydraulic Oil (used) with different elements added was obtained from a third party. After homogenization 70 PE bottles of 50 mL were filled and labelled #23217.

The homogeneity of the subsamples was checked by the determination of Nickel and Copper in accordance with ASTM D5185 on 8 stratified randomly selected subsamples.

	Nickel as Ni in mg/kg	Copper as Cu in mg/kg
sample #23217-1	10.0	10.4
sample #23217-2	9.9	10.2
sample #23217-3	9.9	10.3
sample #23217-4	10.0	10.4
sample #23217-5	9.8	10.5
sample #23217-6	9.8	10.4
sample #23217-7	9.9	10.3
sample #23217-8	9.9	10.3

Table 3: homogeneity test results of subsamples #23217

From the above test results the repeatabilities were calculated and compared with 0.3 times the corresponding reproducibility of the reference test method in agreement with the procedure of ISO13528, Annex B2 in the next table.

	Nickel as Ni in mg/kg	Copper as Cu in mg/kg
r (observed)	0.2	0.3
reference test method	D5185:18	D5185:18
0.3 x R (reference test method)	1.4	0.7

Table 4: evaluation of the repeatabilities of subsamples #23217

The calculated repeatabilities are in agreement with 0.3 times the corresponding reproducibility of the reference test method. Therefore, homogeneity of the subsamples was assumed.

Depending on the registration of the participant the appropriate set of PT samples was sent on October 11, 2023. An SDS was added to the sample package.

2.5 STABILITY OF THE SAMPLES

The stability of Hydraulic Oil (used) packed in amber glass and PE bottles was checked. The material was found sufficiently stable for the period of the proficiency test.

2.6 ANALYZES

The participants were requested to determine on sample #23216: Total Acid Number, Density at 15 °C, Flash Point PMcc, Kinematic Viscosity at 40 °C and 100 °C, Kinematic Viscosity Stabinger at 40 °C and 100 °C, Sulfur and Water. Also, some additional details were asked about the determination of Total Acid Number (ASTM D664).

On sample #23217 it was requested to determine 23 elements: Al, Ba, B, Cd, Cr, Cu, Fe, Pb, Li, Mg, Mn, Mo, Ni, K, Si, Ag, Na, Sn, Ti, V, Ca, P and Zn.

It was explicitly requested to treat the samples as if they were routine samples and to report the test results using the indicated units on the report form and not to round the test results, but report as much significant figures as possible. It was also requested not to report 'less than' test results, which are above the detection limit, because such test results cannot be used for meaningful statistical evaluations.

To get comparable test results a detailed report form and a letter of instructions are prepared. On the report form the reporting units are given as well as the reference test methods (when applicable) that will be used during the evaluation. The detailed report form and the letter of instructions are both made available on the data entry portal www.kpmd.co.uk/sgs-iis/. The participating laboratories are also requested to confirm the sample receipt on this data entry portal. The letter of instructions can also be downloaded from the iis website www.iisnl.com.

3 RESULTS

During five weeks after sample dispatch, the test results of the individual laboratories were gathered via the data entry portal www.kpmd.co.uk/sgs-iis/. The reported test results are tabulated per determination in appendices 1 and 2 of this report. The laboratories are presented by their code numbers.

Directly after the deadline, a reminder was sent to those laboratories that had not reported test results at that moment. Shortly after the deadline, the available test results were screened for suspect data. A test result was called suspect in case the Huber Elimination Rule (a robust outlier test) found it to be an outlier. The laboratories that produced these suspect data were asked to check the reported test results (no reanalyzes). Additional or corrected test results are used for data analysis and the original test results are placed under 'Remarks' in the result tables in appendices 1 and 2. Test results that came in after the deadline were not taken into account in this screening for suspect data and thus these participants were not requested for checks.

3.1 STATISTICS

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of June 2018 (iis-protocol, version 3.5).

For the statistical evaluation the *unrounded* (when available) figures were used instead of the rounded test results. Test results reported as '<...' or '>...' were not used in the statistical evaluation.

First, the normality of the distribution of the various data sets per determination was checked by means of the Lilliefors-test, a variant of the Kolmogorov-Smirnov test and by the calculation of skewness and kurtosis. Evaluation of the three normality indicators in combination with the visual evaluation of the graphic Kernel density plot, lead to judgement of the normality being either 'unknown', 'OK', 'suspect' or 'not OK'. After removal of outliers, this check was repeated. If a data set does not have a normal distribution, the (results of the) statistical evaluation should be used with due care.

The assigned value is determined by consensus based on the test results of the group of participants after rejection of the statistical outliers and/or suspect data.

According to ISO13528 all (original received or corrected) results per determination were submitted to outlier tests. In the iis procedure for proficiency tests, outliers are detected prior to calculation of the mean, standard deviation and reproducibility. For small data sets, Dixon (up to 20 test results) or Grubbs (up to 40 test results) outlier tests can be used. For larger data sets (above 20 test results) Rosner's outlier test can be used. Outliers are marked by D(0.01) for the Dixon's test, by G(0.01) or DG(0.01) for the Grubbs' test and by R(0.01) for the Rosner's test. Stragglers are marked by D(0.05) for the Dixon's test, by G(0.05) or DG(0.05) for the Grubbs' test and by R(0.05) for the Rosner's test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

For each assigned value the uncertainty was determined in accordance with ISO13528. Subsequently the calculated uncertainty was evaluated against the respective requirement based on the target reproducibility in accordance with ISO13528. In this PT the criterion of ISO13528, paragraph 9.2.1, was met for all evaluated tests. Therefore, the uncertainty of all assigned values may be negligible and need not be included in the PT report.

Finally, the reproducibilities were calculated from the standard deviations by multiplying them with a factor of 2.8.

3.2 GRAPHICS

In order to visualize the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported test results are plotted. The corresponding laboratory numbers are on the X-axis. The straight horizontal line presents the consensus value (a trimmed mean). The four striped lines, parallel to the consensus value line, are the +3s, +2s, -2s and -3s target reproducibility limits of the selected reference test method. Outliers and other data, which were excluded from the calculations, are represented as a cross. Accepted data are represented as a triangle.

Furthermore, Kernel Density Graphs were made. This is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms. Also, a normal Gauss curve (dotted line) was projected over the Kernel Density Graph (smooth line) for reference. The Gauss curve is calculated from the consensus value and the corresponding standard deviation.

3.3 Z-SCORES

To evaluate the performance of the participating laboratories the z-scores were calculated. As it was decided to evaluate the performance of the participants in this proficiency test (PT) against the literature requirements (derived from e.g. ISO or ASTM test methods), the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation in this interlaboratory study.

The target standard deviation was calculated from the literature reproducibility by division with 2.8. In case no literature reproducibility was available, other target values were used, like Horwitz or an estimated reproducibility based on former iis proficiency tests.

When a laboratory did use a test method with a reproducibility that is significantly different from the reproducibility of the reference test method used in this report, it is strongly advised to recalculate the z-score, while using the reproducibility of the actual test method used, this in order to evaluate whether the reported test result is fit-for-use.

The z-scores were calculated according to:

$$Z_{(\text{target})} = (\text{test result} - \text{average of PT}) / \text{target standard deviation}$$

The $Z_{(\text{target})}$ scores are listed in the test result tables in appendix 1.

Absolute values for $z < 2$ are very common and absolute values for $z > 3$ are very rare. Therefore, the usual interpretation of z-scores is as follows:

$ z < 1$	good
$1 < z < 2$	satisfactory
$2 < z < 3$	questionable
$3 < z $	unsatisfactory

4 EVALUATION

In this proficiency test some problems were encountered with the dispatch of the samples. For the sample for the regular analyzes ten participants reported the test results after the final reporting date and three other participants did not report any test results. For the sample for the Metals determination eight participants reported the test result after the final reporting date and five other participants did not report any test results. Not all participants were able to report all tests requested.

In total 65 participants reported 757 numerical test results. Observed were 47 outlying test results, which is 6.2%. In proficiency tests outlier percentages of 3% - 7.5% are quite normal.

Not all data sets proved to have a normal Gaussian distribution. These are referred to as “not OK” or “suspect”. The statistical evaluation of these data sets should be used with due care, see also paragraph 3.1.

4.1 EVALUATION PER SAMPLE AND PER TEST

In this section the reported test results are discussed per sample and per test. The test methods which were used by the various laboratories were taken into account for explaining the observed differences when possible and applicable. These test methods are also in the tables together with the original data in appendix 1. The abbreviations, used in these tables, are explained in appendix 4.

Unfortunately, a suitable reference test method, providing the precision data, is not available for all determinations. For these tests the calculated reproducibility was compared against the estimated reproducibility calculated with the Horwitz equation.

In the iis PT reports ASTM test methods are referred to with a number (e.g. D7647) and an added designation for the year that the test method was adopted or revised (e.g. D7647:10). When a method has been reapproved an "R" will be added and the year of approval (e.g. D7647:10R18).

sample #23216

Total Acid Number: The group of participants met the target requirements. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D664-A:18e2 Inflection Point 60 mL and Buffer End Point 60 mL but not with the requirements for Inflection Point 125 mL and Buffer End Point 125 mL. It is observed that three participants reported to have used BEP at pH 11 as determination end point. In method ASTM D664-A version 2018e2 the Buffer End Point at pH 10 is mentioned.

Density at 15 °C: The group of participants met the target requirements. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO12185:96.

Flash Point PMcc: The group of participants had difficulty to meet the target requirements. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D93:20 procedure A and procedure B.

Kinematic Viscosity at 40 °C: The precision statement given in ASTM D445 for used (in-service) formulated oils appears to be strict. Therefore, it is decided to use the reproducibilities found in previous iis PTs on used oils as mentioned in iis memo 1401.

The group of participants met the target requirements. Eight statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the estimated reproducibility from iis memo 1401 but not with the requirements of ASTM D445:23.

Kinematic Viscosity at 100 °C: The precision statement given in ASTM D445 for used (in-service) formulated oils appears to be strict. Therefore, it is decided to use the reproducibilities found in previous iis PTs on used oils as mentioned in iis memo 1401.

The group of participants met the target requirements. Eight statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the estimated reproducibility from iis memo 1401 but not with the requirements of ASTM D445:23.

Viscosity Stabinger at 40 °C: The group of participants met the target requirements. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D7042:21a.

Viscosity Stabinger at 100 °C: The group of participants met the target requirements. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D7042:21a.

Sulfur: The group of participants had difficulty to meet the target requirements. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D4294:21.

Water: The group of participants had difficulty to meet the target requirements. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D6304:20 procedure A and not with procedure C, but it is in agreement with procedure B. When the test results from ASTM D6304:20 were evaluated separately for the procedures A, B and C the calculated reproducibilities of procedure A and C are not in agreement with the respective requirements but the calculated reproducibility of procedure B is in agreement with the requirements.

sample #23217

Barium: The group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5185:18.

Copper: The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D5185:18.

Iron: The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D5185:18.

Lead: The group of participants met the target requirements. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5185:18.

- Magnesium:** The group of participants met the target requirements. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5185:18.
- Manganese:** The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D5185:18.
- Nickel:** The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D5185:18.
- Calcium:** The group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the estimated reproducibility calculated with the Horwitz equation.
- Phosphorus:** The group of participants met the target requirements. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5185:18.
- Zinc:** The group of participants had difficulty to meet the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5185:18.

The participants agreed on a concentration near or below the limit of detection for all other elements mentioned in paragraph 2.6. Therefore, no z-scores are calculated for these elements. The reported test results are given in appendix 2.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the reference test method and the reproducibility as found for the group of participating laboratories. The number of significant test results, the average, the calculated reproducibility ($2.8 \times$ standard deviation) and the target reproducibility derived from reference methods are presented in the next tables.

Parameter	unit	n	average	2.8 * sd	R(lit)
Total Acid Number	mg KOH/g	44	0.47	0.19	0.22
Density at 15 °C	kg/L	40	0.8743	0.0004	0.0005
Flash Point PMcc	°C	37	199.5	15.9	14.2
Kinematic Viscosity at 40 °C	mm ² /s	35	40.049	0.431	0.721
Kinematic Viscosity at 100 °C	mm ² /s	31	7.088	0.101	0.156
Viscosity Stabinger at 40 °C	mm ² /s	22	40.119	0.310	0.551

Parameter	unit	n	average	2.8 * sd	R(lit)
Viscosity Stabinger at 100 °C	mm ² /s	22	7.091	0.074	0.094
Sulfur	mg/kg	23	5175	714	475
Water	mg/kg	51	64.2	81.6	44.1

Table 5: reproducibilities of tests on sample #23216

Element	unit	n	average	2.8 * sd	R(lit)
Barium as Ba	mg/kg	38	18.8	3.8	8.8
Copper as Cu	mg/kg	44	10.3	2.2	2.5
Iron as Fe	mg/kg	42	8.6	2.2	2.9
Lead as Pb	mg/kg	39	11.6	2.4	7.2
Magnesium as Mg	mg/kg	38	30.1	6.7	9.9
Manganese as Mn	mg/kg	38	12.0	2.3	2.6
Nickel as Ni	mg/kg	44	10.2	1.8	4.8
Calcium as Ca	mg/kg	39	31.1	8.9	8.3
Phosphorus as P	mg/kg	40	261	50	69
Zinc as Zn	mg/kg	43	293	53	43

Table 6: reproducibilities of tests on sample #23217

Without further statistical calculations it can be concluded that for many tests there is a good compliance of the group of participants with the reference test methods. The problematic tests have been discussed in paragraph 4.1.

4.3 COMPARISON OF THE PROFICIENCY TEST OF NOVEMBER 2023 WITH PREVIOUS PTS

	November 2023	November 2022	November 2021	November 2020	November 2019
Number of reporting laboratories	65	62	62	57	63
Number of test results	757	1273	1320	1313	1402
Number of statistical outliers	47	53	48	57	87
Percentage of statistical outliers	6.2%	4.2%	3.6%	4.3%	6.2%

Table 7: comparison with previous proficiency tests

In proficiency tests outlier percentages of 3% - 7.5% are quite normal.

The performance of the determinations of the proficiency tests was compared to the requirements of the reference test methods. The conclusions are given in the following table.

Determination	November 2023	November 2022	November 2021	November 2020	November 2019
Total Acid Number	+	+/-	+	+	+/-
Density at 15 °C	+	+	+/-	-	+
Flash Point PMcc	-	+/-	+	+	+/-
Kinematic Viscosity at 40 °C	+	+	+	+	+
Kinematic Viscosity at 100 °C	+	+	+	+	+

Determination	November 2023	November 2022	November 2021	November 2020	November 2019
Viscosity Stabinger at 40 °C	+	++	++	+	+
Viscosity Stabinger at 100 °C	+	+	+	+	+
Sulfur	-	-	-	-	-
Water	--	-	-	++	++
Aluminum as Al	n.e.	++	++	++	+
Barium as Ba	++	++	++	+	++
Boron as B	n.e.	++	+	++	++
Cadmium as Cd	n.e.	-	++	++	-
Chromium as Cr	n.e.	+	+	+	+/-
Copper as Cu	+	+	+	+	+
Iron as Fe	+	+	+	+/-	+
Lead as Pb	++	++	++	++	++
Lithium as Li	n.e.	+	++	-	++
Magnesium as Mg	+	+	+	+	+
Manganese as Mn	+	-	+	+/-	+/-
Molybdenum as Mo	n.e.	+	+	+	+
Nickel as Ni	++	++	++	++	+
Potassium as K	n.e.	++	n.e.	n.e.	(+)
Silicon as Si	n.e.	+	++	+	++
Silver as Ag	n.e.	-	+	+	+
Sodium as Na	n.e.	+/-	+/-	+	+/-
Tin as Sn	n.e.	+	++	++	++
Titanium as Ti	n.e.	++	++	++	++
Vanadium as V	n.e.	-	++	+	+
Calcium as Ca	+/-	+	+	+	+
Phosphorus as P	+	+/-	+/-	-	+
Zinc as Zn	-	+	-	-	+/-

Table 8: comparison determinations to the reference test methods

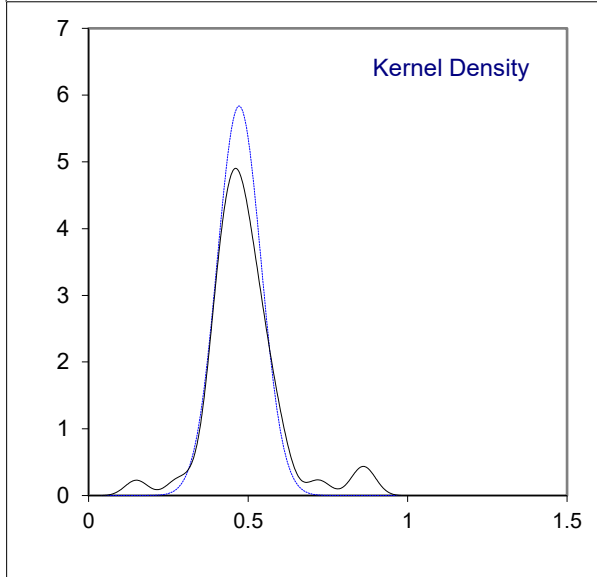
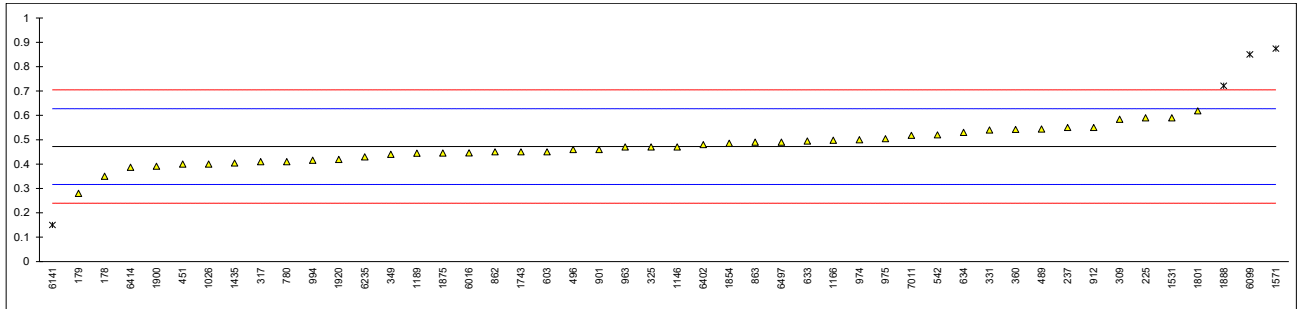
The following performance categories were used:

- ++ : group performed much better than the reference test method
- + : group performed better than the reference test method
- +/- : group performance equals the reference test method
- : group performed worse than the reference test method
- : group performed much worse than the reference test method
- n.e. : not evaluated

APPENDIX 1

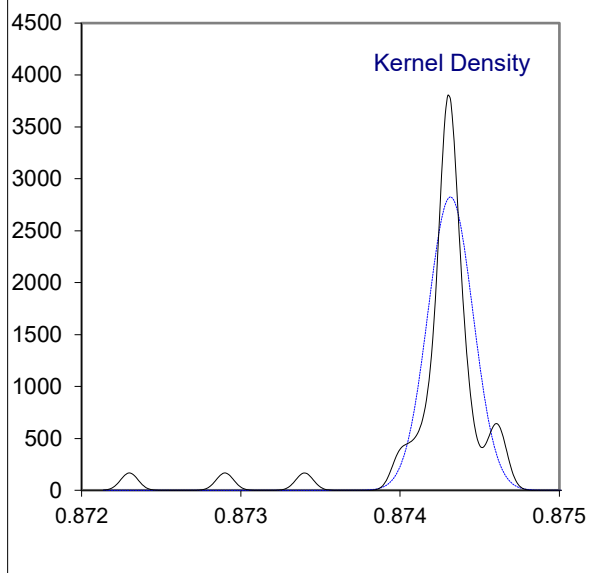
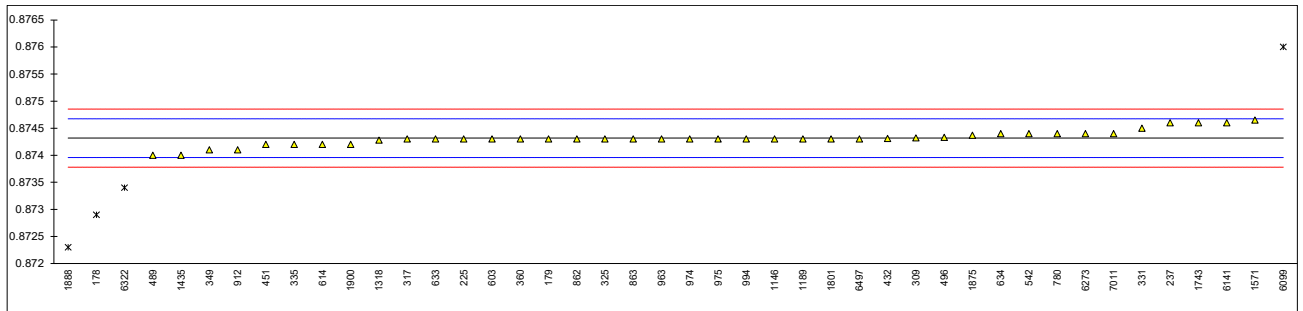
Determination of Total Acid Number on sample #23216; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks	End Point	Volume
178	D664-A	0.35		-1.57		Buffer End Point pH 10	60 mL
179	D664-A	0.28		-2.47		Buffer End Point pH 11	60 mL
225	D974	0.59		1.52		---	---
237	D664-B	0.55		1.00		Inflection Point	125 mL
256		----		----		---	---
257		----		----		---	---
309	D664-A	0.584		1.44		Buffer End Point pH 10	125 mL
317	D974	0.41		-0.80		Inflection Point	60 mL
325	D664-A	0.47		-0.03		Buffer End Point pH 10	125 mL
331	D664-A	0.54		0.88		---	---
335		----		----		---	---
339		----		----		---	---
349	D664-A	0.44		-0.41		Buffer End Point pH 10	125 mL
360	D664-A	0.542		0.90		Inflection Point	60 mL
432		----		----		---	---
442		----		----		---	---
451	D664-A	0.40		-0.93		Buffer End Point pH 10	60 mL
489	EN12634	0.544		0.93		Inflection Point	---
496	D664-A	0.460		-0.16		Buffer End Point pH 10	60 mL
542	D664-A	0.52		0.62		Buffer End Point pH 10	60 mL
562		----		----		---	---
603	D664-A	0.4502		-0.28		Inflection Point	125 mL
614		----		----		---	---
633	D664-A	0.4941		0.28		Inflection Point	60 mL
634	D664-A	0.53		0.75		Inflection Point	60 mL
780	D664-A	0.41		-0.80		Buffer End Point pH 10	60 mL
862	D664-A	0.45		-0.28		Inflection Point	60 mL
863	D664-A	0.49		0.23		Inflection Point	60 mL
901	D664-A	0.46		-0.16		Inflection Point	60 mL
912	D664-A	0.55		1.00		---	---
963	D974	0.47		-0.03		---	---
974	D664-A	0.50		0.36		Inflection Point	125 mL
975	D664-A	0.504		0.41		Inflection Point	125 mL
994	D664-A	0.416		-0.72		Inflection Point	60 mL
1026	D664-A	0.40		-0.93		Buffer End Point pH 11	125 mL
1146	D664-A	0.470		-0.03		Buffer End Point pH 10	125 mL
1166	D664-A	0.4982		0.34		Inflection Point	60 mL
1189	D664-A	0.445		-0.35		Buffer End Point pH 10	60 mL
1318		----		----		---	---
1435	D664-A	0.404		-0.88		---	---
1531	D664-A	0.59		1.52		---	---
1571	D664-A	0.8738	R(0.01)	5.18		Inflection Point	60 mL
1743	D664-A	0.45		-0.28		Buffer End Point pH 11	60 mL
1788		----		----		---	---
1801	D664-A	0.618		1.88		---	---
1854	D664-A	0.485		0.17		---	---
1875	ISO6618	0.4456		-0.34		---	---
1888	D664-A	0.721	R(0.05)	3.21		---	---
1900	D664-A	0.391		-1.04		Inflection Point	60 mL
1920	D664-AMod.	0.419		-0.68		---	100 mL
3031		----		----		---	---
6016	D664-A	0.446		-0.34		---	---
6099	ISO6618	0.85	R(0.01)	4.87		Inflection Point	60 mL
6141	D664-A	0.150	R(0.01)	-4.15		Inflection Point	60 mL
6235	D664-A	0.4295		-0.55		Inflection Point	60 mL
6273		----		----		---	---
6322		----		----		---	---
6402	D7889	0.48	C	0.10	fr. 0.85	---	---
6414	D664-A	0.387		-1.10		Inflection Point	60 mL
6497	D664-A	0.49		0.23		Inflection Point	60 mL
6546		----		----		---	---
7011	D664-A	0.518		0.59		---	---
	normality	OK					
	n	44					
	outliers	4					
	mean (n)	0.4721					
	st.dev. (n)	0.06838					
	R(calc.)	0.1915					
	st.dev.(D664-A:18e2, IP 60mL)	0.07762					
	R(D664-A:18e2, IP 60mL)	0.2173					
	Compare						
	R(D664-A:18e2, IP 125mL)	0.1000					
	R(D664-A:18e2, BEP 60mL)	0.2664					
	R(D664-A:18e2, BEP 125mL)	0.1435					



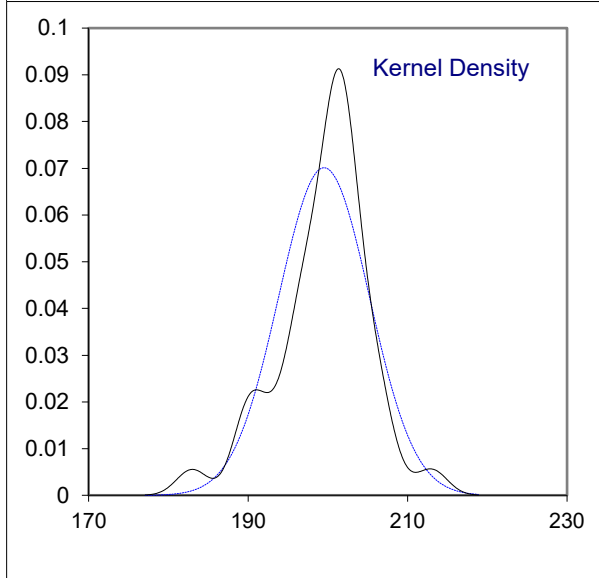
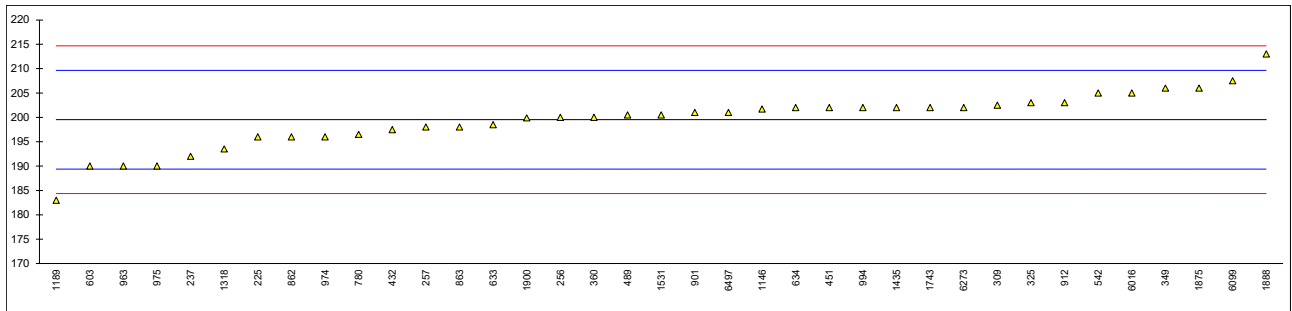
Determination of Density at 15 °C on sample #23216; results in kg/L

lab	method	value	mark	z(targ)	remarks
178	D4052	0.8729	R(0.01)	-7.93	
179	D4052	0.8743		-0.09	
225	D4052	0.8743		-0.09	
237	D4052	0.8746		1.59	
256		----		----	
257		----		----	
309	D4052	0.87432		0.02	
317	D4052	0.8743		-0.09	
325	D4052	0.8743		-0.09	
331	ISO12185	0.8745		1.03	
335	ISO12185	0.8742		-0.65	
339		----		----	
349	D4052	0.8741		-1.21	
360	D4052	0.8743		-0.09	
432	ISO12185	0.87431		-0.04	
442		----		----	
451	D4052	0.8742		-0.65	
489	DIN51757	0.87400		-1.77	
496	ISO12185	0.87433		0.08	
542	D4052	0.8744		0.47	
562		----		----	
603	D4052	0.8743		-0.09	
614	D4052	0.8742		-0.65	
633	D4052	0.8743		-0.09	
634	D4052	0.8744		0.47	
780	ISO12185	0.8744		0.47	
862	D4052	0.8743		-0.09	
863	D4052	0.8743		-0.09	
901		----		----	
912	ISO12185	0.8741	C	-1.21	Reported 874.1 kg/L
963	D4052	0.8743		-0.09	
974	D4052	0.8743		-0.09	
975	D4052	0.8743		-0.09	
994	ISO12185	0.8743		-0.09	
1026		----		----	
1146	D4052	0.8743		-0.09	
1166		----		----	
1189	ISO12185	0.8743		-0.09	
1318	D4052	0.87428		-0.20	
1435	D4052	0.8740		-1.77	
1531		----		----	
1571	D7042	0.87465		1.87	
1743	ISO12185	0.8746		1.59	
1788		----		----	
1801	ISO12185	0.8743		-0.09	
1854		----		----	
1875	DIN51757	0.87437		0.30	
1888	ISO12185	0.8723	R(0.01)	-11.29	
1900	D4052	0.8742		-0.65	
1920		----		----	
3031		----		----	
6016		----		----	
6099	ISO12185	0.8760	R(0.01)	9.43	
6141	D4052	0.8746		1.59	
6235		----		----	
6273	D4052	0.8744	C	0.47	First reported 0.8752
6322	ISO12185	0.8734	C,R(0.01)	-5.13	First reported 0.8733
6402		----		----	
6414		----		----	
6497	D4052	0.8743		-0.09	
6546		----		----	
7011	ISO12185	0.8744		0.47	
	normality	suspect			
	n	40			
	outliers	4			
	mean (n)	0.87432			
	st.dev. (n)	0.000141			
	R(calc.)	0.00040			
	st.dev.(ISO12185:96)	0.000179			
	R(ISO12185:96)	0.0005			



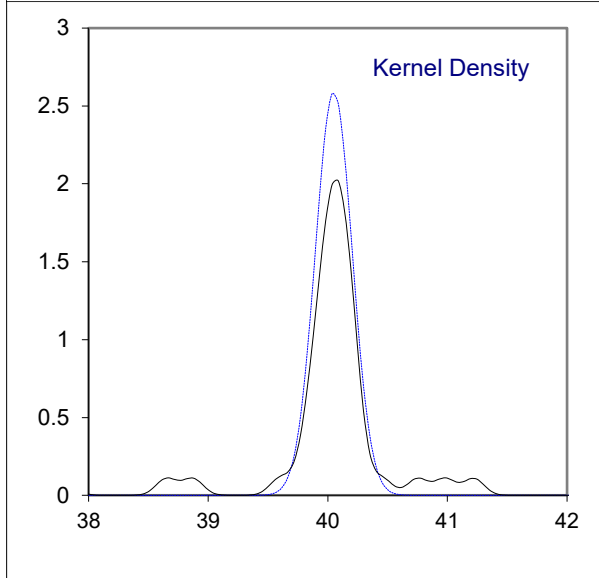
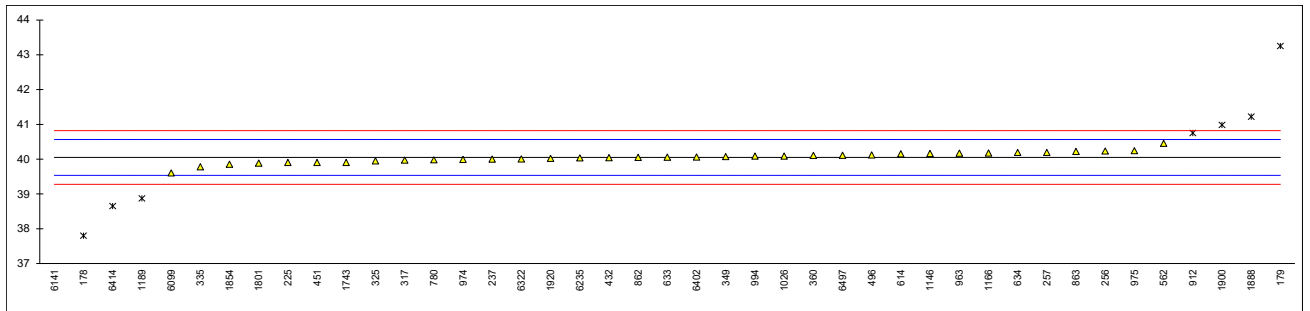
Determination of Flash Point PMcc on sample #23216; results in °C

lab	method	value	mark	z(targ)	remarks
178		----		----	
179		----		----	
225	D93-B	196.0		-0.70	
237	D93-B	192.0		-1.49	
256	D3828	200.0		0.09	
257	D3828	198.0		-0.30	
309	D93-A	202.5		0.59	
317		----		----	
325	D93	203.0		0.69	
331		----		----	
335		----		----	
339		----		----	
349	D93-A	206		1.28	
360	D93-A	200.0		0.09	
432	D93-A	197.48		-0.41	
442		----		----	
451	D93-A	202		0.49	
489	ISO2719-A	200.5		0.19	
496		----		----	
542	D7094	205		1.08	
562		----		----	
603	D93-A	190		-1.88	
614		----		----	
633	D93-A	198.5		-0.20	
634	D93-A	202.0		0.49	
780	D93-A	196.5		-0.60	
862	D93-A	196		-0.70	
863	D93-A	198.0		-0.30	
901	D6450	201.0		0.29	
912	D93-B	203		0.69	
963	D93-A	190.0		-1.88	
974	D93-A	196		-0.70	
975	D93-A	190.0		-1.88	
994	D93-B	202.0		0.49	
1026		----		----	
1146	D93-A	201.7		0.43	
1166		----		----	
1189	D93-A	183		-3.27	
1318	D93-A	193.5		-1.19	
1435	D93-A	202.0		0.49	
1531	D93-A	200.5		0.19	
1571		----		----	
1743	ISO2719-A	202		0.49	
1788		----		----	
1801		----		----	
1854		----		----	
1875	ISO2719-A	206		1.28	
1888	D93	213		2.66	
1900		199.90		0.07	
1920		----		----	
3031		----		----	
6016	D93	205.0		1.08	
6099	ISO2719-A	207.5		1.58	
6141		----		----	
6235		----		----	
6273	D93-B	202		0.49	
6322		----		----	
6402		----		----	
6414		----		----	
6497	D93-A	201.0		0.29	
6546		----		----	
7011		----		----	
	normality	suspect			
	n	37			
	outliers	0			
	mean (n)	199.53			
	st.dev. (n)	5.688			
	R(calc.)	15.93			
	st.dev.(D93-A:20)	5.059			
	R(D93-A:20)	14.17			
Compare					
	R(D93-B:20)	10			



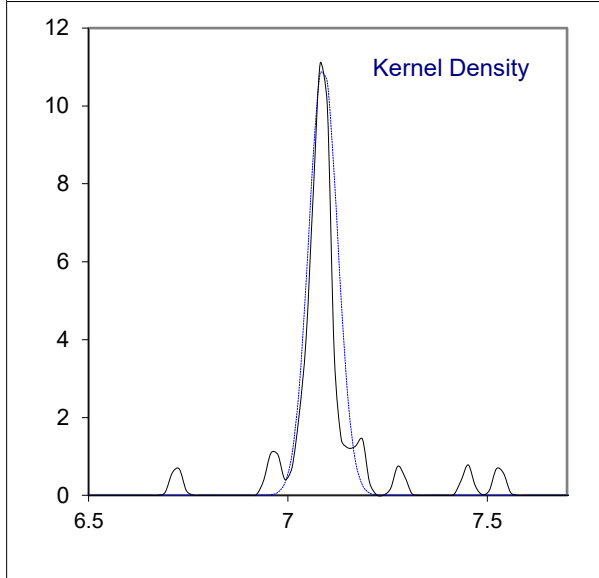
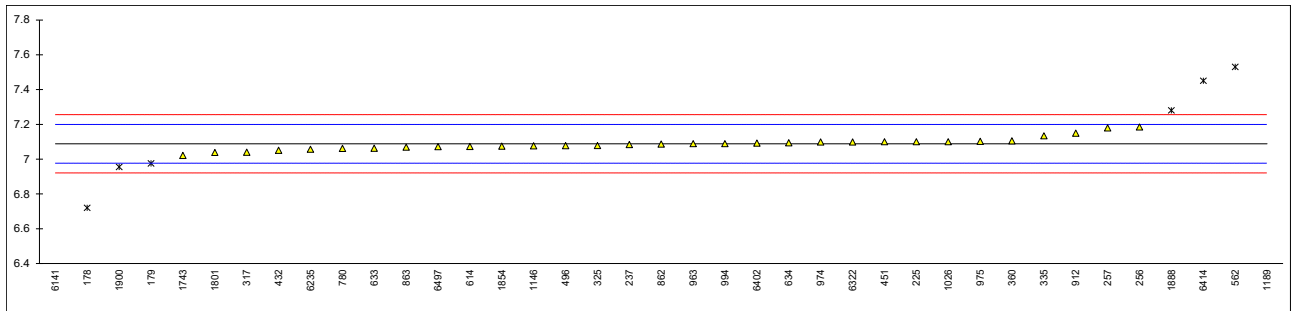
Determination of Kinematic Viscosity at 40 °C on sample #23216; results in mm²/s

lab	method	value	mark	z(targ)	remarks
178	D7279 corrected to D445	37.80	R(0.01)	-8.74	
179	D445	43.25	R(0.01)	12.43	
225	D445	39.90		-0.58	
237	D445	40.00		-0.19	
256	D7279 corrected to D445	40.23		0.70	
257	D7279 corrected to D445	40.19		0.55	
309		----		----	
317	D445	39.97		-0.31	
325	D445	39.95		-0.39	
331		----		----	
335	D445	39.78		-1.05	
339		----		----	
349	D445	40.07		0.08	
360	D445	40.106		0.22	
432	D445	40.04		-0.04	
442		----		----	
451	D7279 corrected to D445	39.9		-0.58	
489		----		----	
496	D445	40.119		0.27	
542		----		----	
562	D445	40.452		1.56	
603		----		----	
614	D445	40.15		0.39	
633	D445	40.055		0.02	
634	D445	40.19		0.55	
780	D445	39.98		-0.27	
862	D445	40.05		0.00	
863	D445	40.22		0.66	
901		----		----	
912	D445	40.75	R(0.01)	2.72	
963	D445	40.17		0.47	
974	D445	39.99		-0.23	
975	D445	40.24		0.74	
994	D445	40.09		0.16	
1026	D445	40.09		0.16	
1146	D445	40.16		0.43	
1166	ISO3104	40.17376		0.48	
1189	D7279 corrected to D445	38.87	R(0.01)	-4.58	
1318		----		----	
1435		----		----	
1531		----		----	
1571		----		----	
1743	D445	39.90		-0.58	
1788		----		----	
1801	D445	39.885		-0.64	
1854	ISO3104	39.85		-0.77	
1875		----		----	
1888	D445	41.22	R(0.01)	4.55	
1900	D7279 corrected to D445	40.98	R(0.01)	3.61	
1920	D445	40.021		-0.11	
3031		----		----	
6016		----		----	
6099	ISO3104	39.6		-1.75	
6141	D445	30.3427	R(0.01)	-37.70	
6235	D445	40.032		-0.07	
6273		----		----	
6322	D7042	40.004		-0.18	
6402	D7279 corrected to D445	40.06		0.04	
6414	D7279 corrected to D445	38.65	R(0.01)	-5.44	
6497	D445	40.11		0.24	
6546		----		----	
7011		----		----	
	normality	suspect			
	n	35			
	outliers	8			
	mean (n)	40.0494			
	st.dev. (n)	0.15398			
	R(calc.)	0.4311			
	st.dev.(iis memo 1401)	0.25746			
	R(iis memo 1401)	0.7209			
Compare					
	R(D445:23)	0.3416			



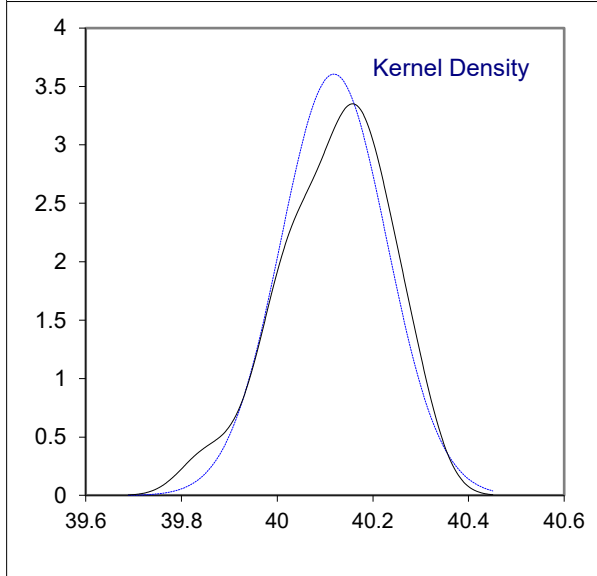
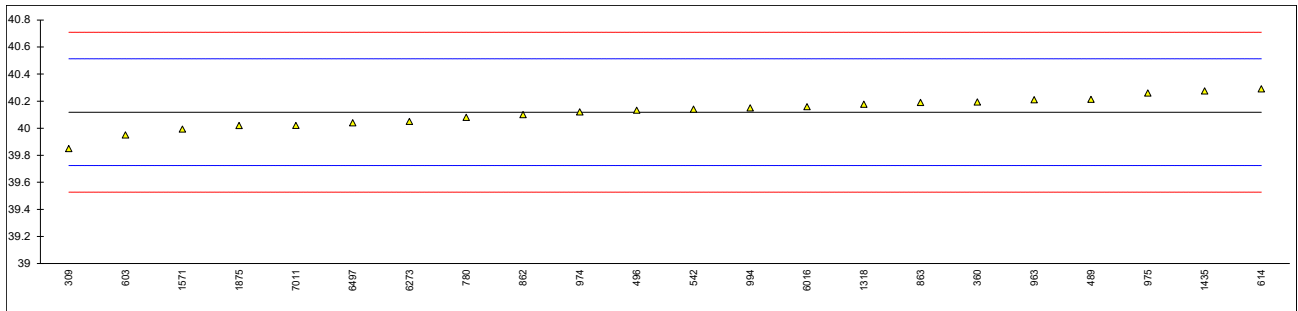
Determination of Kinematic Viscosity at 100 °C on sample #23216; results in mm²/s

lab	method	value	mark	z(targ)	remarks
178	D7279 corrected to D445	6.72	R(0.01)	-6.61	
179	D445	6.975	R(0.01)	-2.03	
225	D445	7.100		0.21	
237	D445	7.084		-0.07	
256	D7279 corrected to D445	7.184		1.72	
257	D7279 corrected to D445	7.179		1.63	
309		----		----	
317	D445	7.040		-0.86	
325	D445	7.078		-0.18	
331		----		----	
335	D445	7.134		0.82	
339		----		----	
349		----		----	
360	D445	7.1050		0.30	
432	D445	7.051		-0.67	
442		----		----	
451	D7279 corrected to D445	7.10		0.21	
489		----		----	
496	D445	7.0768		-0.20	
542		----		----	
562	D445	7.530	R(0.01)	7.93	
603		----		----	
614	D445	7.073		-0.27	
633	D445	7.0625		-0.46	
634	D445	7.094		0.11	
780	D445	7.062		-0.47	
862	D445	7.086		-0.04	
863	D445	7.068		-0.36	
901		----		----	
912	D445	7.149		1.09	
963	D445	7.089		0.02	
974	D445	7.098		0.18	
975	D445	7.102		0.25	
994	D445	7.089		0.02	
1026	D445	7.10		0.21	
1146	D445	7.0764		-0.21	
1166		----		----	
1189	D7279 corrected to D445	9.889	R(0.01)	50.29	
1318		----		----	
1435		----		----	
1531		----		----	
1571		----		----	
1743	D445	7.021		-1.21	
1788		----		----	
1801	D445	7.0381		-0.90	
1854	ISO3104	7.074		-0.25	
1875		----		----	
1888	D445	7.28	R(0.01)	3.44	
1900	D7279 corrected to D445	6.955	R(0.01)	-2.39	
1920		----		----	
3031		----		----	
6016		----		----	
6099		----		----	
6141	D445	5.4574	R(0.01)	-29.28	
6235	D445	7.0567		-0.56	
6273		----		----	
6322	D7042	7.098		0.18	
6402	D7279 corrected to D445	7.092		0.07	
6414	D7279 corrected to D445	7.45	R(0.01)	6.50	
6497	D445	7.072		-0.29	
6546		----		----	
7011		----		----	
	normality	suspect			
	n	31			
	outliers	8			
	mean (n)	7.0881			
	st.dev. (n)	0.03602			
	R(calc.)	0.1009			
	st.dev.(iis memo 1401)	0.05569			
	R(iis memo 1401)	0.1559			
Compare					
	R(D445:23)	0.0590			



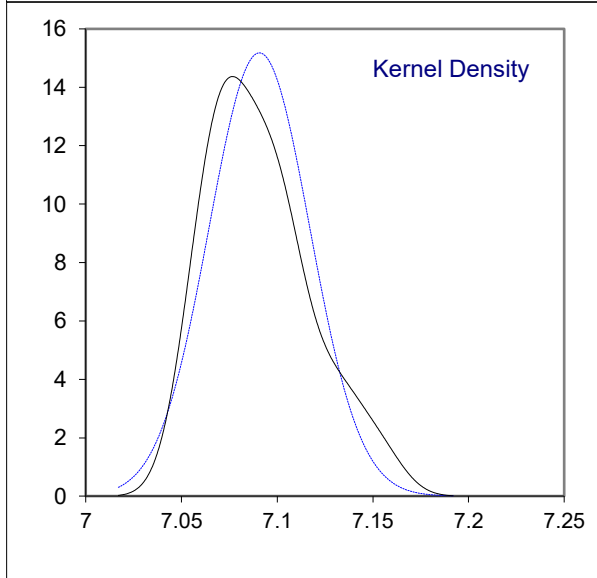
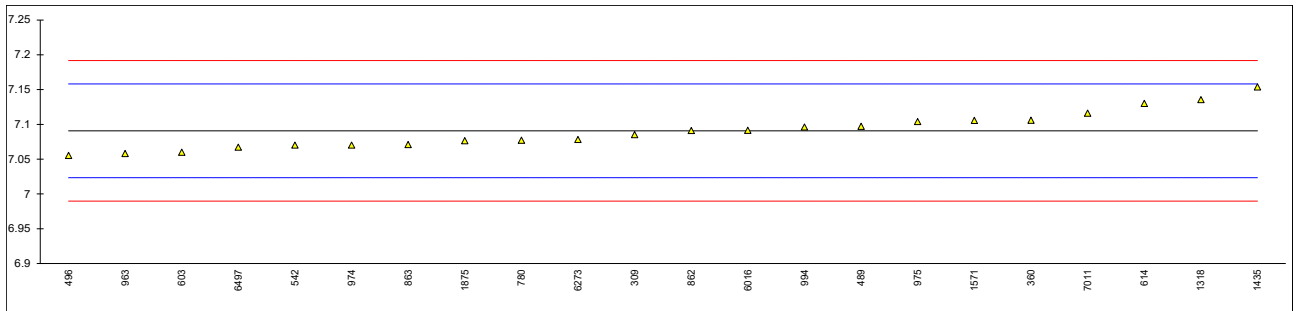
Determination of Kinematic Viscosity Stabinger at 40 °C on sample #23216; results in mm²/s

lab	method	value	mark	z(targ)	remarks
178		----		----	
179		----		----	
225		----		----	
237		----		----	
256		----		----	
257		----		----	
309	D7042	39.85		-1.36	
317		----		----	
325		----		----	
331		----		----	
335		----		----	
339		----		----	
349		----		----	
360	D7042	40.193		0.38	
432		----		----	
442		----		----	
451		----		----	
489	DIN51659-2	40.213		0.48	
496	D7042	40.1320		0.07	
542	D7042	40.14		0.11	
562		----		----	
603	D7042	39.95		-0.86	
614	D7042	40.29		0.87	
633		----		----	
634		----		----	
780	D7042	40.08		-0.20	
862	D7042	40.10		-0.10	
863	D7042	40.19		0.36	
901		----		----	
912		----		----	
963	D7042	40.21		0.46	
974	D7042	40.12		0.01	
975	D7042	40.26		0.72	
994	D7042	40.15		0.16	
1026		----		----	
1146		----		----	
1166		----		----	
1189		----		----	
1318	D7042	40.177		0.30	
1435	D7042	40.275		0.79	
1531		----		----	
1571	D7042	39.9935		-0.64	
1743		----		----	
1788		----		----	
1801		----		----	
1854		----		----	
1875	D7042	40.019		-0.51	
1888		----		----	
1900		----		----	
1920		----		----	
3031		----		----	
6016	D7042	40.159		0.20	
6099		----		----	
6141		----		----	
6235		----		----	
6273	D7042	40.05		-0.35	
6322		----		----	
6402		----		----	
6414		----		----	
6497	D7042	40.04		-0.40	
6546		----		----	
7011	D7042	40.02		-0.50	
	normality	OK			
	n	22			
	outliers	0			
	mean (n)	40.1187			
	st.dev. (n)	0.11062			
	R(calc.)	0.3097			
	st.dev.(D7042:21a)	0.19690			
	R(D7042:21a)	0.5513			



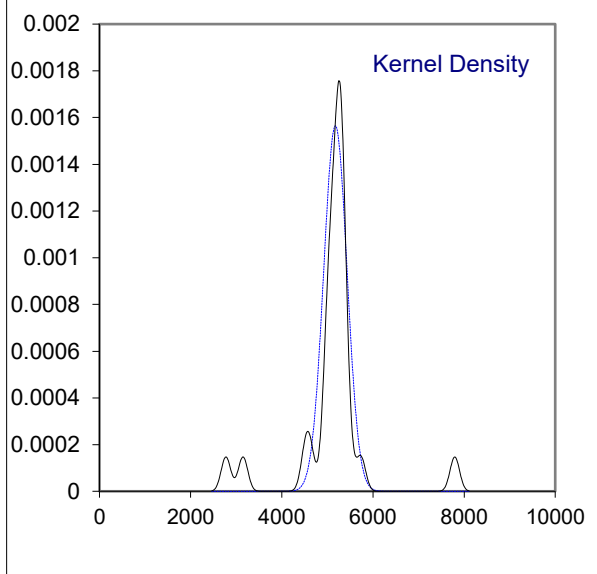
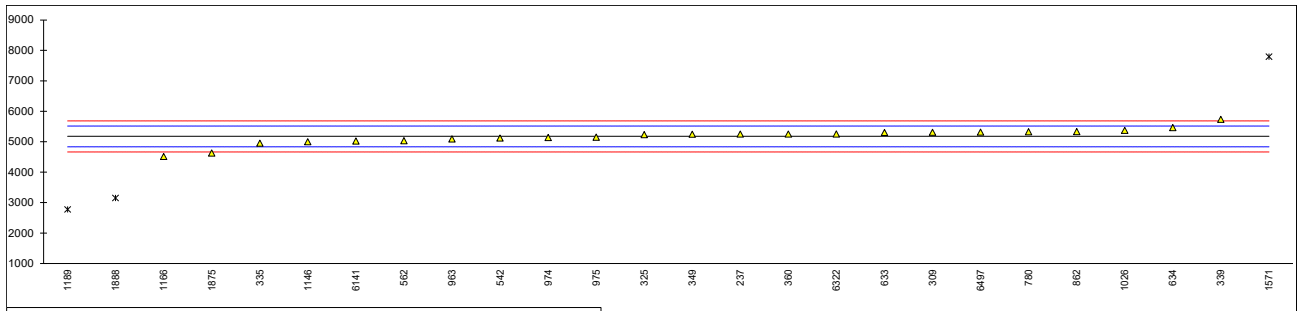
Determination of Kinematic Viscosity Stabinger at 100 °C on sample #23216; results in mm²/s

lab	method	value	mark	z(targ)	remarks
178		----		----	
179		----		----	
225		----		----	
237		----		----	
256		----		----	
257		----		----	
309	D7042	7.085		-0.17	
317		----		----	
325		----		----	
331		----		----	
335		----		----	
339		----		----	
349		----		----	
360	D7042	7.1059		0.45	
432		----		----	
442		----		----	
451		----		----	
489	DIN51659-2	7.0972		0.19	
496	D7042	7.0552		-1.05	
542	D7042	7.07		-0.61	
562		----		----	
603	D7042	7.060		-0.91	
614	D7042	7.130		1.17	
633		----		----	
634		----		----	
780	D7042	7.077		-0.40	
862	D7042	7.091		0.01	
863	D7042	7.071		-0.58	
901		----		----	
912		----		----	
963	D7042	7.058		-0.97	
974	D7042	7.070		-0.61	
975	D7042	7.104		0.40	
994	D7042	7.096		0.16	
1026		----		----	
1146		----		----	
1166		----		----	
1189		----		----	
1318	D7042	7.1355		1.33	
1435	D7042	7.1536		1.87	
1531		----		----	
1571	D7042	7.10555		0.44	
1743		----		----	
1788		----		----	
1801		----		----	
1854		----		----	
1875	D7042	7.0765		-0.42	
1888		----		----	
1900		----		----	
1920		----		----	
3031		----		----	
6016	D7042	7.0915		0.03	
6099		----		----	
6141		----		----	
6235		----		----	
6273	D7042	7.078		-0.38	
6322		----		----	
6402		----		----	
6414		----		----	
6497	D7042	7.067		-0.70	
6546		----		----	
7011	D7042	7.116		0.75	
	normality	OK			
	n	22			
	outliers	0			
	mean (n)	7.0906			
	st.dev. (n)	0.02629			
	R(calc.)	0.0736			
	st.dev.(D7042:21a)	0.03368			
	R(D7042:21a)	0.0943			



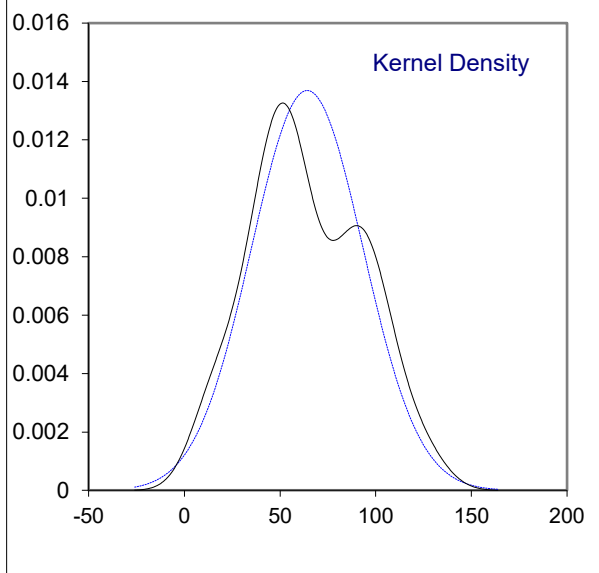
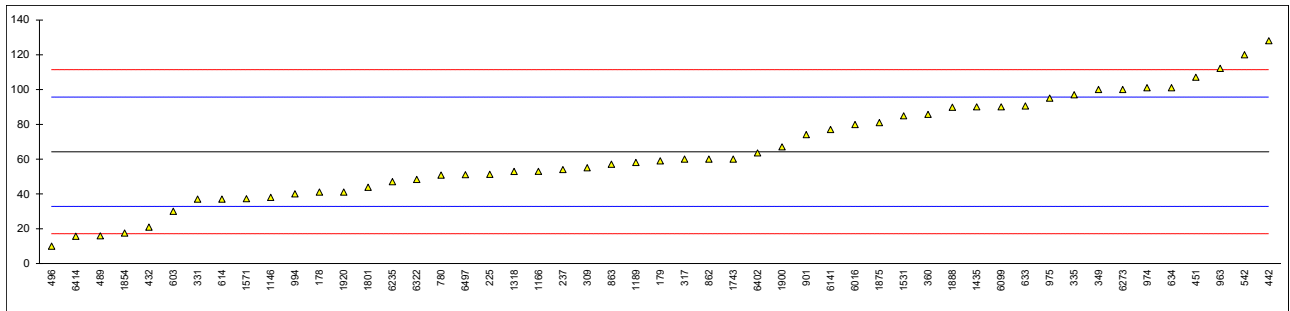
Determination of Sulfur on sample #23216; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178		----		----	
179		----		----	
225		----		----	
237	D4294	5250		0.44	
256		----		----	
257		----		----	
309	ISO8754	5310		0.79	
317		----		----	
325	INH-6443	5230		0.32	
331		----		----	
335	D4294	4950	C	-1.33	First reported 0.495 mg/kg
339	INH-024	5733		3.29	
349	D2622	5244		0.41	
360	D4294	5252		0.45	
432		----		----	
442		----		----	
451		----		----	
489		----		----	
496		----		----	
542	D4294	5120		-0.32	
562	D4294	5032		-0.84	
603		----		----	
614		----		----	
633	D4294	5301		0.74	
634	D4294	5463		1.70	
780	D4294	5325		0.88	
862	D2622	5330		0.91	
863		----		----	
901		----		----	
912		----		----	
963	D4294	5090.50		-0.50	
974	D4294	5140		-0.21	
975	D4294	5150		-0.15	
994		----		----	
1026	D2622	5370	C	1.15	First reported 53700
1146	D4294	5000	C	-1.03	First reported 0.500 mg/kg
1166	In house	4516		-3.88	
1189	D5185	2775	R(0.01)	-14.14	
1318		----		----	
1435		----		----	
1531		----		----	
1571	D5185	7793.045	R(0.01)	15.43	
1743		----		----	
1788		----		----	
1801		----		----	
1854		----		----	
1875	DIN51724-1	4625		-3.24	
1888	D4294	3150.124	R(0.01)	-11.93	
1900		----		----	
1920		----		----	
3031		----		----	
6016		----		----	
6099		----		----	
6141	D4294	5024.5		-0.89	
6235		----		----	
6273		----		----	
6322	DIN51418	5257		0.48	
6402		----		----	
6414		----		----	
6497	D4294	5314		0.82	
6546		----		----	
7011		----		----	
	normality	not OK			
	n	23			
	outliers	3			
	mean (n)	5175.09			
	st.dev. (n)	255.084			
	R(calc.)	714.23			
	st.dev.(D4294:21)	169.718			
	R(D4294:21)	475.21			



Determination of Water on sample #23216; results in mg/kg

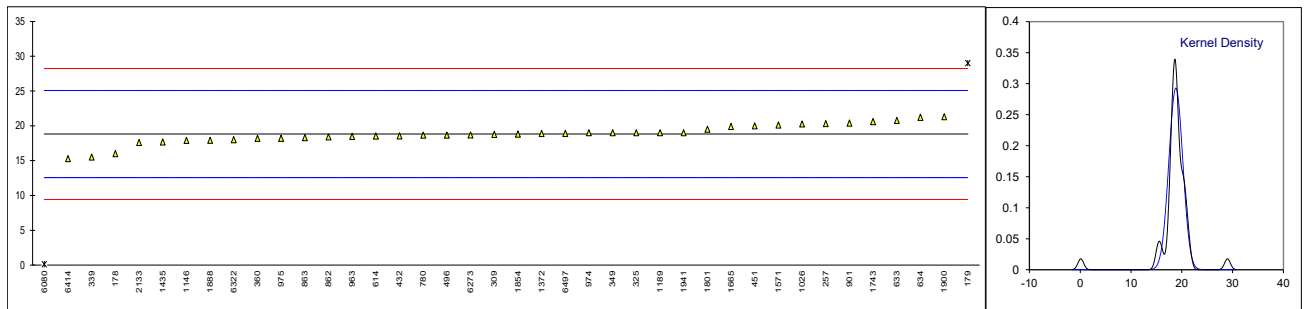
lab	method	value	mark	z(targ)	remarks	
178	D6304-C:20	41		-1.48		
179	D6304-C:16e1	59		-0.33		
225	D6304-A:20	51.31		-0.82		
237	D6304-C:16e1	54		-0.65		
256		----		----		
257		----		----		
309	D6304-C:20	55		-0.59		
317	D6304-A:20	60	C	-0.27	First reported 170	
325	D6304-C	<100		----		
331	D6304-C:20	37		-1.73		
335	ISO12937	97		2.08		
339		----		----		
349	D6304-A:20	100		2.27		
360	ISO12937	85.7		1.36		
432	D6304-B:20	20.9		-2.76		
442	IP438	128		4.05		
451	D6304-A:20	107	C	2.72	First reported 177	
489	DIN51777	15.9		-3.07		
496	D6304-B:20	10		-3.45		
542	D6304-A:20	120		3.54		
562		----		----		
603	D6304-B:20	30		-2.18		
614	D6304-B:20	37		-1.73		
633	D6304-B:20	90.495		1.67		
634	D6304-A:20	101		2.34		
780	D6304-B:20	50.8		-0.85		
862	D6304-B	60		-0.27		
863	D6304-B:20	57		-0.46		
901	D6304-A:20	74		0.62		
912		----		----		
963	D6304-A:20	112.1		3.04		
974	D6304-A:20	101		2.34		
975	D6304-A:16e1	95		1.95		
994	D6304-C:20	40		-1.54		
1026		----		----		
1146	D6304-B:20	38		-1.67		
1166	In house	53		-0.71		
1189	D6304-A:20	58		-0.40		
1318	D6304-B:20	52.9		-0.72		
1435	D6304-A:20	90		1.64		
1531	D6304-A:16e1	84.9		1.31		
1571	D6304-C:16e1	37.25		-1.72		
1743	ISO12937	60		-0.27		
1788		----		----		
1801	D6304-B:20	43.8		-1.30		
1854	D6304-C:20	17.5		-2.97		
1875	ISO12937	81.0		1.06		
1888	D6304	89.74		1.62		
1900	D6304-C:20	67.00		0.17		
1920	D6304-B:20	41.0		-1.48		
3031		----		----		
6016	D6304	79.9		0.99		
6099	EN60814	90		1.64		
6141	D1533	77		0.81		
6235	In house	47		-1.10		
6273	D6304-B:20	100		2.27		
6322	EN60814	48.3	C	-1.01	First reported 1023	
6402	D1533	63.5		-0.05		
6414	D6304-B:16e1	15.67		-3.09		
6497	D6304-A:20	51		-0.84		
6546		----		----		
7011		----		----		
				<u>D6304-A:20 only</u>	<u>D6304-B:20 only</u>	<u>D6304-C:20 only</u>
	normality	OK		OK	OK	OK
	n	51		12	12	6
	outliers	0		0	0	0
	mean (n)	64.248		85.451	47.658	42.917
	st.dev. (n)	29.1450		25.1703	25.9568	16.8476
	R(calc.)	81.606		77.164	72.679	47.173
	st.dev.(D6304-A:20)	15.7325		19.2388	--	--
	R(D6304-A:20)	44.051		53.869	--	--
Compare						
	R(D6304-B:20)	128.397		--	113.782	--
	R(D6304-C:20)	31.273		--	--	22.595



Determination of Barium as Ba on sample #23217; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	16		-0.90	
179	D5185	29	R(0.01)	3.25	
237		----		----	
256		----		----	
257	D6595	20.31		0.47	
309	D5185	18.752		-0.02	
325	D5185	19		0.06	
331		----		----	
339	INH-047	15.5		-1.06	
349	D5185	19		0.06	
360	D5185	18.2		-0.20	
432	D5185	18.55		-0.09	
451	D5185	20		0.38	
496	D5185	18.65		-0.06	
542	D6595	<28		----	
562		----		----	
614	D5185	18.52		-0.10	
633	D6595	20.773		0.62	
634	D6595	21.21		0.76	
780	D5185	18.65		-0.06	
862	D5185	18.4		-0.13	
863	D5185	18.3		-0.17	
901	D5185	20.4		0.50	
912		----		----	
963	D5185	18.48		-0.11	
974	D5185	19		0.06	
975	D5185	18.22		-0.19	
994	D5185	>4		----	
1026	D5185	20.25872	C	0.46	First reported 202.5872
1059		----		----	
1146	D5185	17.889		-0.30	
1166		----		----	
1189	D5185	19		0.06	
1372	D5185	18.90		0.02	
1435	D5185	17.694		-0.36	
1571	D5185	20.1257		0.42	
1665		19.91		0.35	
1743	NF t60-106	20.6		0.57	
1801	D5185	19.5		0.22	
1854	D5185	18.8		-0.01	
1875		----		----	
1888	D5185	17.919		-0.29	
1900	D5185	21.291		0.79	
1941		19		0.06	
2133		17.600		-0.39	
3031		----		----	
6080	D5185	0.1	R(0.01)	-5.97	
6273	D5185	18.684		-0.04	
6322	DIN51418	18		-0.26	
6414	D5185	15.280		-1.13	
6497	In house	18.9		0.02	
6546		----		----	

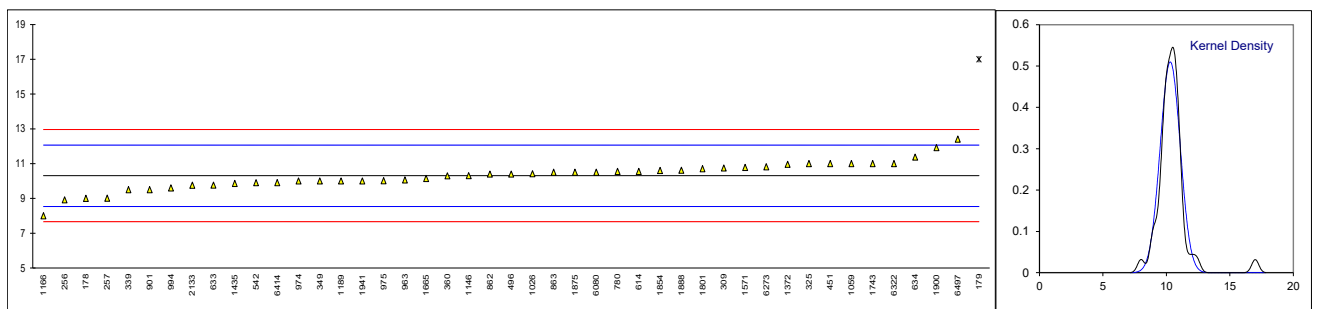
normality suspect
n 38
outliers 2
mean (n) 18.8228
st.dev. (n) 1.36237
R(calc.) 3.8146
st.dev.(D5185:18) 3.13620
R(D5185:18) 8.7814



Determination of Copper as Cu on sample #23217; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	9		-1.47	
179	D5185	17	R(0.01)	7.59	
237		----		----	
256	D5185	8.92		-1.56	
257	D6595	9.01		-1.46	
309	D5185	10.744		0.50	
325	D5185	11		0.79	
331		----		----	
339	INH-047	9.5		-0.91	
349	D5185	10.0		-0.34	
360	D5185	10.3		0.00	
432		----		----	
451	D5185	11		0.79	
496	D5185	10.4		0.11	
542	D6595	9.90		-0.45	
562		----		----	
614	D5185	10.55		0.28	
633	D6595	9.759		-0.61	
634	D6595	11.37		1.21	
780	D5185	10.55		0.28	
862	D5185	10.4		0.11	
863	D5185	10.5		0.23	
901	D5185	9.5		-0.91	
912		----		----	
963	D5185	10.06		-0.27	
974	D5185	10		-0.34	
975	D5185	10.02		-0.32	
994	D5185	9.6		-0.79	
1026	D5185	10.4119		0.13	
1059	In house	11		0.79	
1146	D5185	10.305		0.00	
1166	In house	8		-2.61	
1189	D5185	10		-0.34	
1372	D5185	10.96		0.75	
1435	D5185	9.855		-0.50	
1571	D5185	10.777		0.54	
1665		10.14		-0.18	
1743	NF t60-106	11		0.79	
1801	D5185	10.7		0.45	
1854	D5185	10.6		0.34	
1875	EN11885	10.5		0.23	
1888	D5185	10.621		0.36	
1900	D5185	11.914		1.83	
1941		10		-0.34	
2133		9.756		-0.62	
3031		----		----	
6080	D5185	10.5		0.23	
6273	D5185	10.810		0.58	
6322	DIN51418	11		0.79	
6414	D5185	9.904		-0.45	
6497	In house	12.4		2.38	
6546		----		----	

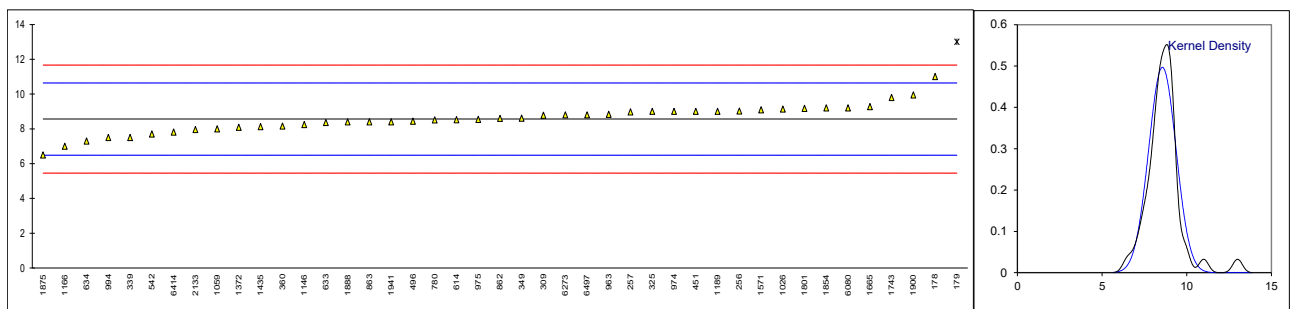
normality suspect
n 44
outliers 1
mean (n) 10.3008
st.dev. (n) 0.78213
R(calc.) 2.1900
st.dev.(D5185:18) 0.88293
R(D5185:18) 2.4722



Determination of Iron as Fe on sample #23217; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	11		2.36	
179	D5185	13	R(0.01)	4.29	
237		----		----	
256	D5185	9.02		0.44	
257	D6595	8.97		0.39	
309	D5185	8.772		0.20	
325	D5185	9		0.42	
331		----		----	
339	INH-047	7.5		-1.03	
349	D5185	8.61		0.05	
360	D5185	8.16		-0.39	
432		----		----	
451	D5185	9		0.42	
496	D5185	8.44		-0.12	
542	D6595	7.7		-0.83	
562		----		----	
614	D5185	8.52		-0.04	
633	D6595	8.357		-0.20	
634	D6595	7.29		-1.23	
780	D5185	8.51		-0.05	
862	D5185	8.6		0.04	
863	D5185	8.4		-0.16	
901		----		----	
912		----		----	
963	D5185	8.83		0.26	
974	D5185	9		0.42	
975	D5185	8.54		-0.02	
994	D5185	7.5	C	-1.03	First reported 5.9
1026	D5185	9.1257		0.54	
1059	In house	8		-0.54	
1146	D5185	8.245		-0.31	
1166	In house	7		-1.51	
1189	D5185	9		0.42	
1372	D5185	8.09		-0.46	
1435	D5185	8.122		-0.43	
1571	D5185	9.0853		0.51	
1665		9.27		0.68	
1743	NF t60-106	9.8		1.20	
1801	D5185	9.17		0.59	
1854	D5185	9.2		0.62	
1875	EN11885	6.5		-1.99	
1888	D5185	8.391		-0.17	
1900	D5185	9.939		1.33	
1941		8.4		-0.16	
2133		7.954		-0.59	
3031		----		----	
6080	D5185	9.2		0.62	
6273	D5185	8.800		0.23	
6322	DIN51418	<10		----	
6414	D5185	7.810		-0.73	
6497	In house	8.8		0.23	
6546		----		----	

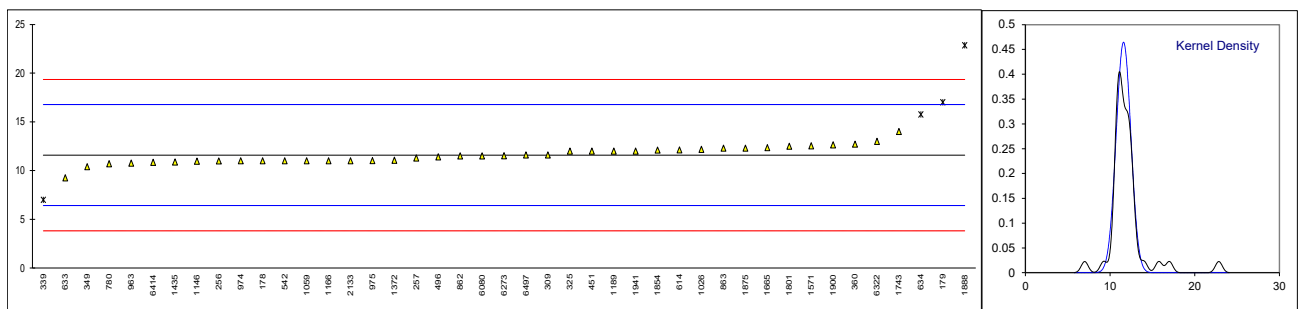
normality suspect
n 42
outliers 1
mean (n) 8.5624
st.dev. (n) 0.80255
R(calc.) 2.2471
st.dev.(D5185:18) 1.03496
R(D5185:18) 2.8979



Determination of Lead as Pb on sample #23217; results in mg/kg

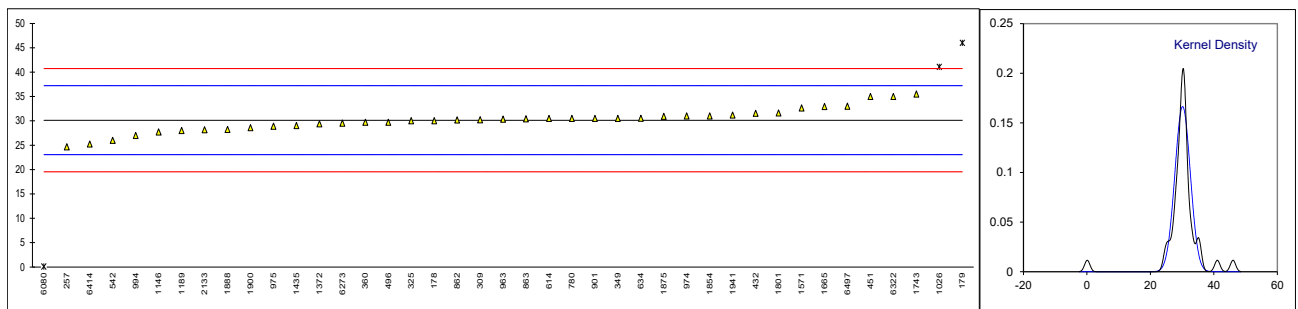
lab	method	value	mark	z(targ)	remarks
178	D5185	11		-0.23	
179	D5185	17	R(0.01)	2.09	
237		----		----	
256	D5185	10.98		-0.24	
257	D6595	11.28		-0.12	
309	D5185	11.610		0.01	
325	D5185	12		0.16	
331		----		----	
339	INH-047	7	R(0.01)	-1.77	
349	D5185	10.4		-0.46	
360	D5185	12.7		0.43	
432		----		----	
451	D5185	12		0.16	
496	D5185	11.4		-0.07	
542	D6595	11		-0.23	
562		----		----	
614	D5185	12.11		0.20	
633	D6595	9.246		-0.91	
634	D6595	15.76	R(0.01)	1.61	
780	D5185	10.70		-0.34	
862	D5185	11.5		-0.03	
863	D5185	12.3		0.27	
901		----		----	
912		----		----	
963	D5185	10.76		-0.32	
974	D5185	11		-0.23	
975	D5185	11.02		-0.22	
994	D5185	<10		----	
1026	D5185	12.1793		0.23	
1059	In house	11		-0.23	
1146	D5185	10.948		-0.25	
1166	In house	11		-0.23	
1189	D5185	12		0.16	
1372	D5185	11.06		-0.20	
1435	D5185	10.883		-0.27	
1571	D5185	12.5374		0.37	
1665		12.34		0.29	
1743	NF t60-106	14		0.93	
1801	D5185	12.5		0.35	
1854	D5185	12.1		0.20	
1875	EN11885	12.3		0.27	
1888	D5185	22.844	R(0.01)	4.35	
1900	D5185	12.63		0.40	
1941		12		0.16	
2133		11.006		-0.23	
3031		----		----	
6080	D5185	11.5		-0.03	
6273	D5185	11.516		-0.03	
6322	DIN51418	13		0.55	
6414	D5185	10.853		-0.28	
6497	In house	11.6		0.00	
6546		----		----	

normality suspect
n 39
outliers 4
mean (n) 11.5887
st.dev. (n) 0.85865
R(calc.) 2.4042
st.dev.(D5185:18) 2.58831
R(D5185:18) 7.2473



Determination of Magnesium as Mg on sample #23217; results in mg/kg

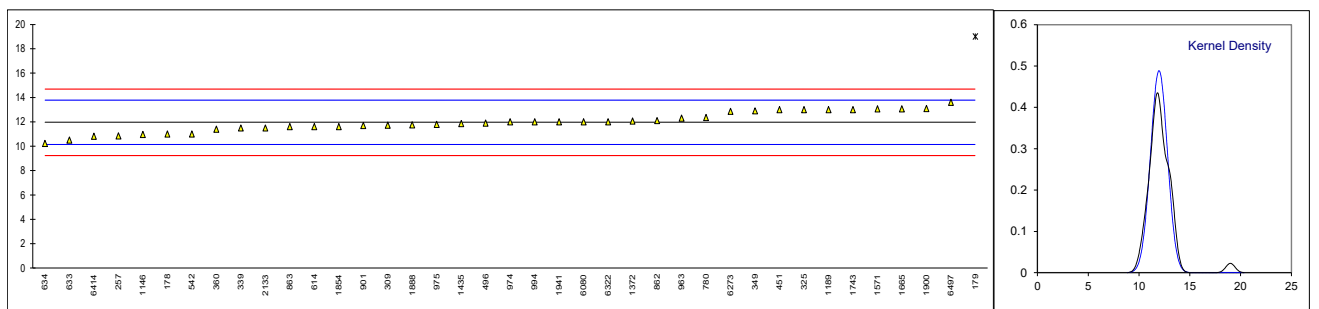
lab	method	value	mark	z(targ)	remarks
178	D5185	30		-0.04	
179	D5185	46	R(0.01)	4.48	
237		----		----	
256		----		----	
257	D6595	24.65		-1.55	
309	D5185	30.230		0.03	
325	D5185	30		-0.04	
331		----		----	
339	INH-047	<50		----	
349	D5185	30.5		0.11	
360	D5185	29.72		-0.12	
432	D5185	31.55		0.40	
451	D5185	35		1.38	
496	D5185	29.72		-0.12	
542	D6595	26		-1.17	
562		----		----	
614	D5185	30.5		0.11	
633		----		----	
634	D6595	30.52		0.11	
780	D5185	30.50		0.11	
862	D5185	30.2		0.02	
863	D5185	30.4		0.08	
901	D5185	30.5		0.11	
912		----		----	
963	D5185	30.33		0.06	
974	D5185	31		0.25	
975	D5185	28.90		-0.35	
994	D5185	27	C	-0.88	First reported 17
1026	D5185	41.06007	C,R(0.01)	3.09	First reported 410.6007
1059	In house	<60		----	
1146	D5185	27.706		-0.68	
1166		----		----	
1189	D5185	28		-0.60	
1372	D5185	29.37		-0.21	
1435	D5185	29.046		-0.31	
1571	D5185	32.6508		0.71	
1665		32.93		0.79	
1743	NF t60-106	35.5		1.52	
1801	D5185	31.6		0.42	
1854	D5185	31.0		0.25	
1875	EN11885	30.9		0.22	
1888	D5185	28.210		-0.54	
1900	D5185	28.58		-0.44	
1941		31.2		0.30	
2133		28.172		-0.55	
3031		----		----	
6080	D5185	0.1	R(0.01)	-8.48	
6273	D5185	29.515		-0.17	
6322	DIN51418	35		1.38	
6414	D5185	25.236		-1.38	
6497	In house	33.0		0.81	
6546		----		----	
	normality	OK			
	n	38			
	outliers	3			
	mean (n)	30.1273			
	st.dev. (n)	2.39449			
	R(calc.)	6.7046			
	st.dev.(D5185:18)	3.53976			
	R(D5185:18)	9.9113			



Determination of Manganese as Mn on sample #23217; results in mg/kg

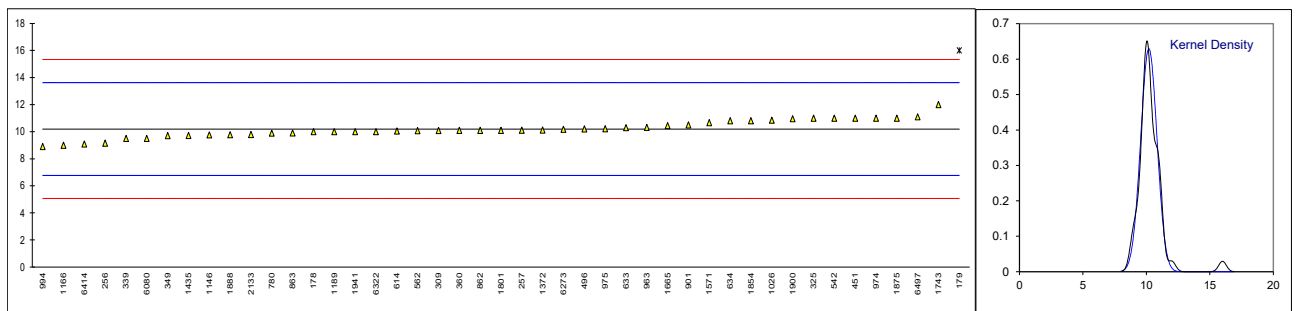
lab	method	value	mark	z(targ)	remarks
178	D5185	11		-1.06	
179	D5185	19	R(0.01)	7.71	
237		----		----	
256		----		----	
257	D6595	10.84		-1.23	
309	D5185	11.722		-0.27	
325	D5185	13		1.13	
331		----		----	
339	INH-047	11.5		-0.51	
349	D5185	12.9		1.02	
360	D5185	11.4		-0.62	
432		----		----	
451	D5185	13		1.13	
496	D5185	11.9		-0.07	
542	D6595	11		-1.06	
562		----		----	
614	D5185	11.6		-0.40	
633	D6595	10.505		-1.60	
634	D6595	10.22		-1.91	
780	D5185	12.35		0.42	
862	D5185	12.1		0.15	
863	D5185	11.6		-0.40	
901	D5185	11.7		-0.29	
912		----		----	
963	D5185	12.31		0.38	
974	D5185	12		0.04	
975	D5185	11.78		-0.20	
994	D5185	12	C	0.04	First reported 8.4
1026		----		----	
1059		----		----	
1146	D5185	10.969		-1.09	
1166		----		----	
1189	D5185	13		1.13	
1372	D5185	12.06		0.10	
1435	D5185	11.853		-0.12	
1571	D5185	13.0698		1.21	
1665		13.07		1.21	
1743	NF t60-106	13		1.13	
1801		----		----	
1854	D5185	11.6		-0.40	
1875		----		----	
1888	D5185	11.750		-0.24	
1900	D5185	13.097		1.24	
1941		12		0.04	
2133		11.500		-0.51	
3031		----		----	
6080	D5185	12		0.04	
6273	D5185	12.862		0.98	
6322	DIN51418	12		0.04	
6414	D5185	10.817		-1.26	
6497	In house	13.6		1.79	
6546		----		----	

normality OK
n 38
outliers 1
mean (n) 11.9651
st.dev. (n) 0.81627
R(calc.) 2.2856
st.dev.(D5185:18) 0.91261
R(D5185:18) 2.5553



Determination of Nickel as Ni on sample #23217; results in mg/kg

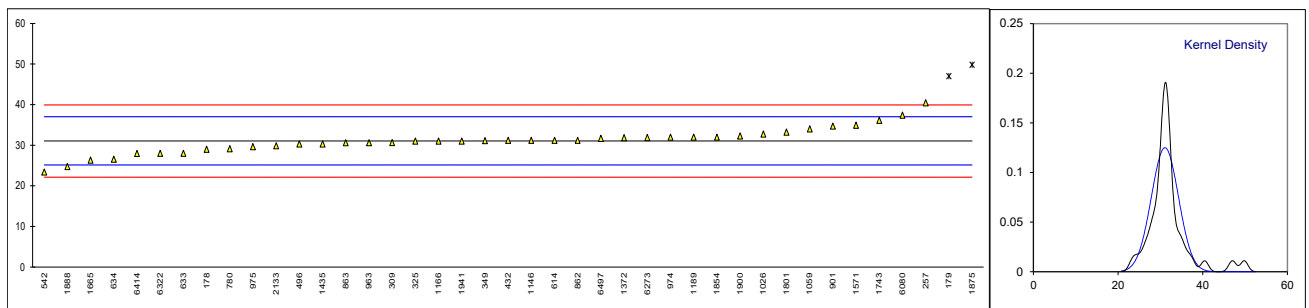
lab	method	value	mark	z(targ)	remarks
178	D5185	10		-0.12	
179	D5185	16	R(0.01)	3.39	
237		----		----	
256	D5185	9.15		-0.61	
257	D6595	10.11		-0.05	
309	D5185	10.085		-0.07	
325	D5185	11		0.47	
331		----		----	
339	INH-047	9.5		-0.41	
349	D5185	9.7		-0.29	
360	D5185	10.1		-0.06	
432		----		----	
451	D5185	11		0.47	
496	D5185	10.2		0.00	
542	D6595	11		0.47	
562	D5185	10.074		-0.07	
614	D5185	10.05		-0.09	
633	D6595	10.291		0.05	
634	D6595	10.80		0.35	
780	D5185	9.89		-0.18	
862	D5185	10.1		-0.06	
863	D5185	9.9		-0.17	
901	D5185	10.5		0.18	
912		----		----	
963	D5185	10.31		0.07	
974	D5185	11		0.47	
975	D5185	10.22		0.01	
994	D5185	8.9	C	-0.76	First reported 6.2
1026	D5185	10.8488		0.38	
1059		----		----	
1146	D5185	9.756		-0.26	
1166	In house	9		-0.70	
1189	D5185	10		-0.12	
1372	D5185	10.12		-0.05	
1435	D5185	9.712		-0.28	
1571	D5185	10.657		0.27	
1665		10.44		0.14	
1743	NF t60-106	12		1.05	
1801	D5185	10.1		-0.06	
1854	D5185	10.8		0.35	
1875	EN11885	11.0		0.47	
1888	D5185	9.765		-0.25	
1900	D5185	10.951		0.44	
1941		10		-0.12	
2133		9.792		-0.24	
3031		----		----	
6080	D5185	9.5		-0.41	
6273	D5185	10.172		-0.01	
6322	DIN51418	10		-0.12	
6414	D5185	9.088		-0.65	
6497	In house	11.1		0.53	
6546		----		----	
normality		OK			
n		44			
outliers		1			
mean (n)		10.1973			
st.dev. (n)		0.63365			
R(calc.)		1.7742			
st.dev.(D5185:18)		1.71071			
R(D5185:18)		4.7900			



Determination of Calcium as Ca on sample #23217; results in mg/kg

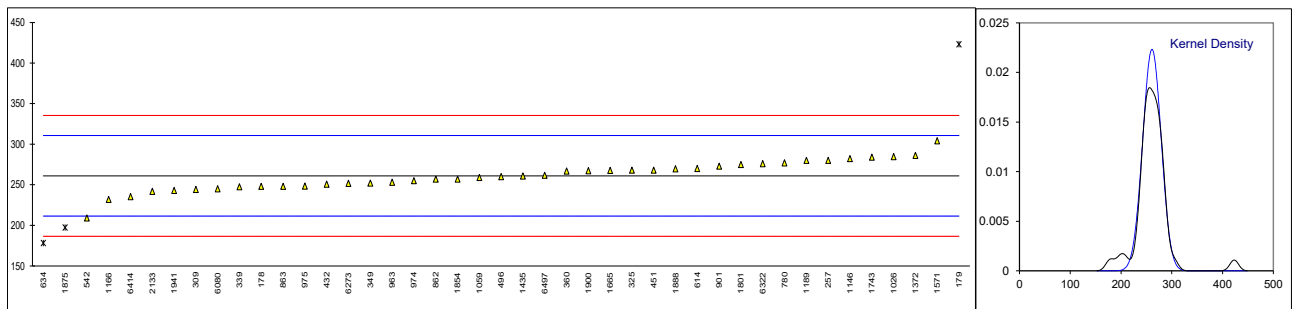
lab	method	value	mark	z(targ)	remarks
178	D5185	29		-0.69	
179	D5185	47	R(0.01)	5.38	
237		----		----	
256		----		----	
257	D6595	40.44		3.17	
309	D5185	30.648		-0.14	
325	D5185	31		-0.02	
331		----		----	
339	INH-047	<50		----	
349	D5185	31.1		0.02	
360	D5185	< 40.0		----	
432	D5185	31.18		0.04	
451	D5185	< 50		----	
496	D5185	30.32		-0.25	
542	D6595	23.4		-2.58	
562		----		----	
614	D5185	31.2		0.05	
633	D6595	28.001		-1.03	
634	D6595	26.56		-1.52	
780	D5185	29.10		-0.66	
862	D5185	31.2		0.05	
863	D5185	30.6		-0.15	
901	D5185	34.7		1.23	
912		----		----	
963	D5185	30.62		-0.15	
974	D5185	32		0.32	
975	D5185	29.63		-0.48	
994	D5185	<40		----	
1026	D5185	32.72701	C	0.56	First reported 327.2701
1059	In house	34		0.99	
1146	D5185	31.188		0.05	
1166	In house	31		-0.02	
1189	D5185	32		0.32	
1372	D5185	31.84		0.27	
1435	D5185	30.322		-0.25	
1571	D5185	34.9238		1.31	
1665		26.32		-1.60	
1743	NF t60-106	36.1		1.70	
1801	D5185	33.2		0.72	
1854	D5185	32.0		0.32	
1875	EN11885	49.8	C,R(0.01)	6.33	First reported 64.6
1888	D5185	24.739		-2.13	
1900	D5185	32.283		0.41	
1941		31.0		-0.02	
2133		29.854		-0.41	
3031		----		----	
6080	D5185	37.4		2.14	
6273	D5185	31.858		0.27	
6322	DIN51418	28		-1.03	
6414	D5185	27.963		-1.04	
6497	In house	31.7		0.22	
6546		----		----	

normality suspect
n 39
outliers 2
mean (n) 31.0543
st.dev. (n) 3.18944
R(calc.) 8.9304
st.dev.(Horwitz) 2.96248
R(Horwitz) 8.2949



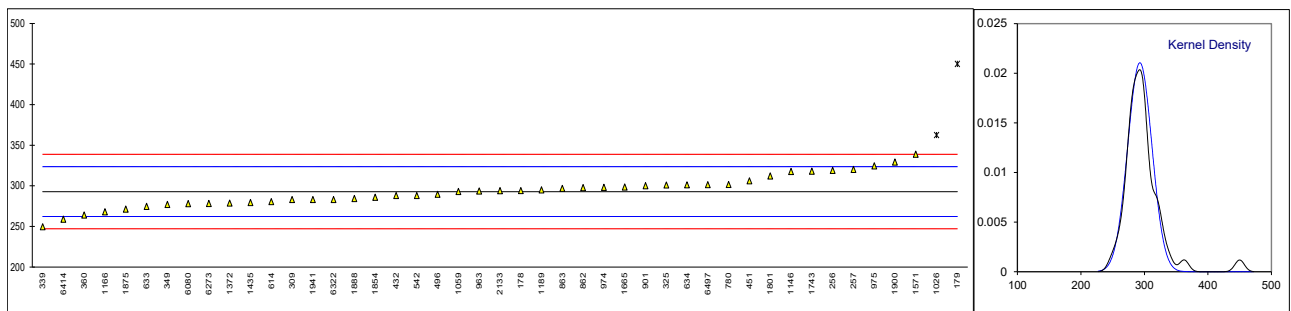
Determination of Phosphorus as P on sample #23217; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	248		-0.52	
179	D5185	423	R(0.01)	6.53	
237		----		----	
256		----		----	
257	D6595	280.01		0.77	
309	D5185	244.355		-0.67	
325	D5185	268		0.28	
331		----		----	
339	INH-047	247.5		-0.54	
349	D5185	252		-0.36	
360	D5185	267		0.24	
432	D5185	250.8		-0.41	
451	D5185	268		0.28	
496	D5185	260.1		-0.04	
542	D6595	209		-2.10	
562		----		----	
614	D5185	270.0		0.36	
633		----		----	
634	D6595	178.29	R(0.05)	-3.33	
780	D5185	277.00		0.64	
862	D5185	257		-0.16	
863	D5185	248.1		-0.52	
901	D5185	273		0.48	
912		----		----	
963	D5185	253.13		-0.32	
974	D5185	255		-0.24	
975	D5185	248.4		-0.51	
994		----		----	
1026	D5185	284.6644		0.95	
1059	In house	259		-0.08	
1146	D5185	282.228		0.85	
1166	In house	232		-1.17	
1189	D5185	280		0.77	
1372	D5185	286.12		1.01	
1435	D5185	260.852		-0.01	
1571	D5185	304.144		1.74	
1665		267.62		0.27	
1743	NF t60-106	284		0.93	
1801	D5185	275		0.56	
1854	D5185	257		-0.16	
1875	EN11885	197.3	C,R(0.05)	-2.57	First reported 186.7
1888	D5185	269.645		0.35	
1900	D5185	267.38		0.26	
1941		243	C	-0.73	First reported 318
2133		241.944	C	-0.77	First reported 182.540
3031		----		----	
6080	D5185	245		-0.65	
6273	D5185	251.724		-0.37	
6322	DIN51418	276		0.60	
6414	D5185	235.346		-1.03	
6497	In house	261.7		0.03	
6546		----		----	
	normality	OK			
	n	40			
	outliers	3			
	mean (n)	261.019			
	st.dev. (n)	17.8712			
	R(calc.)	50.039			
	st.dev.(D5185:18)	24.8111			
	R(D5185:18)	69.471			



Determination of Zinc as Zn on sample #23217; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	294		0.07	
179	D5185	450	R(0.01)	10.26	
237		----		----	
256	D5185	318.92		1.70	
257	D6595	320.16		1.78	
309	D5185	282.956		-0.65	
325	D5185	301		0.53	
331		----		----	
339	INH-047	249.5		-2.83	
349	D5185	277		-1.04	
360	D5185	264		-1.88	
432	D5185	287.9		-0.32	
451	D5185	306		0.86	
496	D5185	289.6		-0.21	
542	D6595	288		-0.32	
562		----		----	
614	D5185	280.4		-0.81	
633	D6595	274.595		-1.19	
634	D6595	301.19		0.54	
780	D5185	301.50		0.56	
862	D5185	297.8		0.32	
863	D5185	296.8		0.26	
901	D5185	300		0.47	
912		----		----	
963	D5185	293.59		0.05	
974	D5185	298		0.33	
975	D5185	324.5		2.06	
994		----		----	
1026	D5185	362.5441	R(0.05)	4.55	
1059	In house	293		0.01	
1146	D5185	317.603		1.61	
1166	In house	268		-1.62	
1189	D5185	295		0.14	
1372	D5185	278.64		-0.93	
1435	D5185	279.313		-0.88	
1571	D5185	338.902		3.00	
1665		298.53		0.37	
1743	NF t60-106	318		1.64	
1801	D5185	312		1.25	
1854	D5185	286		-0.45	
1875	EN11885	271.2		-1.41	
1888	D5185	284.239		-0.56	
1900	D5185	329.18		2.37	
1941		283		-0.64	
2133		293.861		0.06	
3031		----		----	
6080	D5185	278		-0.97	
6273	D5185	278.201		-0.96	
6322	DIN51418	283		-0.64	
6414	D5185	258.960		-2.21	
6497	In house	301.4		0.56	
6546		----		----	
normality		OK			
n		43			
outliers		2			
mean (n)		292.871			
st.dev. (n)		18.9434			
R(calc.)		53.042			
st.dev.(D5185:18)		15.3202			
R(D5185:18)		42.896			



APPENDIX 2

Determination of other reported metals on sample #23217; results in mg/kg

lab	Al	B	Cd	Cr	Li	Mo	K	Si	Ag
178	1	1	1	0	----	0	0	1	0
179	1	0	0	1	----	1	4	2	0
237	----	----	----	----	----	----	----	----	----
256	0.29	----	----	0.18	----	----	----	1.19	0.26
257	0.37	0.29	0.68	0.20	0.32	0.74	0.0	1.23	0.21
309	<5	<5	<5	<5	<5	<5	<5	<5	<5
325	<1	<1	<1	<1	<1	<1	<2	1	<1
331	----	----	----	----	----	----	----	----	----
339	<5	<50	<1	<5	<50	<5	<50	----	----
349	0.47	<0,1	0.32	0.29	0.19	0.2	1.4	0.3	0.2
360	0.37	5.2	0.35	0.36	----	0.31	< 1.0	1.1	< 0.50
432	----	0.14	----	----	----	----	----	1.49	----
451	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
496	0.41	2.63	0.35	0.14	0.74	0.09	0.63	0.44	0.31
542	<0.23	0.50	0.07	0.20	----	0.21	<0.35	<3.2	<31
562	0.450	0.252	----	0.432	----	0.036	0.445	0.032	0.20
614	<1	<4	<1	<1	<1	<1	1.3	1.06	<1
633	----	0.262	0.170	0.308	0.389	----	0.140	----	0.217
634	10.00	0.00	----	0.39	----	6.75	0.00	7.79	0.11
780	0.00	1.47	----	0.00	----	0.00	0.00	0.00	0.00
862	<1	<1	<1	<1	<1	<1	<1	<1	<1
863	<1	1.1	<1	<1	----	<1	<1	<1	<1
901	----	----	----	----	----	----	----	----	----
912	----	----	----	----	----	----	----	----	----
963	<1	1.56	<1	<1	<1	<1	<1	0.92	<1
974	<1	2	<1	<1	<1	<1	<1	1	<1
975	<1	1.55	0.84	<1	<1	<1	<1	1.04	1.35
994	<6	<4	<1	<1	----	<5	<40	<8	<5
1026	0.6166	0.6250	----	0.3505	----	0.3091	----	0.8170	----
1059	<6	----	----	<4	----	<3	----	<6	----
1146	<2	----	----	<1	<1	<5	----	<4	<5
1166	0	----	----	0	----	----	0	2	----
1189	<1	<1	<1	<1	<1	<1	<1	1	<1
1372	0.59	2.09	0.84	0.51	----	0.67	1.35	1.79	0.71
1435	0.043	0.625	0.326	0.308	0.224	0.294	0	0.571	0.299
1571	1.200545	0.33271	----	0.34251	----	0.41366	----	1.09444	0.19378
1665	0.43	0.44	0.42	0.35	----	0.30	< 2	1.03	0.38
1743	0.46	0.41	0.40	0.38	0.17	0.45	0	1.2	0.30
1801	0.0623	5.53	----	0.358	----	0.354	1.59	0.237	----
1854	0.37	<0.1	----	0.19	0.16	<0.1	----	0.7	0.32
1875	2.5	----	----	0.7	----	----	----	----	----
1888	0.102	0.171	0.421	1.544	----	0.301	----	1.201	0.642
1900	0.259	3.60	----	0.313	----	0.209	0.132	0.973	0
1941	1.8	<4	----	<1	----	<5	<40	1.5	----
2133	0.529	1.153	0.334	0.328	----	0.296	----	0.835	0.312
3031	----	----	----	----	----	----	----	----	----
6080	0.58	0	0.5	0.39	----	0	8.2	2.7	0.5
6273	0.569	0.774	0.365	0.405	----	0.365	0.110	1.487	0.307
6322	<10	----	<5	<5	----	<5	<5	<10	<5
6414	1.670	6.424	----	0.493	----	0.581	3.572	0.745	1.67
6497	<2,4	----	0.7	0.7	----	1.0	<0,5	1.1	0.6
6546	----	----	----	----	----	----	----	----	----

Determination of other reported metals on sample #23217; results in mg/kg -- continued --

lab	Na	Sn	Ti	V
178	2	0	0	0
179	1	2	0	0
237	----	----	----	----
256	0.57	0.12	----	0.31
257	0.64	0.17	0.27	0.44
309	<5	<5	<5	<5
325	<2	<1	<1	<1
331	----	----	----	----
339	<50	<5	<5	<5
349	16.1	0.1	0.2	0.3
360	< 7.0	0.35	0.31	0.35
432	----	----	----	----
451	< 1	< 1	< 1	< 1
496	0.93	0.25	0.22	0.02
542	<3.6	<30	<6.8	<2.1
562	0.953	0.446	0.154	0.556
614	<2	<1	<1	<1
633	2.282	0.008	0.062	0.752
634	2.31	0.00	1.24	1.10
780	0.00	0.00	0.00	0.00
862	<1	<1	<1	<1
863	<1	<1	<1	<1
901	----	----	----	----
912	----	----	----	----
963	0.69	<1	<1	<1
974	1	<1	<1	<1
975	1.32	<1	<1	<1
994	<7	<10	<5	<1
1026	0.4440	0.3804	0.3330	0.3262
1059	----	<8	----	----
1146	<4	<1	<5	<1
1166	----	0	----	0
1189	<1	<1	<1	<1
1372	1.54	2.64	0.38	0.38
1435	0.131	0	0.297	0.294
1571	0.64202	0.52584	0.30345	0.37548
1665	1.73	0.63	0.32	0.31
1743	0.73	0.78	0.33	0.31
1801	0	0.503	----	----
1854	0.83	0.5	0.12	<0.1
1875	not det	----	1.7	1.0
1888	4.615	1.341	0.566	1.359
1900	0.649	1.239	0.282	0.164
1941	----	1.0	1.0	<1
2133	0.430	0.421	0.317	0.286
3031	----	----	----	----
6080	0.2	0.15	0.6	0
6273	3.470	0.282	0.369	0.322
6322	<10	<5	<5	<5
6414	1.4	0.949	0.462	0.672
6497	----	<0,5	0.3	0.4
6546	----	----	----	----

APPENDIX 3**Number of participants per country**

1 lab in ARGENTINA
1 lab in AUSTRALIA
1 lab in AUSTRIA
1 lab in AZERBAIJAN
2 labs in BELGIUM
1 lab in BOTSWANA
1 lab in BULGARIA
1 lab in CHILE
2 labs in CHINA, People's Republic
1 lab in COTE D'IVOIRE
1 lab in DENMARK
1 lab in EGYPT
1 lab in FINLAND
4 labs in FRANCE
4 labs in GERMANY
2 labs in GREECE
1 lab in INDIA
1 lab in IRAN, Islamic Republic of
1 lab in IRELAND
1 lab in KAZAKHSTAN
2 labs in MALAYSIA
2 labs in MOROCCO
5 labs in NETHERLANDS
1 lab in NIGERIA
2 labs in NORWAY
1 lab in PAKISTAN
2 labs in PHILIPPINES
1 lab in POLAND
1 lab in PORTUGAL
1 lab in QATAR
1 lab in RUSSIAN FEDERATION
2 labs in SAUDI ARABIA
1 lab in SERBIA
1 lab in SLOVENIA
3 labs in SPAIN
3 labs in SWEDEN
1 lab in SWITZERLAND
2 labs in TANZANIA
1 lab in TURKEY
2 labs in UNITED ARAB EMIRATES
2 labs in UNITED KINGDOM
2 labs in UNITED STATES OF AMERICA

APPENDIX 4

Abbreviations

C	= final test result after checking of first reported suspect test result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01)	= outlier in Grubbs' outlier test
G(0.05)	= straggler in Grubbs' outlier test
DG(0.01)	= outlier in Double Grubbs' outlier test
DG(0.05)	= straggler in Double Grubbs' outlier test
R(0.01)	= outlier in Rosner's outlier test
R(0.05)	= straggler in Rosner's outlier test
E	= calculation difference between reported test result and result calculated by iis
W	= test result withdrawn on request of participant
ex	= test result excluded from statistical evaluation
n.a.	= not applicable
n.e.	= not evaluated
n.d.	= not detected
fr.	= first reported
f+?	= possibly a false positive test result?
f-?	= possibly a false negative test result?
SDS	= Safety Data Sheet

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