Results of Proficiency Test
Ethanol (Bio / Fuel grade)
December 2020

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) in accordance with the latest version of the EN15376 and ASTM D4806 every year. During the annual proficiency testing program 2020/2021 it was decided to continue the round robin for the analysis of Ethanol (Bio / Fuel grade).

In this interlaboratory study 59 laboratories in 32 different 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. It was decided to send three different samples of Ethanol (Bio / Fuel grade), one bottle of 1L labelled #20245 for regular analyzes, one bottle of 50mL labelled #20246 for Inorganic Chloride, Sulfate and total Sulfur determination and one bottle of 250mL labelled #20249 for determination of Nonvolatile matter 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 a batch of approximately 100 liters of Ethanol (Bio / Fuel grade) was obtained from a European supplier and spiked with Bitrex. After homogenization 96 amber glass bottles of 1L were filled and labelled #20245.
The homogeneity of the subsamples was checked by determination of Density in accordance with ASTM D4052 at 20°C and Water in accordance with E203 on 8 stratified randomly selected subsamples.

	Density at 20°C in kg/L	Water in %M/M
Sample #20245-1	0.78975	0.117
Sample #20245-2	0.78978	0.119
Sample #20245-3	0.78976	0.118
Sample #20245-4	0.78976	0.119
Sample #20245-5	0.78976	0.118
Sample #20245-6	0.78976	0.118
Sample #20245-7	0.78976	0.118
Sample #20245-8	0.78976	0.119

Table 1: homogeneity test results of subsamples #20245

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 kgL	Water in %M/M
r (observed)	0.00002	0.002
reference test method	ISO12185:96	E203:16
0.3 x R (reference test method)	0.00015	0.023

Table 2: evaluation of the repeatabilities of subsamples #20245

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 total Sulfur in Ethanol (Bio / Fuel grade) a batch of about 5L Ethanol (Bio / Fuel grade) was spiked with Sodium Chloride (NaCl) and Sodium Sulfate (Na2SO4) dissolved in water. After homogenization 90 PE bottles of 50mL were filled and labelled #20246.
The homogeneity of the subsamples was checked by determination of Chloride as Cl in accordance with EN15492 on 7 stratified randomly selected subsamples.

	Chloride as Cl in mg/kg
sample #20246-1	2.1
sample #20246-2	2.0
sample #20246-3	1.9
sample #20246-4	1.9
sample #20246-5	1.9
sample #20246-6	2.0
sample #20246-7	2.0

Table 3: homogeneity test results of subsamples #20246

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.

	Chloride as Cl in mg/kg
r (observed)	0.21
reference test method	D7319:17
0.3 x R (reference test method)	0.20

Table 4: evaluation of the repeatability of subsamples ##20246

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 about 25L Ethanol (Bio / Fuel grade) was spiked with Sodium Chloride (NaCl) dissolved in water. After homogenization 96 amber glass bottles of 250mL were filled and labelled #20249.
The homogeneity of the subsamples was checked by determination of Nonvolatile matter in accordance with EN15691 on 7 stratified randomly selected subsamples.

	Nonvolatile matter in mg/100mL
sample #20249-1	34
sample #20249-2	34
sample #20249-3	33
sample #20249-4	33
sample #20249-5	33
sample #20249-6	34
sample #20249-7	33

Table 5: homogeneity test results of subsamples #20249

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/100mL
r (observed)	1.5
reference test method	EN15691:09
0.3 x R (reference test method)	1.9

Table 6: evaluation of the repeatability of subsamples ##20249

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 sample labelled #20245, one sample labelled #20246 and one sample labelled #20249 was sent on November 11, 2020. 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 #20245: Total Acidity as Acetic Acid, Appearance, Copper as Cu, Density at 20°C, Electrical Conductivity at 25°C, Nonvolatile matter, Nitrogen, pHe (LiCl and KCl), 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), Bitrex and Gum (solvent washed).
On sample #20246 it was requested to determine Inorganic Chloride as Cl, Sulfate as SO_4 and Sulfur.
On sample #20249 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.

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, e.g. ISO reproducibilities, 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

Some problems were encountered with the dispatch of the samples due to the COVID-19 pandemic. Therefore, the reporting time on the data entry portal was extended with another three weeks. When considering the test results of the three samples together one participant reported test results after the final reporting date and ten participants did not report any test results. Not all participants were able to report all tests requested.
In total 49 participants reported 507 numerical test results. Observed were 18 outlying test results, which is 3.6%. 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. 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. D5501) and an added designation for the year that the test method was adopted or revised (e.g. D5501:20).

Sample #20245

Total Acidity: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN15491:07 and ASTM D1613:17

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

Copper as Cu: Almost all of the participants reported a test result near or below the application range of the method EN15488:07. Therefore, no z-scores were calculated.

Density at 20°C: 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 ISO12185:96.

Electrical Conductivity at 25°C: This determination was very problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not at all in agreement with the requirements of EN15938:10.

Nonvolatile matter: This determination was not problematic. All participants reported a test result near or below the application range of the method EN15691:09. Therefore, no z-scores were calculated.

Nitrogen: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D4629:17.

pHe: It is known that the pHe determined with a LiCl electrode will be lower than the pHe determined with a KCl electrode. Two test methods are available for the determination of the pHe of Ethanol: EN15490, that describes the use of a LiCl electrode and ASTM D6423, that describes the use of a KCl electrode.

pHe (LiCl): This determination may be problematic. Only 5 participants reported a test result. Due to the large variation in the test results it was decided not to calculate z-scores.

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

Phosphorus as P: This determination was not problematic. Almost all of the participants reported a test result near or below the application range of the method EN15487:07. Therefore, no z-scores were calculated.

Water, Coulometric: 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 EN15489:07, ASTM E1064:16 and ASTM D6304:16e1.

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 EN15692:09.

GC general: 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 (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. No statistical outliers were observed. The calculated reproducibility is in full 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%, isopropanol%, 2-methyl-1-butanol% and 3-methyl-1-butanol%.
This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full 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 was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the estimated reproducibility using the Horwitz equation based on nine components.

Methanol: This determination may be problematic depending on the test method used. Five statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the estimated reproducibility using 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 for Ethanol by mass and Ethanol by volume. No statistical outliers were observed but in total eight test results were excluded. For both Ethanol by mass and Ethanol by volume the calculated reproducibility after rejection of the suspect data is in agreement with the requirements of ASTM D5501:20.

Bitrex: This determination may be problematic. Only 5 participants reported a test result. Due to the large variation in the test results it was decided not to calculate z-scores.

Gum (solvent washed): This determination was not problematic. Almost all of the participants agreed on a test result <1 mg/100mL. Therefore, no z-scores were calculated.

Sample #20246

Inorganic Chloride: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D7319:17 or EN15492:12.

Sulfate as SO_4: This determination may be problematic depending on the test method used. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D7319:17, but is not in agreement with the requirements of EN15492:12 or ASTM D7328:17.

Sulfur: 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 EN15485:07, EN15486:07 and ASTM D5453:19a.

Sample #20249

Nonvolatile matter: 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 EN15691:09 and ASTM D1353:13.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the reference test method or as declared by the estimated target reproducibility calculated with the Horwitz equation 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 literature reference test methods (in casu ASTM, EN and ISO test methods) or estimated using the Horwitz equation are presented in the next tables.

Parameter	unit	n	average	2.8 * sd	R(lit)
Total Acidity as Acetic Acid	mg/kg	37	16.5	10.4	13.7
Appearance		41	Pass	n.a.	n.a.
Copper as Cu	mg/kg	21	<0.07	n.e.	n.e.
Density at 20°C	kg/L	44	0.7898	0.0002	0.0005
Electrical Conductivity at 25°C	µS/cm	29	1.18	0.42	0.21
Nonvolatile matter	mg/100mL	28	<10	n.e.	n.e.
Nitrogen	mg/kg	16	1.69	1.39	1.06
pHe (LiCl)		5	6.99	2.02	(0.67)
pHe (KCl)		15	7.25	1.09	1.08
Phosphorus as P	mg/L	18	<0.15	n.e.	n.e.
Water, Coulometric	%M/M	38	0.127	0.021	0.021
Water, Volumetric	%M/M	25	0.121	0.020	0.078
Ethanol + higher alcohols (EN15721)	%M/M	30	99.924	0.048	0.045
Higher alcohols (EN15721)	%M/M	29	0.125	0.033	0.034
Impurities (EN15721)	%M/M	24	0.070	0.040	0.035
Methanol	%M/M	26	0.005	0.0018	0.0013
Ethanol (D5501)	%M/M	12	99.733	0.228	0.993
Ethanol (D5501)	%V/V	13	99.787	0.258	0.992
Bitrex	mg/kg	5	<50	n.e.	n.e.
Gum (solvent washed)	mg/100mL	13	<1	n.e.	n.e.

Table 7: reproducibilities of tests on sample #20245

Results between brackets should be used with due care

Parameter	unit	n	average	2.8 * sd	R(lit)
Inorganic Chloride as Cl	mg/kg	24	1.9	0.9	0.6
Sulfate as SO_4	mg/kg	21	1.1	1.3	1.5
Sulfur	mg/kg	23	1.2	0.6	3.3
Nonvolatile matter	mg/100mL	28	33.5	5.7	6.2

Table 8: reproducibilities of tests on sample #20246 and sample #20249

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 2020 WITH PREVIOUS PTS

	December 2020	November 2019	December 2018	December 2017	December 2016
Number of reporting laboratories	49	51	53	59	57
Number of test results	507	457	473	537	476
Number of statistical outliers	18	16	14	22	31
Percentage of statistical outliers	3.6%	3.5%	3.0%	4.1%	6.5%

Table 9: 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 2020	November 2019	December 2018	December 2017	December 2016
Acidity, Total as Acetic Acid	++	+	+	-	+
Density at 20°C	++	++	++	++	++
Electrical Conductivity at 25°C	--	-	--	--	--
Nonvolatile matter	n.e./ +	n.e.	(--)	(--)	(--)
Nitrogen	-	-	-	-	--
pHe	+/-	+/-	-	-	+/-
Water, Coulometric	+/-	-	+/-	+/-	+
Water, Volumetric	+	+	+	++	++
Ethanol + higher alcohols (EN15721)	+/-	++	--	-	-
Higher alcohols (EN15721)	+/-	+	+/-	+/-	-
Impurities (EN15721)	-	++	-	-	--
Methanol	-	--	--	-	-
Ethanol (D5501)	++	++	+	+	++
Inorganic Chloride as Cl	-	-	-	+	(++)
Sulfate as SO_4	+	-	-	--	--
Sulfur	++	++	+	+	+

Table 9: comparison determinations against the reference test methods
Results between brackets should be used with care, because the average was near or below the application range.

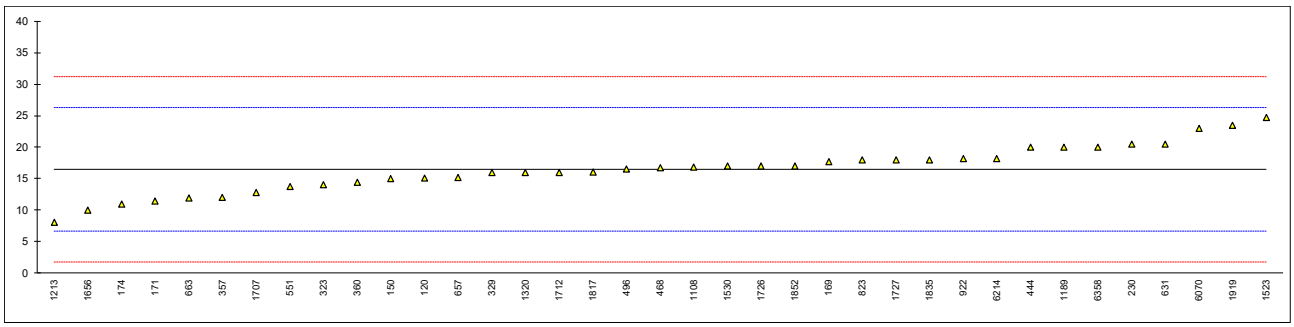
The following performance categories were used:

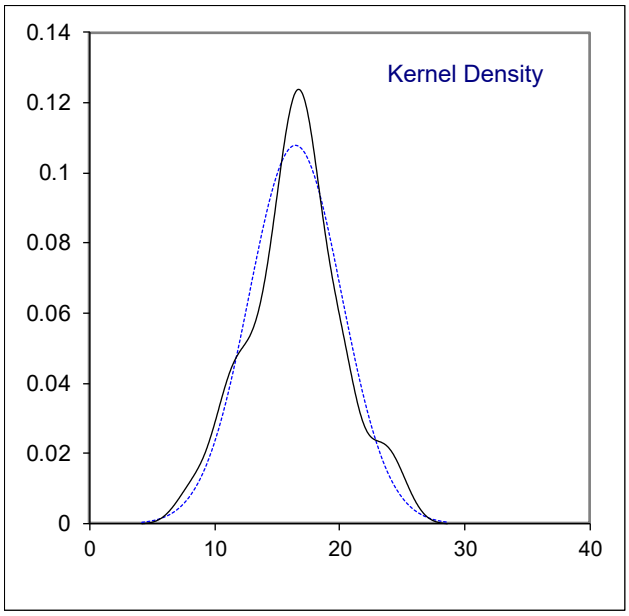
- ++ : group performed much better than the reference test method
- + : group performed better than the reference test method
- +/- : group performance equals the reference test method
- - : group performed worse than the reference test method
- -- : group performed much worse than the reference test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

APPENDIX 1

Determination of Total Acidity as Acetic Acid on sample #20245; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	EN15491	<30		-----	
120	D1613	15.1		-0.28	
150	D1613	15		-0.30	
169	D7795	17.7		0.25	
171	D1613	11.4		-1.04	
174	D1613	11		-1.12	
175		-----		-----	
230	D1613	20.5		0.82	
311	EN15491	<30		-----	
323	EN15491	14		-0.51	
329	EN15491	16		-0.10	
333	EN15491	<30		-----	
334	EN15491	<30		-----	
337		-----		-----	
343	EN15491	<30		-----	
357	EN15491	12		-0.92	
360	EN15491	14.4		-0.43	
396		-----		-----	
444	EN15491	20		0.72	
468	EN15491	16.7		0.04	
495		-----		-----	
496	EN15491	16.5		0.00	
511		-----		-----	
541		-----		-----	
551	D1613	13.7		-0.57	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631	D1613	20.5		0.82	
633		-----		-----	
634		-----		-----	
657	D1613	15.2203		-0.26	
663	D1613	11.9	C	-0.94	first reported 0.00119 mg/kg
823	D1613	18		0.31	
913		-----		-----	
922	D1613	18.2		0.35	
1108	EN15491	16.776		0.06	
1189	EN15491	20		0.72	
1213	D1613	8.1		-1.71	
1320	ISO17315	16		-0.10	
1397		-----		-----	
1438		-----		-----	
1523	D1388	24.743		1.69	
1530	EN15491	17		0.10	
1656	EN15491	10		-1.33	
1707	D1613	12.8		-0.75	
1712	EN15491	16		-0.10	
1726	EN15491	17		0.10	
1727	EN15491	18		0.31	
1817	ISO1388	16.08		-0.08	
1835	EN15491	18		0.31	
1852	EN15491	17		0.10	
1919	EN15491	23.5		1.43	
6070	D1613	23		1.33	
6072		-----		-----	
6214	EN15491	18.2		0.35	
6297		-----		-----	
6341		-----		-----	
6358	EN15491	20		0.72	
	normality	OK			
	n	37			
	outliers	0			
	mean (n)	16.487			
	st.dev. (n)	3.6977			
	R(calc.)	10.353			
	st.dev.(EN15491:07)	4.8929			
	R(EN15491:07)	13.7			application range: 30 – 150 mg/kg
	compare				
	R(D1613:17)	14			application range: <500 mg/kg


40
35
30
25
20
15
10
5
0
1213
1656
174
171
663
357
1707
551
323
360
150
120
657
329
1320
1712
1817
496
468
1108
1530
1726
1852
169
823
1727
1835
922
6214
444
1189
6358
230
631
6070
1919
1523


Kernel Density
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
10
20
30
40

Determination of Appearance on sample #20245;

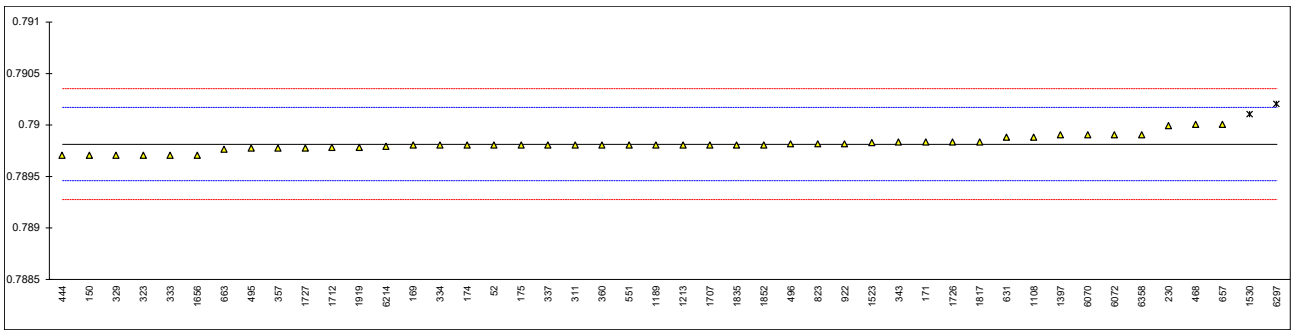
lab	method	value	mark	z(targ)	remarks
52	EN15769	Clear & Coloured		-----	
120	D4176	C&B		-----	
150	E2680	Pass		-----	
169	Visual	CBFSM		-----	
171	Visual	CFSM		-----	
174	Visual	Clear & Free		-----	
175	D4176	Pass		-----	
230	Visual	C&B		-----	
311	EN15769	clear & colourless		-----	
323	D4176	c&b		-----	
329	Visual	clear		-----	
333	Visual	Clear and bright		-----	
334	EN15769	clear and bright FFSM		-----	
337	Visual	colourless		-----	
343	Visual	clear & bright		-----	
357	E2680	Pass		-----	
360	EN15769	Clear and Colourless		-----	
396		-----		-----	
444	EN15769	Pass		-----	
468	EN15769	C&C		-----	
495	EN15769	Clear and colourless		-----	
496	Visual	clear&bright		-----	
511		-----		-----	
541		-----		-----	
551	E2680	Pass		-----	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631	Visual	clear & bright		-----	
633		-----		-----	
634		-----		-----	
657	E2680	Pass		-----	
663	Visual	Bright & Clear		-----	
823	E2680	Pass		-----	
913		-----		-----	
922	Visual	Clear and bright		-----	
1108		-----		-----	
1189	Visual	C/B		-----	
1213		-----		-----	
1320		-----		-----	
1397	EN15769	colourless, bright		-----	
1438		-----		-----	
1523		-----		-----	
1530	Visual	bright and clear		-----	
1656	EN15769	pass		-----	
1707	Visual	C&B		-----	
1712	EN15769	C&B		-----	
1726	EN15769	Clear&Colorless		-----	
1727	Visual	Clear&Colorless		-----	
1817	Visual	PASS		-----	
1835	EN15769	C&C		-----	
1852	Visual	clear & bright		-----	
1919		-----		-----	
6070	Visual	Clear and Free		-----	
6072		-----		-----	
6214	EN15769	Clear and colourless		-----	
6297		-----		-----	
6341		-----		-----	
6358	EN15769	clear and colourless		-----	
	n	41			
	mean	Pass (Clear and Bright)			

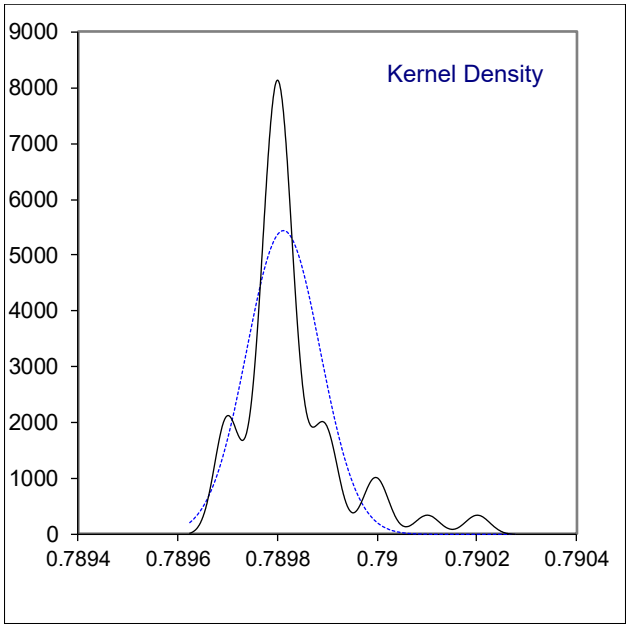
Determination of Copper as Cu on sample #20245; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	EN15837	<0.050		-----	
120		-----		-----	
150	D1688	<0.1		-----	
169	D1688	<0.05		-----	
171		-----		-----	
174		-----		-----	
175	D1688	<0.05		-----	
230		-----		-----	
311	EN15837	<0.050		-----	
323	EN15488	<0.070		-----	
329	EN15488	0.002		-----	
333	EN15488	<0.07		-----	
334		-----		-----	
337		-----		-----	
343	EN15837	<0,050		-----	
357		-----		-----	
360	EN15837	< 0.050		-----	
396		-----		-----	
444	EN15837	0.002		-----	
468	EN15488	<0,07		-----	
495		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	INH-2047	<0.04		-----	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631	D1688	<0.05		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663	In house	0.0001		-----	
823	UOP389	<0.01		-----	
913		-----		-----	
922	D1688	<0.05		-----	
1108		-----		-----	
1189		-----		-----	
1213		-----		-----	
1320		-----		-----	
1397		-----		-----	
1438		-----		-----	
1523		-----		-----	
1530		-----		-----	
1656	D1688-A	<0.1		-----	
1707		-----		-----	
1712	EN15488	<0,07		-----	
1726		-----		-----	
1727		-----		-----	
1817		-----		-----	
1835	EN15837	<0.050		-----	
1852		-----		-----	
1919		-----		-----	
6070	D1688	0.025		-----	
6072		-----		-----	
6214	EN15488	0.0013		-----	
6297		-----		-----	
6341		-----		-----	
6358	EN15488	<0,070		-----	
	n	21			
	mean (n)	<0.07			
	application range of test method EN15488:07: 0.07-0.20mg/kg				

Determination of Density at 20°C on sample #20245; results in kg/L

lab	method	value	mark	z(targ)	remarks
52	ISO12185	0.7898		-0.07	
120		-----		-----	
150	D4052	0.7897		-0.63	
169	D4052	0.7898		-0.07	
171	D4052	0.78983		0.10	
174	D4052	0.7898		-0.07	
175	D4052	0.7898		-0.07	
230	D4052	0.78999		0.99	
311	D4052	0.7898		-0.07	
323	D4052	0.7897		-0.63	
329	D4052	0.7897		-0.63	
333	ISO12185	0.7897		-0.63	
334	ISO12185	0.7898		-0.07	
337	ISO12185	0.7898		-0.07	
343	ISO12185	0.78983	C	0.10	first reported 0.7904
357	D4052	0.78977		-0.24	
360	ISO12185	0.7898		-0.07	
396		-----		-----	
444	D4052	0.7897		-0.63	
468	ISO12185	0.7900		1.05	
495	ISO12185	0.78977		-0.24	
496	ISO12185	0.78981		-0.01	
511		-----		-----	
541		-----		-----	
551	D4052	0.7898		-0.07	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631	D4052	0.78988		0.38	
633		-----		-----	
634		-----		-----	
657	D4052	0.7900		1.05	
663	D4052	0.78976		-0.29	
823	ISO12185	0.78981		-0.01	
913		-----		-----	
922	D4052	0.78981		-0.01	
1108	D4052	0.78988		0.38	
1189	D4052	0.7898		-0.07	
1213	D4052	0.7898		-0.07	
1320		-----		-----	
1397	ISO12185	0.7899	C	0.49	first reported 789.9 kg/L
1438		-----		-----	
1523	D4052	0.7898245		0.07	
1530	ISO12185	0.79010	R(0.05)	1.61	
1656	D4052	0.7897		-0.63	
1707	D4052	0.7898		-0.07	
1712	ISO12185	0.78978		-0.18	
1726	D4052	0.78983		0.10	
1727	D4052	0.78977		-0.24	
1817	Table OIML	0.78983		0.10	
1835	ISO12185	0.78980		-0.07	
1852	ISO12185	0.7898		-0.07	
1919	ISO12185	0.78978		-0.18	
6070	D4052	0.7899		0.49	
6072	D4052	0.7899	C	0.49	first reported 789.9 kg/L
6214	ISO12185	0.78979		-0.13	
6297	D4052	0.7902	C,R(0.01)	2.17	reported 790.2 kg/L
6341		-----		-----	
6358	ISO12185	0.7899		0.49	
	normality	suspect			
	n	44			
	outliers	2			
	mean (n)	0.78981			
	st.dev. (n)	0.000073			
	R(calc.)	0.00021			
	st.dev.(ISO12185:96)	0.000179			
	R(ISO12185:96)	0.0005			

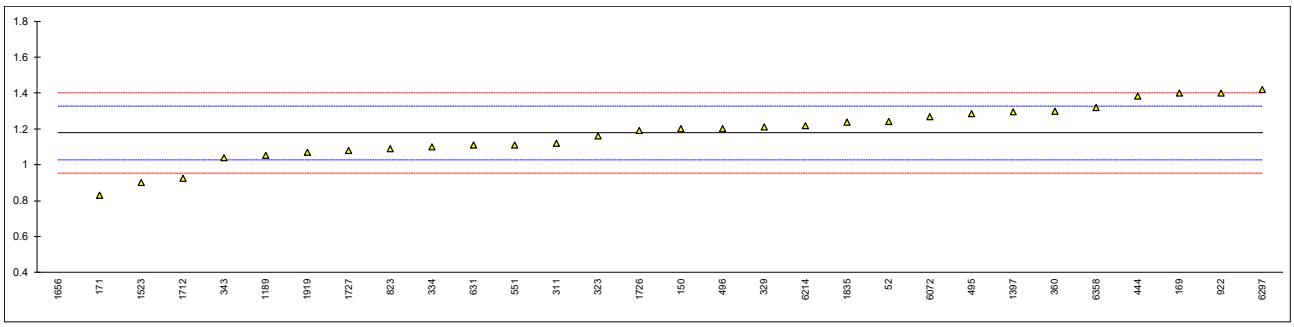

0.791
0.7905
0.79
0.7895
0.789
0.7885
444 150 329 323 333 1656 663 495 357 1727 1712 1919 6214 169 334 174 52 175 337 311 360 551 1189 1213 1707 1835 1852 496 823 922 1523 343 171 1726 1817 631 1108 1397 6070 6072 6358 230 468 657 1530 6297

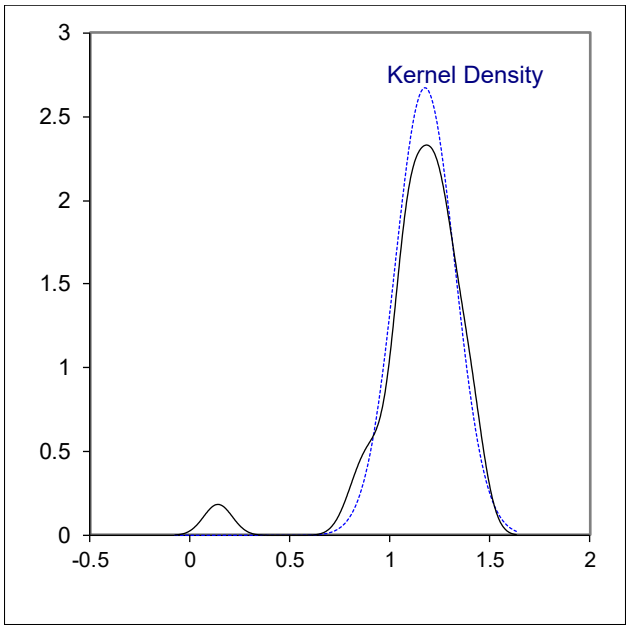

Kernel Density
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0.7894
0.7896
0.7898
0.79
0.7902
0.7904

Determination of Electrical Conductivity at 25°C on sample #20245; results in µS/cm

lab	method	value	mark	z(targ)	remarks
52	EN15938	1.24		0.83	
120		-----		-----	
150	EN15938	1.2		0.30	
169	NBR10547	1.40	C	2.98	reported 140 µS/cm, possibly a unit error?
171	EN15938	0.83	C	-4.67	reported 83 µS/cm, possibly a unit error?
174	D1125	<10		-----	
175		-----		-----	
230		-----		-----	
311	EN15938	1.12		-0.78	
323	EN15938	1.16		-0.24	
329	EN15938	1.21		0.43	
333		-----		-----	
334	EN15938	1.10		-1.04	
337		-----		-----	
343	EN15938	1.04	C	-1.85	first reported 0.72
357		-----		-----	
360	EN15938	1.3	C	1.64	first reported 0.7
396		-----		-----	
444	EN15938	1.384		2.76	
468		-----		-----	
495	EN15938	1.286		1.45	
496	EN15938	1.2		0.30	
511		-----		-----	
541		-----		-----	
551	NBR10547	1.11		-0.91	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631	D1125	1.11	C	-0.91	first reported 111
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
823	D1125	1.090		-1.18	
913		-----		-----	
922	D5391	1.40	C	2.98	first reported 0.46
1108		-----		-----	
1189	EN15938	1.053		-1.67	
1213		-----		-----	
1320		-----		-----	
1397	EN2788	1.296		1.58	
1438		-----		-----	
1523	D2624	0.90		-3.73	
1530		-----		-----	
1656	EN15938	0.14	C,R(0.01)	-13.92	first reported <1
1707		-----		-----	
1712	EN15938	0.926		-3.38	
1726	EN15938	1.19		0.16	
1727	EN15938	1.08		-1.31	
1817		-----		-----	
1835	EN15938	1.238		0.81	
1852		-----		-----	
1919	EN15938	1.07		-1.45	
6070		-----		-----	
6072	NBR10547	1.268		1.21	
6214	EN15938	1.218		0.54	
6297	NBR10547	1.42		3.25	reported 142 µS/m
6341		-----		-----	
6358	EN15938	1.319		1.89	

normality	OK
n	29
outliers	1
mean (n)	1.178
st.dev. (n)	0.1493
R(calc.)	0.418
st.dev.(EN15938:10)	0.0746
R(EN15938:10)	0.209


1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
1656
171
1523
1712
343
1189
1919
1727
823
334
631
551
311
323
1726
150
496
329
6214
1835
52
6072
495
1397
360
6358
444
169
922
6297


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

Determination of Nonvolatile matter on sample #20245; results in mg/100mL

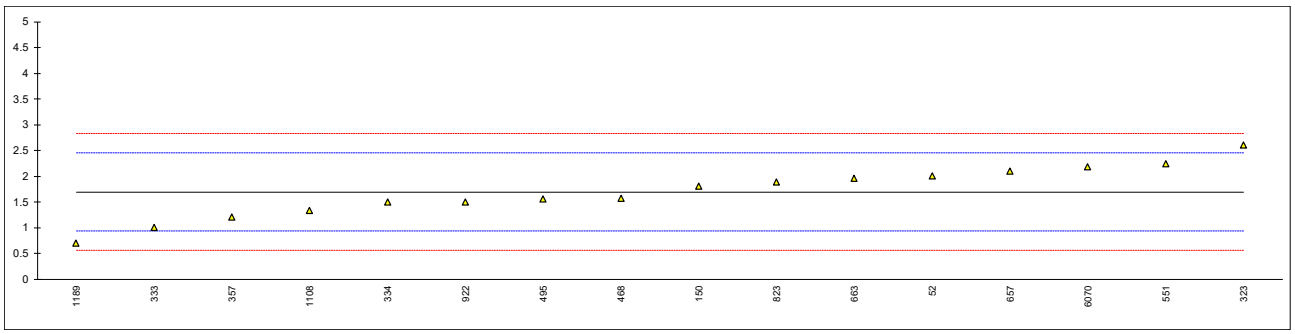
lab	method	value	mark	z(targ)	remarks
52	EN15691	<10		-----	
120		-----		-----	
150	D1353	1.4		-----	
169	D1353	0.00		-----	
171	D1353	3		-----	
174	D1353	0.6		-----	
175		-----		-----	
230	D1353	2.7		-----	
311	EN15691	<10		-----	
323	EN15691	1.9		-----	
329	EN15691	1.4		-----	
333		-----		-----	
334		-----		-----	
337		-----		-----	
343	EN15691	<10		-----	
357	EN15691	1		-----	
360	EN15691	1.1		-----	
396		-----		-----	
444	EN15691	0		-----	
468	EN15691	<1,0		-----	
495		-----		-----	
496	EN15691	<3.5		-----	
511		-----		-----	
541		-----		-----	
551	D1353	0.5		-----	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	D1353	1.2		-----	
663		-----		-----	
823	D1353	0.4		-----	
913		-----		-----	
922	D1353	1.0		-----	
1108		-----		-----	
1189	EN15691	1.8		-----	
1213		-----		-----	
1320		-----		-----	
1397	EN15691	<0,1		-----	
1438		-----		-----	
1523		-----		-----	
1530	EN15691	<1		-----	
1656		-----		-----	
1707	D1353	1.2		-----	
1712		-----		-----	
1726	EN15691	0.8		-----	
1727	EN15691	<10		-----	
1817	In house	0.6		-----	
1835	EN15691	<10		-----	
1852		-----		-----	
1919		-----		-----	
6070	D1353	4.9		-----	
6072		-----		-----	
6214		-----		-----	
6297		-----		-----	
6341		-----		-----	
6358		-----		-----	

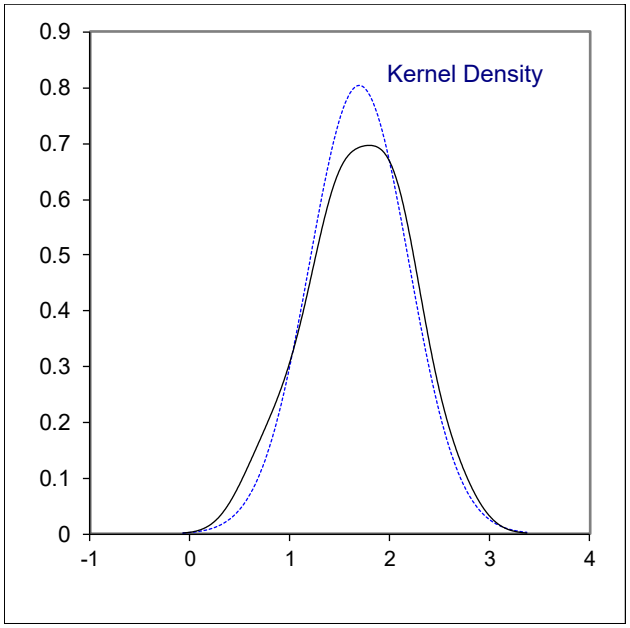
n 28
mean (n) <10
application range of test method EN15691:09: 10 – 25 mg/100mL

Determination of Nitrogen on sample #20245; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	D4629	2.0		0.81	
120		-----		-----	
150	D4629	1.8		0.28	
169		-----		-----	
171		-----		-----	
174		-----		-----	
175		-----		-----	
230		-----		-----	
311		-----		-----	
323	D4629	2.6		2.39	
329		-----		-----	
333	D4629	1.00		-1.83	
334	D4629	1.5		-0.51	
337		-----		-----	
343		-----		-----	
357	D4629	1.2		-1.30	
360		-----		-----	
396		-----		-----	
444		-----		-----	
468	D4629	1.57		-0.33	
495	D4629	1.55		-0.38	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	D4629	2.24		1.44	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	D4629	2.1		1.07	
663	D4629	1.96		0.70	
823	D4629	1.88		0.49	
913		-----		-----	
922	D4629	1.5		-0.51	
1108	D5762	1.334		-0.95	
1189	D4629	0.7		-2.62	
1213		-----		-----	
1320		-----		-----	
1397		-----		-----	
1438		-----		-----	
1523		-----		-----	
1530	D4629	<1		-----	
1656		-----		-----	
1707		-----		-----	
1712		-----		-----	
1726		-----		-----	
1727		-----		-----	
1817		-----		-----	
1835		-----		-----	
1852		-----		-----	
1919		-----		-----	
6070	D4629	2.174		1.27	
6072		-----		-----	
6214		-----		-----	
6297		-----		-----	
6341		-----		-----	
6358		-----		-----	

normality	OK
n	16
outliers	0
mean (n)	1.694
st.dev. (n)	0.4953
R(calc.)	1.387
st.dev.(D4629:17)	0.3792
R(D4629:17)	1.062


5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1189
333
357
1108
334
922
495
488
150
823
663
52
657
6070
551
323


Kernel Density
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-1
0
1
2
3
4

Determination of pHe with LiCl electrode on sample #20245;

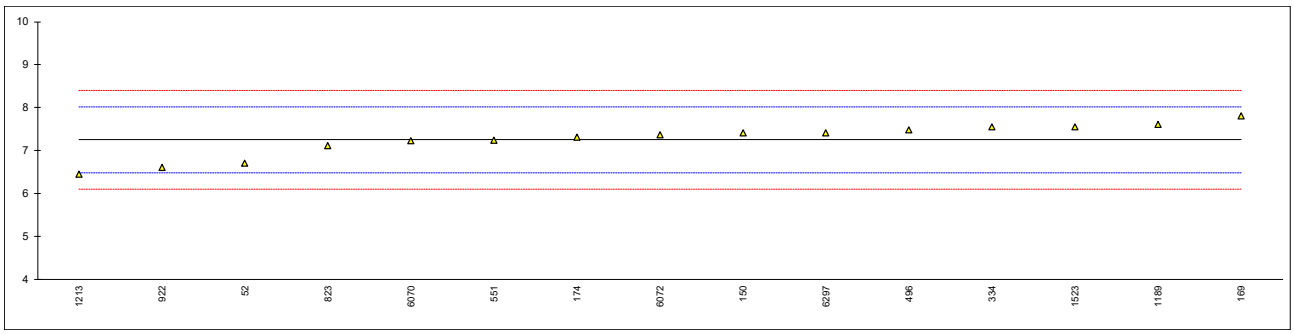
lab	method	value	mark	z(targ)	remarks
52		-----		-----	
120		-----		-----	
150		-----		-----	
169		-----		-----	
171	D6423	8.01		-----	
174		-----		-----	
175		-----		-----	
230		-----		-----	
311		-----		-----	
323		-----		-----	
329		-----		-----	
333		-----		-----	
334		-----		-----	
337		-----		-----	
343		-----		-----	
357		-----		-----	
360		-----		-----	
396		-----		-----	
444		-----		-----	
468		-----		-----	
495		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	NBR10891	6.21		-----	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
823		-----		-----	
913		-----		-----	
922		-----		-----	
1108		-----		-----	
1189		-----		-----	
1213		-----		-----	
1320		-----		-----	
1397		-----		-----	
1438		-----		-----	
1523		-----		-----	
1530		-----		-----	
1656		-----		-----	
1707		-----		-----	
1712		-----		-----	
1726	EN15490	7.43		-----	
1727	EN15490	6.59		-----	
1817		-----		-----	
1835	EN15490	6.7		-----	
1852		-----		-----	
1919		-----		-----	
6070		-----		-----	
6072		-----		-----	
6214		-----		-----	
6297		-----		-----	
6341		-----		-----	
6358		-----		-----	

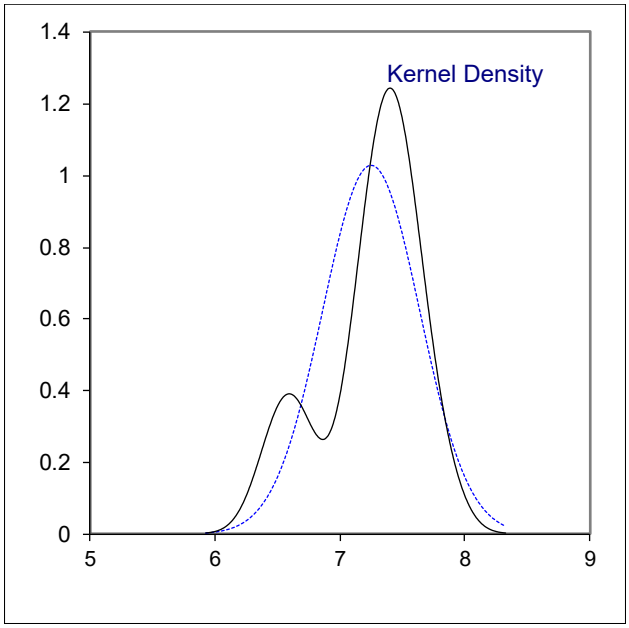
normality	unknown
n	5
outliers	0
mean (n)	6.988
st.dev. (n)	0.722
R(calc.)	2.0223
st.dev.(EN15490:07)	(0.240)
R(EN15490:07)	(0.6708)

Determination of pHe with KCl electrode on sample #20245;

lab	method	value	mark	z(targ)	remarks
52	EN15490	6.7		-1.42	
120		-----		-----	
150	D6423	7.4		0.39	
169	D6423	7.8		1.43	
171		-----		-----	
174	D6423	7.3		0.13	
175		-----		-----	
230		-----		-----	
311		-----		-----	
323		-----		-----	
329		-----		-----	
333		-----		-----	
334	EN15490	7.55	C	0.78	first reported 4.707
337		-----		-----	
343		-----		-----	
357		-----		-----	
360		-----		-----	
396		-----		-----	
444		-----		-----	
468		-----		-----	
495		-----		-----	
496	EN15490	7.47		0.57	
511		-----		-----	
541		-----		-----	
551	D6423	7.23		-0.05	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
823	D6423	7.104		-0.38	
913		-----		-----	
922	D6423	6.6		-1.68	
1108		-----		-----	
1189	EN15490	7.6		0.91	
1213	D6423	6.45		-2.07	
1320		-----		-----	
1397		-----		-----	
1438		-----		-----	
1523	D6423	7.552		0.79	
1530		-----		-----	
1656		-----		-----	
1707		-----		-----	
1712		-----		-----	
1726		-----		-----	
1727		-----		-----	
1817		-----		-----	
1835		-----		-----	
1852		-----		-----	
1919		-----		-----	
6070	D6423	7.22		-0.08	
6072	D6423	7.36		0.29	
6214		-----		-----	
6297	D6423	7.4		0.39	
6341		-----		-----	
6358		-----		-----	

normality	OK
n	15
outliers	0
mean (n)	7.249
st.dev. (n)	0.3875
R(calc.)	1.085
st.dev.(D6423:20a)	0.3855
R(D6423:20a)	1.079


10
9
8
7
6
5
4
1213
922
52
823
6070
551
174
6072
150
6297
496
334
1523
1189
169


Kernel Density
1.4
1.2
1
0.8
0.6
0.4
0.2
0
5
6
7
8
9

Determination of Phosphorus as P on sample #20245; results in mg/L

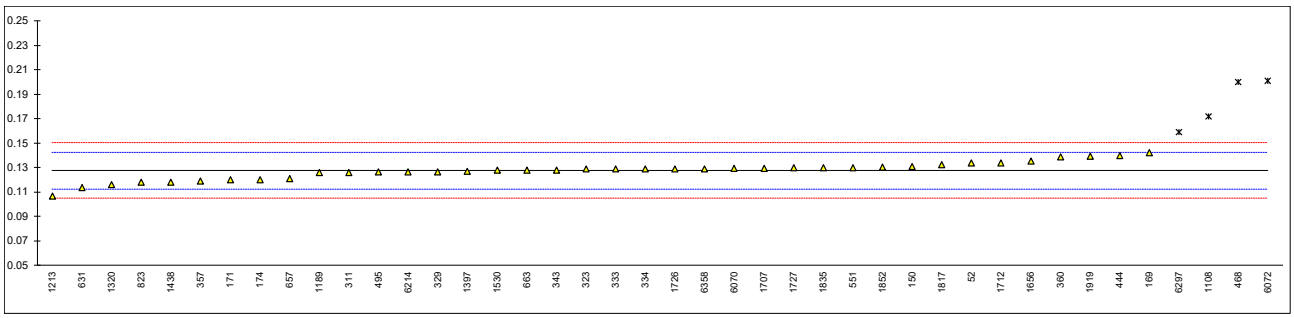
lab	method	value	mark	z(targ)	remarks
52	EN15837	<0.10		-----	
120		-----		-----	
150	D3231	<0.20		-----	
169		-----		-----	
171	D3231	<0.10		-----	
174		-----		-----	
175		-----		-----	
230		-----		-----	
311	EN15837	<0.13		-----	
323	EN15487	<0.10		-----	
329	EN15487	0.004		-----	
333		-----		-----	
334		-----		-----	
337		-----		-----	
343	EN15487	<0,13		-----	
357		-----		-----	
360	EN15837	< 0.10		-----	
396		-----		-----	
444	EN15837	0.09		-----	
468		-----		-----	
495		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	INH-2047	<0.13		-----	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
823	UOP389	<0.11		-----	
913		-----		-----	
922		-----		-----	
1108	EN15487	0.00		-----	
1189		-----		-----	
1213		-----		-----	
1320		-----		-----	
1397		-----		-----	
1438		-----		-----	
1523		-----		-----	
1530		-----		-----	
1656	EN15487	<0.01		-----	
1707		-----		-----	
1712	EN15487	0.01		-----	
1726	EN15487	0.023		-----	
1727	EN15487	<0,15		-----	
1817		-----		-----	
1835	EN15837	0.03		-----	
1852		-----		-----	
1919		-----		-----	
6070	EN15487	0.4		-----	possibly a false positive test result?
6072		-----		-----	
6214	EN15487	0.139		-----	
6297		-----		-----	
6341		-----		-----	
6358	EN15487	<0,15		-----	
	n	18			
	mean (n)	<0.15			

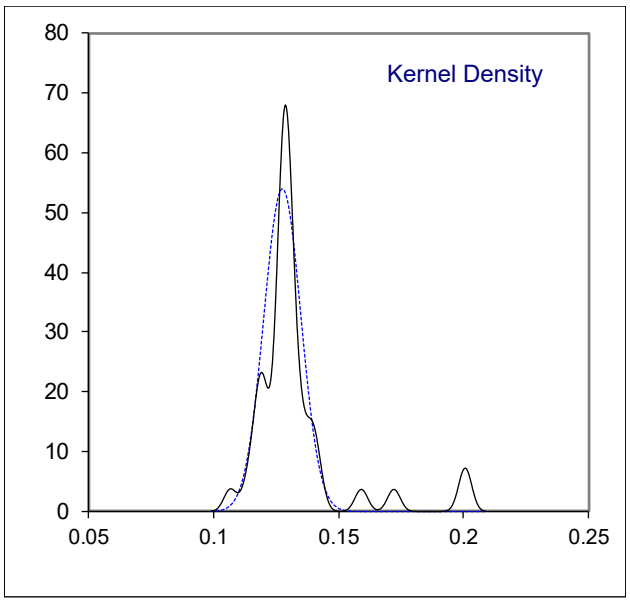
application range test method EN15487:07: 0.15 – 1.50 mg/L

Determination of Water, Coulometric on sample #20245; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	EN15489	0.134		0.86	
120		-----		-----	
150	E1064	0.131		0.47	
169	E1064	0.142		1.92	
171	EN15489	0.11996		-0.99	
174	E1064	0.120		-0.98	
175		-----		-----	
230		-----		-----	
311	EN15489	0.126		-0.19	
323	EN15489	0.1288		0.18	
329	D6304	0.1263		-0.15	
333	EN15489	0.129		0.20	
334	EN15489	0.129		0.20	
337		-----		-----	
343	EN15489	0.128		0.07	
357	E1064	0.1188		-1.14	
360	EN15489	0.1389		1.51	
396		-----		-----	
444	EN15489	0.1398		1.63	
468	EN15489	0.20	C,R(0.01)	9.58	first reported 0.24
495	EN15489	0.1262		-0.17	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	E1064	0.130		0.34	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631	D6304	0.1136		-1.83	
633		-----		-----	
634		-----		-----	
657	E1064	0.1210		-0.85	
663	E1064	0.1280		0.07	
823	E1064	0.1182		-1.22	
913		-----		-----	
922		-----		-----	
1108	EN15489	0.172	C,R(0.01)	5.88	reported 0.172 mg/kg
1189	EN15489	0.1257		-0.23	
1213	D6304	0.10661		-2.75	
1320	ISO12937	0.1162		-1.49	
1397	EN15489	0.127		-0.06	
1438	D6304	0.1182		-1.22	
1523		-----		-----	
1530	EN15489	0.12762		0.02	
1656	EN15489	0.1353		1.04	
1707	EN15489	0.1295		0.27	
1712	EN15489	0.1340		0.86	
1726	EN15489	0.129		0.20	
1727	EN15489	0.1296		0.28	
1817	In house	0.1323		0.64	
1835	EN15489	0.1297		0.30	
1852	EN15489	0.1304		0.39	
1919	EN15489	0.13906		1.53	
6070	E1064	0.1293		0.24	
6072	E1064	0.201	C,R(0.01)	9.72	first reported 0.163
6214	EN15489	0.12622		-0.16	
6297	E1064	0.159	R(0.01)	4.17	
6341		-----		-----	
6358	EN15489	0.129		0.20	

normality	OK
n	38
outliers	4
mean (n)	0.12745
st.dev. (n)	0.007389
R(calc.)	0.02069
st.dev.(EN15489:07)	0.007570
R(EN15489:07)	0.02120
compare	
R(E1064:16)	0.02027
R(D6304:16e1)	0.20811

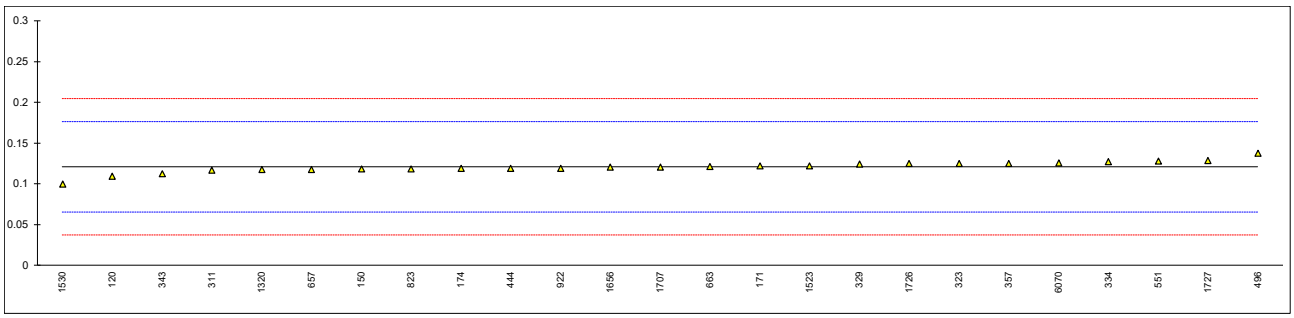

0.25
0.23
0.21
0.19
0.17
0.15
0.13
0.11
0.09
0.07
0.05
1213
631
1320
823
1438
357
171
174
657
1189
311
495
6214
329
1397
1530
663
343
323
333
334
1726
6358
6070
1707
1727
1835
551
1852
150
1817
52
1712
1656
360
1919
444
169
6297
1108
468
6072

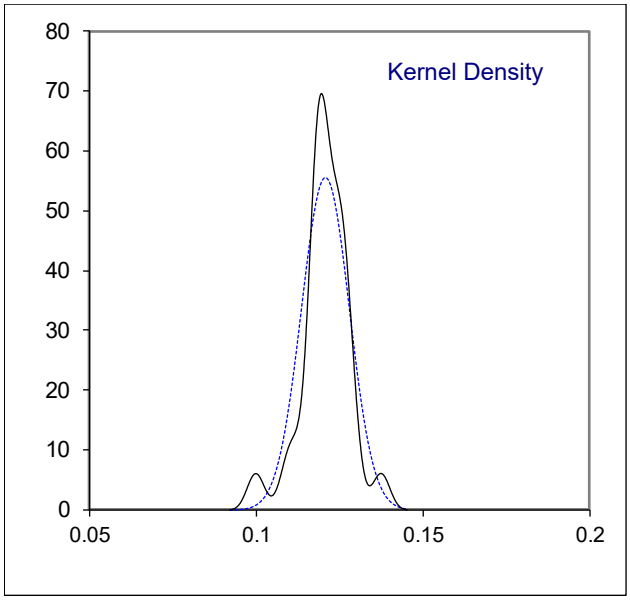

Kernel Density
80
70
60
50
40
30
20
10
0
0.05
0.1
0.15
0.2
0.25

Determination of Water, Volumetric on sample #20245; results in %M/M

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
120	E203	0.10935		-0.41	
150	E203	0.118		-0.10	
169		-----		-----	
171	E203	0.1217		0.03	
174	E203	0.119		-0.06	
175		-----		-----	
230		-----		-----	
311	EN15692	0.117		-0.13	
323	E203	0.1251		0.16	
329	E203	0.1245		0.13	
333		-----		-----	
334	E203	0.1270		0.22	
337		-----		-----	
343	E203	0.112		-0.31	
357	E203	0.1252		0.16	
360		-----		-----	
396		-----		-----	
444	E203	0.1190		-0.06	
468		-----		-----	
495		-----		-----	
496	E203	0.1375		0.60	
511		-----		-----	
541		-----		-----	
551	E203	0.128		0.26	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	E203	0.1175		-0.12	
663	E203	0.1214		0.02	
823	D1364	0.1182		-0.09	
913		-----		-----	
922	E203	0.119		-0.06	
1108		-----		-----	
1189		-----		-----	
1213		-----		-----	
1320	E203	0.1174		-0.12	
1397		-----		-----	
1438		-----		-----	
1523	E203	0.122		0.04	
1530	E203	0.09982		-0.75	
1656	E203	0.1202		-0.02	
1707	E203	0.1202		-0.02	
1712		-----		-----	
1726	EN15692	0.1250		0.15	
1727	EN15692	0.1289		0.29	
1817		-----		-----	
1835		-----		-----	
1852		-----		-----	
1919		-----		-----	
6070	E203	0.1258		0.18	
6072		-----		-----	
6214		-----		-----	
6297		-----		-----	
6341		-----		-----	
6358		-----		-----	

normality	not OK
n	25
outliers	0
mean (n)	0.12075
st.dev. (n)	0.007194
R(calc.)	0.02014
st.dev.(E203:16)	0.027857
R(E203:16)	0.078
compare	
R(EN15692:09)	0.095

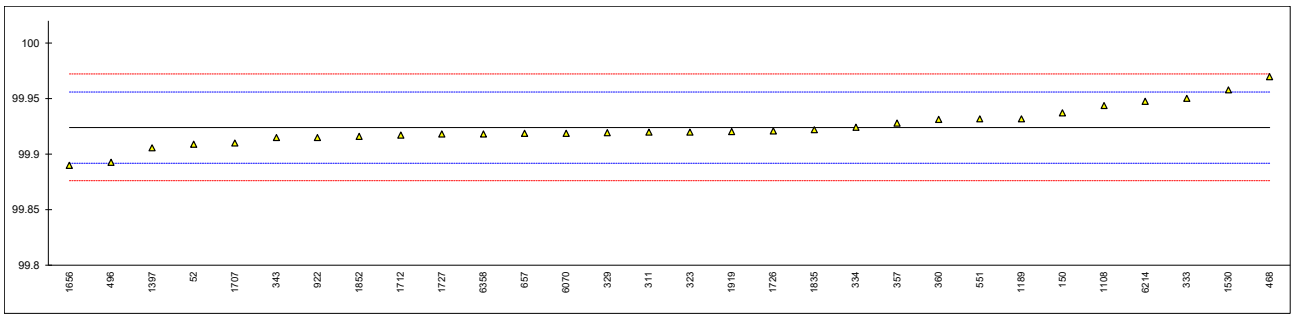

0.3
0.25
0.2
0.15
0.1
0.05
0
1530
120
343
311
1320
657
150
823
174
444
922
1656
1707
663
171
1523
329
1726
323
357
6070
334
551
1727
496

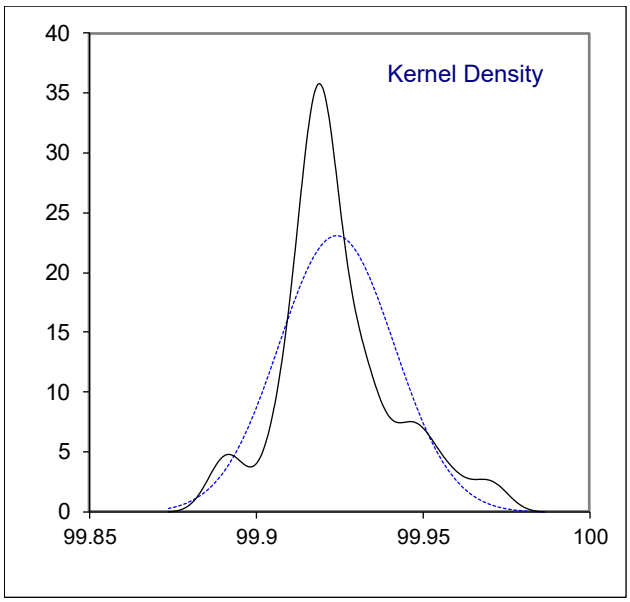

Kernel Density
80
70
60
50
40
30
20
10
0
0.05
0.1
0.15
0.2

Determination of Ethanol incl. higher alcohols acc. to EN15721 on sample #20245 in %M/M

lab	method	value	mark	z(targ)	remarks
52	EN15721	99.909		-0.94	
120		-----		-----	
150	EN15721	99.937		0.81	
169		-----		-----	
171		-----		-----	
174		-----		-----	
175		-----		-----	
230		-----		-----	
311	EN15721	99.92		-0.25	
323	EN15721	99.920		-0.25	
329	EN15721	99.9195		-0.28	
333	EN15721	99.950		1.62	
334	EN15721	99.924		0.00	
337		-----		-----	
343	EN15721	99.915		-0.57	
357	EN15721	99.928		0.25	
360	EN15721	99.9311		0.44	
396		-----		-----	
444		-----		-----	
468	EN15721	99.97		2.87	
495		-----		-----	
496	EN15721	99.8927		-1.96	
511		-----		-----	
541		-----		-----	
551	INH-1313	99.932		0.50	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	INH-02	99.9185		-0.35	
663		-----		-----	
823		-----		-----	
913		-----		-----	
922	INH-02	99.915		-0.57	
1108	EN15721	99.944		1.25	
1189	EN15721	99.932		0.50	
1213		-----		-----	
1320		-----		-----	
1397	EN15721	99.906		-1.13	
1438		-----		-----	
1523		-----		-----	
1530	EN15721	99.958		2.12	
1656	EN15721	99.89		-2.13	
1707	EN15721	99.91		-0.88	
1712	EN15721	99.9170		-0.44	
1726	EN15721	99.921		-0.19	
1727	EN15721	99.918		-0.38	
1817		-----		-----	
1835	EN15721	99.922		-0.13	
1852	EN15721	99.9163		-0.48	
1919	EN15721	99.9205		-0.22	
6070	EN15721	99.919		-0.32	
6072		-----		-----	
6214	EN15721	99.9477		1.48	
6297		-----		-----	
6341		-----		-----	
6358	EN15721	99.918		-0.38	

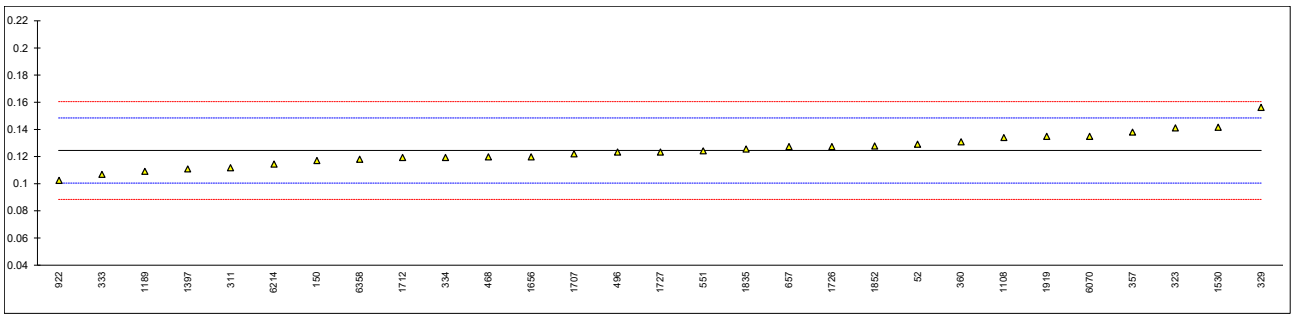
normality	suspect
n	30
outliers	0
mean (n)	99.92404
st.dev. (n)	0.017249
R(calc.)	0.04830
st.dev.(EN15721:13)	0.015989
R(EN15721:13)	0.04477

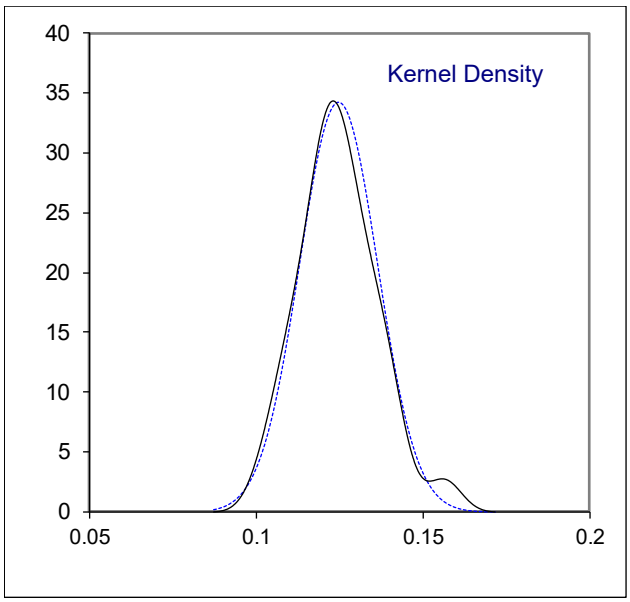

100
99.95
99.9
99.85
99.8
1656
496
1397
52
1707
343
922
1852
1712
1727
6358
657
6070
329
311
323
1919
1726
1835
334
357
360
551
1189
150
1108
6214
333
1530
468


Kernel Density
40
35
30
25
20
15
10
5
0
99.85
99.9
99.95
100

Determination of Higher alcohols acc. to EN15721 on sample #20245; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	EN15721	0.129		0.37	
120		-----		-----	
150	EN15721	0.117		-0.62	
169		-----		-----	
171		-----		-----	
174		-----		-----	
175		-----		-----	
230		-----		-----	
311	EN15721	0.112		-1.04	
323	EN15721	0.141		1.37	
329	EN15721	0.1562		2.63	
333	EN15721	0.107		-1.46	
334	EN15721	0.1196		-0.41	
337		-----		-----	
343		-----		-----	
357	EN15721	0.138		1.12	
360	EN15721	0.1308		0.52	
396		-----		-----	
444		-----		-----	
468	EN15721	0.12		-0.38	
495		-----		-----	
496	EN15721	0.1234		-0.09	
511		-----		-----	
541		-----		-----	
551	INH-1313	0.12409		-0.04	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	INH-02	0.1272		0.22	
663		-----		-----	
823		-----		-----	
913		-----		-----	
922	INH-02	0.1024		-1.84	
1108	EN15721	0.134		0.79	
1189	EN15721	0.109		-1.29	
1213		-----		-----	
1320		-----		-----	
1397	EN15721	0.111		-1.12	
1438		-----		-----	
1523		-----		-----	
1530	EN15721	0.1415	C	1.41	first reported 0.2286
1656	EN15721	0.12	C	-0.38	first reported 0.33
1707	In house	0.122		-0.21	
1712	EN15721	0.1192		-0.44	
1726	EN15721	0.1272		0.22	
1727	EN15721	0.1235		-0.09	
1817		-----		-----	
1835	EN15721	0.1258		0.11	
1852	EN15721	0.1280		0.29	
1919	EN15721	0.1348		0.85	
6070	EN15721	0.135		0.87	
6072		-----		-----	
6214	EN15721	0.1145		-0.83	
6297		-----		-----	
6341		-----		-----	
6358	EN15721	0.118		-0.54	
	normality	OK			
	n	29			
	outliers	0			
	mean (n)	0.12452			
	st.dev. (n)	0.011675			
	R(calc.)	0.03269			
	st.dev.(EN15721:13)	0.012039			
	R(EN15721:13)	0.03371			

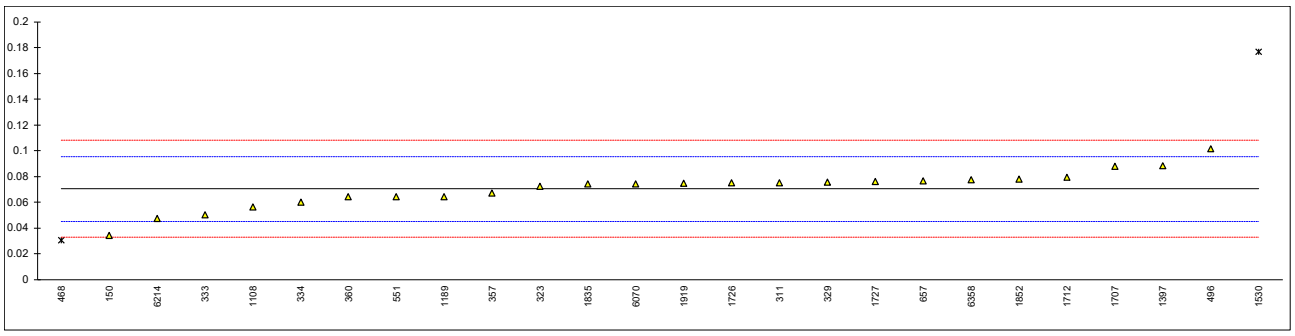

0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
922
333
1189
1397
311
6214
150
6358
1712
334
468
1656
1707
496
1727
551
1835
657
1726
1852
52
360
1108
1919
6070
357
323
1530
329

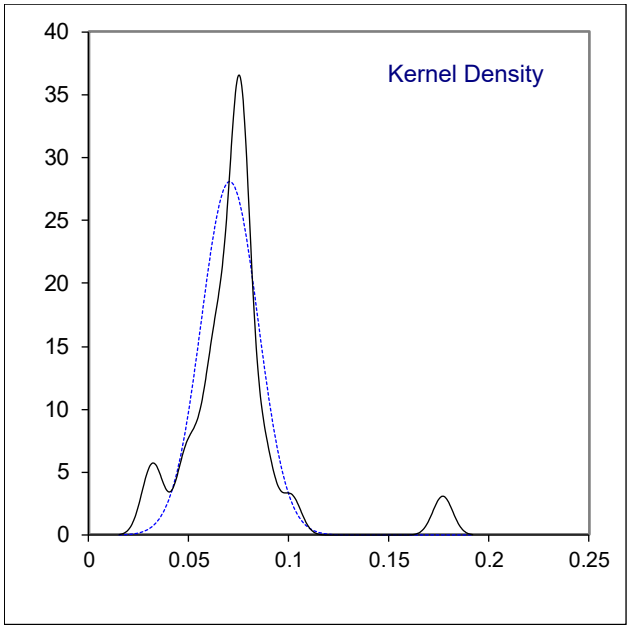

Kernel Density
40
35
30
25
20
15
10
5
0
0.05
0.1
0.15
0.2

Determination of Impurities acc. to EN15721 on sample #20245; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	EN15721	<0.1		-----	
120		-----		-----	
150	EN15721	0.034	C	-2.89	first reported 0.177
169		-----		-----	
171		-----		-----	
174		-----		-----	
175		-----		-----	
230		-----		-----	
311	EN15721	0.075		0.37	
323	EN15721	0.072		0.13	
329	EN15721	0.0753		0.39	
333	EN15721	0.050		-1.62	
334	EN15721	0.060	C	-0.82	first reported 0.1958
337		-----		-----	
343		-----		-----	
357	EN15721	0.067		-0.27	
360	EN15721	0.0639		-0.51	
396		-----		-----	
444		-----		-----	
468	EN15721	0.03	R(0.05)	-3.21	
495		-----		-----	
496	EN15721	0.1010		2.44	
511		-----		-----	
541		-----		-----	
551	INH-1313	0.06400		-0.50	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	INH-02	0.0761		0.46	
663		-----		-----	
823		-----		-----	
913		-----		-----	
922		-----		-----	
1108	EN15721	0.056		-1.14	
1189	EN15721	0.064		-0.50	
1213		-----		-----	
1320		-----		-----	
1397	EN15721	0.088		1.40	
1438		-----		-----	
1523		-----		-----	
1530	EN15721	0.1767	C,R(0.01)	8.45	first reported 0.2702
1656		-----		-----	
1707	In house	0.0877		1.38	
1712	EN15721	0.0792		0.70	
1726	EN15721	0.0749		0.36	
1727	EN15721	0.076		0.45	
1817		-----		-----	
1835	EN15721	0.0739		0.28	
1852	EN15721	0.0775		0.57	
1919	EN15721	0.0745		0.33	
6070	EN15721	0.074		0.29	
6072		-----		-----	
6214	EN15721	0.047137		-1.84	
6297		-----		-----	
6341		-----		-----	
6358	EN15721	0.077		0.53	

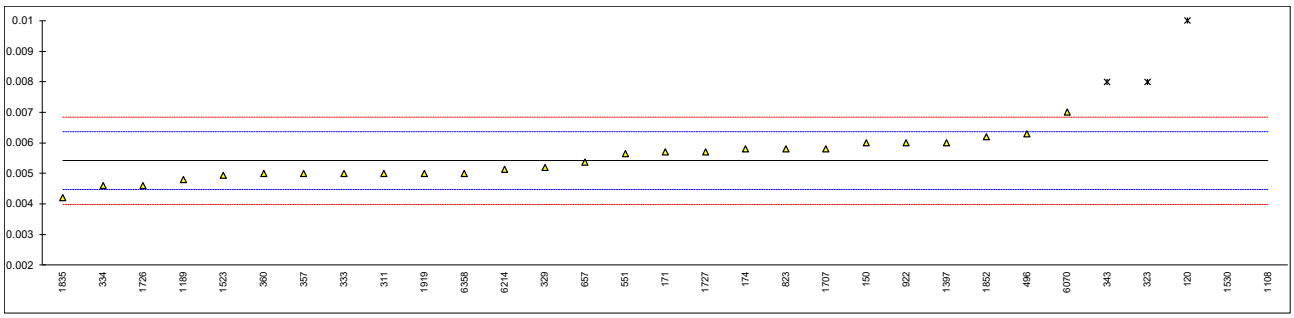
normality	suspect
n	24
outliers	2
mean (n)	0.07034
st.dev. (n)	0.014179
R(calc.)	0.03970
st.dev.(Horwitz (n=9))	0.012586
R(Horwitz (n=9))	0.03524

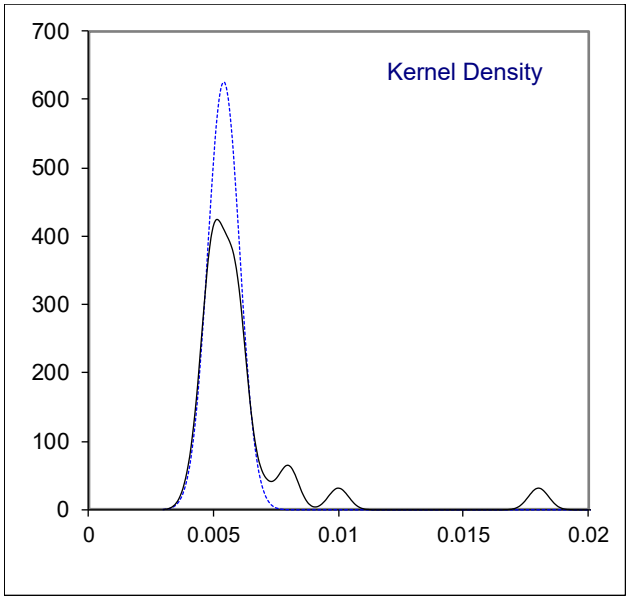

0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
468
150
6214
333
1108
334
360
551
1189
357
323
1835
6070
1919
1726
311
329
1727
657
6358
1852
1712
1707
1397
496
1530


Kernel Density
40
35
30
25
20
15
10
5
0
0
0.05
0.1
0.15
0.2
0.25

Determination of Methanol on sample #20245; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	EN15721	<0.1		-----	
120	D5501	0.01	R(0.01)	9.65	
150	EN15721	0.006		1.23	
169		-----		-----	
171	D5501	0.0057		0.60	
174	D5501	0.0058	C	0.81	first reported 0.01
175		-----		-----	
230		-----		-----	
311	EN15721	0.005		-0.87	
323	EN15721	0.008	R(0.05)	5.44	
329	EN15721	0.0052		-0.45	
333	EN15721	0.005		-0.87	
334	EN15721	0.0046		-1.71	
337		-----		-----	
343	EN15721	0.008	R(0.05)	5.44	
357	EN15721	0.005		-0.87	
360	EN15721	0.0050		-0.87	
396		-----		-----	
444		-----		-----	
468	EN15721	<0,01		-----	
495		-----		-----	
496	EN15721	0.0063		1.86	
511		-----		-----	
541		-----		-----	
551	INH-1313	0.00565		0.50	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631	D5501	<0.01	C	-----	first reported 0.02
633		-----		-----	
634		-----		-----	
657	INH-02	0.005364	C	-0.11	first reported 53.64 %M/M
663		-----		-----	
823	D5501	0.0058	C	0.81	first reported 0.0221
913		-----		-----	
922	INH-02	0.0060		1.23	
1108	EN15721	0.029	C,R(0.01)	49.65	first reported 0
1189	EN15721	0.0048		-1.29	
1213	D5501	-----	C	-----	fr. 0.09, corrected into: Not detected with LOD = 0,01% v/v
1320		-----		-----	
1397	EN15721	0.006		1.23	
1438		-----		-----	
1523	D5501	0.004931		-1.02	
1530	EN15721	0.0180	C,R(0.01)	26.49	first reported 0.0207
1656	EN15721	<0.01		-----	
1707	In house	0.0058		0.81	
1712	EN15721	<0,010		-----	
1726	EN15721	0.0046		-1.71	
1727	EN15721	0.0057		0.60	
1817		-----		-----	
1835	EN15721	0.0042		-2.56	
1852	EN15721	0.0062		1.65	
1919	EN15721	0.005		-0.87	
6070	EN15721	0.007		3.34	
6072		-----		-----	
6214	EN15721	0.00513		-0.60	
6297		-----		-----	
6341		-----		-----	
6358	EN15721	0.005		-0.87	
	normality	OK			
	n	26			
	outliers	5			
	mean (n)	0.00541			
	st.dev. (n)	0.000638			
	R(calc.)	0.00179			
	st.dev.(Horwitz)	0.000475			
	R(Horwitz)	0.00133			
	compare				
	R(D5501:20)	0.01319			application range: 0.01 – 0.6 %M/M
	R(EN15721:13)	-0.00449			application range: 0.1 – 3 %M/M

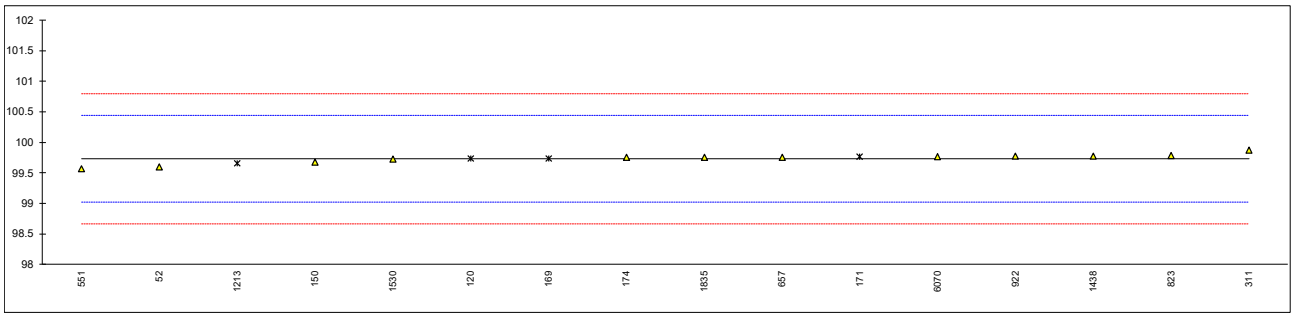

0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
1835
334
1726
1189
1523
360
357
333
311
1919
6358
6214
329
657
551
171
1727
174
823
1707
150
922
1397
1852
496
6070
343
323
120
1530
1108

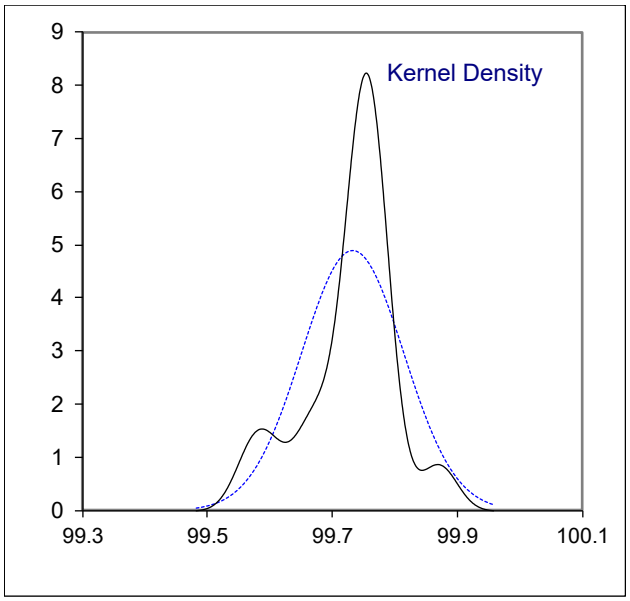

Kernel Density
700
600
500
400
300
200
100
0
0
0.005
0.01
0.015
0.02

Determination of Ethanol acc. to ASTM D5501 on sample #20245; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D5501	99.60		-0.37	
120	D5501	99.73	ex	-0.01	result excluded as Ethanol %M/M is > Ethanol %V/V which is not possible
150	D5501	99.68		-0.15	
169	D5501	99.7349	ex	0.01	result excluded as Ethanol %M/M is > Ethanol %V/V which is not possible
171	D5501	99.76	ex	0.08	result excluded as Ethanol %M/M is > Ethanol %V/V which is not possible
174	D5501	99.75		0.05	
175		-----		-----	
230		-----		-----	
311	D5501	99.87		0.39	
323		-----		-----	
329		-----		-----	
333		-----		-----	
334		-----		-----	
337		-----		-----	
343		-----		-----	
357		-----		-----	
360		-----		-----	
396		-----		-----	
444		-----		-----	
468		-----		-----	
495		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	D5501	99.57		-0.46	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	D5501	99.7589		0.07	
663		-----		-----	
823	D5501	99.7810		0.14	
913		-----		-----	
922	D5501	99.77		0.11	
1108		-----		-----	
1189		-----		-----	
1213	D5501	99.66	ex	-0.20	result excluded as Ethanol %M/M is > Ethanol %V/V which is not possible
1320		-----		-----	
1397		-----		-----	
1438	In house	99.77		0.11	
1523		-----		-----	
1530	D5501	99.7298		-0.01	
1656		-----		-----	
1707		-----		-----	
1712		-----		-----	
1726		-----		-----	
1727		-----		-----	
1817		-----		-----	
1835	D5501	99.75		0.05	
1852		-----		-----	
1919		-----		-----	
6070	D5501	99.76		0.08	
6072		-----		-----	
6214		-----		-----	
6297		-----		-----	
6341		-----		-----	
6358		-----		-----	

normality	OK
n	12
outliers	0 + 4ex
mean (n)	99.7325
st.dev. (n)	0.08139
R(calc.)	0.2279
st.dev.(D5501:20)	0.35454
R(D5501:20)	0.9927

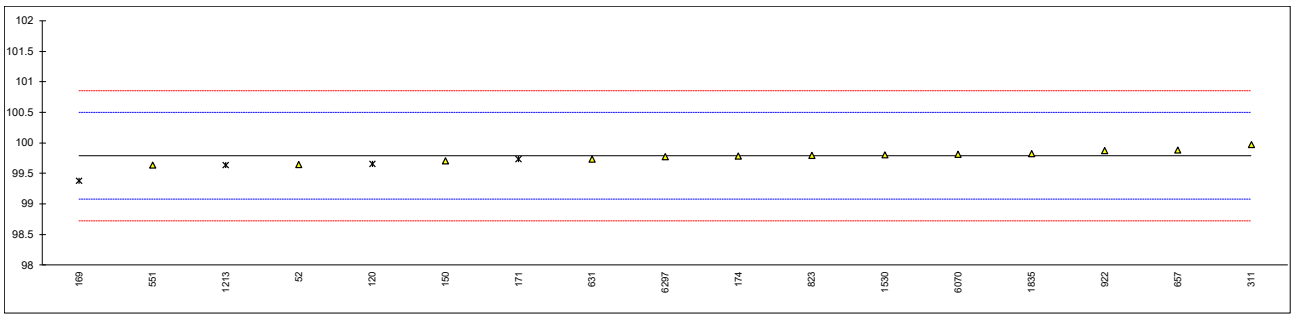

102
101.5
101
100.5
100
99.5
99
98.5
98
551
52
1213
150
1530
120
169
174
1835
657
171
6070
922
1438
823
311

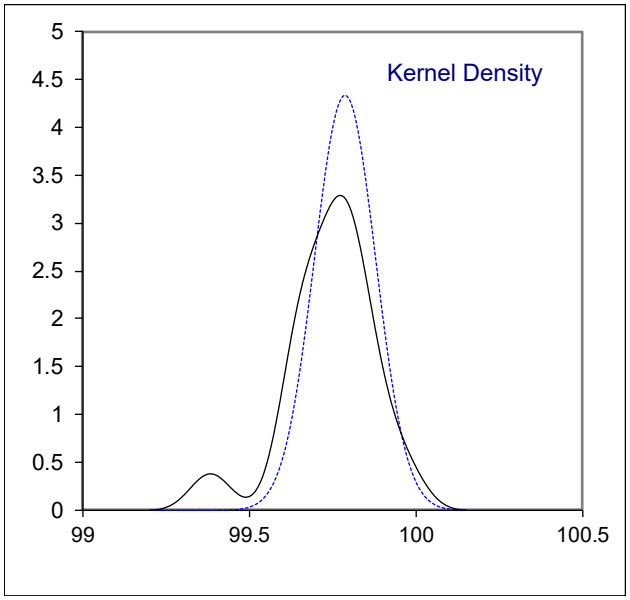

Kernel Density
9
8
7
6
5
4
3
2
1
0
99.3
99.5
99.7
99.9
100.1

Determination of Ethanol acc. to ASTM D5501 on sample #20245; results in %V/V

lab	method	value	mark	z(targ)	remarks
52	D5501	99.65		-0.39	
120	D5501	99.66	ex	-0.36	result excluded as Ethanol %M/M is > Ethanol %V/V which is not possible
150	D5501	99.71		-0.22	
169	D5501	99.3832	ex	-1.14	result excluded as Ethanol %M/M is > Ethanol %V/V which is not possible
171	D5501	99.73	ex	-0.16	result excluded as Ethanol %M/M is > Ethanol %V/V which is not possible
174	D5501	99.78		-0.02	
175		-----		-----	
230		-----		-----	
311	D5501	99.97		0.52	
323		-----		-----	
329		-----		-----	
333		-----		-----	
334		-----		-----	
337		-----		-----	
343		-----		-----	
357		-----		-----	
360		-----		-----	
396		-----		-----	
444		-----		-----	
468		-----		-----	
495		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	D5501	99.64		-0.42	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631	D5501	99.733		-0.15	
633		-----		-----	
634		-----		-----	
657	D5501	99.8854		0.28	
663		-----		-----	
823	D5501	99.7948		0.02	
913		-----		-----	
922	D5501	99.87		0.23	
1108		-----		-----	
1189		-----		-----	
1213	D5501	99.64	ex	-0.42	result excluded as Ethanol %M/M is > Ethanol %V/V which is not possible
1320		-----		-----	
1397		-----		-----	
1438		-----		-----	
1523		-----		-----	
1530	D5501	99.8		0.04	
1656		-----		-----	
1707		-----		-----	
1712		-----		-----	
1726		-----		-----	
1727		-----		-----	
1817		-----		-----	
1835	D5501	99.82		0.09	
1852		-----		-----	
1919		-----		-----	
6070	D5501	99.81		0.06	
6072		-----		-----	
6214		-----		-----	
6297	D5501	99.77		-0.05	
6341		-----		-----	
6358		-----		-----	

normality	OK
n	13
outliers	0 + 4ex
mean (n)	99.7872
st.dev. (n)	0.09196
R(calc.)	0.2575
st.dev.(D5501:20)	0.35442
R(D5501:20)	0.9924


102
101.5
101
100.5
100
99.5
99
98.5
98
169
551
1213
52
120
150
171
631
6297
174
823
1530
6070
1835
922
657
311


Kernel Density
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
99
99.5
100
100.5

Determination of Bitrex on sample #20245; results in mg/kg

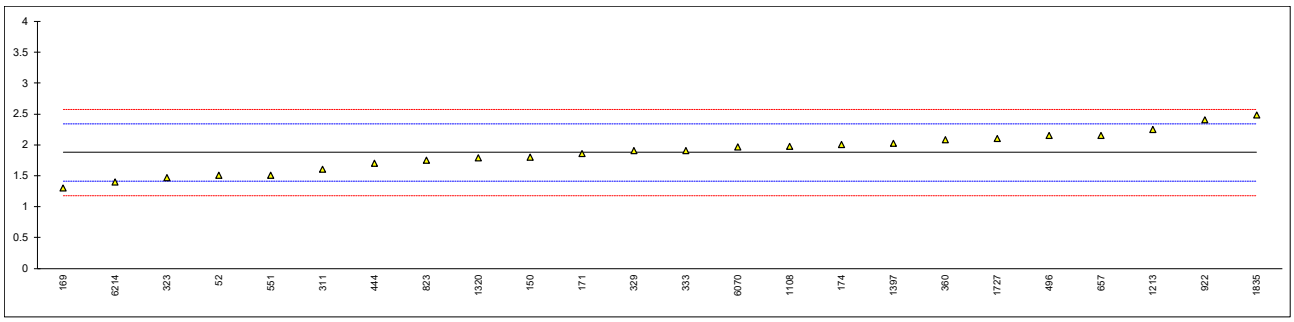
lab	method	value	mark	z(targ)	remarks
52		-----		-----	
120		-----		-----	
150		-----		-----	
169		-----		-----	
171		-----		-----	
174		-----		-----	
175		-----		-----	
230		-----		-----	
311		-----		-----	
323		-----		-----	
329	In house	35		-----	
333		-----		-----	
334		-----		-----	
337		-----		-----	
343	INH-1877	13.41		-----	
357		-----		-----	
360		-----		-----	
396		-----		-----	
444		-----		-----	
468		-----		-----	
495		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	INH-3284	46.5		-----	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
823		-----		-----	
913		-----		-----	
922		-----		-----	
1108		-----		-----	
1189		-----		-----	
1213		-----		-----	
1320		-----		-----	
1397		-----		-----	
1438		38.3		-----	
1523		-----		-----	
1530		-----		-----	
1656		-----		-----	
1707	In house	12.66		-----	
1712		-----		-----	
1726		-----		-----	
1727		-----		-----	
1817		-----		-----	
1835		-----		-----	
1852		-----		-----	
1919		-----		-----	
6070		-----		-----	
6072		-----		-----	
6214		-----		-----	
6297		-----		-----	
6341		-----		-----	
6358		-----		-----	
	n	5			
	mean (n)	<50			

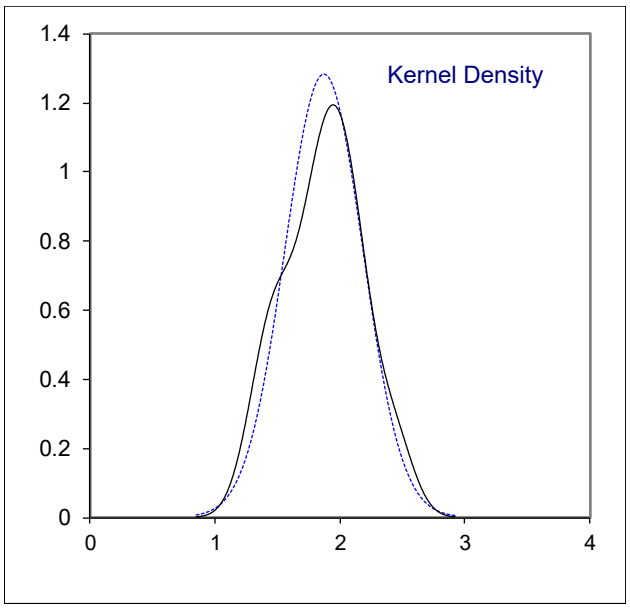
Determination of Gum (solvent washed) on sample #20245; results in mg/100mL

lab	method	value	mark	z(targ)	remarks
52	D381	<0.5		-----	
120	D381	<0.5		-----	
150	D381	<0.5		-----	
169	D381	0.0		-----	
171	D381	<0.5		-----	
174		-----		-----	
175		-----		-----	
230		-----		-----	
311		-----		-----	
323		-----		-----	
329		-----		-----	
333		-----		-----	
334	D381	<0.5		-----	
337		-----		-----	
343		-----		-----	
357	D381	<1		-----	
360	D381	0.8		-----	
396		-----		-----	
444		-----		-----	
468		-----		-----	
495		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	D381	<0.5		-----	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
823	D381	<0.5		-----	
913		-----		-----	
922	D381	1.3		-----	
1108		-----		-----	
1189	D381	0.3		-----	
1213		-----		-----	
1320		-----		-----	
1397		-----		-----	
1438		-----		-----	
1523		-----		-----	
1530	D381	<1		-----	
1656		-----		-----	
1707		-----		-----	
1712		-----		-----	
1726		-----		-----	
1727		-----		-----	
1817		-----		-----	
1835		-----		-----	
1852		-----		-----	
1919		-----		-----	
6070	D381	0.2		-----	
6072		-----		-----	
6214		-----		-----	
6297		-----		-----	
6341		-----		-----	
6358		-----		-----	
	n	13			
	mean (n)	<1			

Determination of Inorganic Chloride as Cl on sample #20246; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	EN15492	1.5		-1.62	
120		-----		-----	
150	D7319	1.8		-0.33	
169	D7319	1.3		-2.49	
171	D7319	1.854		-0.09	
174	D7319	2		0.54	
175		-----		-----	
230	INH-23	<2		-----	
311	EN15492	1.6		-1.19	
323	EN15492	1.47		-1.75	
329	EN15492	1.9		0.10	
333	EN15492	1.9		0.10	
334	EN15492	<1.0		<-3.78	possibly a false negative test result?
337		-----		-----	
343		-----		-----	
357		-----		-----	
360	EN15492	2.08		0.88	
396		-----		-----	
444	EN15492	1.7		-0.76	
468		-----		-----	
495		-----		-----	
496	EN15492	2.15		1.19	
511		-----		-----	
541		-----		-----	
551	D7319	1.5		-1.62	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	D7328	2.15	C	1.19	first reported 5.85
663		-----		-----	
823	D7319	1.749		-0.55	
913		-----		-----	
922	D7328	2.4		2.27	
1108	EN15492	1.97		0.41	
1189		-----		-----	
1213	D7328	2.2497		1.62	
1320	EN10304-1	1.79		-0.37	
1397	EN15492	2.02		0.62	
1438		-----		-----	
1523		-----		-----	
1530		-----		-----	
1656		-----		-----	
1707		-----		-----	
1712		-----	W	-----	first reported 5.84 with test method EN15484
1726		-----		-----	
1727	EN15492	2.1		0.97	
1817		-----		-----	
1835	EN15492	2.48		2.61	
1852		-----		-----	
1919		-----		-----	
6070	D7319	1.9596		0.36	
6072		-----		-----	
6214	EN15492	1.3954		-2.08	
6297		-----		-----	
6341		-----		-----	
6358	EN15484	<5,0		-----	
	normality	OK			
	n	24			
	outliers	0			
	mean (n)	1.876			
	st.dev. (n)	0.3108			
	R(calc.)	0.870			
	st.dev.(D7319:17)	0.2314			
	R(D7319:17)	0.648			application range: 0.75 – 50 mg/kg
	compare				
	R(EN15492:12)	0.641			application range: 1 – 30 mg/kg

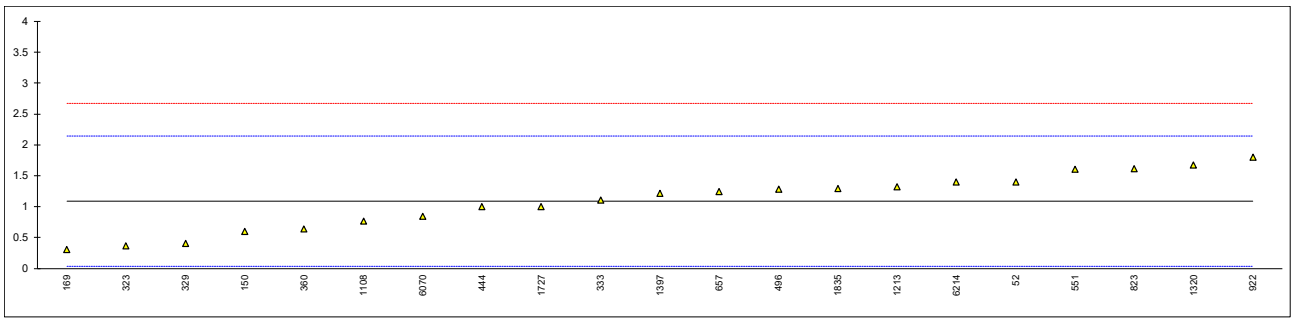

4
3.5
3
2.5
2
1.5
1
0.5
0
169
6214
323
52
551
311
444
823
1320
150
171
329
333
6070
1108
174
1397
360
1727
496
657
1213
922
1835

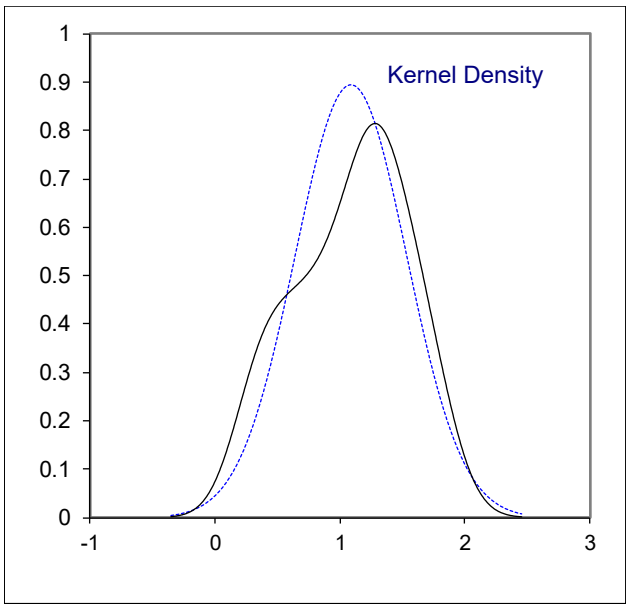

Kernel Density
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
1
2
3
4

Determination of Sulfate as SO_4 on sample #20246; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	EN15492	1.4		0.59	
120		-----		-----	
150	D7319	0.6		-0.92	
169	D7319	0.3		-1.49	
171	D7319	<1.0		-----	
174	D7319	<1		-----	
175		-----		-----	
230		-----		-----	
311	EN15492	<1.0		-----	
323	EN15492	0.36		-1.38	
329	EN15492	0.4		-1.30	
333	EN15492	1.1		0.03	
334	EN15492	<1.0		-----	
337		-----		-----	
343	EN15492	<1		-----	
357		-----		-----	
360	EN15492	0.64		-0.85	
396		-----		-----	
444	EN15492	1.0		-0.16	
468		-----		-----	
495		-----		-----	
496	EN15492	1.28		0.37	
511		-----		-----	
541		-----		-----	
551	D7319	1.6		0.97	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	D7328	1.244		0.30	
663		-----		-----	
823	D7319	1.607		0.99	
913		-----		-----	
922	D7328	1.8		1.35	
1108	EN15492	0.76		-0.62	
1189		-----		-----	
1213	D7328	1.3210		0.44	
1320	EN10304-1	1.67		1.11	
1397	EN15492	1.21		0.23	
1438		-----		-----	
1523		-----		-----	
1530		-----		-----	
1656		-----		-----	
1707		-----		-----	
1712		-----		-----	
1726		-----		-----	
1727	EN15492	1.0		-0.16	
1817		-----		-----	
1835	EN15492	1.29		0.39	
1852		-----		-----	
1919		-----		-----	
6070	D7319	0.8431		-0.46	
6072		-----		-----	
6214	EN15492	1.3973		0.59	
6297		-----		-----	
6341		-----		-----	
6358		-----		-----	

normality	OK	
n	21	
outliers	0	
mean (n)	1.087	
st.dev. (n)	0.4465	
R(calc.)	1.250	
st.dev.(D7319:17)	0.5265	
R(D7319:17)	1.474	application range: 1 – 20 mg/kg
compare		
R(EN15492:12)	0.3780	application range: 1 - 20 mg/kg
R(D7328:17)	1.0861	application range: 0.55 – 20 mg/kg

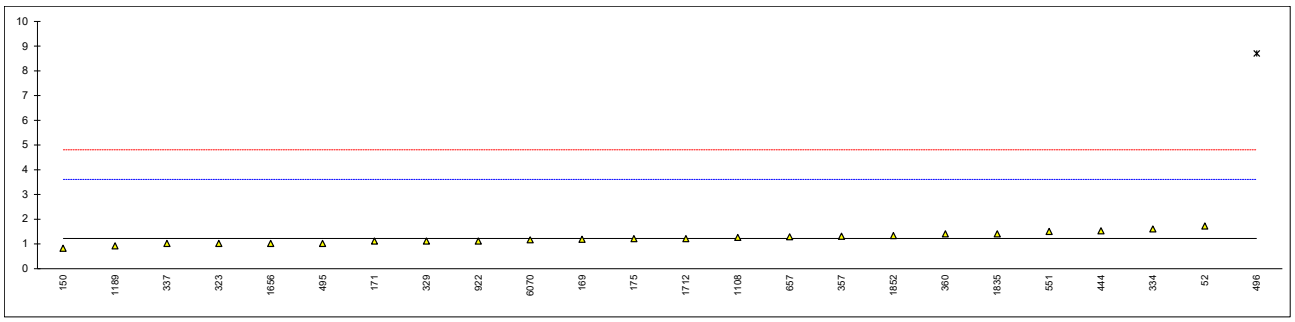

4
3.5
3
2.5
2
1.5
1
0.5
0
169
323
329
150
360
1108
6070
444
1727
333
1397
657
496
1835
1213
6214
52
551
823
1320
922

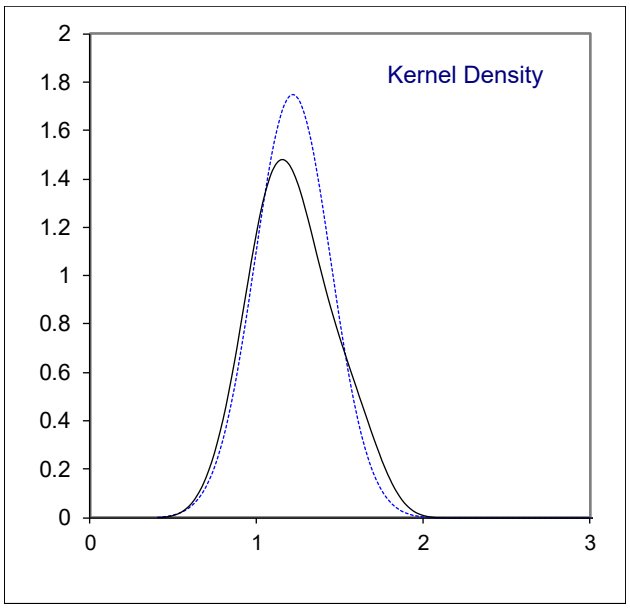

Kernel Density
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-1
0
1
2
3

Determination of Sulfur on sample #20246; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	EN15486	1.7		0.40	
120		-----		-----	
150	D5453	0.8		-0.35	
169	D5453	1.18		-0.03	
171	D5453	1.091		-0.10	
174		-----		-----	
175	D5453	1.2		-0.01	
230		-----		-----	
311	EN15486	<5.0		-----	
323	EN15486	1.0		-0.18	
329	D5453	1.1		-0.10	
333		-----		-----	
334	D5453	1.6		0.32	
337	EN15486	1.0		-0.18	
343	D5453	<1		-----	
357	D5453	1.3		0.07	
360	EN15486	1.4		0.15	
396		-----		-----	
444	EN15486	1.52		0.25	
468	EN15486	<2		-----	
495	ISO20846	1.01		-0.17	
496	EN15485	8.7	R(0.01)	6.26	
511		-----		-----	
541		-----		-----	
551	D5453	1.5		0.24	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	D5453	1.28		0.05	
663		-----		-----	
823	D5453	<1.0		-----	
913		-----		-----	
922	D5453	1.1		-0.10	
1108		1.24		0.02	
1189	EN15485	0.9		-0.26	
1213	D5453	<2		-----	
1320		-----		-----	
1397		-----		-----	
1438		-----		-----	
1523		-----		-----	
1530		-----		-----	
1656	EN15486	1.0		-0.18	
1707		-----		-----	
1712	EN15486	1.2		-0.01	
1726		-----		-----	
1727		-----		-----	
1817		-----		-----	
1835	EN15486	1.4		0.15	
1852	ISO20846	1.31		0.08	
1919		-----		-----	
6070	D5453	1.146		-0.06	
6072		-----		-----	
6214		-----		-----	
6297		-----		-----	
6341		-----		-----	
6358		-----		-----	

normality	OK	
n	23	
outliers	1	
mean (n)	1.216	
st.dev. (n)	0.2284	
R(calc.)	0.640	
st.dev.(EN15485:07)	1.1947	
R(EN15485:07)	3.345	application range: 7 – 20 mg/kg
compare		
R(EN15468:07)	1.865	application range: 5 – 20 mg/kg
R(D5453:19a)	0.671	at a concentration < 400 mg/kg; application range: 1-8000 mg/kg

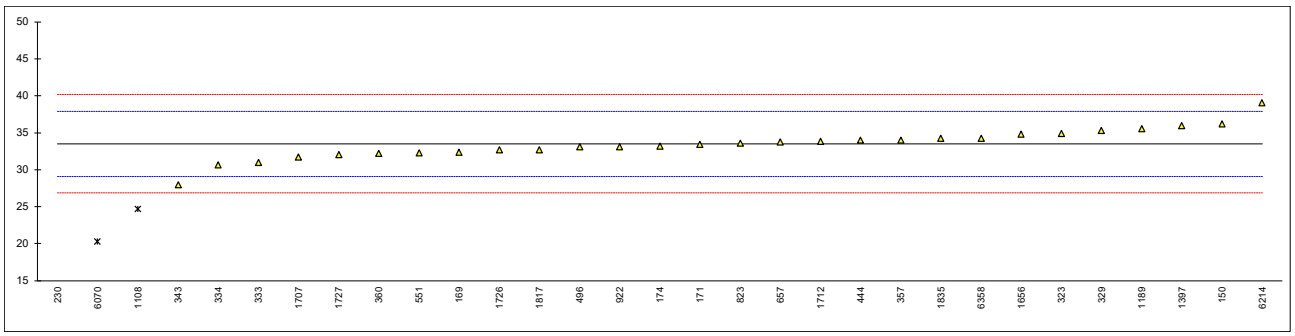

10
9
8
7
6
5
4
3
2
1
0
150
1189
337
323
1656
495
171
329
922
6070
169
175
1712
1108
657
357
1852
360
1835
551
444
334
52
496

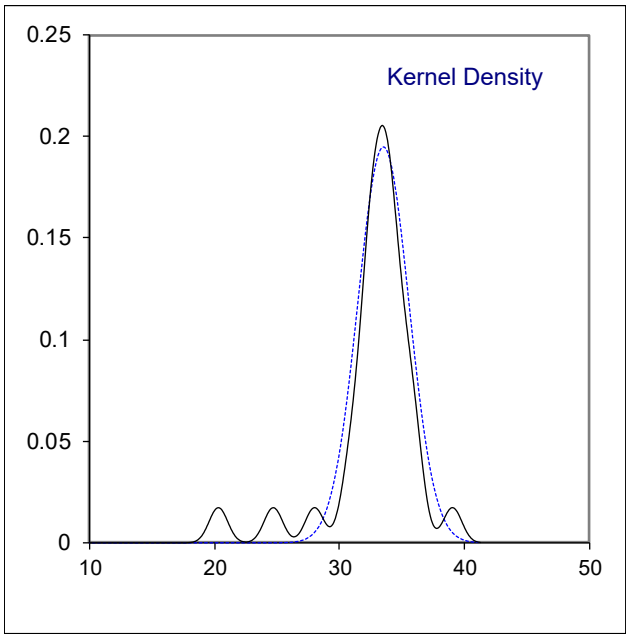

Kernel Density
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
1
2
3

Determination of Nonvolatile matter on sample #20249; results in mg/100mL

lab	method	value	mark	z(targ)	remarks
52	EN15691	>25		-----	
120		-----		-----	
150	D1353	36.2		1.21	
169	D1353	32.4		-0.50	
171	D1353	33.45		-0.03	
174	D1353	33.2		-0.14	
175		-----		-----	
230	D1353	0.9	C,R(0.01)	-14.74	first reported 40.9
311	EN15691	>25		-----	
323	EN15691	34.9		0.63	
329	EN15691	35.3		0.81	
333	EN15691	31		-1.14	
334	EN15691	30.7		-1.27	
337		-----		-----	
343	EN15691	28		-2.49	
357	D1353	34		0.22	
360	EN15691	32.2		-0.59	
396		-----		-----	
444	EN15691	34	C	0.22	first reported 17
468		-----		-----	
495		-----		-----	
496	EN15691	33.1		-0.19	
511		-----		-----	
541		-----		-----	
551	D1353	32.3		-0.55	
554		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
657	D1353	33.8		0.13	
663		-----		-----	
823	D1353	33.6		0.04	
913		-----		-----	
922	D1353	33.1		-0.19	
1108	EN15691	24.7	R(0.05)	-3.98	
1189	D1353	35.6		0.94	
1213		-----		-----	
1320		-----		-----	
1397	EN15691	36		1.12	
1438		-----		-----	
1523		-----		-----	
1530		-----		-----	
1656	EN15691	34.8		0.58	
1707	EN15691	31.7		-0.82	
1712	EN15691	33.85		0.15	
1726	EN15691	32.7		-0.37	
1727	EN15691	32.1		-0.64	
1817	In house	32.75		-0.35	
1835	EN15691	34.3		0.36	
1852		-----		-----	
1919		-----		-----	
6070	D1353	20.3	R(0.01)	-5.97	
6072		-----		-----	
6214	EN15691	39.05		2.50	
6297		-----		-----	
6341		-----		-----	
6358	EN15691	34.3		0.36	

normality	not OK
n	28
outliers	3
mean (n)	33.514
st.dev. (n)	2.0470
R(calc.)	5.732
st.dev.(EN15691:09)	2.2122
R(EN15691:09)	6.194
compare	
R(D1353:13)	14.461


50
45
40
35
30
25
20
15
230
6070
1108
343
334
333
1707
1727
360
551
169
1726
1817
496
922
174
171
823
657
1712
444
357
1835
6358
1656
323
329
1189
1397
150
6214


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

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
3 labs in	COLOMBIA
1 lab in	CROATIA
1 lab in	FINLAND
3 labs in	FRANCE
4 labs in	GERMANY
1 lab in	GREECE
1 lab in	HUNGARY
1 lab in	INDIA
1 lab in	INDONESIA
1 lab in	ISRAEL
1 lab in	ITALY
1 lab in	MAURITIUS
2 labs in	NETHERLANDS
1 lab in	PAKISTAN
1 lab in	PERU
3 labs in	PHILIPPINES
2 labs in	POLAND
1 lab in	SINGAPORE
1 lab in	SLOVAKIA
1 lab in	SOUTH KOREA
4 labs in	SPAIN
2 labs in	SWEDEN
2 labs in	THAILAND
1 lab in	TURKEY
2 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
SDS	= Safety Data Sheet

Literature

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