Institute for
Interlaboratory Studies

Results of Proficiency Test
Ethanol (Bio / Fuel grade)
December 2022

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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1 INTRODUCTION

Since 1995 the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for the analysis of Ethanol (Bio / Fuel grade) based on the latest version of EN15376 and ASTM D4806 every year. During the annual proficiency testing program 2022/2023 it was decided to continue the round robin for the analysis of Ethanol (Bio / Fuel grade).

In this interlaboratory study 62 laboratories in 31 countries registered for participation, see appendix 2 for the number of participants per country. In this report the results of the Ethanol (Bio / Fuel grade) proficiency test 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 an ISO/IEC17025 accredited laboratory.
In this proficiency test the participants received three different samples of Ethanol (Bio / Fuel grade), see table below.

Sample ID	Quantity	Purpose
#22245	1x 1 L	Regular analyzes
#22246	1x 100 mL	Inorganic Chloride, Sulfate and Sulfur
#22247	1x 250 mL	Nonvolatile matter

Table 1: Ethanol (Bio / Fuel grade) samples used in PT iis22C11

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 Ethanol (Bio / Fuel grade) a batch of approximately 100 liters of Ethanol (Bio / Fuel grade) was obtained from a local supplier. After homogenization 85 amber glass bottles of 1 L were filled and labelled #22245. The homogeneity of the subsamples was checked by determination of Density at 20 °C in accordance with ASTM D4052 and Water in accordance with ASTM E203 on 8 stratified randomly selected subsamples.

	Density at 20 °C in kg/L	Water in %M/M
sample #22245-1	0.78961	0.090
sample #22245-2	0.78962	0.091
sample #22245-3	0.78960	0.091
sample #22245-4	0.78961	0.090
sample #22245-5	0.78962	0.090
sample #22245-6	0.78962	0.090
sample #22245-7	0.78962	0.089
sample #22245-8	0.78962	0.090

Table 2: homogeneity test results of subsamples #22245

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

	Density at 20 °C in kg/L	Water in %M/M
r (observed)	0.00002	0.002
reference test method	ISO12185:96	ASTM E203:16
0.3 x R (reference test method)	0.00015	0.023

Table 3: evaluation of the repeatabilities of subsamples #22245

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

For the preparation of the sample for the determination of Inorganic Chloride, Sulfate and Sulfur in Ethanol (Bio / Fuel grade) a batch of approximately 10 L Ethanol (Bio / Fuel grade) was spiked with Sodium Chloride (NaCl) and Sodium Sulfate (Na_2SO_4) dissolved in water. After homogenization 85 PE bottles of 100 mL were filled and labelled #22246.
The homogeneity of the subsamples was checked by determination of Inorganic Chloride as Cl in accordance with EN15492 on 8 stratified randomly selected subsamples.

	Inorganic Chloride as Cl in mg/kg
sample #22246-1	3.2
sample #22246-2	3.4
sample #22246-3	3.3
sample #22246-4	3.5
sample #22246-5	3.3
sample #22246-6	3.2
sample #22246-7	3.4
sample #22246-8	3.3

Table 4: homogeneity test results of subsamples #22246

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

	Inorganic Chloride as Cl in mg/kg
r (observed)	0.29
reference test method	ASTM D7319:22
0.3 x R (reference test method)	0.29

Table 5: evaluation of the repeatability of subsamples #22246

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

For the preparation of the sample for the determination of Nonvolatile matter in Ethanol (Bio / Fuel grade) a batch of approximately 25 L Ethanol (Bio / Fuel grade) was spiked with Sodium Chloride (NaCl) dissolved in water. After homogenization 85 amber glass bottles of 250 mL were filled and labelled #22247.
The homogeneity of the subsamples was checked by determination of Nonvolatile matter in accordance with EN15691 on 8 stratified randomly selected subsamples.

	Nonvolatile matter in mg/100 mL
sample #22247-1	12.4
sample #22247-2	12.3
sample #22247-3	12.4
sample #22247-4	12.5
sample #22247-5	12.4
sample #22247-6	12.2
sample #22247-7	12.5
sample #22247-8	12.6

Table 6: homogeneity test results of subsamples #22247

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

	Nonvolatile matter in mg/100 mL
r (observed)	0.3
reference test method	EN15691:09
0.3 x R (reference test method)	0.7

Table 7: evaluation of the repeatability of subsamples #22247

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

To each of the participating laboratories one 1 L bottle of Ethanol (Bio/Fuel grade) labelled #22245, one 100 mL bottle labelled #22246 and one 250 mL bottle labelled #22247 was sent on November 09, 2022. An SDS was added to the sample package.

2.5 STABILITY OF THE SAMPLES

The stability of Ethanol (Bio / Fuel grade) packed in amber glass bottles 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 #22245: Total Acidity as Acetic Acid, Appearance, Copper as Cu, Density at 20 °C, Electrical Conductivity at 25 °C, Nitrogen, pHe (LiCl and KCl electrode), Phosphorus as P, Water (Coulometric and Volumetric), Ethanol incl. higher alcohols (acc. EN15721), Higher alcohols (acc. EN15721), Impurities (acc. EN15721), Methanol, Ethanol by mass and by volume (acc. ASTM D5501) and Gum (solvent washed).
On sample #22246 it was requested to determine Inorganic Chloride as Cl, Sulfate as SO_4 and Sulfur.
On sample #22247 it was requested to determine Nonvolatile matter.

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 appendix 1 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 appendix 1. 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:

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

The $z_{(target)}$ 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. Therefore, the reporting time on the data entry portal was extended with another two weeks. When considering the test results of the three samples together five participants reported test results after the extended reporting date and five other participants did not report any test results. Not all participants were able to report all tests requested.
In total 57 participants reported 500 numerical test results. Observed were 32 outlying test results, which is 6.4%. In proficiency studies 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 3.

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. D1353) and an added designation for the year that the test method was adopted or revised (e.g. D1353:13). When a method has been reapproved an “R” will be added and the year of approval (e.g. D1353:13R21).

sample #22245

Total Acidity as Acetic Acid: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of EN15491:21 and ASTM D1613:17

Appearance: This determination was not problematic. All reporting participants agreed about the appearance as Clear and Bright (Pass).

Copper as Cu: This determination was not problematic. Almost all reporting participants agreed on a value near or below the application range. Therefore, no z-scores are calculated.

Density at 20 °C: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO12185:96.

Electrical Conductivity at 25 °C: This determination was very problematic. No statistical outliers were observed. The calculated reproducibility is not at all in agreement with the requirements of EN15938:10.

Nitrogen: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D4629:17.

It is known that the pHe determined with a LiCl electrode will be lower than the pHe determined with a KCl electrode. Therefore, the test results are requested separately. Test method EN15490 describes the use of a LiCl electrode and test method ASTM D6423 describes the use of a KCl electrode.

pHe (LiCl): This determination was very problematic. No statistical outliers were observed. The calculated reproducibility is not at all in agreement with the requirements of EN15490:07.

pHe (KCl): This determination was very problematic. No statistical outliers were observed. The calculated reproducibility is not at all in agreement with the requirements of D6423:20a.

Phosphorus as P: This determination was not problematic. Almost all participants agreed on a value near or below the application range. Therefore, no z-scores are calculated.

Water, Coulometric: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of EN15489:07 and ASTM E1064:16.

Water, Volumetric: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM E203:16 and in full agreement with the requirements of EN15692:21.

The test results reported for the Ethanol content is depending on the test method used by the laboratory. Test method EN15721 uses a different definition for Ethanol than ASTM D5501. Therefore, the participants in this proficiency test were requested to report the Ethanol content for each of the two definitions.

Ethanol incl. higher alcohols (EN15721): In EN15721 the purity (the Ethanol content) is defined as: Ethanol (incl. higher alcohols) = 100% - impurity% - methanol%, where the higher alcohols consequently are not included in “impurity%” but in Ethanol content.
This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of EN15721:13.

Higher alcohols (EN15721): In EN15721 the higher alcohol content is defined as: the sum of n-propanol%, n-butanol%, sec-butanol%, isobutanol%, 2-methyl-1-butanol% and 3-methyl-1-butanol%.
This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of EN15721:13.

Impurities (EN15721): In EN15721 the impurity content is defined as: content of all components except for Ethanol%, Methanol% and the higher alcohols%.
This determination may be problematic for a number of laboratories. Seven 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 based on nine components.

Methanol: This determination may be problematic depending on the test method used. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not at all in agreement with the estimated reproducibility calculated with the Horwitz equation but is in agreement with the requirements of ASTM D5501:20. A negative value for the reproducibility is found at this concentration level for test method EN15721:13 which is theoretically not correct.

Ethanol (D5501): This determination was not problematic by mass and by volume. In total no statistical outliers were observed but four test results were excluded. Both calculated reproducibilities after rejection of the suspect data are in agreement with the requirements of ASTM D5501:20.

Gum (solvent washed): This determination was not problematic. All reporting participants agreed on a test result <1 mg/100mL. Therefore, no z-scores are calculated.

sample #22246

Inorganic Chloride: This determination may be problematic depending on the test method used. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D7319:22, but not with the requirements of EN15492:12.

Sulfate as SO_4: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D7319:22, EN15492:12 and ASTM D7328:22.

Sulfur: This determination may be problematic depending on the test method used. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of EN15485:07, ISO20846:19 and EN15486:07 but not with the requirements of ASTM D5453:19a.

sample #22247

Nonvolatile matter: This determination was not problematic. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of EN15691:09 and in agreement with the requirements of ASTM D1353:13R21.

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 * 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 Acidity as Acetic Acid	mg/kg	33	14.0	12.2	13.7
Appearance		45	C&B (Pass)	n.a.	n.a.
Copper as Cu	mg/kg	24	<0.07	n.e.	n.e.
Density at 20 °C	kg/L	51	0.7897	0.0002	0.0005
Electrical Conductivity at 25 °C	µS/cm	36	0.57	0.37	0.14
Nitrogen	mg/kg	9	0.47	0.41	0.55
pHe (LiCl)		9	6.40	1.66	0.61
pHe (KCl)		18	7.08	2.29	1.09
Phosphorus as P	mg/L	23	<0.15	n.e.	n.e.
Water, Coulometric	%M/M	47	0.095	0.013	0.021
Water, Volumetric	%M/M	23	0.093	0.022	0.078
Ethanol incl. high. alc. (EN15721)	%M/M	26	99.958	0.024	0.035
Higher alcohols (EN15721)	%M/M	22	0.096	0.019	0.025
Impurities (EN15721)	%M/M	15	0.032	0.013	0.018
Methanol	%M/M	29	0.0115	0.0056	0.0025
Ethanol (D5501)	%M/M	16	99.813	0.144	0.992
Ethanol (D5501)	%V/V	18	99.889	0.208	0.992
Gum (solvent washed)	mg/100 mL	16	<1	n.e.	n.e.

Table 8: reproducibilities of tests on sample #22245

Parameter	unit	n	average	2.8 * sd	R(lit)
Inorganic Chloride as Cl	mg/kg	25	3.3	1.0	1.0
Sulfate as SO_4	mg/kg	19	2.9	3.1	2.8
Sulfur	mg/kg	19	1.2	0.9	3.3
Nonvolatile matter	mg/100 mL	30	11.8	2.0	2.2

Table 9: reproducibilities of tests on sample #22246 and sample #22247

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 DECEMBER 2022 WITH PREVIOUS PTS

	December 2022	December 2021	December 2020	November 2019	December 2018
Number of reporting laboratories	57	64	49	51	53
Number of test results	500	579	507	457	473
Number of statistical outliers	32	32	18	16	14
Percentage of statistical outliers	6.4%	5.5%	3.6%	3.5%	3.0%

Table 10: 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.

Parameter	December 2022	December 2021	December 2020	November 2019	December 2018
Total Acidity as Acetic Acid	+	+/-	++	+	+
Density at 20 °C	++	++	++	++	++
Electrical Conductivity at 25 °C	--	--	--	-	--
Nitrogen	+	+	-	-	-
pHe	--	+/-	+/-	+/-	-
Water, Coulometric	+	+	+/-	-	+/-
Water, Volumetric	++	++	+	+	+
Ethanol incl. high. alc. (EN15721)	+	+	+/-	++	--
Higher alcohols (EN15721)	+	-	+/-	+	+/-
Impurities (EN15721)	+	+/-	-	++	-
Methanol	--	-	-	--	--
Ethanol (D5501)	++	++	++	++	+
Inorganic Chloride as Cl	+/-	+/-	-	-	-
Sulfate as SO_4	-	+/-	+	-	-
Sulfur	++	++	++	++	+
Nonvolatile matter	+/-	-	n.e./ +	n.e.	(--)

Table 11: comparison of determinations to the reference test methods

For results between brackets no z-scores are calculated.

The following performance categories were used:

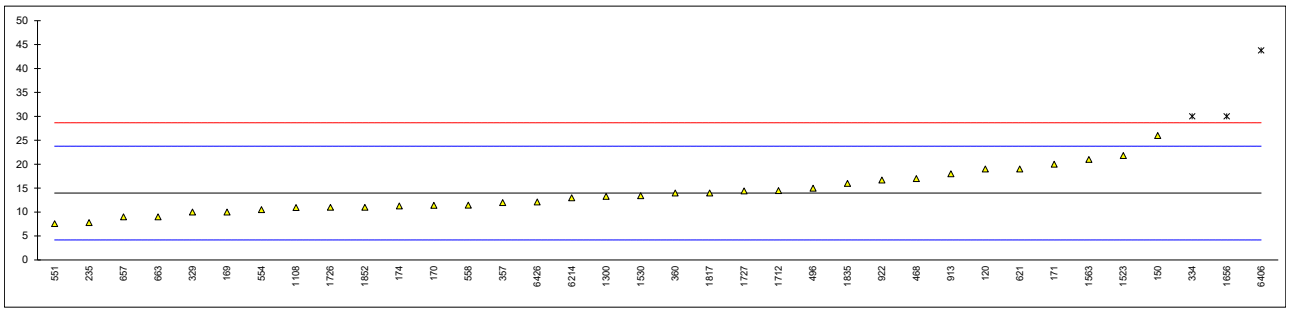
- ++ : group performed much better than the reference test method
- + : group performed better than the reference test method
- +/- : group performance equals the reference test method
- - : group performed worse than the reference test method
- -- : group performed much worse than the reference test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

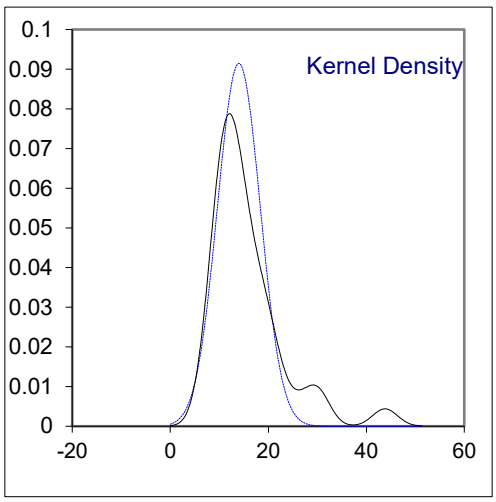
APPENDIX 1

Determination of Total Acidity as Acetic Acid on sample #22245; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	EN15491	<30		-----	
120	D1613	19.0		1.03	
150	D1613	26		2.46	
169	D7795	10.0		-0.81	
170	D1613	11.4		-0.53	
171	EN15491	20		1.23	
174	D1613	11.3		-0.55	
175		-----		-----	
235	D1613	7.8		-1.26	
315	EN15491	<30		-----	
323	EN15491	<30		-----	
329	EN15491	10		-0.81	
333	EN15491	<30		-----	
334	EN15491	30	R(0.05)	3.27	
337		-----		-----	
343	EN15491	<30		-----	
357	EN15491	12		-0.40	
360	EN15491	14		0.00	
444		-----		-----	
468	EN15491	17		0.62	
492		-----		-----	
495		-----		-----	
496	EN15491	15		0.21	
511		-----		-----	
541		-----		-----	
551	D1613	7.6		-1.30	
554	D1613	10.5		-0.71	
558	NBR9866	11.44		-0.52	
621	D1613	19.0		1.03	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	D1613	9		-1.02	
663	D1613	9		-1.02	
823		-----		-----	
859		-----		-----	
913	D1613	18		0.82	
922	D1613	16.7		0.56	
1011		-----		-----	
1108	EN15491	10.948		-0.62	
1213		-----		-----	
1300	EN15491	13.3		-0.14	
1523	ISO1388/2	21.81		1.60	
1530	EN15491	13.4		-0.12	
1563	EN15491	21		1.44	
1656	EN15491	30	R(0.05)	3.27	
1712	EN15491	14.5		0.11	
1726	EN15491	11		-0.61	
1727	EN15491	14.45		0.10	
1817	ISO1388/2	14		0.00	
1835	EN15491	16		0.41	
1852	EN15491	11		-0.61	
1919		-----		-----	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214	EN15491	12.99		-0.20	
6297		-----		-----	
6303		-----		-----	
6406	EN15491	43.8	R(0.01)	6.10	
6424		-----		-----	
6426	NEN341	12.1264		-0.38	

	normality	OK
	n	33
	outliers	3
	mean (n)	13.978
	st.dev. (n)	4.3613
	R(calc.)	12.212
	st.dev.(EN15491:21)	4.8929
	R(EN15491:21)	13.7
Compare		
	R(D1613:17)	14


50
45
40
35
30
25
20
15
10
5
0
551
235
657
663
329
169
554
1108
1726
1852
174
170
558
357
6426
6214
1300
1530
360
1817
1727
1712
496
1835
922
468
913
120
621
171
1563
1523
150
334
1656
6406


Kernel Density
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-20
0
20
40
60

Determination of Appearance on sample #22245;

lab	method	value	mark	z(targ)	remarks
52	EN15769	Clear & colorless		-----	
120		-----		-----	
150	E2680	Pass		-----	
169	Visual	Pass		-----	
170	Visual	Clear and Bright		-----	
171	Visual	CFFSM		-----	
174	Visual	Clear & Free		-----	
175	D4176	Pass		-----	
235	Visual	C&B		-----	
315	EN15769	cl & col		-----	
323	Visual	clear and bright		-----	
329	Visual	clear		-----	
333	Visual	Clear and bright		-----	
334	Visual	clear & bright		-----	
337	Visual	incolore		-----	
343	Visual	C&B		-----	
357	E2680	Pass		-----	
360	EN15769	Clear and Colourless		-----	
444	E2680	Pass		-----	
468	EN15769	C&C		-----	
492		-----		-----	
495	EN15769	Clear and colourless		-----	
496	Visual	clear & bright		-----	
511	Visual	clear and bright		-----	
541		-----		-----	
551	Visual	Pass		-----	
554	E2680	Pass		-----	
558	Visual	Pass		-----	
621	Visual	Pass		-----	
631		-----		-----	
633		-----		-----	
634		Clear & Bright		-----	
657	E2680	Clear and free from suspended solid		-----	
663	Visual	Bright & Clear		-----	
823	E2680	Pass		-----	
859		-----		-----	
913	D2680	Clear & Bright		-----	
922	Visual	Clear & Bright		-----	
1011		-----		-----	
1108	Visual	Clear & Bright		-----	
1213		-----		-----	
1300	EN15769	Clear&colourless		-----	
1523		-----		-----	
1530	Visual	C & B		-----	
1563	EN15769	Clear and colourless		-----	
1656	Visual	Pass		-----	
1712	EN15769	clear&colourless		-----	
1726	EN15769	Clear&Colourless		-----	
1727	Visual	Clear&Colorless		-----	
1817	Visual	Pass		-----	
1835	EN15769	C&C		-----	
1852	Visual	clear		-----	
1919		-----		-----	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214	EN15769	clear & colourless		-----	
6297		-----		-----	
6303		-----		-----	
6406	E2680	Pass		-----	
6424		-----		-----	
6426		-----		-----	
	n	45			
	mean (n)	Clear and Bright (Pass)			

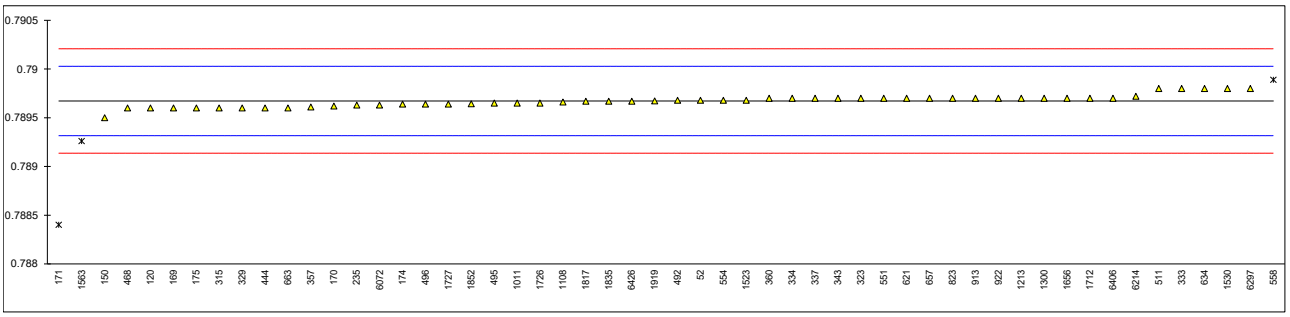
Determination of Copper as Cu on sample #22245; results in mg/kg

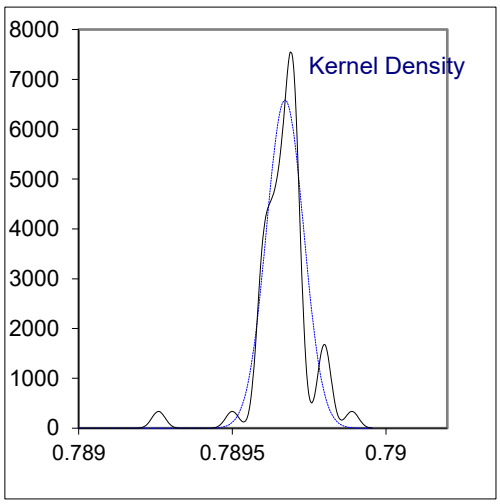
lab	method	value	mark	z(targ)	remarks
52	EN15837	<0.050		-----	
120		-----		-----	
150	D1688	0.00		-----	
169	D1688	<0.05		-----	
170	D1688	0.00		-----	
171	EN15488	<0.07		-----	
174		-----		-----	
175	D1688	<0.05		-----	
235		-----		-----	
315	EN15837	<0.050		-----	
323	EN15488	<0.070		-----	
329	EN15488	<0.07		-----	
333		-----		-----	
334	EN15837	0.008		-----	
337		-----		-----	
343	EN15837	<0,050		-----	
357		-----		-----	
360	EN15837	< 0.050		-----	
444		-----		-----	
468	EN15488	<0,1		-----	
492		-----		-----	
495		-----		-----	
496		-----		-----	
511	D1688	<0.05		-----	
541		-----		-----	
551	INH-2047	<0.04		-----	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634	D1688	0.032		-----	
657		-----		-----	
663	INH-12441	<0.05		-----	
823	UOP389	<0.01		-----	
859		-----		-----	
913		-----		-----	
922	D1688	<0.05		-----	
1011		-----		-----	
1108		-----		-----	
1213		<0.1		-----	
1300	EN15837	<0.05		-----	
1523		-----		-----	
1530		-----		-----	
1563	EN15488	0.007		-----	
1656	EN15837	<0.05		-----	
1712	EN15488	<0,07		-----	
1726		-----		-----	
1727		-----		-----	
1817		-----		-----	
1835	EN15837	<0.050		-----	
1852		-----		-----	
1919		-----		-----	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214	EN15488	0.00163		-----	
6297		-----		-----	
6303		-----		-----	
6406		-----		-----	
6424		-----		-----	
6426		-----		-----	
	n	24			
	mean (n)	<0.07			Application range EN15488:07: 0.07 – 0.20 mg/kg

Determination of Density at 20 °C on sample #22245; results in kg/L

lab	method	value	mark	z(targ)	remarks
52	ISO12185	0.78968		0.04	
120	D4052	0.7896		-0.40	
150	D4052	0.7895		-0.96	
169	D4052	0.7896		-0.40	
170	D4052	0.78962		-0.29	
171	D4052	0.7884	R(0.01)	-7.12	
174	D4052	0.78964		-0.18	
175	D4052	0.7896		-0.40	
235	ISO12185	0.78963		-0.24	
315	D4052	0.7896		-0.40	
323	D4052	0.7897		0.16	
329	D4052	0.7896		-0.40	
333	ISO12185	0.7898		0.72	
334	ISO12185	0.7897		0.16	
337	ISO12185	0.7897		0.16	
343	ISO12185	0.7897		0.16	
357	D4052	0.78961		-0.35	
360	ISO12185	0.7897		0.16	
444	D4052	0.7896		-0.40	
468	ISO12185	0.7896		-0.40	
492	ISO12185	0.78968		0.04	
495	ISO12185	0.78965		-0.12	
496	ISO12185	0.78964		-0.18	
511	D4052	0.7898		0.72	
541		-----		-----	
551	D4052	0.7897		0.16	
554	D4052	0.78968		0.04	
558	D4052	0.78989	R(0.05)	1.22	
621	D4052	0.7897		0.16	
631		-----		-----	
633		-----		-----	
634	D4052	0.7898		0.72	
657	D4052	0.7897		0.16	
663	D4052	0.7896		-0.40	
823	ISO12185	0.7897		0.16	
859		-----		-----	
913	D4052	0.7897		0.16	
922	D4052	0.7897		0.16	
1011	ISO12185	0.78965	C	-0.12	first reported 0.7939
1108	D4052	0.78966		-0.07	
1213	D4052	0.7897	C	0.16	first reported 0.79045
1300	ISO12185	0.78970		0.16	
1523	D4052	0.78968		0.04	
1530	ISO12185	0.78980		0.72	
1563	ISO12185	0.78926	R(0.01)	-2.31	
1656	ISO12185	0.7897		0.16	
1712	ISO12185	0.7897		0.16	
1726	D4052	0.78965		-0.12	
1727	D4052	0.78964		-0.18	
1817	Table OIML	0.78967		-0.01	
1835	ISO12185	0.78967		-0.01	
1852	ISO12185	0.789643		-0.16	
1919	ISO12185	0.789672		0.00	
2458		-----		-----	
6072	D4052	0.78963	C	-0.24	reported 789.63 kg/L
6201		-----		-----	
6214	ISO12185	0.78972		0.27	
6297	D4052	0.7898	C	0.72	reported 789.8 kg/L
6303		-----		-----	
6406	ISO12185	0.7897		0.16	
6424		-----		-----	
6426	D4052	0.78967		-0.01	

normality	OK
n	51
outliers	3
mean (n)	0.789672
st.dev. (n)	0.0000606
R(calc.)	0.000170
st.dev.(ISO12185:96)	0.0001786
R(ISO12185:96)	0.0005

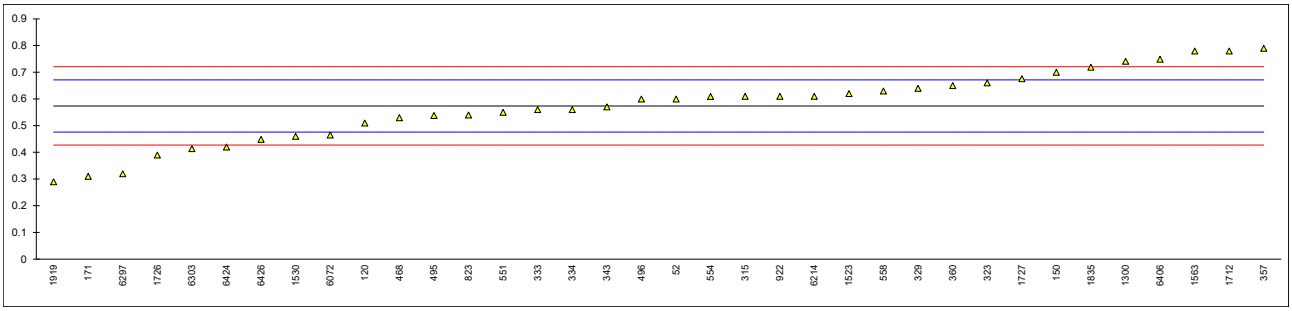

0.7905
0.79
0.7895
0.789
0.7885
0.788
171 1563 150 468 120 169 175 315 329 444 663 357 170 235 6072 174 496 1727 1852 495 1011 1726 1108 1817 1835 6426 1919 492 52 554 1523 360 334 337 343 323 551 621 657 823 913 922 1213 1300 1656 1712 6406 6214 511 333 634 1530 6297 558

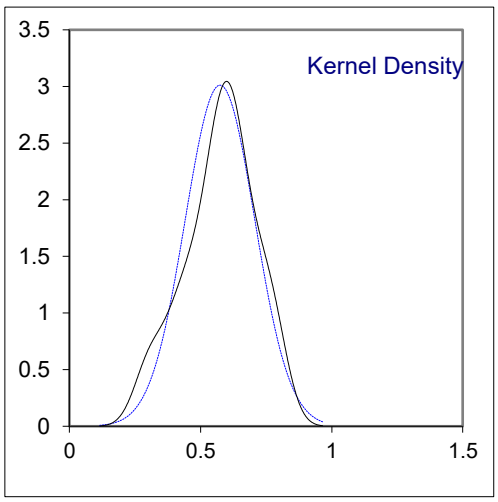

Kernel Density
8000
7000
6000
5000
4000
3000
2000
1000
0
0.789
0.7895
0.79

Determination of Electrical Conductivity at 25 °C on sample #22245; results in µS/cm

lab	method	value	mark	z(targ)	remarks
52	EN15938	0.60		0.54	
120	EN15938	0.51		-1.30	
150	EN15938	0.70	C	2.59	first reported 0.07
169		-----		-----	
170		-----		-----	
171	EN15938	0.31		-5.39	
174	D1125	<10		-----	
175		-----		-----	
235		-----		-----	
315	EN15938	0.61		0.74	
323	EN15938	0.66		1.77	
329	EN15938	0.64		1.36	
333	EN15938	0.56		-0.28	
334	EN15938	0.56		-0.28	
337		-----		-----	
343	EN15938	0.57		-0.07	
357	EN15938	0.79		4.43	
360	EN15938	0.65		1.56	
444		-----		-----	
468	EN15938	0.53		-0.89	
492		-----		-----	
495	EN15938	0.538		-0.73	
496	EN15938	0.600		0.54	
511		-----		-----	
541		-----		-----	
551	NBR10547	0.55		-0.48	
554	NBR10547	0.6091		0.73	
558	NBR10547	0.63		1.15	
621	EN15938	<10		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
823	D1125	0.54		-0.69	
859		-----		-----	
913		-----		-----	
922	EN15938	0.61		0.74	
1011		-----		-----	
1108		-----		-----	
1213		-----		-----	
1300	EN15938	0.741		3.43	
1523	D2624	0.62		0.95	
1530	EN15938	0.46		-2.33	
1563	EN15938	0.78		4.22	
1656		-----		-----	
1712	EN15938	0.780		4.22	
1726	EN15938	0.39		-3.76	
1727	EN15938	0.676		2.10	
1817		-----		-----	
1835	EN15938	0.719		2.98	
1852		-----		-----	
1919	EN15938	0.29		-5.80	
2458		-----		-----	
6072	NBR10547	0.465		-2.22	
6201		-----		-----	
6214	EN15938	0.61		0.74	
6297	NBR10547	0.32		-5.19	
6303	NBR10547	0.414		-3.27	
6406	EN15938	0.749		3.59	
6424	NBR10547	0.420		-3.14	
6426	In house	0.449		-2.55	

normality	OK
n	36
outliers	0
mean (n)	0.5736
st.dev. (n)	0.13251
R(calc.)	0.3710
st.dev.(EN15938:10)	0.04886
R(EN15938:10)	0.1368

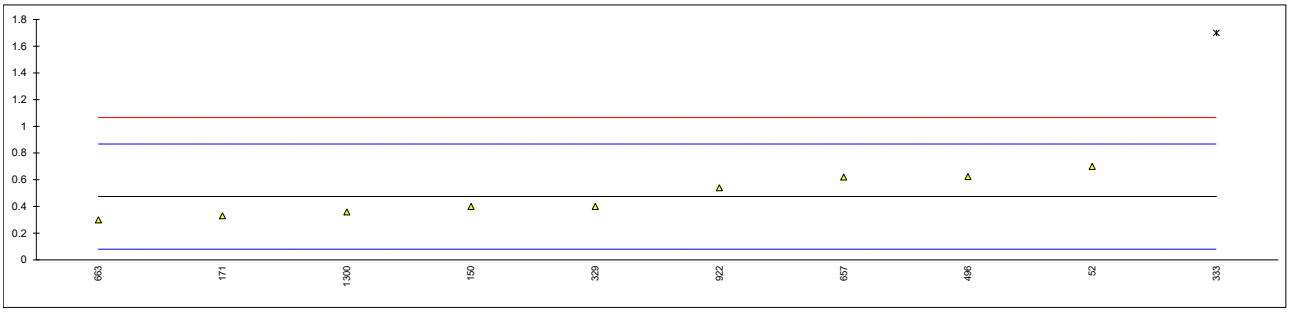

0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1919
171
6297
1726
6303
6424
6426
1530
6072
120
468
495
823
551
333
334
343
496
52
554
315
922
6214
1523
558
329
360
323
1727
150
1835
1300
6406
1563
1712
357

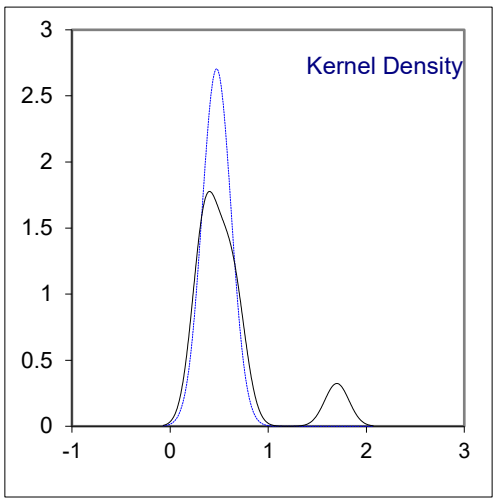

Kernel Density
3.5
3
2.5
2
1.5
1
0.5
0
0
0.5
1
1.5

Determination of Nitrogen on sample #22245; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	D4629	0.7		1.14	
120		-----		-----	
150	D4629	0.4		-0.38	
169		-----		-----	
170		-----		-----	
171	D4629	0.33		-0.73	
174		-----		-----	
175		-----		-----	
235		-----		-----	
315		-----		-----	
323	D4629	<1.0		-----	
329	D5762	0.4		-0.38	
333	D4629	1.7	G(0.01)	6.22	
334		-----		-----	
337		-----		-----	
343		-----		-----	
357		-----		-----	
360		-----		-----	
444		-----		-----	
468	D4629	<1		-----	
492		-----		-----	
495		-----		-----	
496	D4629	0.6233		0.75	
511		-----		-----	
541		-----		-----	
551	D4629	<1		-----	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	D4629	0.62		0.74	
663	D4629	0.3		-0.89	
823		-----		-----	
859		-----		-----	
913		-----		-----	
922	D4629	0.54		0.33	
1011		-----		-----	
1108		-----		-----	
1213		-----		-----	
1300	D4629	0.359		-0.59	
1523		-----		-----	
1530		-----		-----	
1563		-----		-----	
1656		-----		-----	
1712		-----		-----	
1726		-----		-----	
1727		-----		-----	
1817		-----		-----	
1835		-----		-----	
1852		-----		-----	
1919		-----		-----	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214		-----		-----	
6297		-----		-----	
6303		-----		-----	
6406		-----		-----	
6424		-----		-----	
6426		-----		-----	

normality	OK
n	9
outliers	1
mean (n)	0.475
st.dev. (n)	0.1476
R(calc.)	0.413
st.dev.(D4629:17)	0.1970
R(D4629:17)	0.552

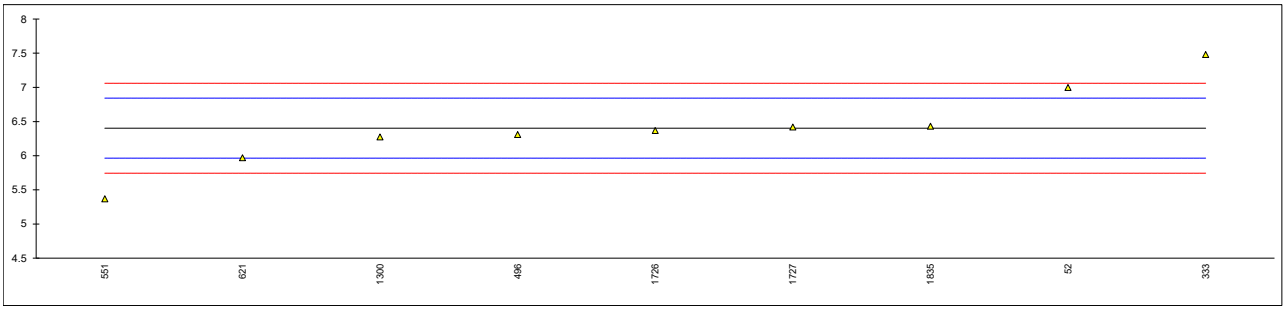

1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
663
171
1300
150
329
922
657
496
52
333

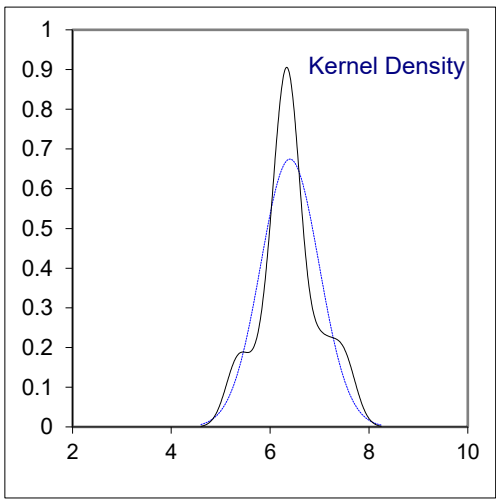

Kernel Density
3
2.5
2
1.5
1
0.5
0
-1
0
1
2
3

Determination of pHe with LiCl electrode on sample #22245;

lab	method	value	mark	z(targ)	remarks
52	EN15490	7.00		2.72	
120		-----		-----	
150		-----		-----	
169		-----		-----	
170		-----		-----	
171		-----		-----	
174		-----		-----	
175		-----		-----	
235		-----		-----	
315		-----		-----	
323		-----		-----	
329		-----		-----	
333	EN15490	7.48		4.91	
334		-----		-----	
337		-----		-----	
343		-----		-----	
357		-----		-----	
360		-----		-----	
444		-----		-----	
468		-----		-----	
492		-----		-----	
495		-----		-----	
496	EN15490	6.31		-0.42	
511		-----		-----	
541		-----		-----	
551	NBR10891	5.37		-4.70	
554		-----		-----	
558		-----		-----	
621	EN15490	5.97		-1.97	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
823		-----		-----	
859		-----		-----	
913		-----		-----	
922		-----		-----	
1011		-----		-----	
1108		-----		-----	
1213		-----		-----	
1300	EN15490	6.275		-0.58	
1523		-----		-----	
1530		-----		-----	
1563		-----		-----	
1656		-----		-----	
1712		-----		-----	
1726	EN15490	6.37		-0.15	
1727	EN15490	6.42		0.08	
1817		-----		-----	
1835	EN15490	6.43		0.12	
1852		-----		-----	
1919		-----		-----	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214		-----		-----	
6297		-----		-----	
6303		-----		-----	
6406		-----		-----	
6424		-----		-----	
6426		-----		-----	

normality	suspect
n	9
outliers	0
mean (n)	6.403
st.dev. (n)	0.5914
R(calc.)	1.656
st.dev.(EN15490:07)	0.2195
R(EN15490:07)	0.615

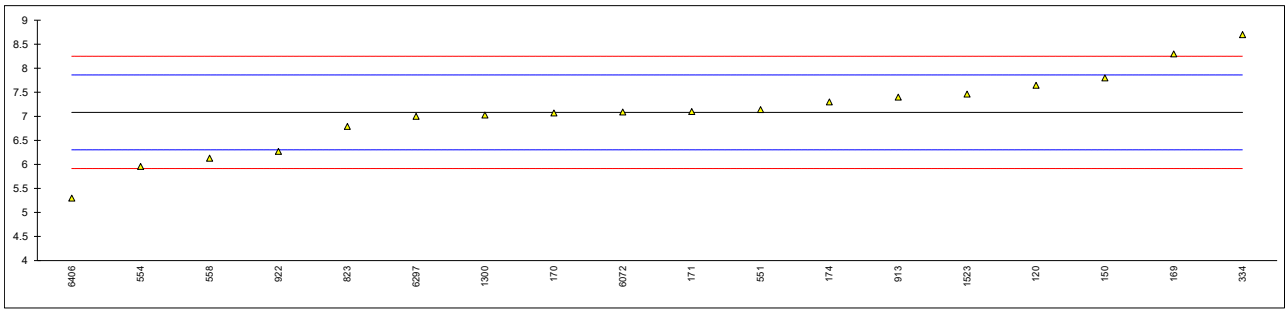

8
7.5
7
6.5
6
5.5
5
4.5
551
621
1300
496
1726
1727
1835
52
333

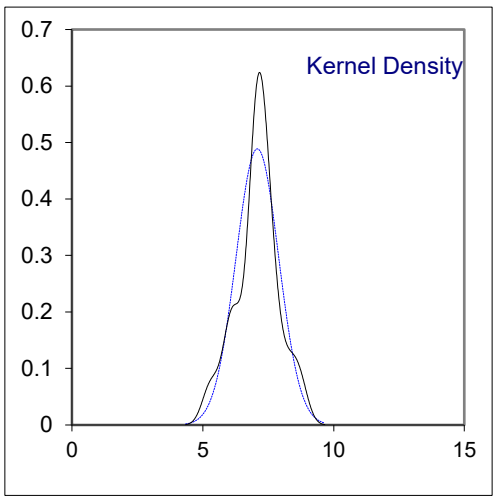

Kernel Density
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2
4
6
8
10

Determination of pHe with KCl electrode on sample #22245;

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
120	D6423	7.648		1.45	
150	D6423	7.8		1.85	
169	D6423	8.3		3.13	
170	D6423	7.07		-0.03	
171	D6423	7.1		0.04	
174	D6423	7.30		0.56	
175		-----		-----	
235		-----		-----	
315		-----		-----	
323		-----		-----	
329		-----		-----	
333		-----		-----	
334	D6423	8.7		4.16	
337		-----		-----	
343		-----		-----	
357		-----		-----	
360		-----		-----	
444		-----		-----	
468		-----		-----	
492		-----		-----	
495		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	D6423	7.14		0.15	
554	D6423	5.96		-2.89	
558	D6423	6.13		-2.45	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
823	D6423	6.79		-0.75	
859		-----		-----	
913	D6423	7.4		0.82	
922	D6423	6.27		-2.09	
1011		-----		-----	
1108		-----		-----	
1213		-----		-----	
1300	D6423	7.026		-0.15	
1523	EN15490	7.4625		0.98	
1530		-----		-----	
1563		-----		-----	
1656		-----		-----	
1712		-----		-----	
1726		-----		-----	
1727		-----		-----	
1817		-----		-----	
1835		-----		-----	
1852		-----		-----	
1919		-----		-----	
2458		-----		-----	
6072	D6423	7.09		0.02	
6201		-----		-----	
6214		-----		-----	
6297	D6423	7.0		-0.21	
6303		-----		-----	
6406	D6423	5.3		-4.59	
6424		-----		-----	
6426		-----		-----	

normality	OK
n	18
outliers	0
mean (n)	7.083
st.dev. (n)	0.8164
R(calc.)	2.286
st.dev.(D6423:20a)	0.3888
R(D6423:20a)	1.089


9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
6406
554
558
922
823
6297
1300
170
6072
171
551
174
913
1523
120
150
169
334


Kernel Density
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
5
10
15

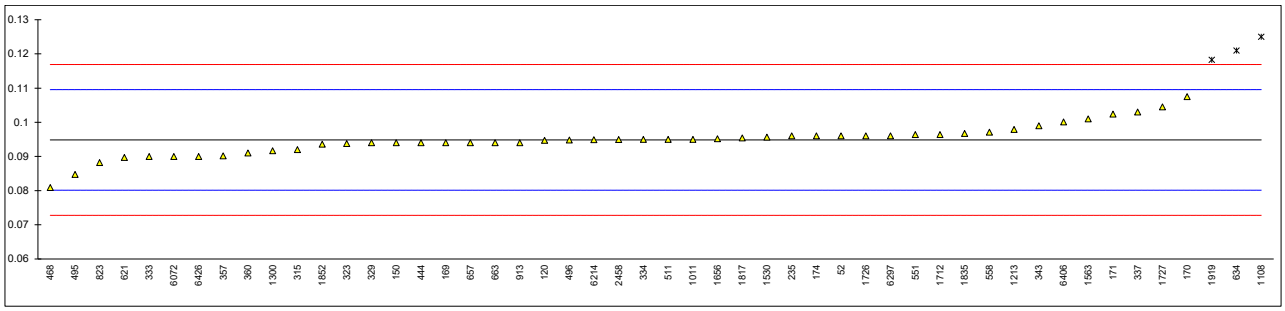
Determination of Phosphorus as P on sample #22245; results in mg/L

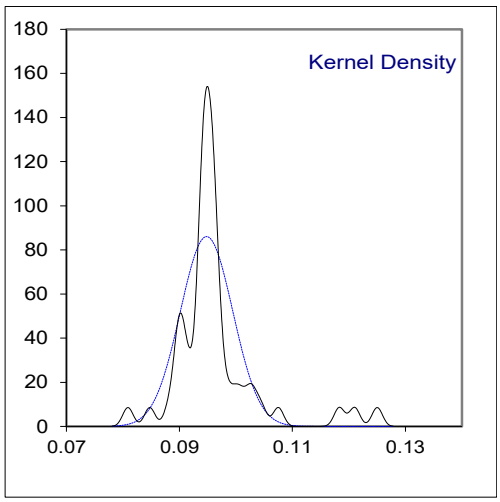
lab	method	value	mark	z(targ)	remarks
52	EN15487	<0.10		-----	
120		-----		-----	
150	D3231	<0.15	C	-----	first reported 1.1039
169		-----		-----	
170		-----		-----	
171	EN15487	<0.15		-----	
174		-----		-----	
175		-----		-----	
235		-----		-----	
315	EN15837	<0.13		-----	
323	EN15487	<0.15		-----	
329	EN15487	<0.15		-----	
333	EN15487	<0.15		-----	
334	EN15487	0.06		-----	
337		-----		-----	
343	EN15487	<0.13		-----	
357		-----		-----	
360	EN15837	< 0.10		-----	
444		-----		-----	
468	EN15487	<0.08		-----	
492		-----		-----	
495		-----		-----	
496		-----		-----	
511	EN15487	<0.15		-----	
541		-----		-----	
551	INH-2047	<0.04		-----	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
823	UOP389	<0.11		-----	
859		-----		-----	
913		-----		-----	
922		-----		-----	
1011		-----		-----	
1108	EN15487	<0.03		-----	
1213		-----		-----	
1300	EN15487	0.003		-----	
1523		-----		-----	
1530	EN15487	7.80		-----	possibly a false positive test result?
1563	EN15487	0.003		-----	
1656	EN15487	<0.01		-----	
1712	EN15487	0.001		-----	
1726	EN15487	0.032		-----	
1727	EN15487	<0.01		-----	
1817		-----		-----	
1835	EN15837	<0.13		-----	
1852		-----		-----	
1919		-----		-----	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214	EN15487	0.023		-----	
6297		-----		-----	
6303		-----		-----	
6406		-----		-----	
6424		-----		-----	
6426		-----		-----	
	n	23			
	mean (n)	<0.15			Application range EN15487:07 0.15 – 1.50 mg/L

Determination of Water, Coulometric on sample #22245; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	EN15489	0.096		0.16	
120	E1064	0.09468		-0.02	
150	E1064	0.094		-0.11	
169	E1064	0.094		-0.11	
170	E1064	0.1075		1.73	
171	E1064	0.1024		1.03	
174	E1064	0.096		0.16	
175		-----		-----	
235	D6304	0.096	C	0.16	first reported 0.116
315	EN15489	0.092		-0.38	
323	EN15489	0.0938		-0.14	
329	D6304	0.0940		-0.11	
333	EN15489	0.090		-0.66	
334	EN15489	0.095		0.02	
337	EN15489	0.103		1.11	
343	EN15489	0.099		0.57	
357	E1064	0.0902		-0.63	
360	EN15489	0.091		-0.52	
444	E1064	0.0940		-0.11	
468	EN15489	0.0809		-1.89	
492		-----		-----	
495	EN15489	0.08476		-1.37	
496	EN15489	0.0948		0.00	
511	E1064	0.095		0.02	
541		-----		-----	
551	D6304	0.0964		0.22	
554		-----		-----	
558	NBR15888	0.0971		0.31	
621	D6304	0.0897		-0.70	
631		-----		-----	
633		-----		-----	
634	D6304	0.121	R(0.01)	3.56	
657	E1064	0.094		-0.11	
663	E1064	0.094		-0.11	
823	E1064	0.0882		-0.90	
859		-----		-----	
913	D1064	0.094		-0.11	
922		-----		-----	
1011	EN15489	0.095		0.02	
1108	EN15489	0.125	R(0.01)	4.11	
1213	E1064	0.0979		0.42	
1300	EN15489	0.0917		-0.42	
1523		-----		-----	
1530	ISO12937	0.09565		0.11	
1563	EN15489	0.1010		0.84	
1656	EN15489	0.0952		0.05	
1712	EN15489	0.0964		0.22	
1726	EN15489	0.096		0.16	
1727	EN15489	0.1045		1.32	
1817	In house	0.0954		0.08	
1835	EN15489	0.0967		0.26	
1852	ISO12937	0.0936		-0.17	
1919	EN15489	0.1183	C,R(0.01)	3.19	first reported 0.1204
2458	ISO12937	0.09495		0.02	
6072	E1064	0.090		-0.66	
6201		-----		-----	
6214	EN15489	0.09492		0.01	
6297	E1064	0.096		0.16	
6303		-----		-----	
6406	EN15489	0.1001		0.72	
6424		-----		-----	
6426	E1064	0.090		-0.66	

	normality	not OK
	n	47
	outliers	3
	mean (n)	0.09482
	st.dev. (n)	0.004638
	R(calc.)	0.01299
	st.dev.(EN15489:07)	0.007351
	R(EN15489:07)	0.02058
Compare		
	R(E1064:16)	0.01508

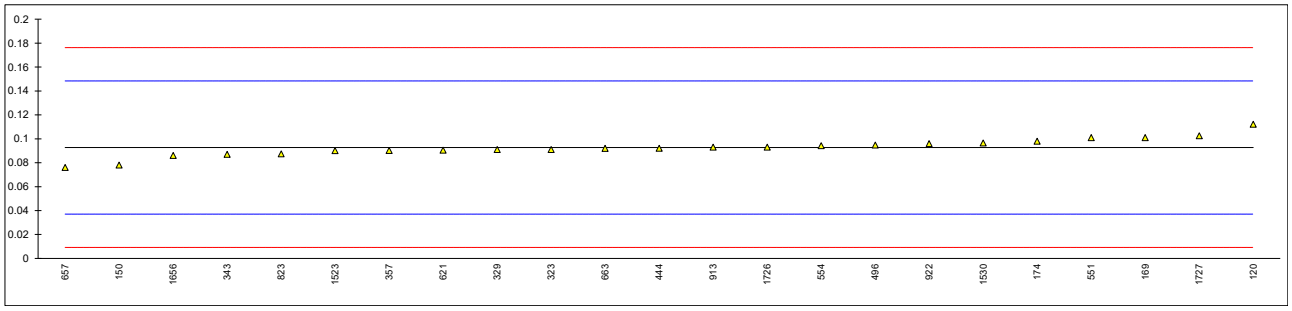

0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
468 495 823 621 333 6072 6426 357 360 1300 315 1852 323 329 150 444 169 657 663 913 120 496 6214 2458 334 511 1011 1656 1817 1530 235 174 52 1726 6297 551 1712 1835 558 1213 343 6406 1563 171 337 1727 170 1919 634 1108

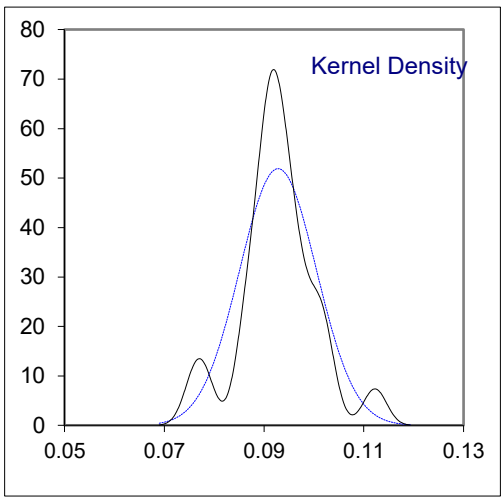

Kernel Density
180
160
140
120
100
80
60
40
20
0
0.07
0.09
0.11
0.13

Determination of Water, Volumetric on sample #22245; results in %M/M

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
120	E203	0.1122		0.70	
150	E203	0.078		-0.53	
169	E203	0.101		0.30	
170		-----		-----	
171		-----		-----	
174	E203	0.098		0.19	
175		-----		-----	
235		-----		-----	
315		-----		-----	
323	E203	0.091		-0.06	
329	E203	0.0910		-0.06	
333		-----		-----	
334		-----		-----	
337		-----		-----	
343	E203	0.087		-0.21	
357	E203	0.0903		-0.09	
360		-----		-----	
444	E203	0.0922		-0.02	
468		-----		-----	
492		-----		-----	
495		-----		-----	
496	EN15692	0.0948		0.07	
511		-----		-----	
541		-----		-----	
551	E203	0.101		0.30	
554	E203	0.0943		0.05	
558		-----		-----	
621	E203	0.0905		-0.08	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	E203	0.076		-0.60	
663	E203	0.092		-0.03	
823	E203	0.0874		-0.19	
859		-----		-----	
913	E203	0.093		0.01	
922	E203	0.0960		0.12	
1011		-----		-----	
1108		-----		-----	
1213		-----		-----	
1300		-----		-----	
1523	E203	0.09		-0.10	
1530	EN15692	0.09655		0.14	
1563		-----		-----	
1656	E203	0.086		-0.24	
1712		-----		-----	
1726	EN15692	0.0931		0.01	
1727	EN15692	0.1026		0.35	
1817		-----		-----	
1835		-----		-----	
1852		-----		-----	
1919		-----		-----	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214		-----		-----	
6297		-----		-----	
6303		-----		-----	
6406		-----		-----	
6424		-----		-----	
6426		-----		-----	

	normality	suspect
	n	23
	outliers	0
	mean (n)	0.09278
	st.dev. (n)	0.007692
	R(calc.)	0.02154
	st.dev.(E203:16)	0.027857
	R(E203:16)	0.078
Compare		
	R(EN15692:21)	0.0236

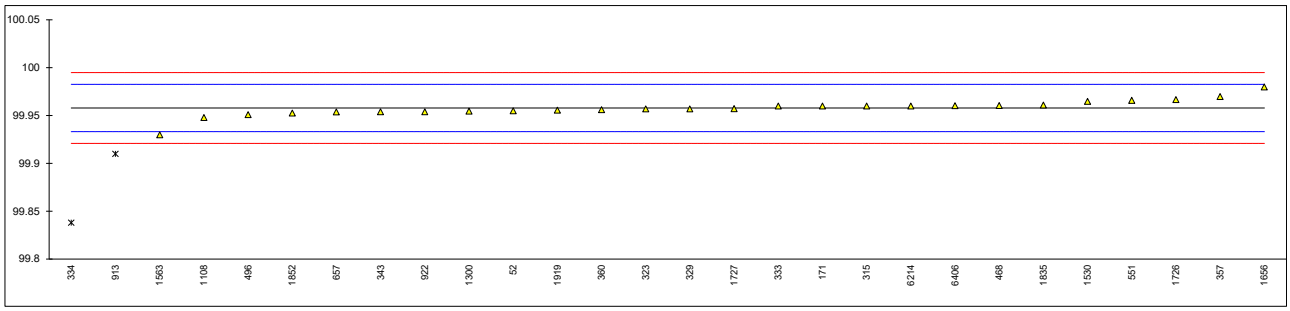

0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
657
150
1656
343
823
1523
357
621
329
323
663
444
913
1726
554
496
822
1530
174
551
169
1727
120

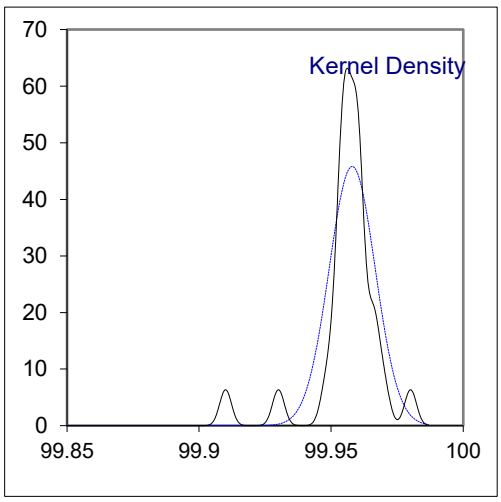

Kernel Density
80
70
60
50
40
30
20
10
0
0.05
0.07
0.09
0.11
0.13

Determination of Ethanol incl. higher alcohols acc. to EN15721 on sample #22245 in %M/M

lab	method	value	mark	z(targ)	remarks
52	EN15721	99.955		-0.24	
120		-----		-----	
150		-----		-----	
169		-----		-----	
170		-----		-----	
171	EN15721	99.96		0.17	
174		-----		-----	
175		-----		-----	
235		-----		-----	
315	EN15721	99.96		0.17	
323	EN15721	99.957		-0.07	
329	EN15721	99.957		-0.07	
333	EN15721	99.960		0.17	
334	EN15721	99.838	R(0.01)	-9.72	
337		-----		-----	
343	EN15721	99.954		-0.32	
357	EN15721	99.970		0.98	
360	EN15721	99.9562		-0.14	
444		-----		-----	
468	EN15721	99.96045		0.21	
492		-----		-----	
495		-----		-----	
496	EN15721	99.9509		-0.57	
511		-----		-----	
541		-----		-----	
551	EN15721	99.966		0.66	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	INH-02	99.9539		-0.33	
663		-----		-----	
823		-----		-----	
859		-----		-----	
913	EN15721	99.91	R(0.01)	-3.89	
922	INH-02	99.954		-0.32	
1011		-----		-----	
1108	EN15721	99.948		-0.80	
1213		-----		-----	
1300	EN15721	99.9546		-0.27	
1523		-----		-----	
1530	EN15721	99.965		0.57	
1563	EN15721	99.93		-2.26	
1656	EN15721	99.98		1.79	
1712		-----		-----	
1726	EN15721	99.96665		0.71	
1727	EN15721	99.9573		-0.05	
1817		-----		-----	
1835	EN15721	99.9610		0.25	
1852	EN15721	99.9527		-0.42	
1919	EN15721	99.9556		-0.19	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214	EN15721	99.96003		0.17	
6297		-----		-----	
6303		-----		-----	
6406	EN15721	99.9604		0.20	
6424		-----		-----	
6426		-----		-----	

normality	not OK
n	26
outliers	2
mean (n)	99.95792
st.dev. (n)	0.008709
R(calc.)	0.02438
st.dev.(EN15721:13)	0.012331
R(EN15721:13)	0.03453

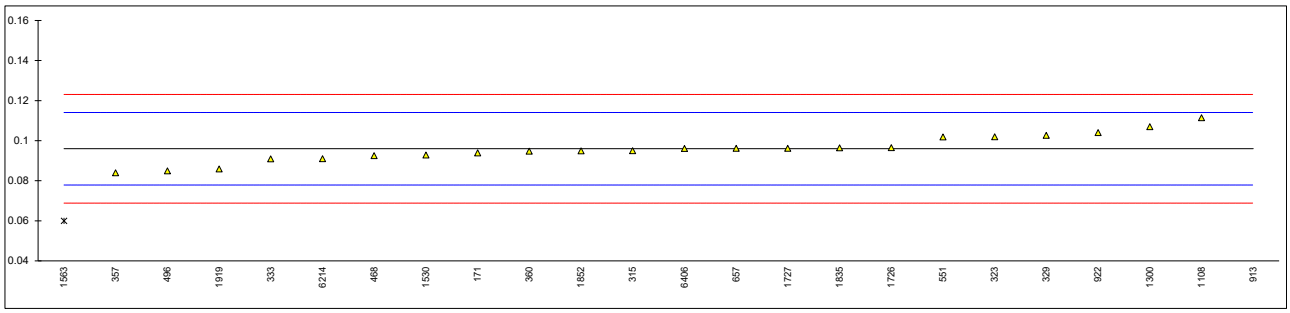

100.05
100
99.95
99.9
99.85
99.8
334
913
1563
1108
496
1852
657
343
922
1300
52
1919
360
323
329
1727
333
171
315
6214
6406
468
1835
1530
551
1726
357
1656

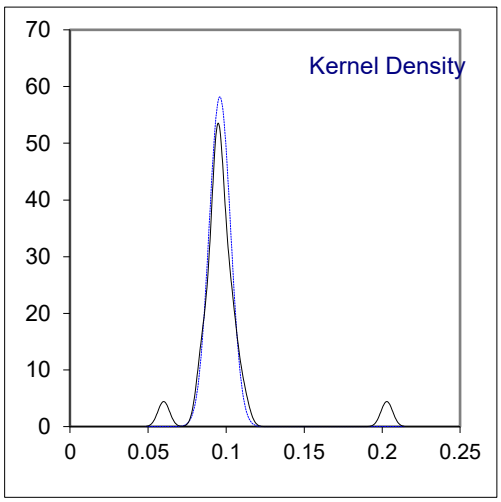

Kernel Density
70
60
50
40
30
20
10
0
99.85
99.9
99.95
100

Determination of Higher alcohols acc. to EN15721 on sample #22245; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	EN15721	<0.100		-----	
120		-----		-----	
150		-----		-----	
169		-----		-----	
170		-----		-----	
171	EN15721	0.0939		-0.23	
174		-----		-----	
175		-----		-----	
235		-----		-----	
315	EN15721	0.095		-0.11	
323	EN15721	0.102		0.67	
329	EN15721	0.1027		0.74	
333	EN15721	0.091		-0.55	
334	EN15721	<0.100		-----	
337		-----		-----	
343		-----		-----	
357	EN15721	0.084		-1.33	
360	EN15721	0.0948		-0.13	
444		-----		-----	
468	EN15721	0.0925		-0.39	
492		-----		-----	
495		-----		-----	
496	EN15721	0.0850		-1.22	
511		-----		-----	
541		-----		-----	
551	EN15721	0.1019		0.66	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	INH-02	0.0962		0.02	
663		-----		-----	
823		-----		-----	
859		-----		-----	
913	EN15721	0.203	R(0.01)	11.86	
922	INH-02	0.1040	C	0.89	first reported 0.0688
1011		-----		-----	
1108	EN15721	0.1115		1.72	
1213		-----		-----	
1300	EN15721	0.107		1.22	
1523		-----		-----	
1530	EN15721	0.0929		-0.34	
1563	EN15721	0.06	R(0.01)	-3.99	
1656		-----		-----	
1712		-----		-----	
1726	EN15721	0.0965514		0.06	
1727	EN15721	0.0962		0.02	
1817		-----		-----	
1835	EN15721	0.0965		0.06	
1852	EN15721	0.0949		-0.12	
1919	EN15721	0.0859		-1.12	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214	EN15721	0.09106		-0.55	
6297		-----		-----	
6303		-----		-----	
6406	EN15721	0.0961		0.01	
6424		-----		-----	
6426		-----		-----	

normality	OK
n	22
outliers	2
mean (n)	0.09598
st.dev. (n)	0.006859
R(calc.)	0.01920
st.dev.(EN15721:13)	0.009026
R(EN15721:13)	0.02527

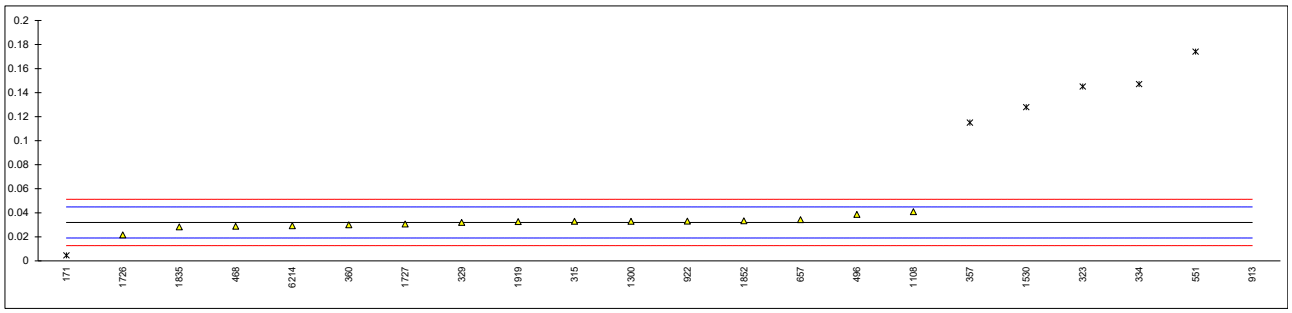

0.16
0.14
0.12
0.1
0.08
0.06
0.04
1563
357
496
1919
333
6214
468
1530
171
360
1852
315
6406
657
1727
1835
1726
551
323
329
922
1300
1108
913

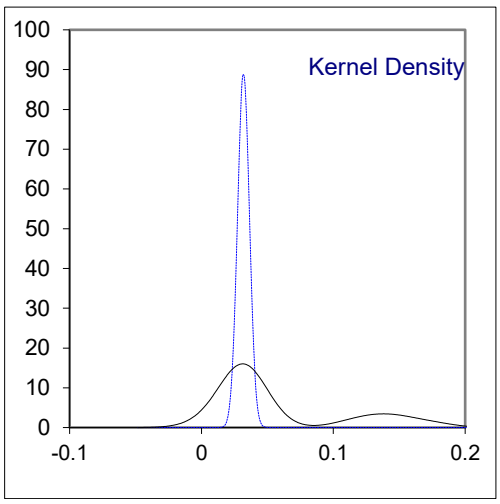

Kernel Density
70
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25

Determination of Impurities acc. to EN15721 on sample #22245; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	EN15721	<0.100		-----	
120		-----		-----	
150		-----		-----	
169		-----		-----	
170		-----		-----	
171	EN15721	0.0046	R(0.01)	-4.25	
174		-----		-----	
175		-----		-----	
235		-----		-----	
315	EN15721	0.033		0.16	
323	EN15721	0.145	R(0.01)	17.53	
329	EN15721	0.0320		0.00	
333	EN15721	<0.100		-----	
334	EN15721	0.147	R(0.01)	17.84	
337		-----		-----	
343		-----		-----	
357	EN15721	0.115	R(0.01)	12.88	
360	EN15721	0.0300		-0.31	
444		-----		-----	
468	EN15721	0.0288		-0.50	
492		-----		-----	
495		-----		-----	
496	EN15721	0.0387		1.04	
511		-----		-----	
541		-----		-----	
551	EN15721	0.1741	R(0.01)	22.05	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	INH-02	0.0343		0.36	
663		-----		-----	
823		-----		-----	
859		-----		-----	
913	EN15721	0.290	R(0.01)	40.03	
922	INH-02	0.0331		0.17	
1011		-----		-----	
1108	EN15721	0.041		1.40	
1213		-----		-----	
1300	EN15721	0.033		0.16	
1523		-----		-----	
1530	EN15721	0.1279	R(0.01)	14.88	
1563		-----		-----	
1656		-----		-----	
1712		-----		-----	
1726	EN15721	0.02169		-1.60	
1727	EN15721	0.0307		-0.20	
1817		-----		-----	
1835	EN15721	0.0283		-0.57	
1852	EN15721	0.0334		0.22	
1919	EN15721	0.0327		0.11	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214	EN15721	0.029252		-0.43	
6297		-----		-----	
6303		-----		-----	
6406		-----		-----	
6424		-----		-----	
6426		-----		-----	

normality	suspect
n	15
outliers	7
mean (n)	0.03200
st.dev. (n)	0.004475
R(calc.)	0.01253
st.dev.(Horwitz (n=9))	0.006446
R(Horwitz (n=9))	0.01805

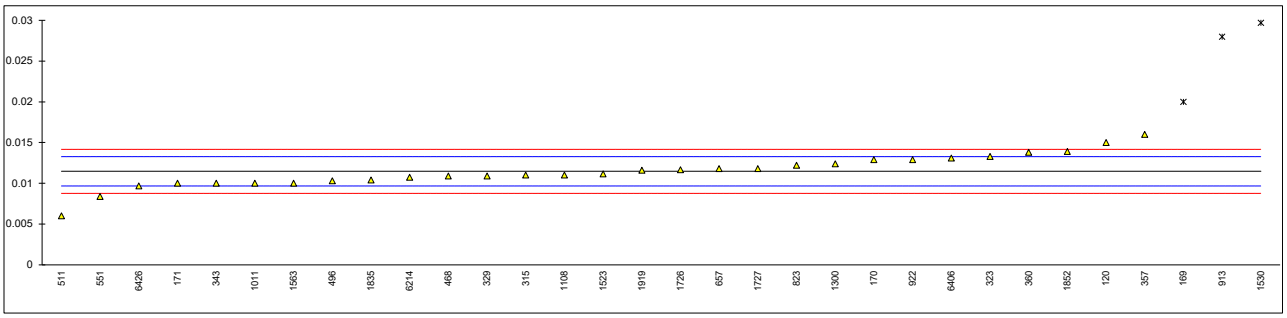

0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
171
1726
1835
468
6214
360
1727
329
1919
315
1300
922
1852
657
496
1108
357
1530
323
334
551
913

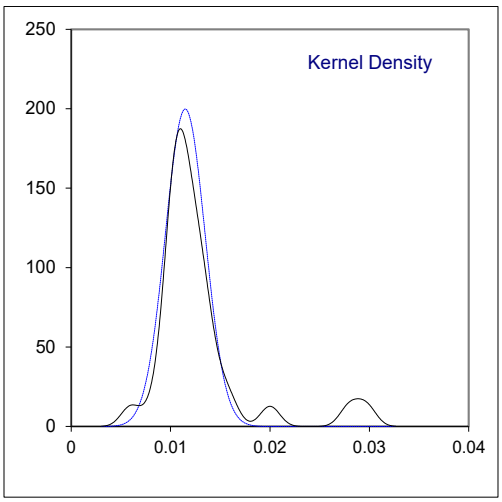

Kernel Density
100
90
80
70
60
50
40
30
20
10
0
-0.1
0
0.1
0.2

Determination of Methanol on sample #22245; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	EN15721	<0.100		-----	
120	D5501	0.015		3.92	
150		-----		-----	
169	D5501	0.02	R(0.01)	9.48	
170	D5501	0.0129	C	1.58	first reported 0
171	EN15721	0.01		-1.64	
174		-----		-----	
175		-----		-----	
235		-----		-----	
315	EN15721	0.011		-0.53	
323	EN15721	0.0133	C	2.03	first reported 0.133
329	EN15721	0.0109		-0.64	
333	EN15721	<0.100		-----	
334	EN15721	<0.100		-----	
337		-----		-----	
343	EN15721	0.01		-1.64	
357	EN15721	0.016		5.03	
360	EN15721	0.0138		2.59	
444		-----		-----	
468	EN15721	0.0109		-0.64	
492		-----		-----	
495		-----		-----	
496	EN15721	0.0103		-1.31	
511	D5501	0.006		-6.09	
541		-----		-----	
551	EN15721	0.00837		-3.45	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634	D5501	<0.01		-----	
657	INH-02	0.0118		0.36	
663		-----		-----	
823	D5501	0.0122		0.81	
859		-----		-----	
913	EN15721	0.028	R(0.01)	18.38	
922	INH-02	0.0129		1.58	
1011	D5501	0.01		-1.64	
1108	EN15721	0.011		-0.53	
1213		-----		-----	
1300	EN15721	0.0124		1.03	
1523	D5501	0.011145		-0.37	
1530	EN15721	0.0297	R(0.01)	20.27	
1563	EN15721	0.01		-1.64	
1656		-----		-----	
1712		-----		-----	
1726	EN15721	0.0116631		0.21	
1727	EN15721	0.0118		0.36	
1817		-----		-----	
1835	EN15721	0.0104		-1.20	
1852	EN15721	0.0139		2.70	
1919	EN15721	0.0116		0.14	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214	EN15721	0.01073		-0.83	
6297		-----		-----	
6303		-----		-----	
6406	EN15721	0.0131		1.81	
6424		-----		-----	
6426	INEN2014	0.009666		-2.01	

	normality	suspect
	n	29
	outliers	3
	mean (n)	0.01147
	st.dev. (n)	0.001998
	R(calc.)	0.00559
	st.dev.(Horwitz)	0.000899
	R(Horwitz)	0.00252
Compare		
	R(D5501:20)	0.01392
	R(EN15721:13)	-0.00246

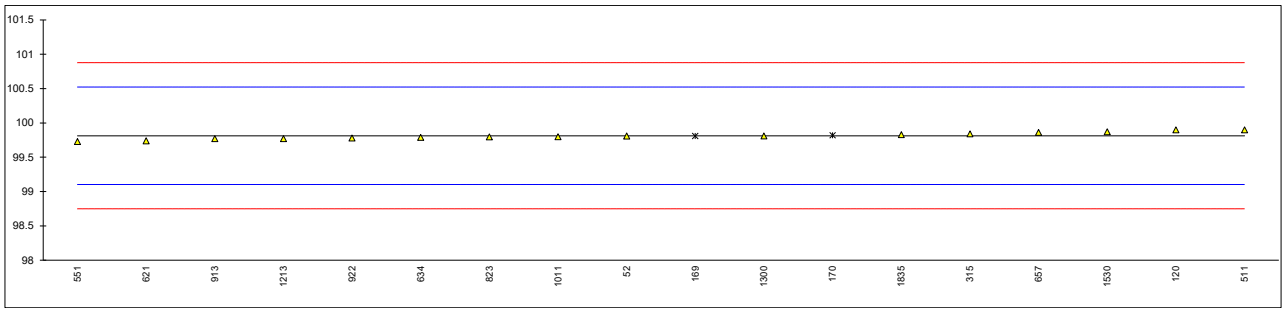

0.03
0.025
0.02
0.015
0.01
0.005
0
511
551
6426
171
343
1011
1563
496
1835
6214
468
329
315
1108
1523
1919
1726
657
1727
823
1300
170
922
6406
323
360
1652
120
357
169
913
1530

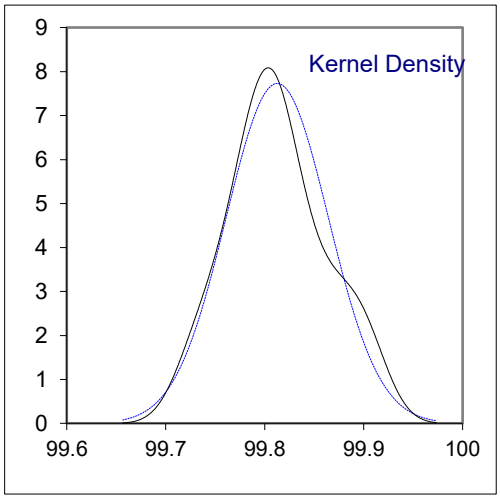

Kernel Density
250
200
150
100
50
0
0
0.01
0.02
0.03
0.04

Determination of Ethanol acc. to ASTM D5501 on sample #22245; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D5501	99.81		-0.01	
120	D5501	99.90		0.25	
150		-----		-----	
169	D5501	99.81	ex	-0.01	test result excluded as Ethanol %M/M > Ethanol %V/V
170	D5501	99.82	ex	0.02	test result excluded as Ethanol %M/M > Ethanol %V/V
171		-----		-----	
174		-----		-----	
175		-----		-----	
235		-----		-----	
315	D5501	99.84		0.08	
323		-----		-----	
329		-----		-----	
333		-----		-----	
334		-----		-----	
337		-----		-----	
343		-----		-----	
357		-----		-----	
360		-----		-----	
444		-----		-----	
468		-----		-----	
492		-----		-----	
495		-----		-----	
496		-----		-----	
511	D5501	99.90		0.25	
541		-----		-----	
551	D5501	99.73		-0.23	
554		-----		-----	
558		-----		-----	
621	D5501	99.74		-0.21	
631		-----		-----	
633		-----		-----	
634	D5501	99.79		-0.06	
657	D5501	99.8617		0.14	
663		-----		-----	
823	D5501	99.7983		-0.04	
859		-----		-----	
913	D5501	99.77		-0.12	
922	D5501	99.78		-0.09	
1011	D5501	99.80		-0.04	
1108		-----		-----	
1213	D5501	99.77		-0.12	
1300	D5501	99.811		0.00	
1523		-----		-----	
1530	D5501	99.872		0.17	
1563		-----		-----	
1656		-----		-----	
1712		-----		-----	
1726		-----		-----	
1727		-----		-----	
1817		-----		-----	
1835	D5501	99.83		0.05	
1852		-----		-----	
1919		-----		-----	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214		-----		-----	
6297		-----		-----	
6303		-----		-----	
6406		-----		-----	
6424		-----		-----	
6426		-----		-----	

normality	OK
n	16
outliers	0+2ex
mean (n)	99.8127
st.dev. (n)	0.05160
R(calc.)	0.1445
st.dev.(D5501:20)	0.35437
R(D5501:20)	0.9922

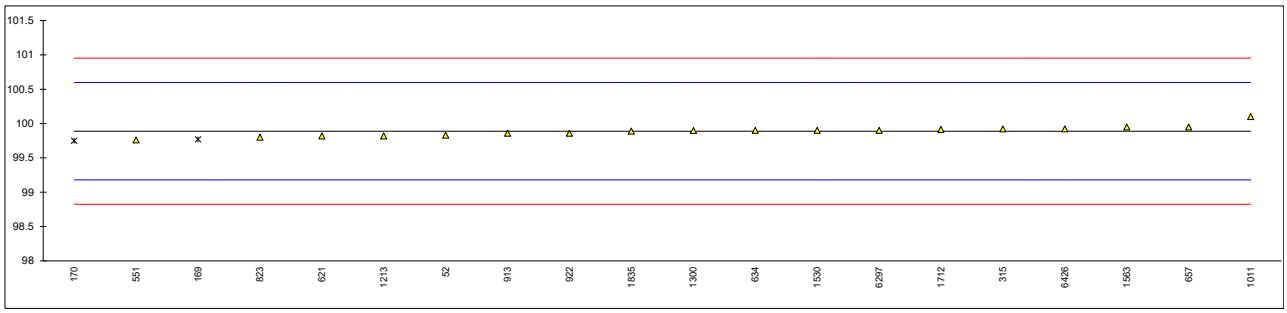

101.5
101
100.5
100
99.5
99
98.5
98
551
621
913
1213
922
634
823
1011
52
169
1300
170
1835
315
657
1530
120
511

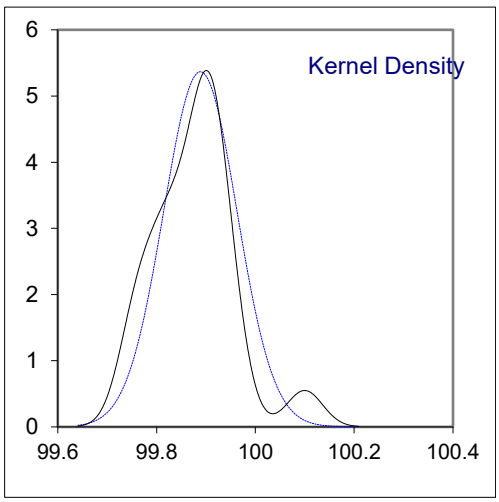

Kernel Density
9
8
7
6
5
4
3
2
1
0
99.6
99.7
99.8
99.9
100

Determination of Ethanol acc. to ASTM D5501 on sample #22245; results in %V/V

lab	method	value	mark	z(targ)	remarks
52	D5501	99.83		-0.17	
120		-----		-----	
150		-----		-----	
169	D5501	99.77	ex	-0.34	test result excluded as Ethanol %M/M > Ethanol %V/V
170	D5501	99.75	ex	-0.39	test result excluded as Ethanol %M/M > Ethanol %V/V
171		-----		-----	
174		-----		-----	
175		-----		-----	
235		-----		-----	
315	D5501	99.92		0.09	
323		-----		-----	
329		-----		-----	
333		-----		-----	
334		-----		-----	
337		-----		-----	
343		-----		-----	
357		-----		-----	
360		-----		-----	
444		-----		-----	
468		-----		-----	
492		-----		-----	
495		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	D5501	99.76		-0.36	
554		-----		-----	
558		-----		-----	
621	D5501	99.82		-0.19	
631		-----		-----	
633		-----		-----	
634	D5501	99.90		0.03	
657	D5501	99.9503		0.17	
663		-----		-----	
823	D5501	99.8019		-0.25	
859		-----		-----	
913	D5501	99.86		-0.08	
922	D5501	99.86		-0.08	
1011	D5501	100.10		0.60	
1108		-----		-----	
1213	D5501	99.82		-0.19	
1300	D5501	99.899		0.03	
1523		-----		-----	
1530	D5501	99.9		0.03	
1563	In house	99.95		0.17	
1656		-----		-----	
1712	PN-A-79528-3	99.915		0.07	
1726		-----		-----	
1727		-----		-----	
1817		-----		-----	
1835	D5501	99.89		0.00	
1852		-----		-----	
1919		-----		-----	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214		-----		-----	
6297	D5501	99.9		0.03	
6303		-----		-----	
6406		-----		-----	
6424		-----		-----	
6426	OIML-ITS-90	99.92		0.09	

normality	not OK
n	18
outliers	0+2ex
mean (n)	99.8887
st.dev. (n)	0.07435
R(calc.)	0.2082
st.dev.(D5501:20)	0.35420
R(D5501:20)	0.9918


101.5
101
100.5
100
99.5
99
98.5
98
170
551
169
823
621
1213
52
913
922
1835
1300
634
1530
6297
1712
315
6426
1563
657
1011


Kernel Density
6
5
4
3
2
1
0
99.6
99.8
100
100.2
100.4

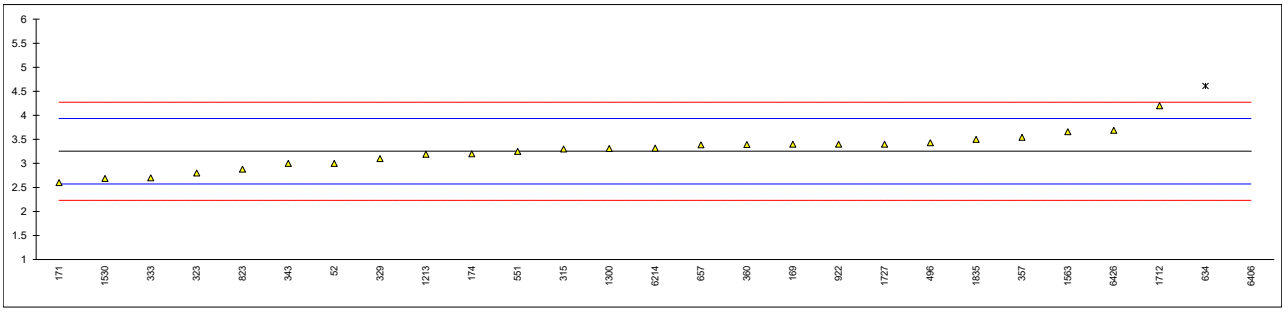
Determination of Gum (solvent washed) on sample #22245; results in mg/100mL

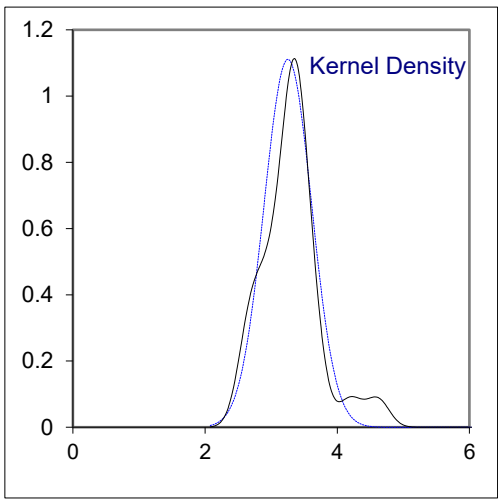
lab	method	value	mark	z(targ)	remarks
52	D381	<0.5		-----	
120		-----		-----	
150	D381	1.0		-----	
169	D381	<0.5		-----	
170	D381	0.6		-----	
171	D381	<1.0		-----	
174		-----		-----	
175	D381	<0.5		-----	
235		-----		-----	
315		-----		-----	
323	D381	<0.5		-----	
329		-----		-----	
333		-----		-----	
334		-----		-----	
337		-----		-----	
343		-----		-----	
357		-----		-----	
360	D381	0.5		-----	
444		-----		-----	
468		-----		-----	
492		-----		-----	
495		-----		-----	
496		-----		-----	
511	D381	<0.5		-----	
541		-----		-----	
551	D381	0.5		-----	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	D381	0		-----	
663	D381	<0.5		-----	
823	D381	<0.5		-----	
859		-----		-----	
913		-----		-----	
922	D381	<1.0		-----	
1011		-----		-----	
1108		-----		-----	
1213	D381	<0.5		-----	
1300	D381	0.33		-----	
1523		-----		-----	
1530		-----		-----	
1563		-----		-----	
1656		-----		-----	
1712		-----		-----	
1726		-----		-----	
1727		-----		-----	
1817		-----		-----	
1835		-----		-----	
1852		-----		-----	
1919		-----		-----	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214		-----		-----	
6297		-----		-----	
6303		-----		-----	
6406		-----		-----	
6424		-----		-----	
6426		-----		-----	
	n	16			
	mean (n)	<1			

Determination of Inorganic Chloride as Cl on sample #22246; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	D7319	3.0		-0.74	
120		-----		-----	
150		-----		-----	
169	D7319	3.4		0.43	
170		-----		-----	
171	D7319	2.6		-1.92	
174	D7319	3.2		-0.16	
175		-----		-----	
235		-----		-----	
315	EN15492	3.3		0.14	
323	EN15492	2.8		-1.33	
329	EN15492	3.1		-0.45	
333	EN15492	2.7		-1.62	
334		-----		-----	
337		-----		-----	
343	EN15492	3.0		-0.74	
357	D7319	3.54		0.84	
360	EN15492	3.39		0.40	
444		-----		-----	
468		-----		-----	
492		-----		-----	
495		-----		-----	
496	EN15492	3.43		0.52	
511		-----		-----	
541		-----		-----	
551	D7319	3.25		-0.01	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634	D512	4.61	R(0.05)	3.99	
657	D7328	3.3843		0.39	
663		-----		-----	
823	D7319	2.88		-1.10	
859		-----		-----	
913		-----		-----	
922	D7328	3.4		0.43	
1011		-----		-----	
1108		-----		-----	
1213	D7328	3.19		-0.18	
1300	EN15492	3.31		0.17	
1523		-----		-----	
1530	EN15492	2.684		-1.67	
1563	EN15492	3.6586		1.19	
1656		-----		-----	
1712	EN15484	4.2		2.78	
1726		-----		-----	
1727	EN15492	3.4		0.43	
1817		-----		-----	
1835	EN15492	3.5		0.73	
1852		-----		-----	
1919		-----		-----	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214	EN15492	3.317		0.19	
6297		-----		-----	
6303		-----		-----	
6406	EN15492	8.803	R(0.01)	16.31	
6424		-----		-----	
6426	In house	3.6879	C	1.28	first reported 4.7285

	normality	OK
	n	25
	outliers	2
	mean (n)	3.253
	st.dev. (n)	0.3591
	R(calc.)	1.005
	st.dev.(D7319:22)	0.3402
	R(D7319:22)	0.953
Compare		
	R(EN15492:12)	0.744

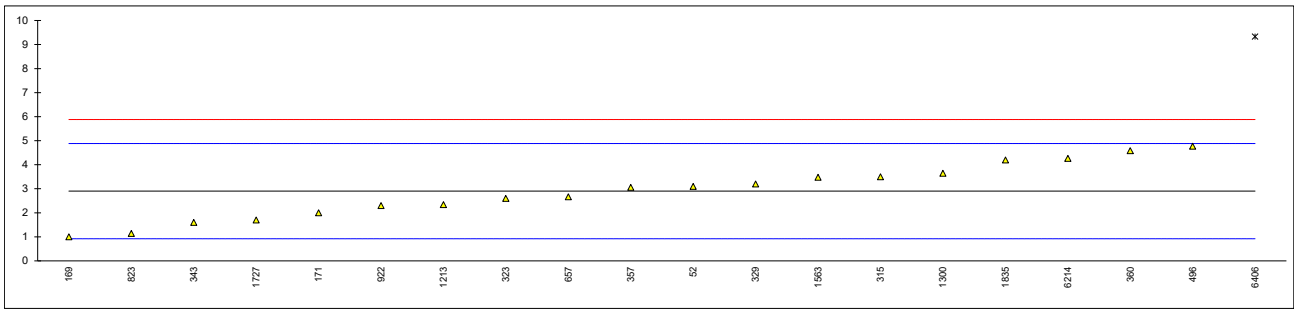

6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
171
1530
333
323
823
343
52
329
1213
174
551
315
1300
6214
657
360
169
922
1727
496
1835
357
1563
6426
1712
634
6406

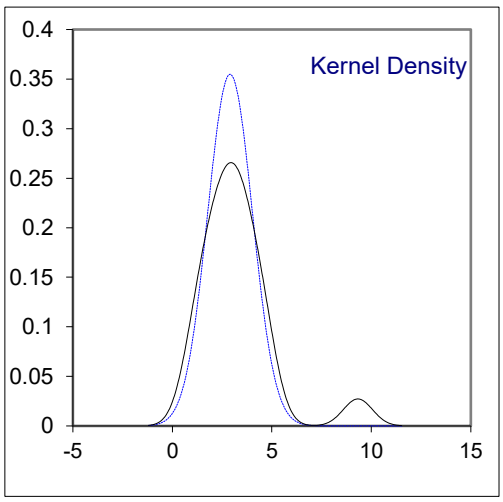

Kernel Density
1.2
1
0.8
0.6
0.4
0.2
0
0
2
4
6

Determination of Sulfate as SO_4 on sample #22246; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	D7319	3.1		0.20	
120		-----		-----	
150		-----		-----	
169	D7319	1.0		-1.92	
170		-----		-----	
171	D7319	2.0		-0.91	
174	D7319	<1		-----	
175		-----		-----	
235		-----		-----	
315	EN15492	3.5		0.60	
323	EN15492	2.6		-0.30	
329	EN15492	3.2		0.30	
333	EN15492	<1.0		-----	
334		-----		-----	
337		-----		-----	
343	EN15492	1.6		-1.31	
357	D7319	3.06		0.16	
360	EN15492	4.58		1.69	
444		-----		-----	
468	EN15492	<1		-----	
492		-----		-----	
495		-----		-----	
496	EN15492	4.77		1.88	
511		-----		-----	
541		-----		-----	
551		-----		-----	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	D7328	2.6649		-0.24	
663		-----		-----	
823	D7319	1.14		-1.78	
859		-----		-----	
913		-----		-----	
922	D7328	2.3		-0.61	
1011		-----		-----	
1108		-----		-----	
1213	D7328	2.34		-0.57	
1300	EN15492	3.65		0.75	
1523		-----		-----	
1530		-----		-----	
1563	EN15492	3.4752		0.58	
1656		-----		-----	
1712		-----		-----	
1726		-----		-----	
1727	EN15492	1.70		-1.21	
1817		-----		-----	
1835	EN15492	4.2		1.31	
1852		-----		-----	
1919		-----		-----	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214	EN15492	4.2634		1.37	
6297		-----		-----	
6303		-----		-----	
6406	EN15492	9.329	R(0.01)	6.48	
6424		-----		-----	
6426		-----		-----	

	normality	OK
	n	19
	outliers	1
	mean (n)	2.902
	st.dev. (n)	1.1241
	R(calc.)	3.147
	st.dev.(D7319:22)	0.9913
	R(D7319:22)	2.776
Compare		
	R(EN15492:12)	0.754
	R(D7328:22)	1.609

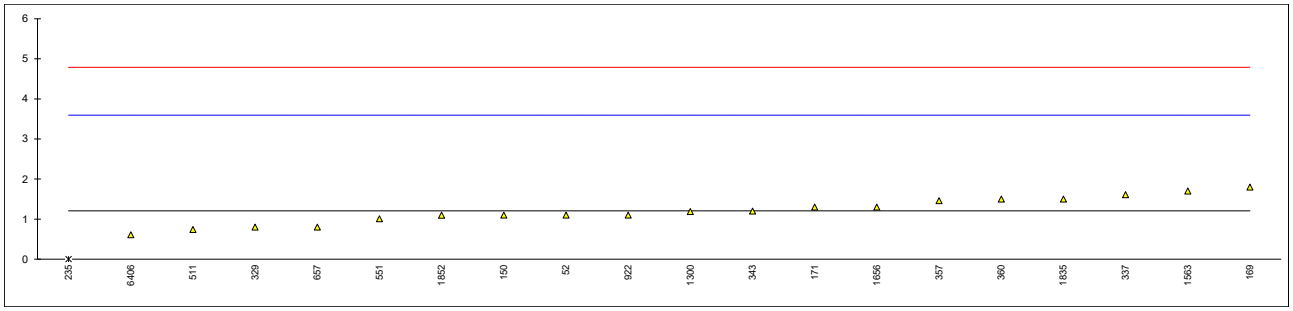

10
9
8
7
6
5
4
3
2
1
0
x
169
823
343
1727
171
922
1213
323
657
357
52
329
1563
315
1300
1835
6214
360
496
6406

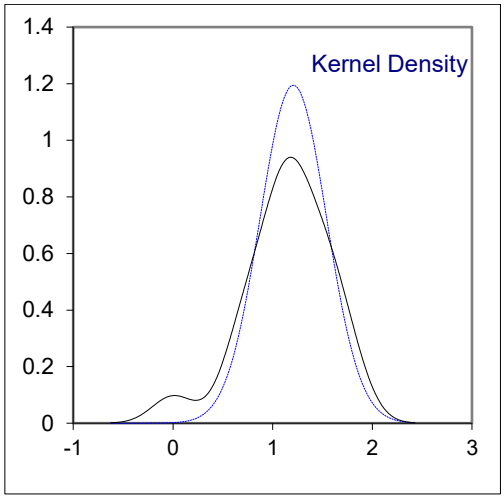

Kernel Density
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-5
0
5
10
15

Determination of Sulfur on sample #22246; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	EN15486	1.1		-0.09	
120		-----		-----	
150	D5453	1.1		-0.09	
169	D5453	1.8		0.50	
170		-----		-----	
171	D5453	1.3		0.08	
174		-----		-----	
175	D5453	<1.0		-----	
235	D5453	0.001	R(0.05)	-1.01	
315	EN15486	<5		-----	
323	EN15485	<5		-----	
329	D5453	0.8		-0.34	
333	ISO20846	<3		-----	
334		-----		-----	
337	EN15486	1.61		0.34	
343	D5453	1.2		-0.01	
357	D5453	1.46		0.21	
360	EN15486	1.5		0.25	
444		-----		-----	
468	EN15486	<2		-----	
492		-----		-----	
495		-----		-----	
496		-----		-----	
511	D5453	0.74		-0.39	
541		-----		-----	
551	D5453	1.01		-0.16	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	D5453	0.8		-0.34	
663		-----		-----	
823	D5453	<1.0		-----	
859		-----		-----	
913		-----		-----	
922	D5453	1.1		-0.09	
1011		-----		-----	
1108		-----		-----	
1213		-----		-----	
1300	EN15485	1.19		-0.01	
1523		-----		-----	
1530		-----		-----	
1563	EN15486	1.7026		0.42	
1656	EN15486	1.3		0.08	
1712	EN15486	<5.0		-----	
1726		-----		-----	
1727		-----		-----	
1817		-----		-----	
1835	EN15486	1.5		0.25	
1852	ISO20846	1.097		-0.09	
1919		-----		-----	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214		-----		-----	
6297		-----		-----	
6303		-----		-----	
6406	EN15485	0.607		-0.50	
6424		-----		-----	
6426		-----		-----	

normality	OK
n	19
outliers	1
mean (n)	1.206
st.dev. (n)	0.3340
R(calc.)	0.935
st.dev.(EN15485:07)	1.1944
R(EN15485:07)	3.344
Compare	
R(ISO20846:19)	1.170
R(EN15486:07)	1.863
R(D5453:19a)	0.667

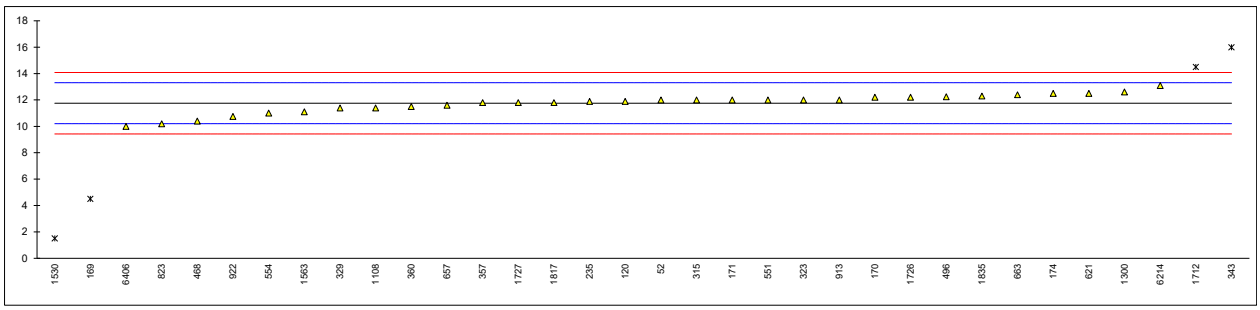




Determination of Nonvolatile matter on sample #22247; results in mg/100mL

lab	method	value	mark	z(targ)	remarks
52	EN15691	12		0.32	
120	D1353	11.9	C	0.19	first reported 0.01190 mg/100 mL
150	D1353	<1.0	C	<-13.86	possibly a false negative test result? / first reported 0
169	D1353	4.5	C,R(0.01)	-9.35	first reported 19.2
170	EN15691	12.2		0.58	
171	EN15691	12		0.32	
174	D1353	12.5		0.96	
175		-----		-----	
235	D1353	11.9		0.19	
315	EN15691	12		0.32	
323	D1353	12		0.32	
329	D1353	11.4		-0.46	
333	EN15691	<10		-----	
334		-----		-----	
337		-----		-----	
343	EN15691	16	R(0.01)	5.47	
357	D1353	11.8		0.06	
360	EN15691	11.5		-0.33	
444		-----		-----	
468	EN15691	10.4		-1.74	
492		-----		-----	
495		-----		-----	
496	D1353	12.25		0.64	
511		-----		-----	
541		-----		-----	
551	D1353	12		0.32	
554	D1353	11.0		-0.97	
558		-----		-----	
621	D1353	12.5		0.96	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	D1353	11.6		-0.20	
663	D1353	12.4		0.83	
823	D1353	10.2		-2.00	
859		-----		-----	
913	D1353	12.0		0.32	
922	D1353	10.75		-1.29	
1011		-----		-----	
1108	EN15691	11.4		-0.46	
1213		-----		-----	
1300	EN15691	12.605		1.10	
1523		-----		-----	
1530	EN15691	1.51	R(0.01)	-13.20	
1563	EN15691	11.1	C	-0.84	reported 0.0111 mg/100 mL
1656		-----		-----	
1712	EN15691	14.5	R(0.05)	3.54	
1726	EN15691	12.2		0.58	
1727	EN15691	11.8		0.06	
1817	In house	11.8		0.06	
1835	EN15691	12.3		0.70	
1852		-----		-----	
1919		-----		-----	
2458		-----		-----	
6072		-----		-----	
6201		-----		-----	
6214	EN15691	13.1		1.74	
6297		-----		-----	
6303		-----		-----	
6406	EN15691	10.0		-2.26	
6424		-----		-----	
6426		-----		-----	

	normality	OK
	n	30
	outliers	4
	mean (n)	11.753
	st.dev. (n)	0.7213
	R(calc.)	2.020
	st.dev.(EN15691:09)	0.7760
	R(EN15691:09)	2.173
Compare		
	R(D1353:13R21)	5.072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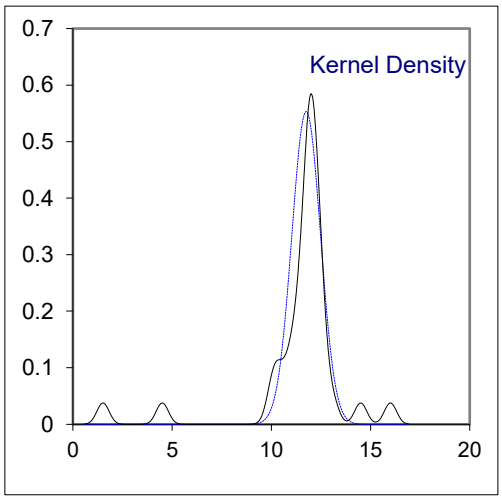
16
14
12
10
8
6
4
2
0
1530
169
6406
823
468
922
554
1563
329
1108
360
657
357
1727
1817
235
120
52
315
171
551
323
913
170
1726
496
1835
663
174
621
1300
6214
1712
343


Kernel Density
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
5
10
15
20

APPENDIX 2

Number of participants per country

1 lab in ARGENTINA
3 labs in BELGIUM
3 labs in BRAZIL
1 lab in BULGARIA
1 lab in CANADA
1 lab in CHINA, People's Republic
4 labs in COLOMBIA
1 lab in ECUADOR
1 lab in ESTONIA
1 lab in FINLAND
3 labs in FRANCE
6 labs in GERMANY
1 lab in GREECE
1 lab in HUNGARY
1 lab in INDIA
1 lab in INDONESIA
1 lab in KOREA, Republic of
1 lab in MAURITIUS
3 labs in NETHERLANDS
1 lab in PAKISTAN
1 lab in PERU
3 labs in PHILIPPINES
1 lab in POLAND
1 lab in PORTUGAL
1 lab in SINGAPORE
4 labs in SPAIN
2 labs in SWEDEN
2 labs in THAILAND
3 labs in UNITED KINGDOM
7 labs in UNITED STATES OF AMERICA
1 lab in VIETNAM

APPENDIX 3

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

Literature

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3 ISO5725 parts 1-6:94
4 ISO13528:05
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7 P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)
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