Results of Proficiency Test
Gasoil B10 (10% FAME)
May 2014

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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CONTENTS

1 INTRODUCTION

Since 2005, the Institute for Interlaboratory Studies organizes a proficiency test for automotive diesel containing 7-10% FAME, according to EN590 and ASTM D7467 every year. In this interlaboratory study on Gasoil B7-B10, 68 laboratories from 31 countries have participated. See appendix 3 for the number of participating laboratories per country.
In this report, the results of the 2014 Gasoil B7-B10 proficiency test are presented and discussed.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test. It was decided to evaluate the gasoil B7-B10 according the (different) test scopes of both EN590 and ASTM D7467. It was decided depending on the registration to send one 1 litre bottle and one 0.5 litre bottle of Gasoil B10 (both labelled #14070), and/or, one 1 litre bottle Gasoil (labelled #14071) especially for Total Contamination.
Analyses for fit-for-use and homogeneity testing were subcontracted.
Participants were requested to report rounded and unrounded results. The unrounded results were preferably used for the statistical evaluation.

2.1 ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in agreement with ISO/IEC 17043:2010 (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentially 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 organisation 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 April 2014 (iis-protocol, version 3.3).

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

The necessary bulk material was purchased from a local petrol station. From this batch approx. 40 litre was used to prepare the Total Contamination samples. To the remaining approx. 110 litre bulk material (Gasoil with 6.6% FAME), 17 litre of a previous batch Gasoil (iis13G03, #13060, Gasoil with 8.2% FAME) was added to come to total volume of 127 litre Gasoil. To this volume, 4.9 litre of pure FAME (B100) was added to increase the FAME content up to 10%. After homogenization, from this mixture, 81 brown glass bottles of 1 litre and 81 brown glass bottles of 0.5 litre were filled. All bottles were labelled #14070.
The homogeneity of the subsamples #14070 (1 litre + 0.5 litre) was checked by determination of density @15 ^{o}C on 8 stratified randomly selected samples (4 times a 1 litre bottle and 4 times a 0.5 litre bottle) in accordance with ASTM D4052.

	Density @ 15 ^{o}C in kg/m^{3}
sample #14070-1	835.51
sample #14070-2	835.48
sample #14070-3	835.49
sample #14070-4	835.48
sample #14070-5	835.49
sample #14070-6	835.48
sample #14070-7	835.49
sample #14070-8	835.49

table 1: homogeneity test results of subsamples #14070

From the above test results, the repeatability was calculated and compared with 0.3 times the corresponding reproducibility in agreement with the procedure of ISO 13528, Annex B2 in the next table:

	Density @ 15 ^{o}C in kg/m^{3}
r (sample #14070)	0.03
reference test	ISO12185:96
0.3 x R(reference test)	0.15

table 2: repeatability of the subsamples #14070

The calculated repeatability was less than 0.3 times the respective reproducibility of the reference method. Therefore, homogeneity of the subsamples #14070 was assumed.

For Total Contamination, each bottle (labelled #14071) was spiked (approx 15 mg/kg) with a fresh prepared and well shaken particulate quartz material BCR-070 (∅ 2.4 – 32.0 µm) in oil suspension. Therefore, an amount of the quartz suspension was weighed in an empty bottle. The adding was checked by weighting the bottle before and after the spiking.
In total 45 bottles were spiked and filled up to 850 mL with the batch of Gasoil, that was kept separate for the Total Contamination sample. After homogenization, a random sample was taken to verify the Total Contamination content.

Depending on the registration of the participant two bottles (1x1L + 1x0.5L), labelled #14070 and/or one bottle of 1L, labelled #14071 were sent to the participating laboratories on May 7, 2014.

2.5 STABILITY OF THE SAMPLES

The stability of Gasoil B7-B10, packed in the brown glass bottles, was checked. The material was found sufficiently stable for the period of the proficiency test.

2.6 ANALYSIS

The participants were asked to determine, according specifications ASTM D7467 and/or EN590: Ash Content, Aromatics by FIA, Cetane Indices D976 and ISO4264, Cloud Point, Cold Filter Plugging Point, Conradson Carbon Residue on 10% distillation Residue (ISO10370 and D524), Copper Corrosion, Density @ 15°C, Distillation, FAME, Flash Point PMcc, Kinematic Viscosity @40°C, Lubricity by HFRR @60°C, Oxidation Stability EN 15751 and ISO12205, Polycyclic Aromatic Hydrocarbons, Pour Point (manual and automated), Sulphur Content, TAN, Total Contamination and Water.

To get comparable results a detailed report form, on which the units were prescribed as well as some of the required standards and a letter of instructions were prepared and made available for download on the iis website www.iisnl.com.
A SDS and a form to confirm receipt of the samples were added to the sample package

3 RESULTS

During four weeks after sample despatch, the results of the individual laboratories were gathered. The original data are tabulated per determination in the appendix 1 of this report. The laboratories are presented by their code numbers.

Directly after deadline, a reminder fax was sent to those laboratories that had not yet reported.

Shortly after the deadline, the available results were screened for suspect data. A 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 (raw data of the) reported results. Additional or corrected results have been used for data analysis and the original results are placed under 'Remarks' in the result tables in appendix 1.

3.1 STATISTICS

Statistical calculations were performed as described in the report ‘iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation’ (iis-protocol, April 2014 version 3.3). For the statistical evaluation the *unrounded* (when available) figures were used instead of the rounded results. 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. Not all data sets proved to have a normal distribution, in which cases the statistical evaluation of the results should be used with due care.
In accordance to ISO 5725 (1986 and 1994) the original results per determination were submitted subsequently to Dixon, Grubbs and Rosner outlier tests. Outliers are marked by D(0.01) for the Dixon test, by G(0.01) or DG(0.01) for the Grubbs test and by R(0.01) for the Rosner General ESD test (see appendix 4, no.15). Stragglers are marked by D(0.05) for the Dixon test, by G(0.05) or DG(0.05) for the Grubbs test and by R(0.05). Both outliers and stragglers were not included in the calculations of the averages and the 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. When the uncertainty passed the evaluation, no remarks are made in the report. However, when the uncertainty failed the evaluation it is mentioned in the report and it will have consequences for the evaluation of the test results.

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 analysis results are plotted. The corresponding laboratory numbers are under 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 standard. Outliers and other data, which were excluded from the calculations, are represented as a "x". 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 (see appendix 4; nos.13 and 14). Also a normal Gauss curve was projected over the Kernel Density Graph.

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. ASTM reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the spread of this interlaboratory study. The target standard deviation was calculated from the literature reproducibility by division with 2.8.

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 in accordance with:

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

The $z_{(target)}$ scores are listed in the 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 maybe as follows:

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

4 EVALUATION

During the execution of this proficiency test some reporting problems occurred. In total 9 participants reported test results after the final reporting date. All laboratories except 1 reported test results, but not all laboratories were able to perform all analyses requested. Finally, 67 participants reported in total 1317 numerical test results. Observed were 33 outlying results, which is 2.5%. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

4.1 EVALUATION PER TEST

In this section, the results are discussed per sample and per test. The specified test methods and requirements were taken into account for explaining the observed differences when possible and applicable. These methods are also in the tables together with the reported data. The abbreviations, used in these tables, are listed in appendix 3.
In the iis PT reports, ASTM methods are referred to with a number (e.g. D2086) and an added designation for the year that the method was adopted or revised (e.g. D2086-08). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D2086-08 (2013)). In the results tables of Appendix 1 only the method number and year of adoption or revision will be used.

The majority of the data sets proved to have a normal distribution. For some other tests the number of reported test results was too small to determine whether the data set was normally distributed. In these cases the results of the statistical evaluations should be used with care.

Ash: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ISO6245:01 and ASTM D482:13.

Aromatics (FIA): No significant conclusions were drawn as the precision and bias of ASTM D1319 with biodiesel blends is not known and is currently under investigation see paragraph X1.11.1 of ASTM D7467:13.
When the calculated reproducibility is compared with the requirements of ASTM D1319:13 for diesel without FAME than the calculated reproducibility is not at all in agreement.

C.I. D976: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in good agreement with the requirements of ASTM D976:06(2011).

C.I. ISO4264: Regretfully, no reproducibility limits are mentioned in ISO4264:07. It should be noted that the ASTM has repeatedly amended the calculations routines in ASTM D4737 to incorporate the various diesel oil specifications mentioned in ASTM D975. The last update of ISO4264 was in 2007, which is the current version (and technically equivalent to the 1996a version of ASTM D4737). In ISO4264 only one calculation routine is mentioned and in the latest ASTM D4737 (2010 version) two calculation routines are mentioned. The user should take care to use and report the correct method as required by clients.

Cloud Point: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier is in good agreement with the requirements of EN23015:94 and ASTM D2500:11.

CFPP: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers is in agreement with the requirements of EN116:97 and IP309:99.

CCR 10% res.: The consensus value of the group was below the application range (0.1% - 30% M/M) of ISO10370:93. Therefore, no significant conclusions were drawn.

Ramsbottom: Only five laboratories reported a test result. Therefore no significant conclusions were drawn.

Copper Corr.: No problems were observed. All participants agreed on a test result of 1.

Density @15°C: This determination was problematic for a number of laboratories. Four statistical outliers were observed. However, the calculated reproducibility

after rejection of the statistical outliers is in agreement with the requirements of ISO12185:96 and ASTM D4052:11.

FAME: This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of EN14078:09.

Flash Point: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ISO2719:02.

Kin. Visc. 40°C: This determination was problematic for a number of laboratories. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO3104:94+corr.1997 and D445:12/IP71:97.

Lubricity: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ISO12156-1:06 and ASTM D6079:11.

Ox. Stab. EN15751: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier is in full agreement with the requirements of EN15751:14.

Ox. Stab. ISO12205: 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 ISO12205:95.

PAH: This determination was problematic. Two statistical outliers were observed. The calculated reproducibility, after rejection of the statistical outliers, is not in agreement with the requirements of EN12916:06.

Pour Point (M): This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ISO3016:94, nor in agreement with the requirements of ASTM D97:12/IP15. The rounding of the test results to 3ºC may (partly) explain the large spread.

Pour Point (A): This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D5950:14. Remarkably two laboratories reported to have used ASTM D97/IP15 and three other laboratories reported to have used ISO3016 which are both manual test methods. These five test results were excluded from the statistical evaluation and were evaluated under the manual method.

Sulphur: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in full agreement with the requirements of ISO20846:11 and ASTM D5453:12.

TAN: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility is in agreement with the requirements of ASTM D664:11.
Seven laboratories reported to have used test method ASTM D974/ISO6618. This method is not equivalent to ASTM D664/IP177. When the ASTM D664/IP177 data were evaluated separately, both average and precision do not differ significantly from the average and precision of full data set.

Water: This determination was problematic for a number of laboratories. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of EN12937:00.

Distillation: This determination was not problematic. Only the 10% recovery point was problematic. In total four statistical outliers were observed and the calculated reproducibilities of IBP, 50% rec., 90% rec., 95% rec., FBP, vol @250° and vol @350°, after rejection of the statistical outliers are all in agreement with the requirements of ISO3405:11 (auto) and of ASTM D86:12 (auto).

Total Contamination: The samples were spiked with a freshly prepared and well shaken suspension of particulate quartz material (ø 2.4-32 µm) in oil. The minimum concentration to be found was known (added amount = 15.31 mg/kg).
This determination was very problematic. No statistical outliers were observed. However, the calculated reproducibility is not at all in agreement with the requirements of EN12662:14.
When the EN12662:14 data were evaluated separately, a higher consensus value is found (41.7 vs 38.0 mg/kg) and a smaller reproducibility (11.5 vs 16.1 mg/kg). The calculated reproducibility of the EN12662:14 data is in full agreement with the requirements of EN12662:14.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the relevant standard and the reproducibility as found for the group of participating laboratories that participated. The average results of the evaluated parameters, calculated reproducibilities and reproducibilities, derived from literature standards (in casu ASTM, EN or ISO standards) are compared in the next tables.

Parameters	*unit*	*n*	*average*	*2.8 * sd*	*R (lit)*
Ash content	%M/M	16	0.0008	0.0008	0.0050
Aromatics by FIA	%V/V	14	25.73	10.71	n.a.
Cetane Index D976		26	54.39	0.57	2.00
Cetane Index ISO4264		45	54.74	1.00	n.a.
Cloud Point	°C	51	-7.9	1.9	4.0
Cold Filter Plugging Point	°C	53	-19.6	2.5	4.6
CCR on 10% distillation residue	%M/M	34	0.033	0.045	(0.025)*
Ramsbottom CR on 10% residue	%M/M	5	0.086	n.a.	n.a.
Copper Corrosion 3hrs @ 50˚C		46	1A	n.a.	n.a.
Density @ 15°C	kg/m^3	60	835.45	0.31	0.50
Fatty Acid Methyl Ester	%V/V	52	9.66	0.84	0.72
Flash Point PMcc	°C	61	66.10	4.03	4.69
Kinematic Viscosity @ 40°C	mm^2/s	51	2.8290	0.0286	0.0314
Lubricity	µm	36	187.6	61.6	102.0
Oxidation Stability EN15751	hrs	26	40.99	8.89	8.18
Oxidation Stability ISO12205	g/m^3	17	3.34	6.97	8.06
Polycyclic Aromatic Hydrocarbons	%M/M	32	2.44	1.17	0.92
Pour Point (manual)	°C	30	-23.3	9.2	6.6
Pour Point (automated)	°C	24	-22.1	3.7	4.5
Sulphur	mg/kg	56	8.25	2.17	2.04
Total Acid Number	mgKOH/g	31	0.024	0.027	0.040
Water	mg/kg	52	74.31	25.27	59.28
Initial Boiling Point	°C	61	173.5	9.8	9.5
10% recovery	°C	61	216.6	5.8	4.8
50% recovery	°C	61	277.9	2.9	3.0
90% recovery	°C	61	332.3	3.8	5.0
95% recovery	°C	61	344.4	5.8	8.6
Final Boiling Point	°C	60	353.1	6.9	7.1
Volume @250°C	%V/V	60	28.4	2.6	2.7
Volume @350°C	%V/V	53	96.3	1.5	2.7
Total Contamination (#14071)	mg/kg	29	38.0	16.1	10.4

Table 3: summary of test results samples #14070 and #14071

*) consensus value is below application range of the test method

Without further statistical calculations, it can be concluded that for most tests there is a good compliance of the group of participating laboratories with the relevant standards. The problematic tests have been discussed in paragraph 4.1.

4.3 COMPARISON OF THE INTERLABORATORY STUDY OF MAY 2014 WITH PREVIOUS PTS.

	May 2014	*April 2013*	*April 2012*	*April 2011*
Number of reporting labs	67	61	57	67
Number of results reported	1317	1257	1197	1363
Statistical outliers	33	29	33	50
Percentage outliers	2.5%	2.4%	2.8%	3.7%

table 4: 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 against the requirements of the respective standards. The conclusions are given the following table:

	May 2014	*April 2013*	*April 2012*	*April 2011*
Ash content	++	+	(++)	(++)
Aromatics by FIA	n.e	n.e	n.e	n.e.
Cetane Index D976	++	++	++	++
Cetane Index ISO4264	n.e	n.e	n.e	n.e.
Cloud Point	++	++	+	++
Cold Filter Plugging Point	+	--	+	+/-
Conradson CR on 10% res.	(-)	(-)	(--)	(--)
Ramsbottom CR on 10% res.	n.e	(--)	n.e	-
Density @ 15 °C	+	+	++	++
Fatty Acid Methyl Ester	-	-	-	--
Flash Point PMcc	+	+	+	++
Kinematic Viscosity @ 40 °C	+	+/-	-	++
Lubricity	++	++	++	++
Oxidation Stability EN15751	+/-	--	--	-
Oxidation Stability ISO12205	+	+/-	+	++
Polycyclic Aromatic Hydrocar.	-	+	-	--
Pour Point manual	--	+/-	+	++
Pour Point automated	+	+	+	++
Sulphur	+/-	++	+	--
TAN	+	+	+	(++)
Water content	++	++	+	++
Distillation	+	+	+	+/-
Total Contamination	--	--	-	--

table 5: comparison determinations against the standard

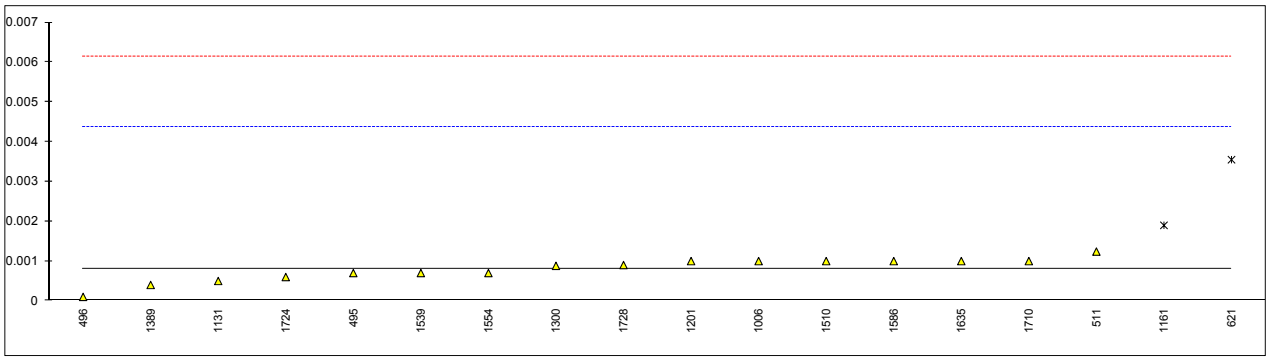
The performance of the determinations against the requirements of the respective standards is listed in the above table. The following performance categories were used:

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

APPENDIX 1

Determination of Ash Content on sample #14070; result in %M/M

lab	method	value	mark	-----	remarks
120	D482	<0.001		-----	
150	ISO6245	<0.001		-----	
312		-----		-----	
323	ISO6245	<0.001		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340	ISO6245	<0.001		-----	
343	ISO6245	< 0.001		-----	
353	IP4	<0.001		-----	
444		-----		-----	
445	IP4	<0.001		-----	
447	D482	<0.001		-----	
463	ISO6245	<0.001		-----	
495	ISO6245	0.0007		-0.05	
496	ISO6245	0.0001		-0.39	
511	D482	0.00124		0.25	
541	ISO6245	<0.001		-----	
621	D482	0.00355	G(0.01)	1.54	
631	D482	<0.001		-----	
634	D482	<0.001		-----	
1006	D482	0.001		0.11	
1017		-----		-----	
1026	ISO6245	<0.01		-----	
1033		-----		-----	
1065		-----		-----	
1081	D482	<0.0001		-----	
1131	ISO6245	0.0005		-0.17	
1134	IP4	<0.001		-----	
1161	ISO6245	0.0019	G(0.05)	0.62	
1194		-----		-----	
1201	ISO6245	0.001		0.11	
1205		-----		-----	
1227		-----		-----	
1237		-----		-----	
1259		-----		-----	
1292		-----		-----	
1300	ISO6245	0.00088		0.05	
1346		-----		-----	
1389	D482	0.0004		-0.22	
1397	ISO6245	<0,001		-----	
1404	ISO6245	<0.001		-----	
1409	ISO6245	<0.001		-----	
1443		-----		-----	
1455	ISO6245	< 0.001		-----	
1459		-----		-----	
1510	IP4	0.001		0.11	
1521		-----		-----	
1539	ISO6245	0.0007		-0.05	
1554	ISO6245	0.0007		-0.05	
1569		-----		-----	
1586	ISO6245	0.001		0.11	
1631		-----		-----	
1634		-----		-----	
1635	ISO6245	0.001		0.11	
1656	ISO6245	<0.01		-----	
1659	ISO6245	<0.001		-----	
1706		-----		-----	
1710	ISO6245	0.001		0.11	
1724	D482	0.0006		-0.11	
1728	D482	0.0009		0.06	
1771		-----		-----	
1776		-----		-----	
1787		-----		-----	
1810		-----		-----	
1811		-----		-----	
1842		-----		-----	
2129	ISO6245	<0.001		-----	
	normality	OK			
	n	16			
	outliers	2			
	mean (n)	0.00080			
	st.dev. (n)	0.000290			
	R(calc.)	0.00081			compare R(D482:13) = 0.005
	R(ISO6245:01)	0.00500			application range: 0.001 – 0.180 % M/M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0.005
0.004
0.003
0.002
0.001
0
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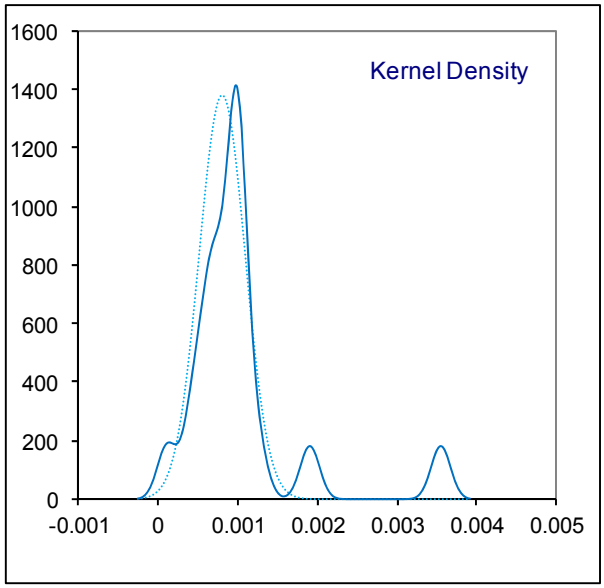
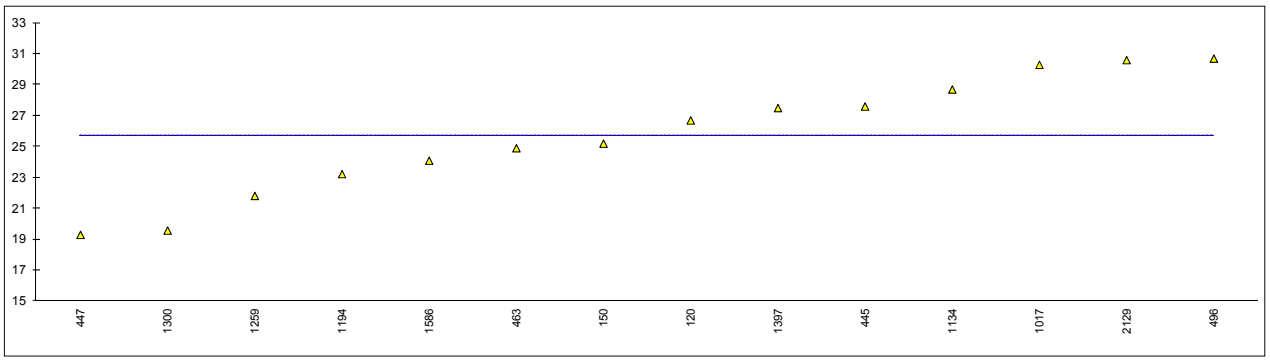
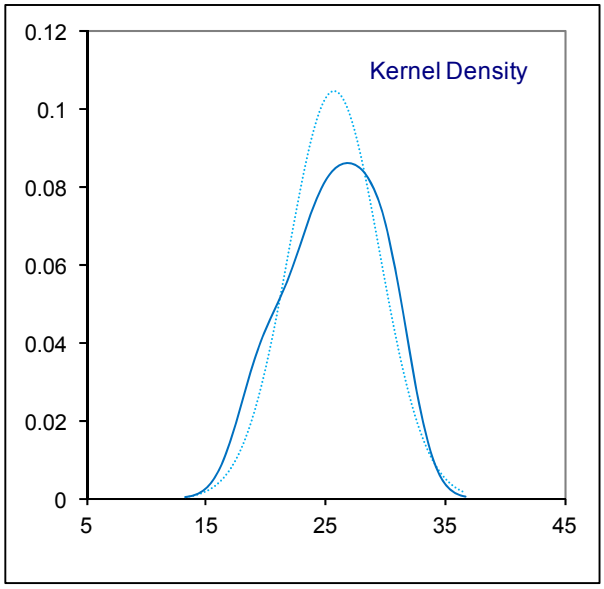
1728
1201
1006
1510
1586
1635
1710
511
1161
621


Kernel Density
1600
1400
1200
1000
800
600
400
200
0
-0.001
0
0.001
0.002
0.003
0.004
0.005

Determination of Aromatics by FIA on sample #14070; result in %V/V

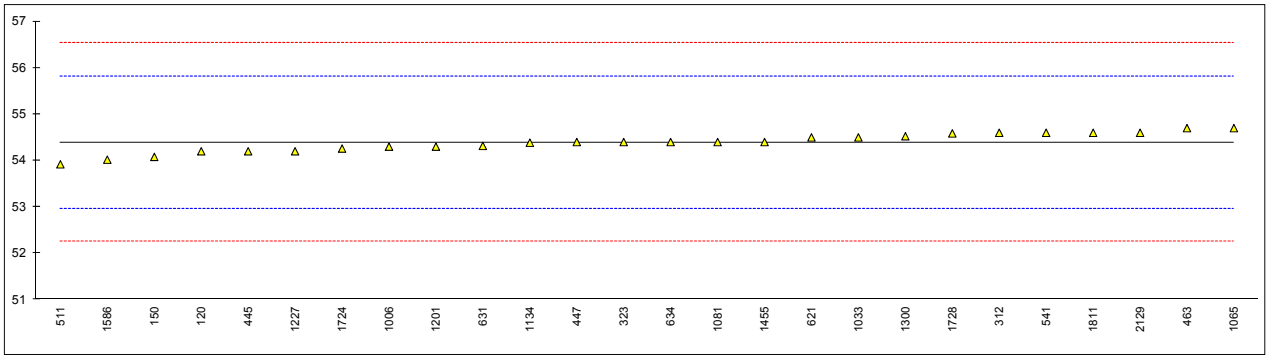
lab	method	value	mark	-----	remarks
120	D1319	26.7		-----	
150	D1319	25.2		-----	
312		-----		-----	
323		-----		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340		-----		-----	
343		-----		-----	
353		-----		-----	
444		-----		-----	
445	D1319	27.6		-----	
447	D1319	19.3		-----	
463	D1319	24.9		-----	
495		-----		-----	
496	D1319	30.70		-----	
511		-----		-----	
541		-----		-----	
621		-----		-----	
631		-----		-----	
634		-----		-----	
1006		-----		-----	
1017	D1319	30.30		-----	
1026		-----		-----	
1033		-----		-----	
1065		-----		-----	
1081		-----		-----	
1131		-----		-----	
1134	D1319	28.7		-----	
1161		-----		-----	
1194	EN12916	23.23		-----	
1201		-----		-----	
1205		-----		-----	
1227		-----		-----	
1237		-----		-----	
1259	D1319	21.81998		-----	
1292		-----		-----	
1300	D1319	19.58		-----	
1346		-----		-----	
1389		-----		-----	
1397	D1319	27.5		-----	
1404		-----		-----	
1409		-----		-----	
1443		-----		-----	
1455		-----		-----	
1459		-----		-----	
1510		-----		-----	
1521		-----		-----	
1539		-----		-----	
1554		-----		-----	
1569		-----		-----	
1586	D1319	24.1		-----	
1631		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656		-----		-----	
1659		-----		-----	
1706		-----		-----	
1710		-----		-----	
1724		-----		-----	
1728		-----		-----	
1771		-----		-----	
1776		-----		-----	
1787		-----		-----	
1810		-----		-----	
1811		-----		-----	
1842		-----		-----	
2129	D1319	30.6		-----	
	normality	OK			
	n	14			
	outliers	0			
	mean (n)	25.731			
	st.dev. (n)	3.8233			
	R(calc.)	10.705			
	R(D1319:13)	n.a.			Compare R(D1319:13 for diesel without FAME) = 3.7

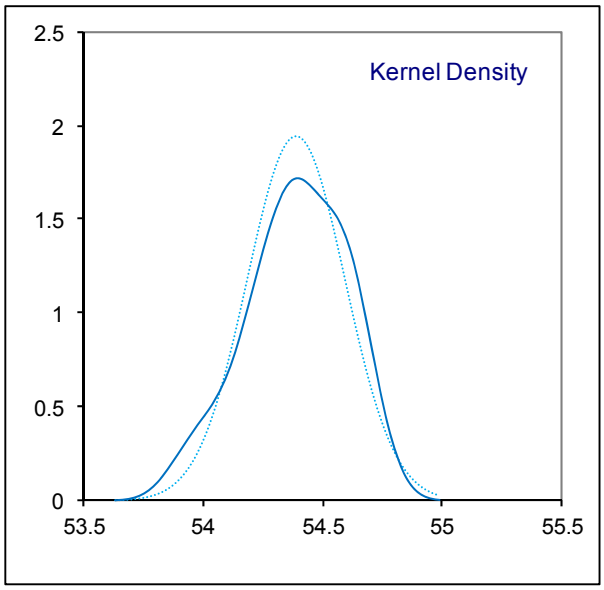

33
31
29
27
25
23
21
19
17
15
447
1300
1259
1194
1586
463
150
120
1397
445
1134
1017
2129
496


Kernel Density
0.12
0.1
0.08
0.06
0.04
0.02
0
5
15
25
35
45

Determination of Cetane Index D976 on sample #14070

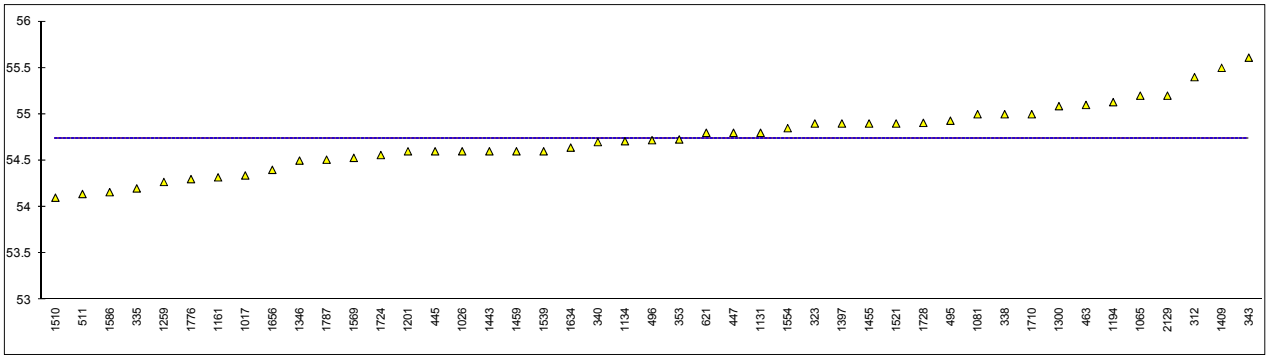
lab	method	value	mark	z(targ)	remarks
120	D976	54.2		-0.26	
150	D976	54.08		-0.43	
312	D976	54.6		0.30	
323	D976	54.4		0.02	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340		-----		-----	
343		-----		-----	
353		-----		-----	
444		-----		-----	
445	D976	54.2		-0.26	
447	D976	54.4		0.02	
463	D976	54.7		0.44	
495		-----		-----	
496		-----		-----	
511	D976	53.92		-0.66	
541	D976	54.6		0.30	
621	D976	54.5		0.16	
631	D976	54.317		-0.10	
634	D976	54.4		0.02	
1006	D976	54.3		-0.12	
1017		-----		-----	
1026		-----		-----	
1033	D976	54.5		0.16	
1065	D976	54.7	C	0.44	first reported: 56.8
1081	D976	54.4		0.02	
1131		-----		-----	
1134	D976	54.386		0.00	
1161		-----		-----	
1194		-----		-----	
1201	D976	54.3		-0.12	
1205		-----		-----	
1227	D976	54.2		-0.26	
1237		-----		-----	
1259		-----		-----	
1292		-----		-----	
1300	D976	54.5248		0.19	
1346		-----		-----	
1389		-----		-----	
1397		-----		-----	
1404		-----		-----	
1409		-----		-----	
1443		-----		-----	
1455	D976	54.4		0.02	
1459		-----		-----	
1510		-----		-----	
1521		-----		-----	
1539		-----		-----	
1554		-----		-----	
1569		-----		-----	
1586	D976	54.02		-0.52	
1631		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656		-----		-----	
1659		-----		-----	
1706		-----		-----	
1710		-----		-----	
1724	D976	54.26		-0.18	
1728	D976	54.586		0.28	
1771		-----		-----	
1776		-----		-----	
1787		-----		-----	
1810		-----		-----	
1811	D976	54.6		0.30	
1842		-----		-----	
2129	D976	54.6		0.30	
	normality	OK			
	n	26			
	outliers	0			
	mean (n)	54.388			
	st.dev. (n)	0.2050			
	R(calc.)	0.574			
	R(D976:06)	2.000			

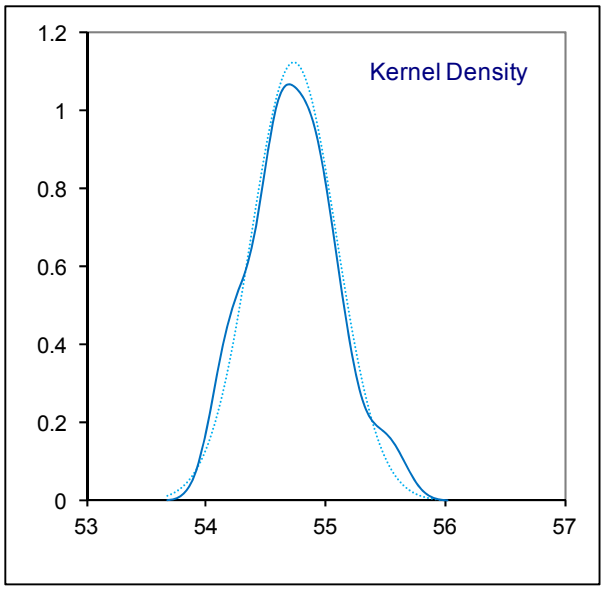

57
56
55
54
53
52
51
511
1586
150
120
445
1227
1724
1006
1201
631
1134
447
323
634
1081
1455
621
1033
1300
1728
312
541
1811
2129
463
1065


Kernel Density
2.5
2
1.5
1
0.5
0
53.5
54
54.5
55
55.5

Determination of Cetane Index ISO4264 on sample #14070

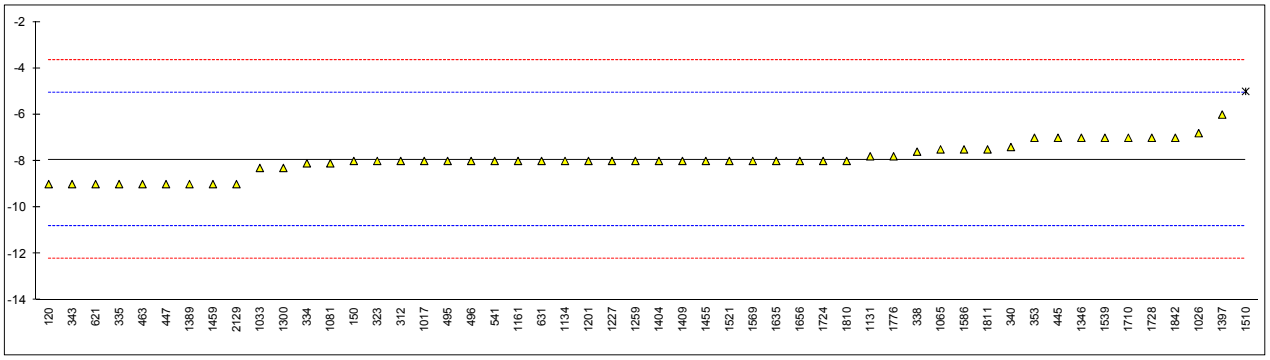
lab	method	value	mark	z(targ)	remarks
120		-----		-----	
150		-----		-----	
312	ISO4264	55.4		-----	
323	ISO4264	54.9		-----	
334		-----		-----	
335	D4737	54.2		-----	
338	ISO4264	55.0		-----	
340	ISO4264	54.7		-----	
343	D4737	55.61		-----	
353	IP380	54.728		-----	
444		-----		-----	
445	ISO4264	54.6		-----	
447	IP380	54.8		-----	
463	ISO4264	55.1		-----	
495	ISO4264	54.93		-----	
496	ISO4264	54.72		-----	
511	D4737	54.14		-----	
541		-----		-----	
621	D4737	54.8		-----	
631		-----		-----	
634		-----		-----	
1006		-----		-----	
1017	ISO4264	54.34		-----	
1026	ISO4264	54.6		-----	
1033		-----		-----	
1065	D4737	55.2	C	-----	first reported:57.4
1081	ISO4264	55.0		-----	
1131	ISO4264	54.8		-----	
1134	ISO4264	54.709		-----	
1161	ISO4264	54.32		-----	
1194	D4737 mod	55.13		-----	
1201	ISO4264	54.6		-----	
1205		-----		-----	
1227		-----		-----	
1237		-----		-----	
1259	ISO4264	54.27		-----	
1292		-----		-----	
1300	ISO4264	55.08683		-----	
1346	ISO4264	54.5		-----	
1389		-----		-----	
1397	ISO4264	54.9		-----	
1404		-----		-----	
1409	ISO4264	55.5		-----	
1443	ISO4264	54.6		-----	
1455	D4737	54.9		-----	
1459	D4737	54.6		-----	
1510	ISO4264	54.1		-----	
1521	ISO4264	54.9		-----	
1539	ISO4264	54.6		-----	
1554	ISO4264	54.85		-----	
1569	ISO4264	54.53		-----	
1586	ISO4264	54.16		-----	
1631		-----		-----	
1634	ISO4264	54.64		-----	
1635		-----		-----	
1656	ISO4264	54.4		-----	
1659		-----		-----	
1706		-----		-----	
1710	ISO4264	55.0		-----	
1724	D4737	54.56		-----	
1728	ISO4264	54.907		-----	
1771		-----		-----	
1776	ISO4264	54.3		-----	
1787	ISO4264	54.51		-----	
1810		-----		-----	
1811		-----		-----	
1842		-----		-----	
2129	ISO4264	55.2		-----	
	normality	OK			
	n	45			
	outliers	0			
	mean (n)	54.741			
	st.dev. (n)	0.3558			
	R(calc.)	0.996			
	R(ISO4264:07)	n.a.			

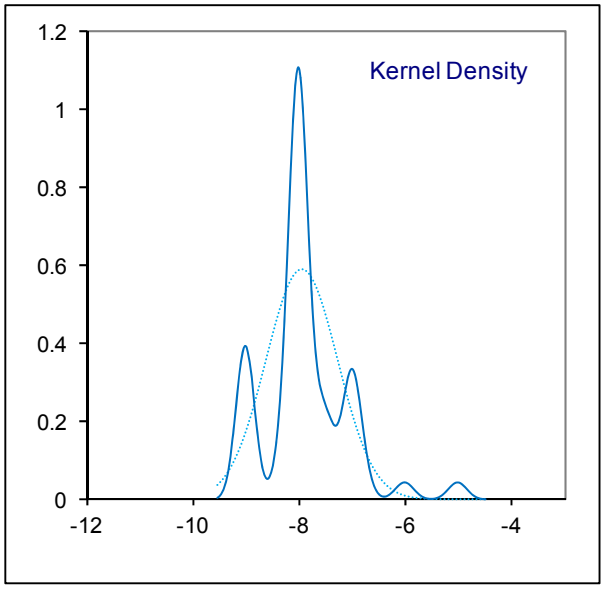

56
55.5
55
54.5
54
53.5
53
1510 511 1586 335 1259 1776 1161 1017 1656 1346 1787 1569 1724 1201 445 1026 1443 1459 1539 1634 340 1134 496 353 621 447 1131 1554 323 1397 1455 1521 1728 495 1081 338 1710 1300 463 1194 1065 2129 312 1409 343


Kernel Density
1.2
1
0.8
0.6
0.4
0.2
0
53
54
55
56
57

Determination of Cloud Point on sample #14070; result in °C

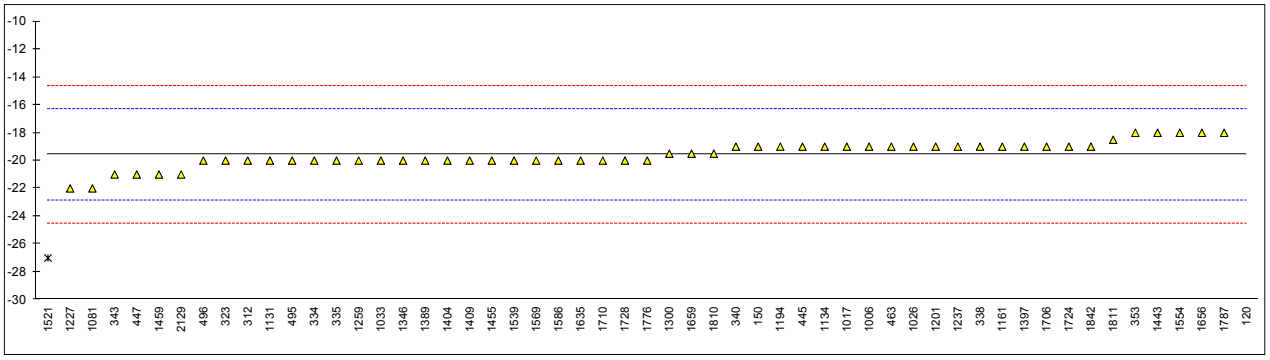
lab	method	value	mark	z(targ)	remarks
120	D2500	-9		-0.75	
150	EN23015	-8		-0.05	
312	D2500	-8		-0.05	
323	EN23015	-8		-0.05	
334	EN23015	-8.1		-0.12	
335	EN23015	-9		-0.75	
338	EN23015	-7.6		0.23	
340	ISO3015	-7.4		0.37	
343	D2500	-9		-0.75	
353	IP219	-7		0.65	
444		-----		-----	
445	IP219	-7		0.65	
447	D2500	-9		-0.75	
463	EN23015	-9		-0.75	
495	EN23015	-8		-0.05	
496	EN23015	-8.0		-0.05	
511		-----		-----	
541	EN23015	-8		-0.05	
621	D2500	-9.0		-0.75	
631	D2500	-8	C	-0.05	first reported: -6
634		-----		-----	
1006		-----		-----	
1017	D5771	-8		-0.05	
1026	D5773	-6.8		0.79	
1033	IP219	-8.3		-0.26	
1065	D5771	-7.5		0.30	
1081	D5771	-8.1		-0.12	
1131	EN23015	-7.8		0.09	
1134	IP219	-8		-0.05	
1161	EN23015	-8		-0.05	
1194		-----		-----	
1201	EN23015	-8		-0.05	
1205		-----		-----	
1227	D2500	-8		-0.05	
1237		-----		-----	
1259	EN23015	-8		-0.05	
1292		-----		-----	
1300	EN23015	-8.3		-0.26	
1346	EN23015	-7		0.65	
1389	D2500	-9		-0.75	
1397	EN23015	-6		1.35	
1404	D2500	-8		-0.05	
1409	EN23015	-8		-0.05	
1443		-----		-----	
1455	D2500	-8		-0.05	
1459	ISO3015	-9		-0.75	
1510	D2500	-5	R(0.01)	2.05	
1521	ISO3015	-8		-0.05	
1539	ISO3015	-7		0.65	
1554		-----		-----	
1569	EN23015	-8		-0.05	
1586	EN23015	-7.5		0.30	
1631		-----		-----	
1634		-----		-----	
1635	EN23015	-8		-0.05	
1656	ISO3015	-8		-0.05	
1659		-----		-----	
1706		-----		-----	
1710	EN23015	-7		0.65	
1724	D2500	-8		-0.05	
1728	D2500	-7		0.65	
1771		-----		-----	
1776	EN23015	-7.8		0.09	
1787		-----		-----	
1810	D2500	-8		-0.05	
1811	EN23015	-7.5		0.30	
1842	D5771	-7		0.65	
2129	EN23015	-9		-0.75	
	normality	OK			
	n	51			
	outliers	1			
	mean (n)	-7.94			
	st.dev. (n)	0.675			
	R(calc.)	1.89			
	R(EN23015:94)	4.00			Compare R(2500:11) = 4.00

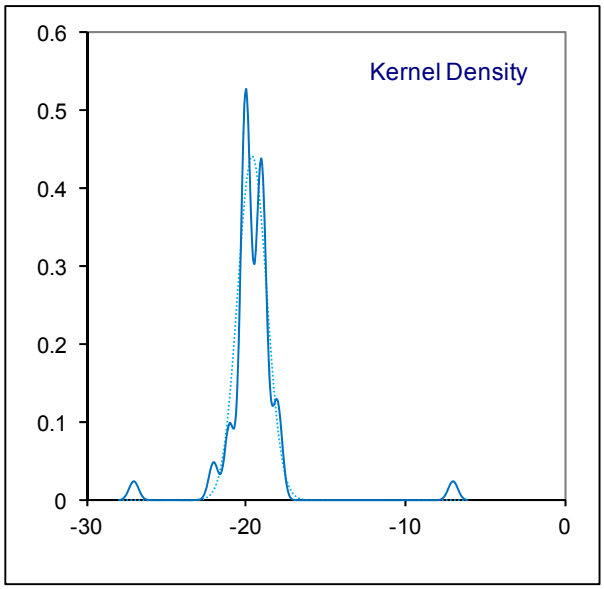

-2
-4
-6
-8
-10
-12
-14
120 343 621 335 463 447 1389 1459 2129 1033 1300 334 1081 150 323 312 1017 495 496 541 1161 631 1134 1201 1227 1259 1404 1409 1455 1521 1569 1635 1656 1724 1810 1131 1776 338 1065 1586 1811 340 353 445 1346 1539 1710 1728 1842 1026 1397 1510


Kernel Density
1.2
1
0.8
0.6
0.4
0.2
0
-12
-10
-8
-6
-4

Determination of Cold Filter Plugging Point on sample #14070; result in °C

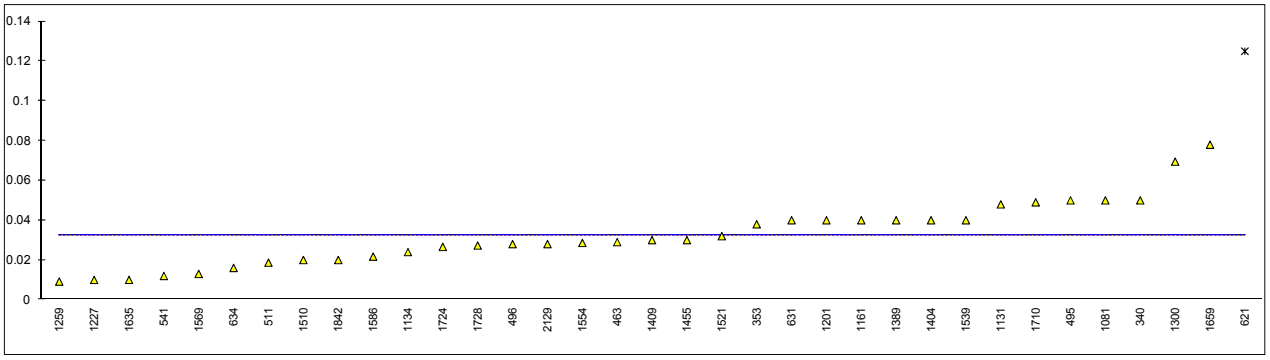
lab	method	value	mark	z(targ)	remarks
120	EN116	-7	C,G(0.01)	7.67	first reported: -10
150	EN116	-19		0.36	
312	EN116	-20		-0.25	
323	EN116	-20		-0.25	
334	EN116	-20		-0.25	
335	EN116	-20		-0.25	
338	EN116	-19		0.36	
340	EN116	-19.0		0.36	
343	EN116	-21		-0.86	
353	IP309	-18		0.97	
444		-----		-----	
445	IP309	-19		0.36	
447	IP309	-21		-0.86	
463	EN116	-19		0.36	
495	EN116	-20		-0.25	
496	EN116	-20.0		-0.25	
511		-----		-----	
541	EN116	<-20		-----	
621		-----		-----	
631		-----		-----	
634		-----		-----	
1006	D6371	-19		0.36	
1017	EN116	-19		0.36	
1026	EN116	-19		0.36	
1033	IP309	-20		-0.25	
1065		-----		-----	
1081	EN116	-22		-1.47	
1131	EN116	-20		-0.25	
1134	EN116	-19		0.36	
1161	EN116	-19		0.36	
1194	EN116	-19		0.36	
1201	EN116	-19		0.36	
1205		-----		-----	
1227	EN116	-22		-1.47	
1237	EN116	-19		0.36	
1259	EN116	-20		-0.25	
1292		-----		-----	
1300	EN16329	-19.5		0.05	
1346	EN116	-20		-0.25	
1389	IP309	-20		-0.25	
1397	EN116	-19		0.36	
1404	EN116	-20		-0.25	
1409	EN116	-20		-0.25	
1443	EN116	-18		0.97	
1455	EN116	-20		-0.25	
1459	EN116	-21		-0.86	
1510		-----		-----	
1521	EN116	-27	G(0.05)	-4.52	
1539	EN116	-20		-0.25	
1554	EN116	-18		0.97	
1569	EN116	-20		-0.25	
1586	EN116	-20		-0.25	
1631		-----		-----	
1634		-----		-----	
1635	EN116	-20		-0.25	
1656	EN116	-18		0.97	
1659	EN116	-19.5		0.05	
1706	EN116	-19.0		0.36	
1710	EN116	-20		-0.25	
1724	IP309	-19		0.36	
1728	D6371	-20		-0.25	
1771		-----		-----	
1776	EN116	-20		-0.25	
1787	EN116	-18		0.97	
1810	EN116	-19.5		0.05	
1811	EN116	-18.5		0.66	
1842	IP309	-19		0.36	
2129	EN116	-21		-0.86	
	normality	OK			
	n	53			
	outliers	2			
	mean (n)	-19.58			
	st.dev. (n)	0.908			
	R(calc.)	2.54			
	R(EN116:97)	4.59			R(EN116:97) = R(IP309:99)

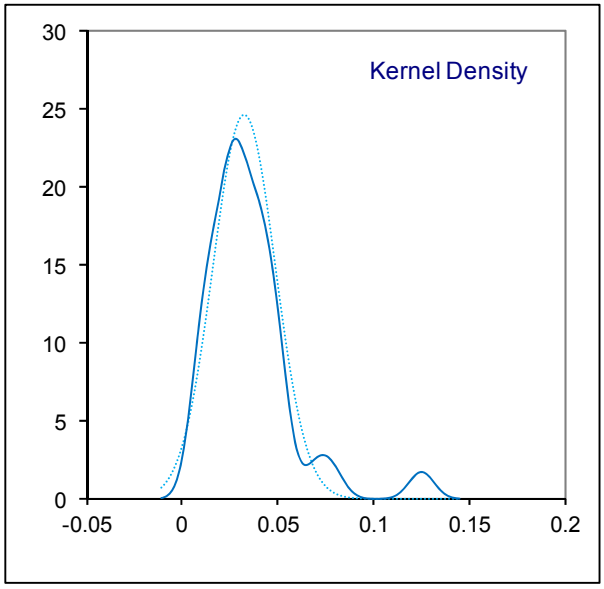

-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
1521 1227 1081 343 447 1459 2129 496 323 312 1131 495 334 335 1259 1033 1346 1389 1404 1409 1455 1539 1569 1586 1635 1710 1728 1776 1300 1659 1810 340 150 1194 445 1134 1017 1006 463 1026 1201 1237 338 1161 1397 1706 1724 1842 1811 353 1443 1554 1656 1787 120


Kernel Density
0.6
0.5
0.4
0.3
0.2
0.1
0
-30
-20
-10
0

Determination of Conradson Carbon Residue on 10% dist. res. on sample #14070; result in %M/M

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
150		-----		-----	
312		-----		-----	
323	ISO10370	<0.10		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340	ISO10370	0.05		-----	
343	D4530	<0.1		-----	
353	IP13	0.038		-----	
444		-----		-----	
445		-----		-----	
447	IP398	<0.10		-----	
463	ISO10370	0.029		-----	
495	ISO10370	0.05		-----	
496	ISO10370	0.028		-----	
511	D189	0.0187		-----	
541	ISO10370	0.012		-----	
621	D189	0.125	R(0.01)	-----	false positive test result?
631	D4530	0.04		-----	
634	D189	0.016		-----	
1006		-----		-----	
1017		-----		-----	
1026		-----		-----	
1033		-----		-----	
1065		-----		-----	
1081	ISO10370	0.05		-----	
1131	ISO10370	0.048		-----	
1134	ISO10370	0.024		-----	
1161	ISO10370	0.04		-----	
1194		-----		-----	
1201	ISO10370	0.04		-----	
1205		-----		-----	
1227	D4530	0.01		-----	
1237		-----		-----	
1259	ISO10370	0.009179		-----	
1292		-----		-----	
1300	ISO10370	0.06948		-----	
1346		-----		-----	
1389	D4530	0.04		-----	
1397	ISO10370	<0.01		-----	
1404	ISO10370	0.040		-----	
1409	ISO10370	0.03		-----	
1443		-----		-----	
1455	ISO10370	0.03		-----	
1459		-----		-----	
1510	IP398	0.02		-----	
1521	ISO10370	0.032		-----	
1539	ISO10370	0.04		-----	
1554	ISO6615	0.0286		-----	
1569	D4530	0.013		-----	
1586	ISO10370	0.0217		-----	
1631		-----		-----	
1634		-----		-----	
1635	ISO10370	0.01		-----	
1656	ISO10370	<0.1		-----	
1659	ISO10370	0.078		-----	
1706		-----		-----	
1710	ISO10370	0.049		-----	
1724	D4530	0.0266		-----	
1728	ISO10370	0.0273		-----	
1771		-----		-----	
1776		-----		-----	
1787		-----		-----	
1810		-----		-----	
1811		-----		-----	
1842	D4530	0.02		-----	
2129	ISO10370	0.028		-----	
	normality	OK			
	n	34			
	outliers	1			
	mean (n)	0.0325			
	st.dev. (n)	0.01624			
	R(calc.)	0.0455			
	R(ISO10370:93)	(0.0250)			application range: 0.1 – 30% M/M.


0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1259 1227 1635 541 1569 634 511 1510 1842 1586 1134 1724 1728 496 2129 1554 463 1409 1455 1521 353 631 1201 1161 1389 1404 1539 1131 1710 495 1081 340 1300 1659 621


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

Determination of Ramsbottom Carbon Res. on 10% dist. res. on sample #14070; result in %M/M

lab	method	value	mark	z(targ)	remarks
120	D524	0.07		-----	
150	D524	0.071		-----	
312		-----		-----	
323		-----		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340		-----		-----	
343		-----		-----	
353		-----		-----	
444		-----		-----	
445		-----		-----	
447		-----		-----	
463		-----		-----	
495		-----		-----	
496		-----		-----	
511	D524	0.070		-----	
541		-----		-----	
621		-----		-----	
631		-----		-----	
634		-----		-----	
1006	D524	0.091		-----	
1017		-----		-----	
1026		-----		-----	
1033		-----		-----	
1065		-----		-----	
1081		-----		-----	
1131		-----		-----	
1134	D524	0.1295		-----	
1161		-----		-----	
1194		-----		-----	
1201		-----		-----	
1205		-----		-----	
1227		-----		-----	
1237		-----		-----	
1259		-----		-----	
1292		-----		-----	
1300		-----		-----	
1346		-----		-----	
1389		-----		-----	
1397		-----		-----	
1404		-----		-----	
1409		-----		-----	
1443		-----		-----	
1455		-----		-----	
1459		-----		-----	
1510		-----		-----	
1521		-----		-----	
1539		-----		-----	
1554		-----		-----	
1569		-----		-----	
1586		-----		-----	
1631		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656		-----		-----	
1659		-----		-----	
1706		-----		-----	
1710		-----		-----	
1724		-----		-----	
1728		-----		-----	
1771		-----		-----	
1776		-----		-----	
1787		-----		-----	
1810		-----		-----	
1811		-----		-----	
1842		-----		-----	
2129		-----		-----	

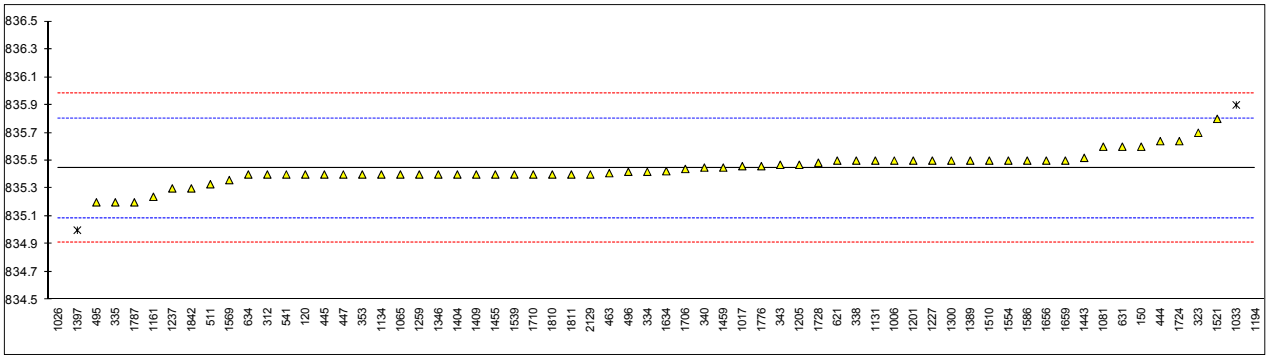
normality	unknown
n	5
outliers	n.a.
mean (n)	0.086
st.dev. (n)	n.a.
R(calc.)	n.a.
R(D524:10)	n.a.

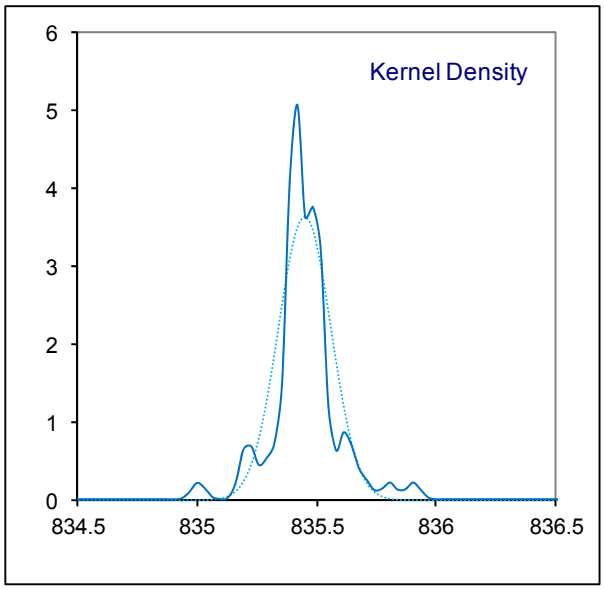
Determination of Copper Corrosion 3hrs @ 50 °C on sample #14070

lab	method	value	mark	z(targ)	remarks
120	D130	1A		-----	
150	ISO2160	1A		-----	
312		-----		-----	
323	ISO2160	1A		-----	
334		-----		-----	
335	D130	1		-----	
338		-----		-----	
340		-----		-----	
343	D130	1A		-----	
353	D130	1A		-----	
444		-----		-----	
445	D130	1A		-----	
447	D130	1A		-----	
463	ISO2160	1A		-----	
495	D130	1A		-----	
496	ISO2160	1A		-----	
511	D130	1A		-----	
541	D130	1A		-----	
621	D130	1A		-----	
631	D130	1A		-----	
634		-----		-----	
1006	D130	1A		-----	
1017	ISO2160	1A		-----	
1026	ISO2160	1A		-----	
1033	IP154	1A		-----	
1065		-----		-----	
1081	D130	1A		-----	
1131		-----		-----	
1134	IP130	1A		-----	
1161	ISO2160	1A		-----	
1194		-----		-----	
1201	ISO2160	1A		-----	
1205		-----		-----	
1227	D130	1A		-----	
1237		-----		-----	
1259	ISO2160	1A		-----	
1292		-----		-----	
1300	ISO2160	1A		-----	
1346	ISO2160	1A		-----	
1389	D130	1A		-----	
1397	ISO2160	1		-----	
1404	ISO2160	1A		-----	
1409	ISO2160	1B		-----	
1443		-----		-----	
1455	D130	1A		-----	
1459		-----		-----	
1510	IP154	1A		-----	
1521		-----		-----	
1539	ISO2160	1A		-----	
1554	ISO2160	1A		-----	
1569	ISO2160	1A		-----	
1586	ISO2160	1B		-----	
1631		-----		-----	
1634	D130	1A		-----	
1635	ISO2160	1A		-----	
1656	ISO2160	1A		-----	
1659	ISO2160	1A		-----	
1706		-----		-----	
1710	ISO2160	1A		-----	
1724	D130	1A		-----	
1728	D130	1A		-----	
1771		-----		-----	
1776		-----		-----	
1787		-----		-----	
1810		-----		-----	
1811		-----		-----	
1842	IP154	1A		-----	
2129	ISO2160	1A		-----	
	normality	n.a			
	n	46			
	outliers	n.a			
	mean (n)	1			
	st.dev. (n)	n.a			
	R(calc.)	n.a			
	R(ISO2160:98)	n.a			

Determination of Density @15 °C on sample #14070; result in kg/m^3

lab	method	value	mark	z(targ)	remarks
120	D4052	835.4		-0.25	
150	ISO12185	835.6	C	0.87	first reported: 836.4
312	D4052	835.4		-0.25	
323	ISO12185	835.7		1.43	
334	ISO12185	835.42		-0.14	
335	ISO12185	835.2	C	-1.37	first reported: 836.2
338	ISO12185	835.5		0.31	
340	ISO12185	835.45		0.03	
343	D4052	835.47		0.14	
353	IP365	835.4		-0.25	
444	ISO12185	835.64		1.09	
445	D4052	835.4		-0.25	
447	D4052	835.4		-0.25	
463	ISO12185	835.41	C	-0.20	probably unit error, reported 0.83541
495	ISO12185	835.2		-1.37	
496	ISO12185	835.42		-0.14	
511	D4052	835.33		-0.64	
541	ISO12185	835.4		-0.25	
621	D1298	835.5		0.31	
631	D4052	835.6		0.87	
634	D4052	835.4	C	-0.25	first reported:0.8354
1006	D4052	835.5		0.31	
1017	ISO12185	835.46		0.08	
1026	D4052	833.5	R(0.01)	-10.89	
1033	IP365	835.9	R(0.01)	2.55	
1065	D4052	835.4		-0.25	
1081	ISO12185	835.6		0.87	
1131	ISO12185	835.5		0.31	
1134	IP365	835.4		-0.25	
1161	ISO12185	835.24		-1.15	
1194	ISO12185Mod.	841.56	C,R(0.01)	34.24	probably unit error, reported 0.84156
1201	ISO12185	835.5		0.31	
1205	ISO12185	835.47		0.14	
1227	D4052	835.5		0.31	
1237	ISO12185	835.3		-0.81	
1259	ISO12185	835.4		-0.25	
1292		-----		-----	
1300	ISO12185	835.5		0.31	
1346	ISO12185	835.4		-0.25	
1389	D4052	835.5		0.31	
1397	ISO12185	835.0	R(0.01)	-2.49	
1404	ISO12185	835.4		-0.25	
1409	ISO12185	835.4		-0.25	
1443	ISO12185	835.52		0.42	
1455	ISO12185	835.4		-0.25	
1459	ISO12185	835.45		0.03	
1510	IP365	835.5	C	0.31	probably unit error, reported 0.8355
1521	ISO3675	835.8		1.99	
1539	ISO12185	835.4		-0.25	
1554	ISO3675	835.5		0.31	
1569	ISO12185	835.36		-0.48	
1586	ISO12185	835.5		0.31	
1631		-----		-----	
1634	ISO12185	835.424		-0.12	
1635		-----		-----	
1656	ISO12185	835.5		0.31	
1659	ISO12185	835.50		0.31	
1706	ISO12185	835.44		-0.03	
1710	ISO12185	835.4		-0.25	
1724	D4052	835.64		1.09	
1728	D4052	835.485		0.22	
1771		-----		-----	
1776	ISO12185	835.46		0.08	
1787	ISO3675	835.2		-1.37	
1810	ISO12185	835.4		-0.25	
1811	ISO12185	835.4		-0.25	
1842	IP365	835.3		-0.81	
2129	D4052	835.4		-0.25	
	normality	suspect			
	n	60			
	outliers	4			
	mean (n)	835.45			
	st.dev. (n)	0.1100			
	R(calc.)	0.308			
	R(ISO12185:96)	0.500			compare R(4052:11) = 0.500

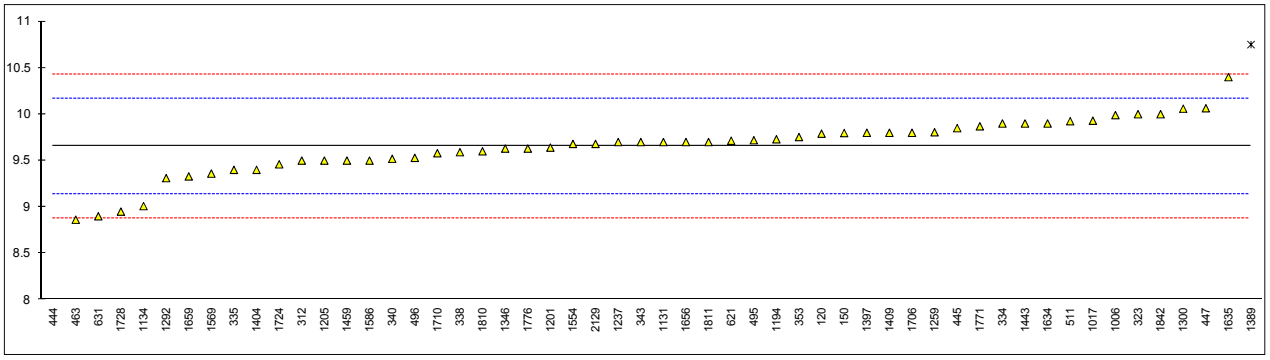

836.5
836.3
836.1
835.9
835.7
835.5
835.3
835.1
834.9
834.7
834.5
1026 1397 495 335 1787 1161 1237 1842 511 1569 634 312 541 120 445 447 353 1134 1065 1259 1346 1404 1409 1455 1539 1710 1810 1811 2129 463 496 334 1634 1706 340 1459 1017 1776 343 1205 1728 621 338 1131 1006 1201 1227 1300 1389 1510 1554 1586 1656 1659 1443 1081 631 150 444 1724 323 1521 1033 1194

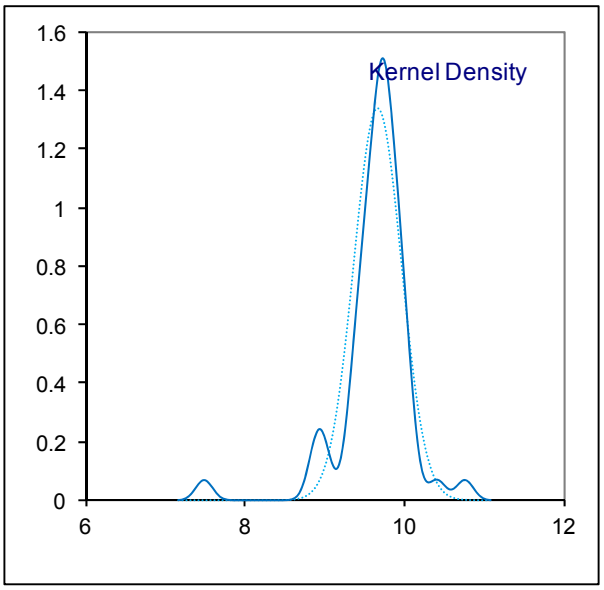

Kernel Density
6
5
4
3
2
1
0
834.5
835
835.5
836
836.5

Determination of Fatty Acid Methyl Esters content on sample #14070; result in %V/V

lab	method	value	mark	z(targ)	remarks
120	D7371	9.79		0.52	
150	EN14078	9.797		0.55	
312	EN14078	9.50		-0.60	
323	EN14078	10.0		1.33	
334	EN14078	9.9		0.95	
335	EN14078	9.4		-0.99	
338	EN14078	9.591		-0.25	
340	EN14078	9.52		-0.52	
343	EN14078	9.7		0.17	
353	EN14078	9.754		0.38	
444	EN14078	7.48	C,R(0.01)	-8.41	first reported: 6.995
445	EN14078	9.85		0.75	
447	EN14078	10.064		1.58	
463	EN14078	8.863		-3.06	
495	EN14078	9.72		0.25	
496	EN14078	9.53		-0.48	
511	D7371	9.925	C	1.04	first reported: 8.328
541		-----		-----	
621	EN14078	9.7145		0.23	
631	EN14078	8.9		-2.92	
634		-----		-----	
1006	EN14078	9.99		1.29	
1017	EN14078	9.93		1.06	
1026		-----		-----	
1033		-----		-----	
1065		-----		-----	
1081		-----		-----	
1131	EN14078	9.7		0.17	
1134	EN14078	9.01		-2.49	
1161		-----		-----	
1194	EN14078Mod.	9.73		0.29	
1201	EN14078	9.64		-0.06	
1205	EN14078	9.5		-0.60	
1227		-----		-----	
1237	EN14078	9.7		0.17	
1259	EN14078	9.805978		0.58	
1292	EN14078	9.3114		-1.33	
1300	EN14078	10.06		1.57	
1346	EN14078	9.63		-0.10	
1389	EN14078	10.75	R(0.05)	4.23	
1397	EN14078	9.8		0.56	
1404	EN14078	9.4		-0.99	
1409	EN14078	9.8		0.56	
1443	EN14078	9.9		0.95	
1455		-----		-----	
1459	EN14078	9.5		-0.60	
1510		-----		-----	
1521		-----		-----	
1539		-----		-----	
1554	EN14078	9.68		0.10	
1569	EN14078	9.36		-1.14	
1586	EN14078	9.5		-0.60	
1631		-----		-----	
1634	EN14078	9.9		0.95	
1635	EN14078	10.4		2.88	
1656	EN14078	9.7		0.17	
1659	EN14078	9.33		-1.26	
1706	EN14078	9.8		0.56	
1710	EN14078	9.58		-0.29	
1724	EN14078	9.46		-0.75	
1728	EN14078	8.95		-2.73	
1771	EN14078	9.87		0.83	
1776	EN14078	9.63		-0.10	
1787		-----		-----	
1810	EN14078	9.6		-0.21	
1811	EN14078	9.70		0.17	
1842	EN14078	10.0		1.33	
2129	EN14078	9.68		0.10	

normality	suspect
n	52
outliers	2
mean (n)	9.655
st.dev. (n)	0.2984
R(calc.)	0.836
R(EN14078:09)	0.724

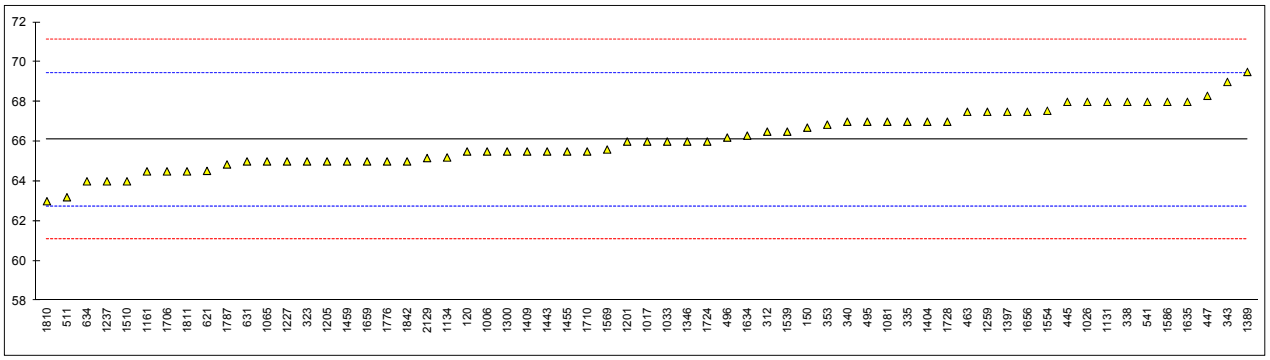

11
10.5
10
9.5
9
8.5
8
444 463 631 1728 1134 1292 1659 1569 335 1404 1724 312 1205 1459 1586 340 496 1710 338 1810 1346 1776 1201 1554 2129 1237 343 1131 1656 1811 621 495 1194 353 120 150 1397 1409 1706 1259 445 1771 334 1443 1634 511 1017 1006 323 1842 1300 447 1635 1389

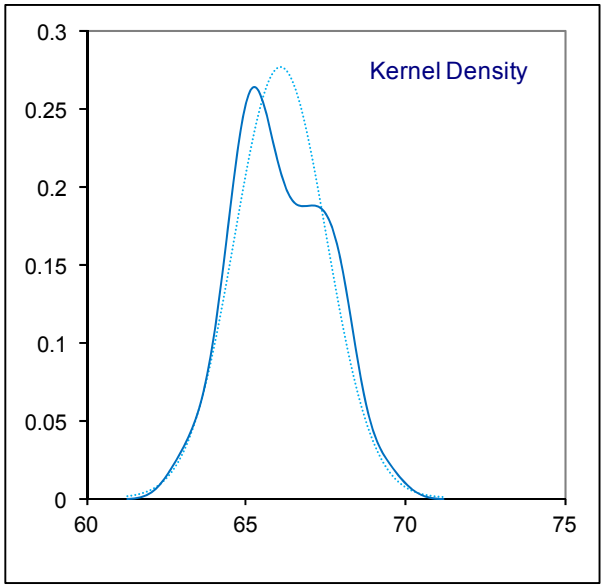

Kernel Density
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
6
8
10
12

Determination of Flash Point PMcc on sample #14070; result in °C

lab	method	value	mark	z(targ)	remarks
120	D93	65.5	C	-0.36	first reported: 73.3
150	ISO2719	66.7		0.36	
312	D93	66.5		0.24	
323	ISO2719	65.0		-0.65	
334		-----		-----	
335	ISO2719	67.0		0.54	
338	ISO2719	68.0		1.14	
340	ISO2719	67.0		0.54	
343	D93	69.0		1.73	
353	IP34	66.850		0.45	
444		-----		-----	
445	IP34	68.0		1.14	
447	D93	68.3		1.31	
463	D93	67.5		0.84	
495	D93	67.0		0.54	
496	ISO2719	66.2		0.06	
511	D93	63.2		-1.73	
541	ISO2719	68.0		1.14	
621	D93	64.525		-0.94	
631	D93	65.0		-0.65	
634	D93	64.0		-1.25	
1006	D93	65.5		-0.36	
1017	ISO2719	66.0		-0.06	
1026	ISO2719	68.0		1.14	
1033	IP34	66.0		-0.06	
1065	D93	65		-0.65	
1081	D93	67		0.54	
1131	ISO2719	68.0		1.14	
1134	IP34	65.2		-0.54	
1161	ISO2719	64.5		-0.95	
1194		-----		-----	
1201	ISO2719	66.0		-0.06	
1205	D93	65.0		-0.65	
1227	D93	65.0		-0.65	
1237	ISO2719	64.0		-1.25	
1259	ISO2719	67.5		0.84	
1292		-----		-----	
1300	ISO2719	65.5		-0.36	
1346	ISO2719	66		-0.06	
1389	D93	69.5		2.03	
1397	ISO2719	67.5		0.84	
1404	ISO2719	67.0		0.54	
1409	ISO2719	65.5		-0.36	
1443	ISO2719	65.5		-0.36	
1455	ISO2719	65.5		-0.36	
1459	ISO2719	65.0		-0.65	
1510	IP34	64.0		-1.25	
1521		-----		-----	
1539	ISO2719	66.5		0.24	
1554	ISO2719	67.55		0.87	
1569	ISO2719	65.6		-0.30	
1586	ISO2719	68.0		1.14	
1631		-----		-----	
1634	D93	66.3		0.12	
1635	ISO2719	68.0		1.14	
1656	ISO2719	67.5		0.84	
1659	ISO3679	65.0		-0.65	
1706	D93	64.5		-0.95	
1710	ISO2719	65.5		-0.36	
1724	D93	66.0		-0.06	
1728	D93	67		0.54	
1771		-----		-----	
1776	ISO2719	65.0		-0.65	
1787	ISO2719	64.85		-0.74	
1810	D93	63.0		-1.85	
1811	ISO2719	64.5		-0.95	
1842	D93	65		-0.65	
2129	ISO2719	65.17		-0.55	

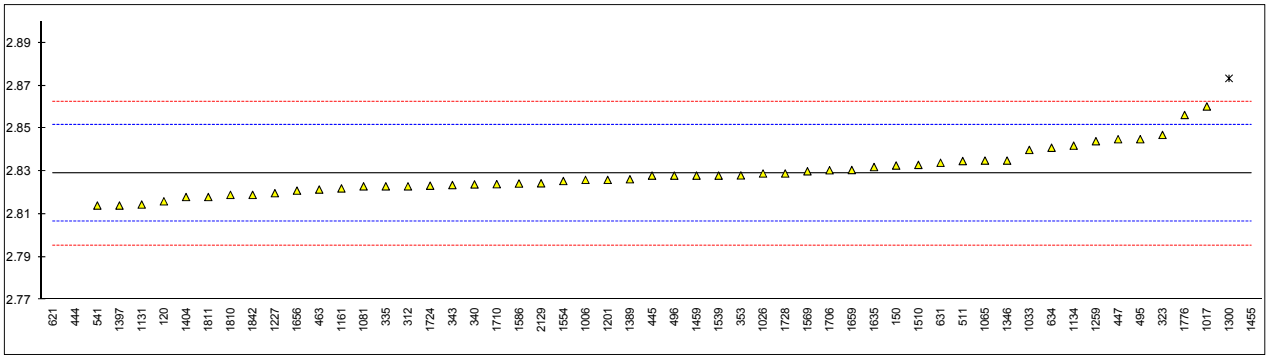
normality	OK
n	61
outliers	0
mean (n)	66.097
st.dev. (n)	1.4407
R(calc.)	4.034
R(ISO2719:02)	4.693

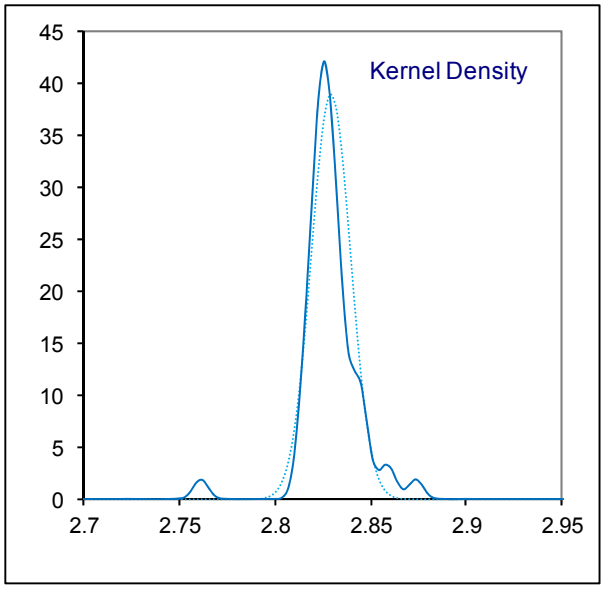

72
70
68
66
64
62
60
58
1810 511 634 1237 1510 1161 1706 1811 621 1787 631 1065 1227 323 1205 1459 1659 1776 1842 2129 1134 120 1006 1300 1409 1443 1455 1710 1569 1201 1017 1033 1346 1724 496 1634 312 1539 150 353 340 495 1081 335 1404 1728 463 1259 1397 1656 1554 445 1026 1131 338 541 1586 1635 447 343 1389


Kernel Density
0.3
0.25
0.2
0.15
0.1
0.05
0
60
65
70
75

Determination of Kinematic Viscosity @ 40°C on sample #14070; result in mm^2/s

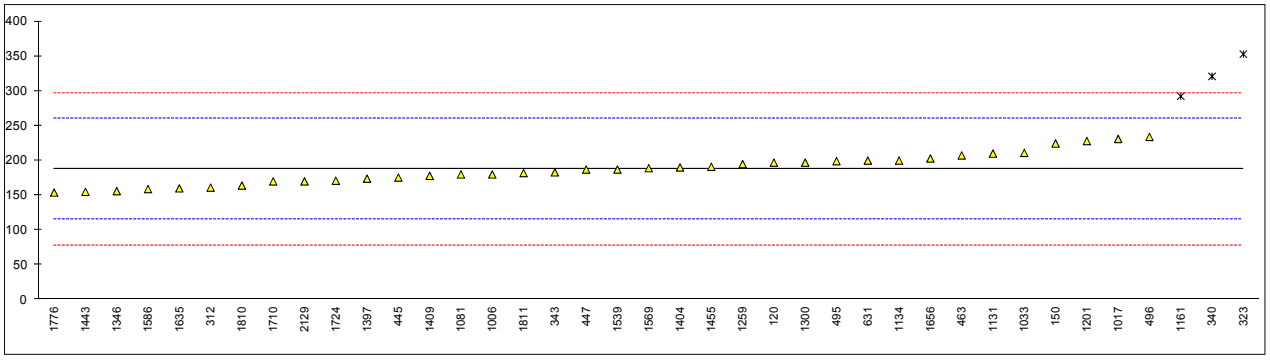
lab	method	value	mark	z(targ)	remarks
120	D445	2.816		-1.16	
150	ISO3104	2.8327		0.33	
312	D445	2.823		-0.54	
323	ISO3104	2.847		1.60	
334		-----		-----	
335	ISO3104	2.823		-0.54	
338		-----		-----	
340	ISO3104	2.8239		-0.46	
343	D445	2.8236		-0.48	
353	IP71	2.8281		-0.08	
444	ISO3104	2.7609	C,R(0.01)	-6.07	first reported: 2.747
445	IP71	2.828		-0.09	
447	D445	2.845	C	1.43	first reported:2.752
463	ISO3104	2.8215		-0.67	
495	ISO3104	2.845		1.43	
496	ISO3104	2.8280		-0.09	
511	D445	2.8348		0.52	
541	ISO3104	2.814		-1.34	
621	D445	2.3982	R(0.01)	-38.42	
631	D445	2.834		0.45	
634	D445	2.841	C	1.07	first reported:2.9145
1006	D445	2.8260		-0.27	
1017	D445	2.8603		2.79	
1026	ISO3104	2.829	C	0.00	first reported: 2.929
1033	IP71	2.840		0.98	
1065	D445	2.835		0.53	
1081	D445	2.823		-0.54	
1131	ISO3104	2.8145		-1.29	
1134	IP71	2.842		1.16	
1161	ISO3104	2.822		-0.63	
1194		-----		-----	
1201	ISO3104	2.826		-0.27	
1205		-----		-----	
1227	D445	2.8198		-0.82	
1237		-----		-----	
1259	ISO3104	2.84407		1.34	
1292		-----		-----	
1300	ISO3104	2.8734	R(0.01)	3.96	
1346	ISO3104	2.835		0.53	
1389	D445	2.8263		-0.24	
1397	ISO3104	2.814		-1.34	
1404	ISO3104	2.818		-0.98	
1409		-----		-----	
1443		-----		-----	
1455	ISO3104	3.186	R(0.01)	31.84	
1459	D7042	2.828		-0.09	
1510	IP71	2.833		0.36	
1521		-----		-----	
1539	ISO3104	2.828		-0.09	
1554	ISO3014	2.82548		-0.31	
1569	ISO3104	2.830		0.09	
1586	ISO3104	2.8243		-0.42	
1631		-----		-----	
1634		-----		-----	
1635	ISO3104	2.832		0.27	
1656	ISO3104	2.821		-0.71	
1659	ISO3104	2.8306		0.14	
1706	ISO3104	2.8305		0.13	
1710	ISO3104	2.824		-0.45	
1724	D445	2.8233		-0.51	
1728	D445	2.829		0.00	
1771		-----		-----	
1776	ISO3104	2.8563		2.43	
1787		-----		-----	
1810	D7042	2.819		-0.89	
1811	ISO3104	2.8180		-0.98	
1842	IP71	2.819		-0.89	
2129	ISO3104	2.8244		-0.41	
	normality	not OK			
	n	51			
	outliers	4			
	mean (n)	2.82901			
	st.dev. (n)	0.010226			
	R(calc.)	0.02863			
	R(ISO3104:94)	0.03140			R(ISO3104:94)=R(445:12)=IP71:97

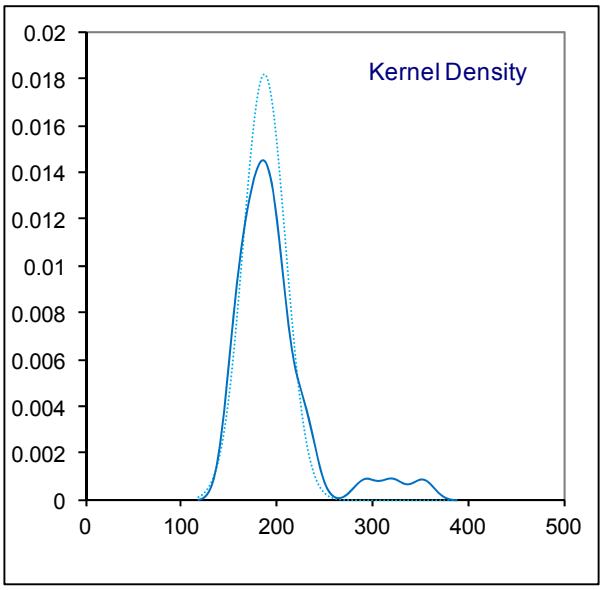

2.89
2.87
2.85
2.83
2.81
2.79
2.77
621 444 541 1397 1131 120 1404 1811 1810 1842 1227 1656 463 1161 1081 335 312 1724 343 340 1710 1586 2129 1554 1006 1201 1389 445 496 1459 1539 353 1026 1728 1569 1706 1659 1635 150 1510 631 511 1065 1346 1033 634 1134 1259 447 495 323 1776 1017 1300 1455


Kernel Density
45
40
35
30
25
20
15
10
5
0
2.7
2.75
2.8
2.85
2.9
2.95

Determination of Lubricity by HFRR on sample #14070; result in µm

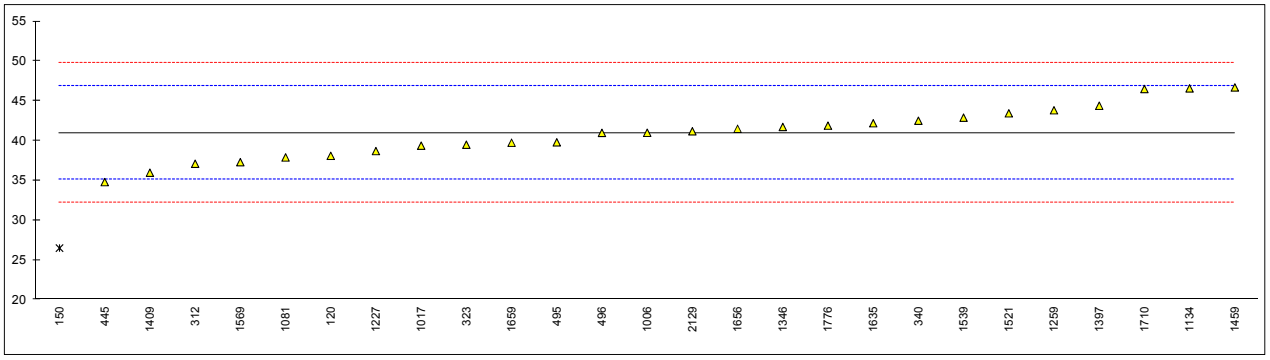
lab	method	value	mark	z(targ)	remarks
120	D6079	197		0.26	
150	ISO12156-1	224.5		1.01	
312	ISO12156-1	161		-0.73	
323	ISO12156-1	353	R(0.01)	4.54	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340	ISO12156-1	321	R(0.01)	3.66	
343	ISO12156-1	183		-0.13	
353		-----		-----	
444		-----		-----	
445	ISO12156-1	175.5		-0.33	
447	ISO12156-1	187		-0.02	
463	ISO12156-1	207.3		0.54	
495	ISO12156-1	199		0.31	
496	ISO12156-1	234		1.27	
511		-----		-----	
541		-----		-----	
621		-----		-----	
631	D7688	200		0.34	
634		-----		-----	
1006	D6079	180		-0.21	
1017	ISO12156-1	231		1.19	
1026		-----		-----	
1033	IP450	211		0.64	
1065		-----		-----	
1081	ISO12156-1	180		-0.21	
1131	ISO12156-1	210		0.62	
1134	ISO12156-1	200		0.34	
1161	ISO12156-1	292.47	R(0.01)	2.88	
1194		-----		-----	
1201	ISO12156-1	228		1.11	
1205		-----		-----	
1227		-----		-----	
1237		-----		-----	
1259	ISO12156-1	195		0.20	
1292		-----		-----	
1300	ISO12156-1	197		0.26	
1346	ISO12156-1	156		-0.87	
1389		-----		-----	
1397	ISO12156-1	174		-0.37	
1404	ISO12156-1	190		0.07	
1409	ISO12156-1	178		-0.26	
1443	ISO12156-1	155		-0.89	
1455	ISO12156-1	191		0.09	
1459		-----		-----	
1510		-----		-----	
1521		-----		-----	
1539	ISO12156-1	187		-0.02	
1554		-----		-----	
1569	ISO12156-1	189		0.04	
1586	ISO12156-1	159		-0.78	
1631		-----		-----	
1634		-----		-----	
1635	ISO12156-1	160		-0.76	
1656	ISO12156-1	203		0.42	
1659		-----		-----	
1706		-----		-----	
1710	ISO12156-1	170		-0.48	
1724	D6079	171		-0.46	
1728		-----		-----	
1771		-----		-----	
1776	ISO12156-1	154		-0.92	
1787		-----		-----	
1810	ISO12156-1	164		-0.65	
1811	ISO12156-1	182		-0.15	
1842		-----		-----	
2129	ISO12156-1	170		-0.48	
	normality	OK			
	n	36			
	outliers	3			
	mean (n)	187.59			
	st.dev. (n)	21.984			
	R(calc.)	61.55			
	R(ISO12156-1:06)	102.00			Compare R(D6079:11) = 80

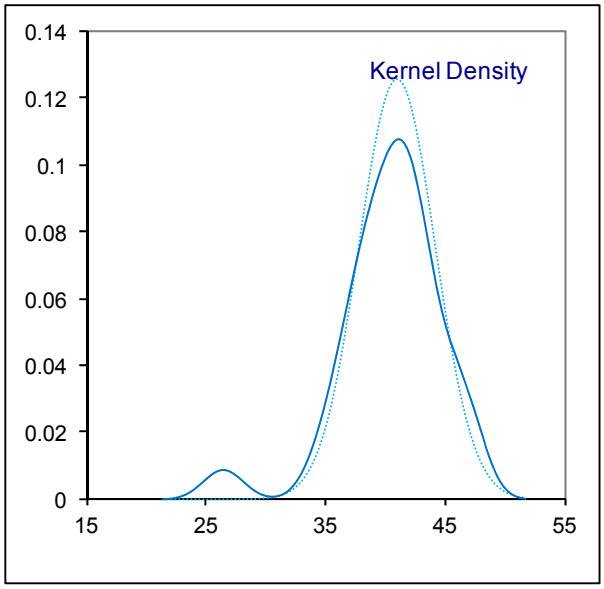

400
350
300
250
200
150
100
50
0
1776 1443 1346 1586 1635 312 1810 1710 2129 1724 1397 445 1409 1081 1006 1811 343 447 1539 1569 1404 1455 1259 120 1300 495 631 1134 1656 463 1131 1033 150 1201 1017 496 1161 340 323


Kernel Density
0.02
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
0 100 200 300 400 500

Determination of Oxidation Stability EN15751 on sample #14070; result in hours

lab	method	value	mark	z(targ)	remarks
120	EN15751	38.1		-0.99	
150	EN15751	26.5	C,R(0.01)	-4.96	first reported: 23
312	EN15751	37.1		-1.33	
323	EN15751	39.5		-0.51	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340	EN15751	42.51		0.52	
343	EN15751	>35		-----	
353		-----		-----	
444		-----		-----	
445	EN15751	34.8		-2.12	
447		-----		-----	
463		-----		-----	
495	EN15751	39.8		-0.41	
496	EN15751	40.99		0.00	
511		-----		-----	
541		-----		-----	
621		-----		-----	
631		-----		-----	
634		-----		-----	
1006	EN15751	41.0		0.00	
1017	EN15751	39.38		-0.55	
1026		-----		-----	
1033		-----		-----	
1065		-----		-----	
1081	EN15751	37.9		-1.06	
1131		-----		-----	
1134	EN15751	46.58		1.92	
1161		-----		-----	
1194		-----		-----	
1201	EN15751	>48		>2.23	false negative test result?
1205		-----		-----	
1227	EN15751	38.7		-0.78	
1237		-----		-----	
1259	EN15751	43.83		0.97	
1292		-----		-----	
1300	EN15751	>48		>2.23	false negative test result?
1346	EN15751	41.73		0.25	
1389		-----		-----	
1397	EN15751	44.4		1.17	
1404	EN15751	>20		-----	
1409	EN15751	35.98		-1.72	
1443		-----		-----	
1455		-----		-----	
1459	EN15751	46.7		1.96	
1510		-----		-----	
1521	EN15751	43.45		0.84	
1539	EN15751	42.9		0.65	
1554		-----		-----	
1569	EN15751	37.3		-1.26	
1586		-----		-----	
1631		-----		-----	
1634		-----		-----	
1635	EN15751	42.2		0.42	
1656	EN15751	41.5		0.18	
1659	EN15751	39.75		-0.42	
1706		-----		-----	
1710	EN15751	46.5		1.89	
1724	EN15751	>24		-----	
1728		-----		-----	
1771		-----		-----	
1776	EN15751	41.9		0.31	
1787		-----		-----	
1810		-----	W	-----	result withdrawn, first reported: 24.5
1811		-----		-----	
1842		-----		-----	
2129	EN15751	41.185		0.07	
	normality	OK			
	n	26			
	outliers	1			
	mean (n)	40.988			
	st.dev. (n)	3.1757			
	R(calc.)	8.892			
	R(EN15751:14)	8.176			

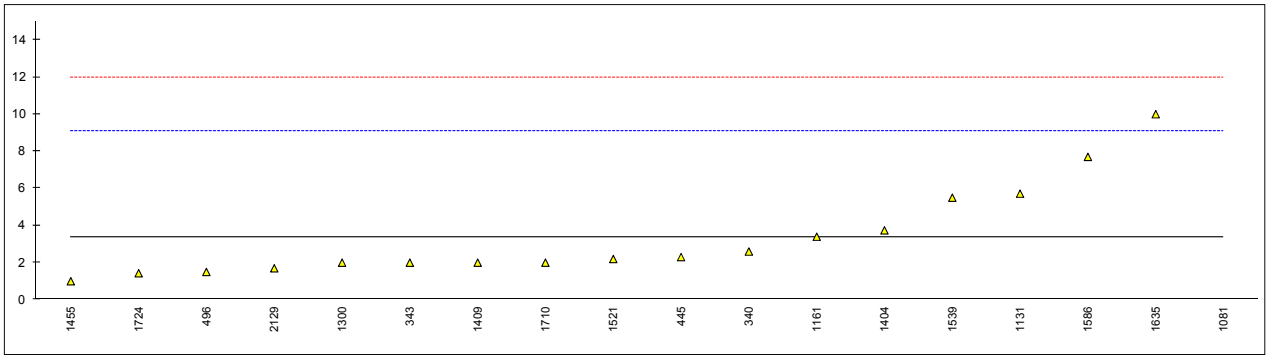

55
50
45
40
35
30
25
20
150
445
1409
312
1569
1081
120
1227
1017
323
1659
495
496
1006
2129
1656
1346
1776
1635
340
1539
1521
1259
1397
1710
1134
1459

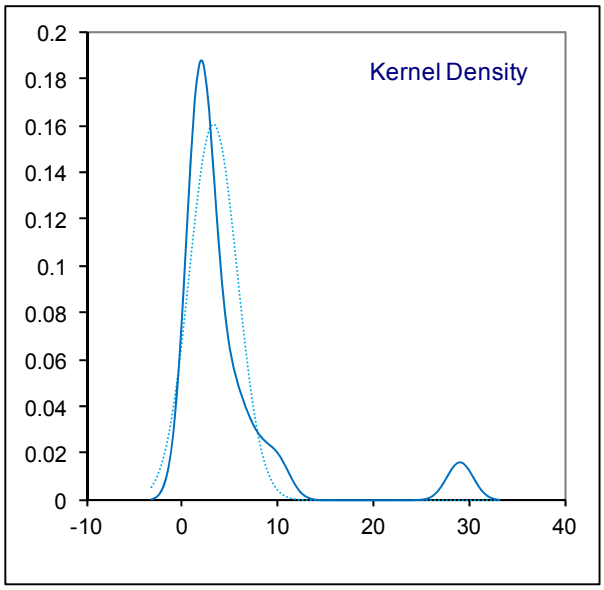

Kernel Density
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
15
25
35
45
55

Determination of Oxidation Stability ISO12205 on sample #14070; result in g/m^3

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
150		-----		-----	
312	ISO12205	<0.5		-----	
323	ISO12205	<1		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340	ISO12205	2.6		-0.26	
343	ISO12205	2		-0.47	
353		-----		-----	
444		-----		-----	
445	IP388	2.3		-0.36	
447	ISO12205	<0		-----	
463		-----		-----	
495		-----		-----	
496	ISO12205	1.5		-0.64	
511		-----		-----	
541		-----		-----	
621		-----		-----	
631		-----		-----	
634		-----		-----	
1006		-----		-----	
1017		-----		-----	
1026		-----		-----	
1033		-----		-----	
1065		-----		-----	
1081	D2274	29	G(0.01)	8.92	
1131	ISO12205	5.72		0.83	
1134		-----		-----	
1161	ISO12205	3.4		0.02	
1194		-----		-----	
1201	ISO12205	<3		-----	
1205		-----		-----	
1227		-----		-----	
1237		-----		-----	
1259		-----		-----	
1292		-----		-----	
1300	ISO12205	1.999		-0.47	
1346		-----		-----	
1389		-----		-----	
1397		-----		-----	
1404	ISO12205	3.74		0.14	
1409	ISO12205	2		-0.47	
1443		-----		-----	
1455	ISO12205	1		-0.81	
1459		-----		-----	
1510		-----		-----	
1521	ISO12205	2.2		-0.40	
1539	ISO12205	5.5		0.75	
1554		-----		-----	
1569		-----		-----	
1586	ISO12205	7.7		1.51	
1631		-----		-----	
1634		-----		-----	
1635	ISO12205	10		2.31	
1656	D2274	<1		-----	
1659		-----		-----	
1706		-----		-----	
1710	ISO12205	2.0		-0.47	
1724	ISO12205	1.43		-0.66	
1728		-----		-----	
1771		-----		-----	
1776		-----		-----	
1787		-----		-----	
1810		-----		-----	
1811		-----		-----	
1842		-----		-----	
2129	ISO12205	1.7		-0.57	

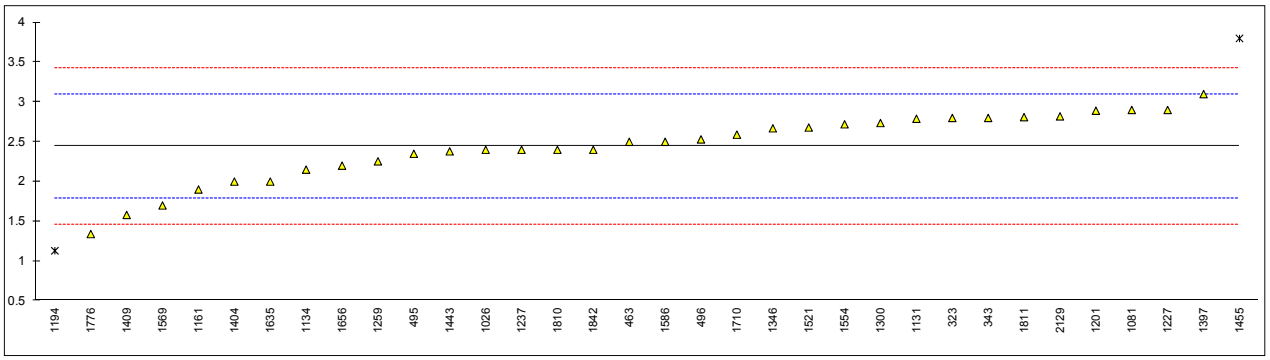
normality	not OK
n	17
outliers	1
mean (n)	3.341
st.dev. (n)	2.4896
R(calc.)	6.971
R(ISO12205:95)	8.059

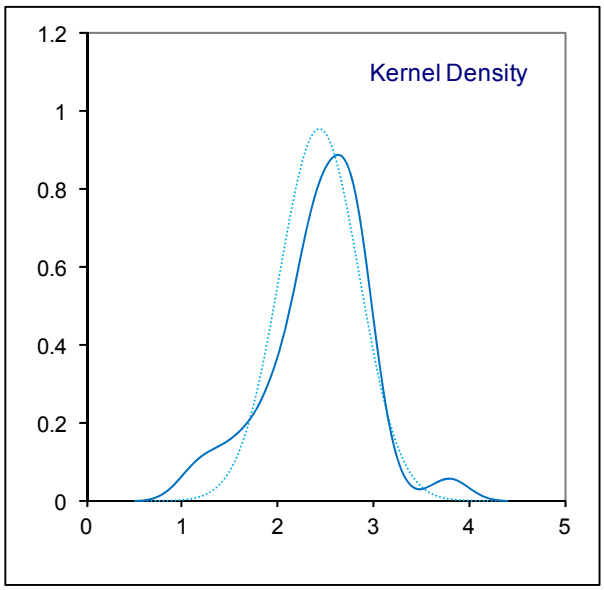

14
12
10
8
6
4
2
0
1455
1724
496
2129
1300
343
1409
1710
1521
445
340
1161
1404
1539
1131
1586
1635
1081


Kernel Density
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
-10
0
10
20
30
40

Determination of Poly Aromatic Hydrocarbons on sample #14070; result in %M/M

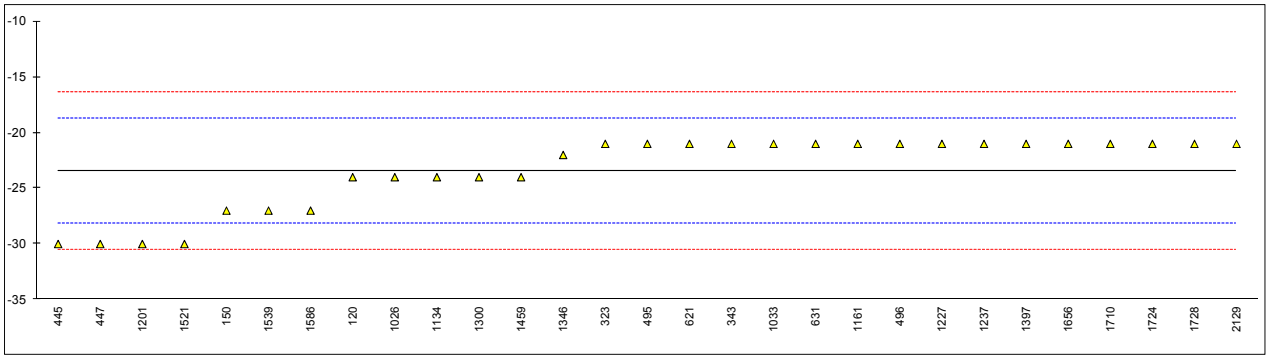
lab	method	value	mark	z(targ)	remarks
120		-----		-----	
150		-----		-----	
312		-----		-----	
323	EN12916	2.8		1.09	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340		-----		-----	
343	EN12916	2.8		1.09	
353		-----		-----	
444		-----		-----	
445		-----		-----	
447		-----		-----	
463	EN12916	2.5		0.17	
495	EN12916	2.35		-0.29	
496	EN12916	2.53		0.26	
511		-----		-----	
541		-----		-----	
621		-----		-----	
631		-----		-----	
634		-----		-----	
1006		-----		-----	
1017		-----		-----	
1026	EN12916	2.4		-0.13	
1033		-----		-----	
1065		-----		-----	
1081	EN12916	2.9		1.39	
1131	EN12916	2.79		1.06	
1134	EN12916	2.15		-0.90	
1161	EN12916	1.9		-1.66	
1194	EN12916Mod.	1.13	R(0.05)	-4.01	
1201	EN12916	2.89		1.36	
1205		-----		-----	
1227	EN12916	2.9		1.39	
1237	EN12916	2.4		-0.13	
1259	EN12916	2.254		-0.58	
1292		-----		-----	
1300	EN12916	2.7361		0.89	
1346	EN12916	2.67		0.69	
1389		-----		-----	
1397	EN12916	3.1		2.00	
1404	EN12916	2.0		-1.35	
1409	EN12916	1.58		-2.64	
1443	EN12916	2.38		-0.19	
1455	EN12916	3.8	R(0.05)	4.14	
1459		-----		-----	
1510		-----		-----	
1521	EN12916	2.68		0.72	
1539		-----		-----	
1554	EN12916	2.72		0.84	
1569	EN12916	1.7		-2.27	
1586	EN12916	2.5		0.17	
1631		-----		-----	
1634		-----		-----	
1635	EN12916	2.0		-1.35	
1656	EN12916	2.2		-0.74	
1659		-----		-----	
1706		-----		-----	
1710	EN12916	2.59		0.45	
1724		-----		-----	
1728		-----		-----	
1771		-----		-----	
1776	EN12916	1.34		-3.37	
1787		-----		-----	
1810	EN12916	2.4		-0.13	
1811	EN12916	2.81		1.12	
1842	IP391	2.4		-0.13	
2129	EN12916	2.82		1.15	
	normality	OK			
	n	32			
	outliers	2			
	mean (n)	2.443			
	st.dev. (n)	0.4177			
	R(calc.)	1.170			
	R(EN12916:06)	0.917			

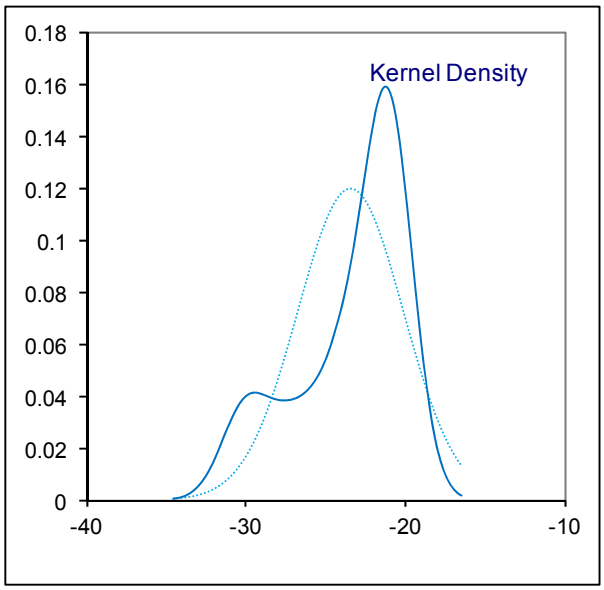

4
3.5
3
2.5
2
1.5
1
0.5
1194
1776
1409
1569
1161
1404
1635
1134
1656
1259
495
1443
1026
1237
1810
1842
463
1586
496
1710
1346
1521
1554
1300
1131
323
343
1811
2129
1201
1081
1227
1397
1455


Kernel Density
1.2
1
0.8
0.6
0.4
0.2
0
0
1
2
3
4
5

Determination of Pour Point (manual) on sample #14070; results in °C

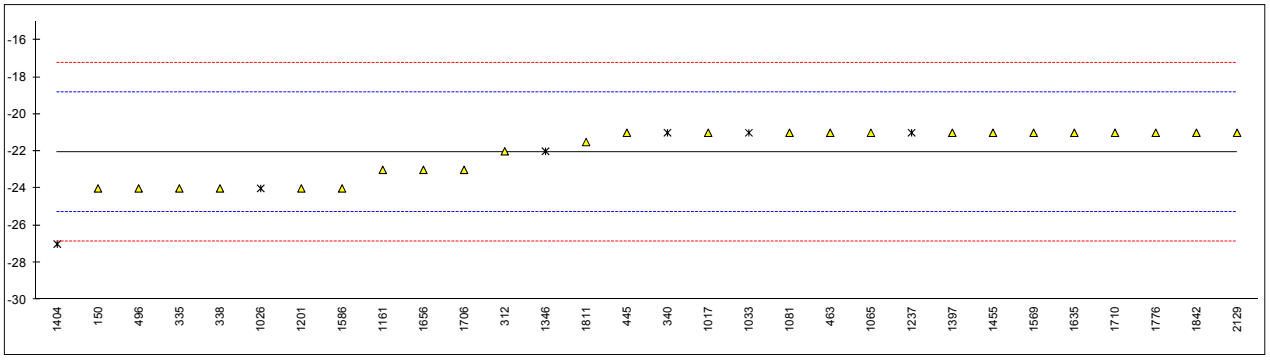
lab	method	value	mark	z(targ)	remarks
120	D97	-24		-0.28	
150	ISO3016	-27		-1.56	
312		-----		-----	
323	ISO3016	-21		0.99	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340	ISO3016	-21.0	C	0.99	test result was reported under pour point automated
343	D97	-21		0.99	
353		-----		-----	
444		-----		-----	
445	IP15	-30		-2.83	
447	D97	-30		-2.83	
463		-----		-----	
495	D97	-21		0.99	
496	ISO3016	-21.0		0.99	
511		-----		-----	
541	ISO3016	<-21		-----	
621	D97	-21.0		0.99	
631	D95	-21		0.99	
634		-----		-----	
1006		-----		-----	
1017		-----		-----	
1026	D97	-24	C	-0.28	test result was reported under pour point automated
1033	IP15	-21		0.99	
1065		-----		-----	
1081		-----		-----	
1131		-----		-----	
1134	IP15	-24		-0.28	
1161	ISO3016	-21		0.99	
1194		-----		-----	
1201	ISO3016	-30		-2.83	
1205		-----		-----	
1227	D97	-21		0.99	
1237	ISO3016	-21	C	0.99	test result was reported under pour point automated
1259		-----		-----	
1292		-----		-----	
1300	ISO3016	-24		-0.28	
1346	ISO3016	-22	C	0.57	test result was reported under pour point automated
1389	D97	< -21		-----	
1397	ISO3016	-21		0.99	
1404		-----		-----	
1409		-----		-----	
1443		-----		-----	
1455		-----		-----	
1459	ISO3016	-24		-0.28	
1510		-----		-----	
1521	ISO3016	-30		-2.83	
1539	ISO3016	-27		-1.56	
1554		-----		-----	
1569		-----		-----	
1586	ISO3016	-27		-1.56	
1631		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656	ISO3016	-21		0.99	
1659		-----		-----	
1706		-----		-----	
1710	ISO3016	-21		0.99	
1724	D97	-21		0.99	
1728	D97	-21		0.99	
1771		-----		-----	
1776		-----		-----	
1787		-----		-----	
1810		-----		-----	
1811		-----		-----	
1842		-----		-----	
2129	ISO3016	-21		0.99	
	normality	OK			
	n	30			
	outliers	0			
	mean (n)	-23.33			
	st.dev. (n)	3.294			
	R(calc.)	9.22			
	R(ISO3016:94)	6.59			compare R(D97:12/IP15) = 6.6

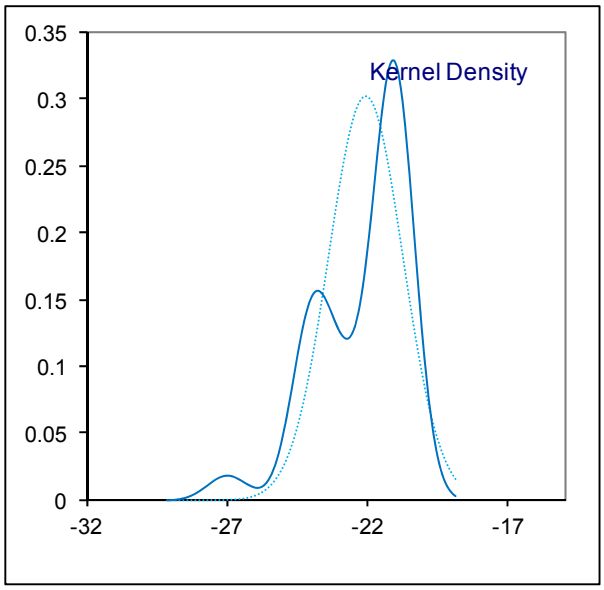

-10
-15
-20
-25
-30
-35
445
447
1201
1521
150
1539
1586
120
1026
1134
1300
1459
1346
323
495
621
343
1033
631
1161
496
1227
1237
1397
1656
1710
1724
1728
2129


Kernel Density
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
-40
-30
-20
-10

Determination of Pour Point (automated) on sample #14070; results in °C

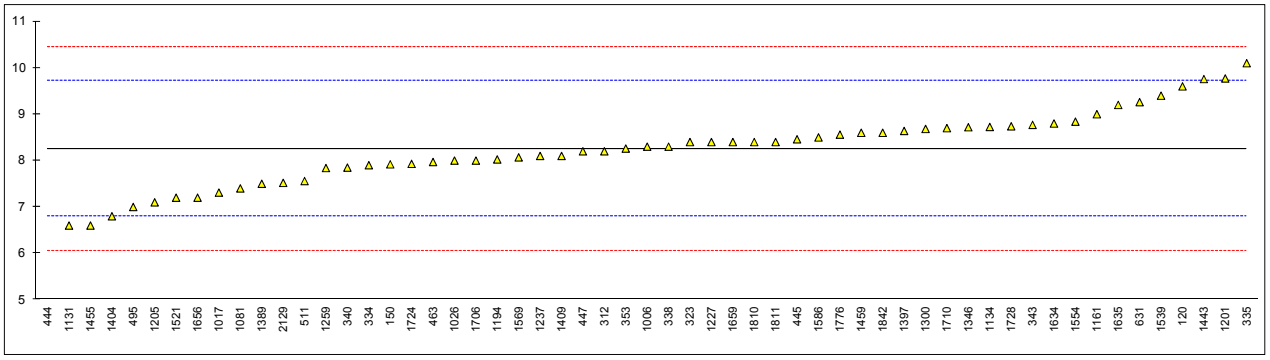
lab	method	value	mark	z(targ)	remarks
120		-----		-----	
150	D5950	-24		-1.21	
312	D5950	-22		0.04	
323		-----		-----	
334		-----		-----	
335	D5950	-24		-1.21	
338	D5950	-24		-1.21	
340	ISO3016	-21.0	ex	0.66	result excluded, ISO3016 is a manual method
343		-----		-----	
353		-----		-----	
444		-----		-----	
445	D5950	-21		0.66	
447		-----		-----	
463	D6892	-21		0.66	
495		-----		-----	
496	D7346	-24.0		-1.21	
511		-----		-----	
541		-----		-----	
621		-----		-----	
631		-----		-----	
634		-----		-----	
1006		-----		-----	
1017	D5950	-21		0.66	
1026	D97	-24	ex	-1.21	result excluded, D97 is a manual method
1033	IP15	-21	ex	0.66	result excluded, IP 15 is a manual method
1065	D5950	-21		0.66	
1081	D5950	-21	C	0.66	first reported: -30
1131		-----		-----	
1134		-----		-----	
1161	D6749	-23		-0.58	
1194		-----		-----	
1201	D5950	-24		-1.21	
1205		-----		-----	
1227		-----		-----	
1237	ISO3016	-21	ex	0.66	result excluded, ISO3016 is a manual method
1259		-----		-----	
1292		-----		-----	
1300		-----		-----	
1346	ISO3016	-22	ex	0.04	result excluded, ISO3016 is a manual method
1389		-----		-----	
1397	D5950	-21		0.66	
1404	D5950	-27	R(0.05)	-3.07	
1409		-----		-----	
1443		-----		-----	
1455	D5950	-21		0.66	
1459		-----		-----	
1510		-----		-----	
1521		-----		-----	
1539		-----		-----	
1554		-----		-----	
1569	D5950	-21.0		0.66	
1586	D5950	-24		-1.21	
1631		-----		-----	
1634		-----		-----	
1635	D5950	-21		0.66	
1656	D5950	-23		-0.58	
1659		-----		-----	
1706	D5950	-23.0		-0.58	
1710	D5950	-21		0.66	
1724		-----		-----	
1728		-----		-----	
1771		-----		-----	
1776	D5950	-21		0.66	
1787		-----		-----	
1810		-----		-----	
1811	D5950	-21.5		0.35	
1842	D5950	-21		0.66	
2129	D5950	-21		0.66	
	normality	OK			
	n	24			
	outliers	1 + 5 excl.			
	mean (n)	-22.06			
	st.dev. (n)	1.321			
	R(calc.)	3.70			
	R(D5950:14)	4.50			

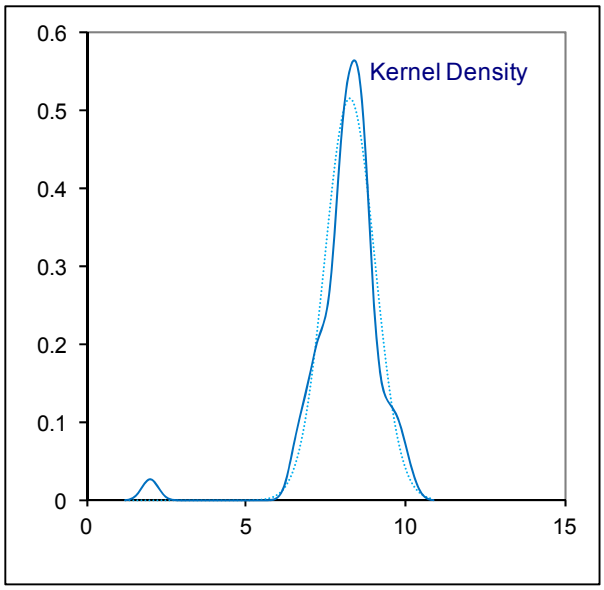

-16
-18
-20
-22
-24
-26
-28
-30
1404
150
496
335
338
1026
1201
1586
1161
1656
1706
312
1346
1811
445
340
1017
1033
1081
463
1065
1237
1397
1455
1569
1635
1710
1776
1842
2129


Kernel Density
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-32
-27
-22
-17

Determination of Sulphur Content on sample #14070; result in mg/kg

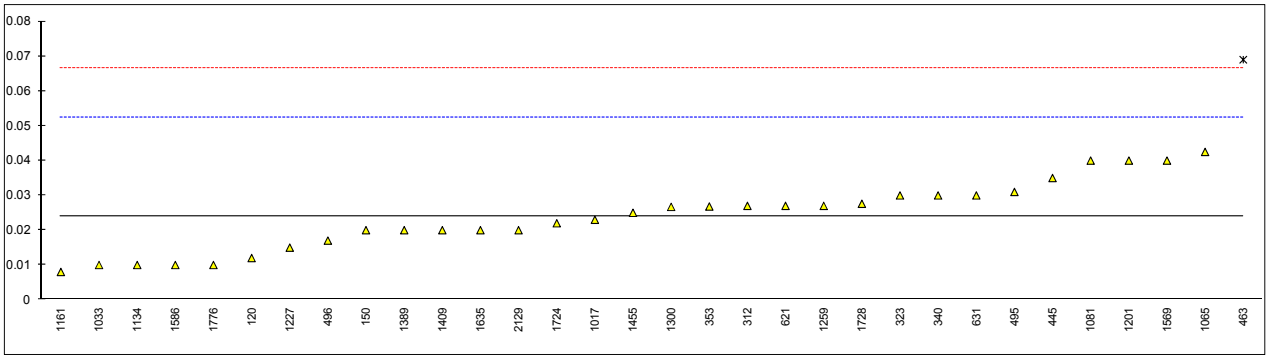
lab	method	value	mark	z(targ)	remarks
120	D5453	9.6		1.84	
150	ISO20846	7.92		-0.46	
312	D5453	8.2		-0.07	
323	ISO20846	8.4		0.20	
334	ISO20846	7.9		-0.48	
335	ISO20846	10.1		2.53	
338	ISO20846	8.3		0.06	
340	ISO20846	7.85		-0.55	
343	ISO20846	8.77		0.71	
353	IP531	8.26		0.01	
444	ISO20846	2.00	C,R(0.01)	-8.56	first reported: 4.79
445	IP490	8.46		0.28	
447	D5453	8.2		-0.07	
463	D5453	7.97		-0.39	
495	ISO20846	7.0		-1.72	
496		-----		-----	
511	D5453	7.56		-0.95	
541		-----		-----	
621	D4294	<20		-----	
631	D5453	9.26		1.38	
634		-----		-----	
1006	D5453	8.3		0.06	
1017	ISO20846	7.31		-1.29	
1026	ISO20846	8.0		-0.35	
1033		-----		-----	
1065		-----		-----	
1081	ISO20846	7.4		-1.17	
1131	ISO20846	6.6		-2.26	
1134	ISO20846	8.7245		0.65	
1161	ISO20846	9.0		1.02	
1194	D7220Mod.	8.025		-0.31	
1201	ISO20846	9.77		2.08	
1205	ISO20846	7.1		-1.58	
1227	D5453	8.4		0.20	
1237	ISO20846	8.1		-0.21	
1259	ISO20846	7.84		-0.57	
1292		-----		-----	
1300	ISO20846	8.6825		0.59	
1346	ISO20846	8.72		0.64	
1389	ISO20846	7.50		-1.03	
1397	ISO20846	8.64		0.53	
1404	ISO20846	6.8		-1.99	
1409	ISO20846	8.1		-0.21	
1443	ISO20846	9.758		2.06	
1455	ISO20846	6.6		-2.26	
1459	in house	8.6		0.47	
1510		-----		-----	
1521	ISO20846	7.2		-1.44	
1539	ISO20846	9.4		1.57	
1554	ISO20846	8.84		0.80	
1569	ISO20846	8.07		-0.25	
1586	ISO20846	8.5		0.34	
1631		-----		-----	
1634	ISO20846	8.8		0.75	
1635	ISO20846	9.2		1.30	
1656	ISO20846	7.2		-1.44	
1659	ISO20846	8.40		0.20	
1706	ISO20846	8.0		-0.35	
1710	ISO20846	8.7		0.61	
1724	D5453	7.93		-0.44	
1728	D5453	8.74		0.67	
1771		-----		-----	
1776	ISO20846	8.56		0.42	
1787		-----		-----	
1810	D5453	8.4		0.20	
1811	ISO20846	8.40		0.20	
1842	D5453	8.6		0.47	
2129	ISO20846	7.52		-1.00	
	normality	OK			
	n	56			
	outliers	1			
	mean (n)	8.253			
	st.dev. (n)	0.7765			
	R(calc.)	2.174			
	R(ISO20846:11)	2.044			compare R(5453:12) = 2.823

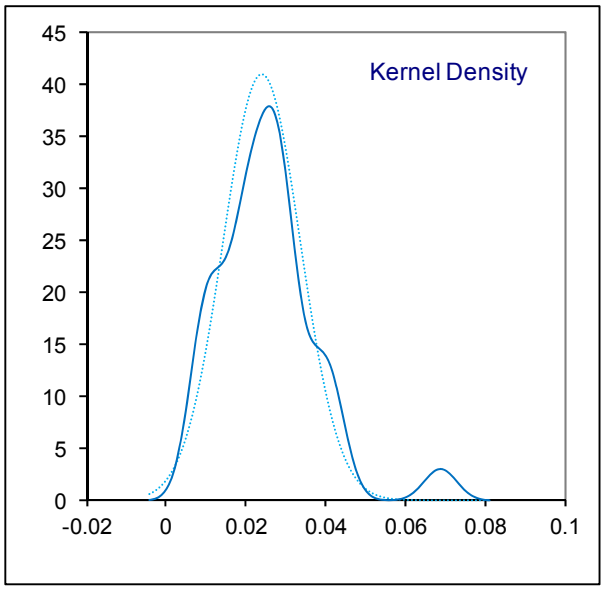

11
10
9
8
7
6
5
444 1131 1455 1404 495 1205 1521 1656 1017 1081 1389 2129 511 1259 340 334 150 1724 463 1026 1706 1194 1569 1237 1409 447 312 353 1006 338 323 1227 1659 1810 1811 445 1586 1776 1459 1842 1397 1300 1710 1346 1134 1728 343 1634 1554 1161 1635 631 1539 120 1443 1201 335


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

Determination of Total acid Number (TAN) on sample #14070; result in mgKOH/g

lab	method	value	mark	z(targ)	remarks
120	D664	0.012		-0.84	
150	D664	0.02		-0.28	
312	D974	0.027		0.21	see §4.1
323	D664	0.03		0.43	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340	D664	0.03		0.43	
343	D664	<0.05		-----	
353	IP177	0.0268		0.20	
444		-----		-----	
445	D664	0.035		0.78	
447	D664	<0.05		-----	
463	D664	0.069	R(0.01)	3.17	
495	D664	0.031		0.50	
496	D664	0.017		-0.49	
511		-----		-----	
541	D664	<0.1		-----	
621	D664	0.027		0.21	
631	D664	0.03		0.43	
634		-----		-----	
1006		-----		-----	
1017	D974	0.023		-0.07	see §4.1
1026	D974	<0.03		-----	see §4.1
1033	D974	0.01		-0.98	see §4.1
1065	D664	0.0425		1.31	
1081	D664	0.04		1.13	
1131		-----		-----	
1134	IP177	0.01		-0.98	
1161	D664	0.008		-1.12	
1194		-----		-----	
1201	D664	0.04		1.13	
1205		-----		-----	
1227	D664	0.015		-0.63	
1237		-----		-----	
1259	D664	0.0270		0.21	
1292		-----		-----	
1300	D664	0.0267		0.19	
1346		-----		-----	
1389	D664	0.02		-0.28	
1397		-----		-----	
1404		-----		-----	
1409	D664	0.02		-0.28	
1443		-----		-----	
1455	D974	0.025		0.07	see §4.1
1459		-----		-----	
1510		-----		-----	
1521		-----		-----	
1539		-----		-----	
1554		-----		-----	
1569	D664	0.04		1.13	
1586	D664	0.01	C	-0.98	first reported: 0.09
1631		-----		-----	
1634		-----		-----	
1635	D664	0.02		-0.28	
1656	ISO6618	<0.1		-----	see §4.1
1659		-----		-----	
1706		-----		-----	
1710		-----		-----	
1724	D664	0.022		-0.14	
1728	D974	0.0276		0.26	see §4.1
1771		-----		-----	
1776	D664	0.01		-0.98	
1787		-----		-----	
1810		-----		-----	
1811		-----		-----	
1842		-----		-----	
2129	D664	0.02		-0.28	
					Only D664 data
	normality	OK			OK
	n	31			26
	outliers	1			1
	mean (n)	0.0240			0.0242
	st.dev. (n)	0.00974			0.01024
	R(calc.)	0.0273			0.0289
	R(D664:11)	0.0398			0.0398

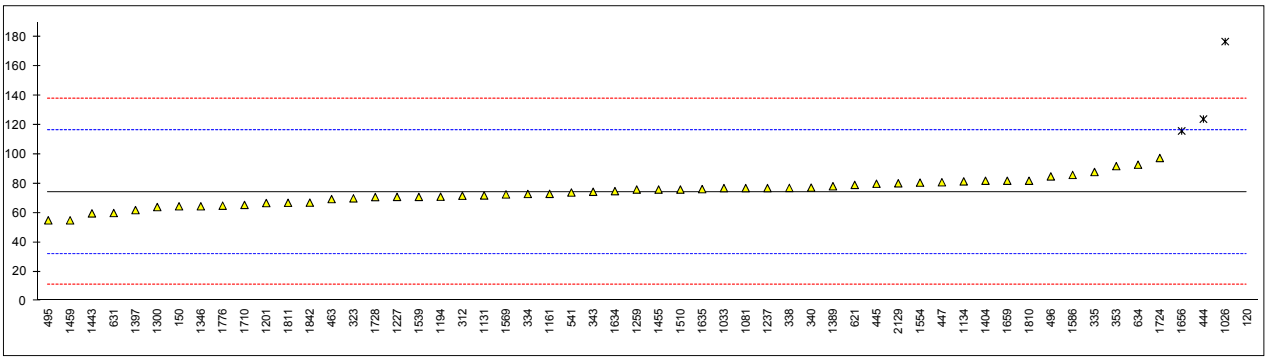

0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
1161
1033
1134
1586
1776
120
1227
496
150
1389
1409
1635
2129
1724
1017
1455
1300
353
312
621
1259
1728
323
340
631
495
445
1081
1201
1569
1065
463

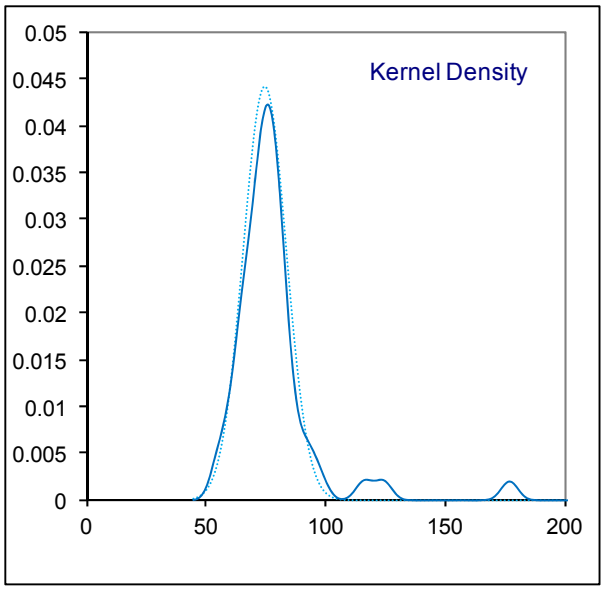

Kernel Density
45
40
35
30
25
20
15
10
5
0
-0.02
0
0.02
0.04
0.06
0.08
0.1

Determination of Water on sample #14070; result in mg/kg

lab	method	value	mark	z(targ)	remarks
120	D6304	262	C,R(0.01)	8.86	first reported: 162
150	ISO12937	64.6		-0.46	
312	ISO12937	71.8		-0.12	
323	ISO12937	70		-0.20	
334	ISO12937	73		-0.06	
335	ISO12937	88		0.65	
338	ISO12937	77.11		0.13	
340	ISO12937	77.3		0.14	
343	ISO12937	74.5		0.01	
353	IP439	92		0.84	
444	ISO12937	124.1	C,R(0.01)	2.35	first reported: 135.6
445	ISO12937	80		0.27	
447	IP438	81		0.32	
463	ISO12937	69.5		-0.23	
495	ISO12937	55		-0.91	
496	ISO12937	85.0		0.50	
511		-----		-----	
541	ISO12937	74		-0.01	
621	D6304	79.19		0.23	
631	D6304	60		-0.68	
634	D6304	93		0.88	
1006		-----		-----	
1017		-----		-----	
1026	D6304	177	R(0.01)	4.85	
1033	IP438	77	C	0.13	first reported: 0.008
1065		-----		-----	
1081	D6304	77		0.13	
1131	ISO12937	72		-0.11	
1134	IP438	81.56		0.34	
1161	ISO12937	73.076		-0.06	
1194	EN12937	71.145		-0.15	
1201	ISO12937	66.8		-0.35	
1205		-----		-----	
1227	D6304	71		-0.16	
1237	ISO12937	77		0.13	
1259	ISO12937	76		0.08	
1292		-----		-----	
1300	ISO12937	64.065		-0.48	
1346	ISO12937	64.6		-0.46	
1389	ISO12937	78.27		0.19	
1397	ISO12937	62		-0.58	
1404	ISO12937	82		0.36	
1409		-----		-----	
1443	ISO12937	59.738		-0.69	
1455	ISO12937	76		0.08	
1459	ISO12937	55		-0.91	
1510	IP438	76		0.08	
1521		-----		-----	
1539	ISO12937	71		-0.16	
1554	ISO12937	80.75		0.30	
1569	ISO12937	72.7		-0.08	
1586	ISO12937	86		0.55	
1631		-----		-----	
1634	ISO12937	74.9		0.03	
1635	ISO12937	76.3		0.09	
1656	ISO12937	116	C,R(0.01)	1.97	first reported: 177
1659	ISO12937	82.0		0.36	
1706		-----		-----	
1710	ISO12937	65.5		-0.42	
1724	D6304	97.55		1.10	
1728	ISO12937	70.9		-0.16	
1771		-----		-----	
1776	ISO12937	65		-0.44	
1787		-----		-----	
1810	ISO12937	82		0.36	
1811	ISO12937	67		-0.35	
1842	IP438	67.1		-0.34	
2129	ISO12937	80.3		0.28	

normality	OK
n	52
outliers	4
mean (n)	74.313
st.dev. (n)	9.0239
R(calc.)	25.267
R(ISO12937:00)	59.283


180
160
140
120
100
80
60
40
20
0
495 1459 1443 631 1397 1300 150 1346 1776 1710 1201 1811 1842 463 323 1728 1227 1539 1194 312 1131 1569 334 1161 541 343 1634 1259 1455 1510 1635 1033 1081 1237 338 340 1389 621 445 2129 1554 447 1134 1404 1659 1810 496 1586 335 353 634 1724 1656 444 1026 120

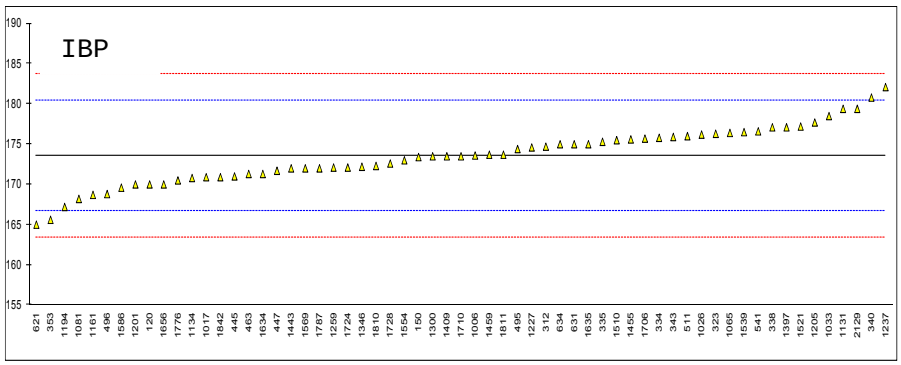

Kernel Density
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
50
100
150
200

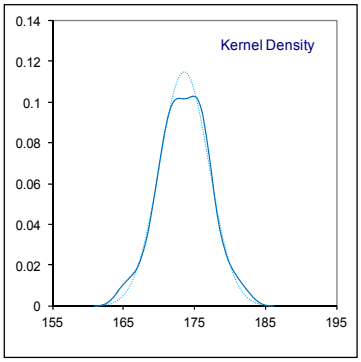
Determination of Distillation on sample #14070; result in °C

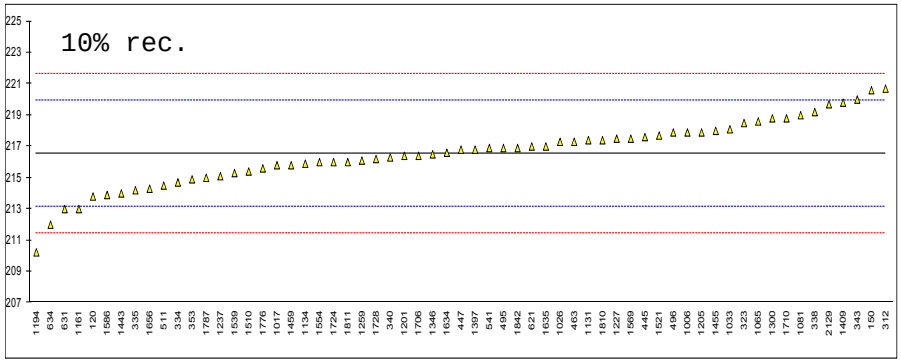
Lab	method	mode	IBP	mark	10%rec	mark	50%rec	mark	90%rec	mark	95%rec	mark	FBP	mark
120	D86	Automated	170.0		213.8		276.9		332.6		345.9		348.9	
150	ISO3405	Automated	173.4		220.6		277.3		330.1		341.4		347.5	
312	D86	Automated	174.7		220.7		279.3		332.2		345.1		351.5	
323	ISO3405	Automated	176.3		218.5		278.4		332.4		344.8		352.9	
334	ISO3405	-----	175.8		214.7		277.8		333.0		343.9		355.4	
335	ISO3405	Automated	175.3		214.2		278.1		333.5		347.6		356.4	
338	ISO3405	Automated	177.1		219.2		278.6		332.8		345.1		355.1	
340	ISO3405	Automated	180.8		216.3		277.8		333.2		346.5		353.9	
343	D86	Automated	175.9		220.0		278.8	C	334.9		347.2		354.2	
353	IP123	Automated	165.6		214.9		278.6		334.4		347.3		356.2	
444		-----	-----		-----		-----		-----		-----		-----	
445	IP123	Automated	171.0		217.6		278.6		330.6		341.9		350.2	
447	D86	Automated	171.7		216.8		278.2		332.8		345.3		354.2	
463	ISO3405	Automated	171.3		217.3		279.5		334.9		347.7		357.4	
495	D86	Automated	174.4		216.9		278.3		332.0		344.3		353.5	
496	ISO3405	Automated	168.8		217.9		277.2		330.9		342.7		352.2	
511	D86	Manual	176.0		214.5		275.5		331.0		343.5		352.5	
541	ISO3405	Automated	176.6		216.9		279.0		332.5		345.0		353.4	
621	D86	Manual	165.0		217.0		278.5		333.0		344.0		350.0	
631	D86	Manual	175.0		213.0		278.0		331.0		342.5		351.5	
634	D86	Manual	175.0		212.0		278.0		334.0		348.0		355.0	
1006	D86	Automated	173.6		217.9		277.9		330.5		341.2		348.8	
1017	ISO3405	Automated	170.9		215.8		276.2		332.3		344.0		353.1	
1026	ISO3405	Automated	176.2		217.3		277.2		332.1		344.9		354.3	
1033	IP123	Automated	178.5		218.1		279.6		333.9		345.0		355.1	
1065	D86	Automated	176.4		218.6		279.5	C	334.2		346.4		356.8	
1081	D86	Automated	168.2		219.0		278.4		332.2		343.3		350.2	
1131	ISO3405	Automated	179.4		217.4		278.0		332.6		345.9		353.6	
1134	IP123	Automated	170.8		215.9		278.0		334.1		347.3		354.4	
1161	ISO3405	Automated	168.7		213.0		276.9		332.8		344.0		351.2	
1194	D86Mod.	Automated	167.2		210.23		277.46		332.56		343.83		346.53	
1201	ISO3405	Automated	170.0		216.4		277.5		332.9		345.7		351.8	
1205	D86	Automated	177.7		217.9		278.8		332.7		345.0		355.2	
1227	D86	Automated	174.6		217.5		279.4		333.4		344.5		353.6	
1237	ISO3405	Manual	182.1		215.1		278.2		330.2		344.2		354.2	
1259	ISO3405	Automated	172.1		216.1		275.7		329.4		338.2		347.1	
1292		-----	-----		-----		-----		-----		-----		-----	
1300	ISO3405	Automated	173.5		218.8		278.9		333.6		346.2		356.0	
1346	ISO3405	Automated	172.2		216.5		276.6		330.0		341.3		351.1	
1389		-----	-----		-----		-----		-----		-----		-----	
1397	ISO3405	Automated	177.1		216.8		277.7		330.6		341.4		354.4	
1404		-----	-----		-----		-----		-----		-----		-----	
1409	ISO3405	Automated	173.5		219.8		279.0		333.3		346.3		352.1	
1443	ISO3405	Manual	172.0		214.0		278.5		333.0		345.5		356.0	
1455	ISO3405	Automated	175.6		218.0		278.1		332.5		345.1		354.1	
1459	ISO3405	Automated	173.7		215.8		277.7		329.1		340.9		350.0	
1510	ISO3405	Automated	175.5		215.4		277.5		332.8		346.9		353.2	
1521	ISO3405	Automated	177.2		217.7		278.2		332.1		345.4		352.8	
1539	ISO3405	Automated	176.5		215.3		277.8		331.3		343.2		354.2	
1554	ISO3405	Manual	173.0		216.0		279.0		334.0		346.0		353.0	
1569	ISO3405	Automated	172.0		217.5		276.3		331.5		341.3		344.4	R(0.05)
1586	ISO3405	Automated	169.6		213.9		276.3		331.6		344.6		353.3	
1631		-----	-----		-----		-----		-----		-----		-----	
1634	D86	Automated	171.3		216.6		277.4		330.9		342.2		354.3	
1635	ISO3405	Manual	175.0		217.0		275.0		330.0		340.0		354.0	
1656	ISO3405	Automated	170.0	C	214.3		277.5		332.9		345.3		352.7	
1659		-----	-----		-----		-----		-----		-----		-----	
1706	ISO3405	Automated	175.7		216.4		278.5		332.4		344.6		353.9	
1710	ISO3405	Automated	173.5		218.8		278.2		332.5		345.2		353.8	
1724	D86	Automated	172.1		216.0		277.7		332.1		344.1		353.0	
1728	D86	Manual	172.6		216.2		279.2		333.7		347.2		354.7	
1771		-----	-----		-----		-----		-----		-----		-----	
1776	ISO3405	Automated	170.5		215.6		276.3		331.2		343.4		349.9	
1787	ISO3405	Manual	172		215		277		331		342		350	
1810	D86	Automated	172.3		217.4		278.0		331.9		342.8		351.9	
1811	ISO3405	Automated	173.7		216		277.6		331.6		342.5		354.0	
1842	D86	Automated	170.9		216.9		277.3		331.7		344.0		355.0	
2129	ISO3405	Automated	179.4		219.7		279.1		333.9		345.2		358.0	
	normality		OK		OK		OK		OK		OK		OK	
	n		61		61		61		61		61		60	
	outliers		0		0		0		0		0		1	
	mean (n)		173.55		216.56		277.89		332.28		344.36		353.05	
	st.dev. (n)		3.485		2.057		1.019		1.345		2.073		2.463	
	R(calc.)		9.76		5.76		2.85		3.77		5.80		6.90	
	R(ISO 3405:11/D86:12)		9.55		4.76		2.97		4.99		8.64		7.10	

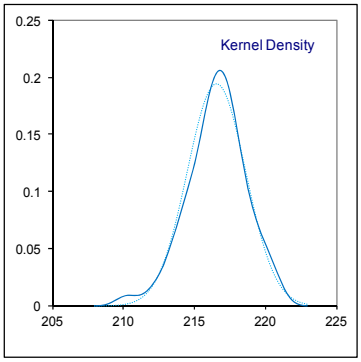
Determination of Distillation Automated on sample #14070; result in %V/V, (continued)

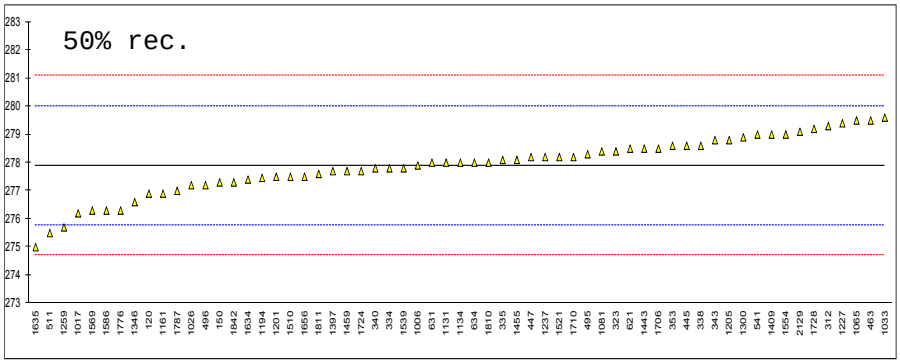
Lab	method	mode	Volume at 250°C	mark	z(targ)	Volume at 350°C	mark	z(targ)	%residue
120	D86	Automated	29.4		1.01	-----		-----	1.2
150	ISO3405	Automated	27.5		-0.96	-----		-----	2.0
312	D86	Automated	26.6		-1.89	96.1		-0.23	2.5
323	ISO3405	Automated	28.1		-0.33	96.6		0.29	1.5
334	ISO3405	-----	28.7		0.29	96.5		0.19	0.5
335	ISO3405	Automated	29.1		0.70	95.5		-0.85	0.6
338	ISO3405	Automated	27.5		-0.96	96.0		-0.33	1.4
340	ISO3405	Automated	28.7		0.29	95.8		-0.54	1.4
343	D86	Automated	26.3		-2.20	95.7		-0.64	0.9
353	IP123	Automated	28.6		0.18	95.6		-0.74	1.0
444		-----	-----		-----	-----		-----	-----
445	IP123	Automated	27.9		-0.54	97.3		1.02	1.6
447	D86	Automated	28.1		-0.33	96.1		-0.23	1.5
463	ISO3405	Automated	27.2		-1.27	95.5		-0.85	0.7
495	D86	Automated	28.5		0.08	96.7		0.40	1.4
496	ISO3405	Automated	29.0		0.60	97.4		1.12	1.4
511	D86	Manual	30.5		2.15	96.0		-0.33	1.0
541	ISO3405	Automated	28.0		-0.44	96.0		-0.33	1.4
621	D86	Manual	28.5		0.08	97.0		0.71	1.6
631	D86	Manual	29.5		1.12	96.9		0.60	1.7
634	D86	Manual	30		1.64	96		-0.33	1
1006		Automated	-----		-----	-----		-----	1.9
1017	ISO3405	Automated	30.4		2.05	96.8		0.50	1.8
1026	ISO3405	Automated	29.1		0.70	96.2		-0.12	1.4
1033	IP123	Automated	26.2		-2.31	95.8		-0.54	1.8
1065	D86	Automated	27.7		-0.75	95.9		-0.43	1.8
1081	D86	Automated	27.6		-0.85	96.8		0.50	1.7
1131	ISO3405	Automated	27.8		-0.65	95.8		-0.54	1.4
1134	IP123	Automated	28.5		0.08	95.9		-0.43	1.6
1161	ISO3405	Automated	29.0		0.60	96.7		0.40	1.0
1194	D86Mod.	Automated	30.07		1.71	-----		-----	1.7
1201	ISO3405	Automated	28.8		0.39	96.2		-0.12	1.5
1205	D86	Automated	27.8		-0.65	96.1		-0.23	1.4
1227	D86	Automated	28.0		-0.44	96.3		-0.02	1.0
1237	ISO3405	Manual	28.1		-0.33	97.0		0.71	1.4
1259	ISO3405	Automated	28.1		-0.33	98.6	R(0.05)	2.37	1.4
1292		-----	-----		-----	-----		-----	-----
1300	ISO3405	Automated	27.7		-0.75	95.5		-0.85	1.6
1346	ISO3405	Automated	29.6		1.22	97.0		0.71	1.4
1389		-----	-----		-----	-----		-----	-----
1397	ISO3405	Automated	27.7		-0.75	97.1		0.81	0.9
1404		-----	-----		-----	-----		-----	-----
1409	ISO3405	Automated	27.0		-1.48	95.9		-0.43	1.8
1443	ISO3405	Manual	29.0		0.60	96.0		-0.33	1.8
1455	ISO3405	Automated	28.2		-0.23	96.0		-0.33	1.2
1459	ISO3405	Automated	28.9		0.49	98.3	R(0.05)	2.06	1.4
1510	ISO3405	Automated	28.9		0.49	95.8		-0.54	1.0
1521	ISO3405	Automated	27.6		-0.85	95.9		-0.43	1.6
1539	ISO3405	Automated	28.3		-0.13	96.5		0.19	-----
1554	ISO3405	Manual	28.5		0.08	96.0		-0.33	1.5
1569	ISO3405	Automated	28.7		0.29	-----		-----	1.4
1586	ISO3405	Automated	29.9		1.53	96.2		-0.12	1.4
1631		-----	-----		-----	-----		-----	-----
1634	D86	Automated	28.6		0.18	97.6		1.33	1.2
1635	ISO3405	Manual	29.0		0.60	97.0		0.71	1.0
1656	ISO3405	Automated	29.7		1.32	96.2		-0.12	1.8
1659		-----	-----		-----	-----		-----	-----
1706	ISO3405	Automated	28.2		-0.23	96.2		-0.12	1.35
1710	ISO3405	Automated	28.0		-0.44	96.2		-0.12	1.4
1724	D86	Automated	28.5		0.08	96.4		0.09	1.4
1728	D86	Manual	27.5		-0.96	95.9		-0.43	1.4
1771		-----	-----		-----	-----		-----	-----
1776	ISO3405	Automated	29.2		0.81	>97.6		-----	1.4
1787	ISO3405	Manual	29		0.60	97		0.71	1.4
1810	D86	Automated	28.1		-0.33	96.9		0.60	1.3
1811	ISO3405	Automated	28.3		-0.13	96.8		0.50	1.4
1842	D86	Automated	28.9		0.49	96.4		0.09	1.7
2129	ISO3405	Automated	27.5		-0.96	96.1		-0.23	1.40
	normality		OK			OK			
	n		60			53			
	outliers		0			2			
	mean (n)		28.42			96.32			
	st.dev. (n)		0.920			0.526			
	R(calc.)		2.58			1.47			
	R(ISO3405:11/D86:12)		2.70			2.70			

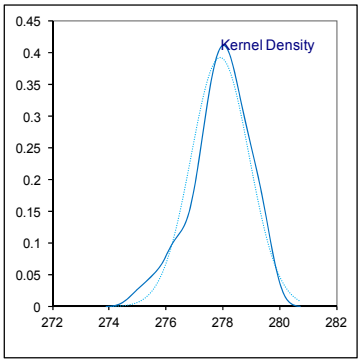

IBP

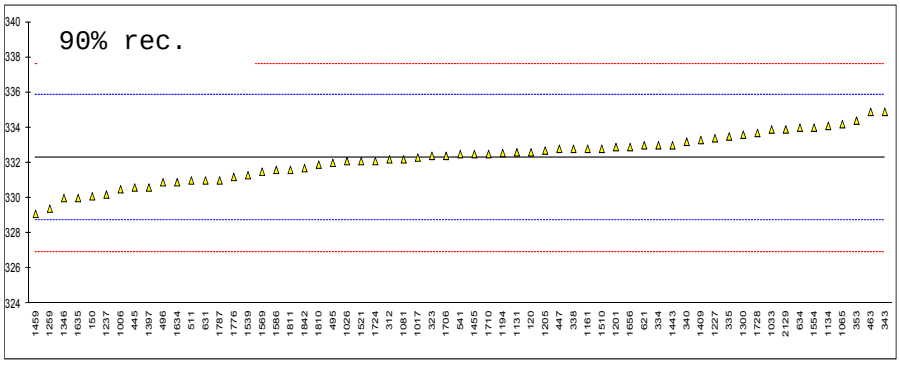

Kernel Density

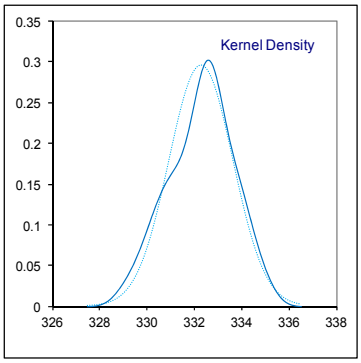

10% rec.

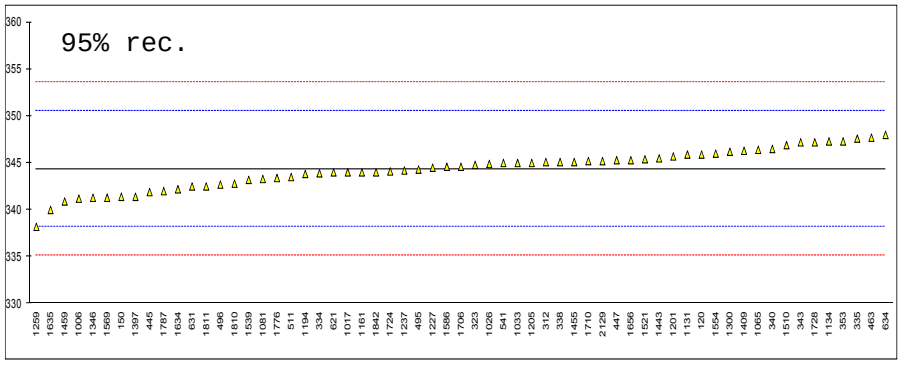

Kernel Density

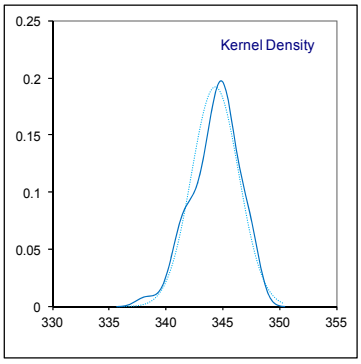

50% rec.

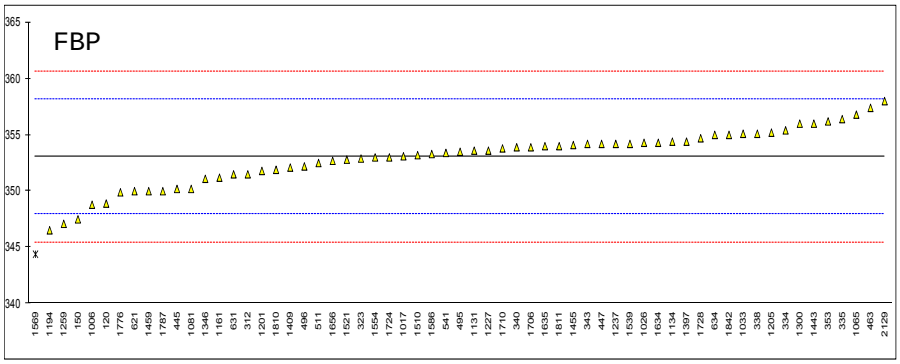

Kernel Density

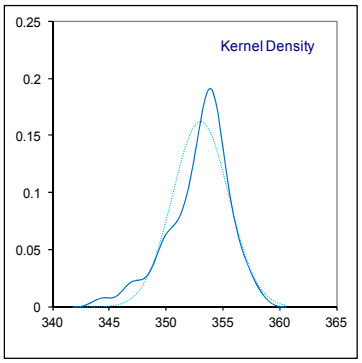

90% rec.

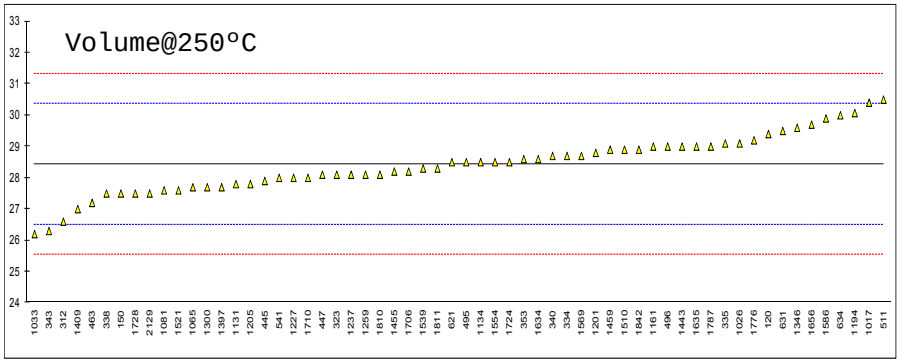

Kernel Density

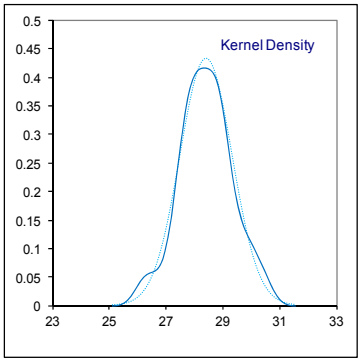

95% rec.

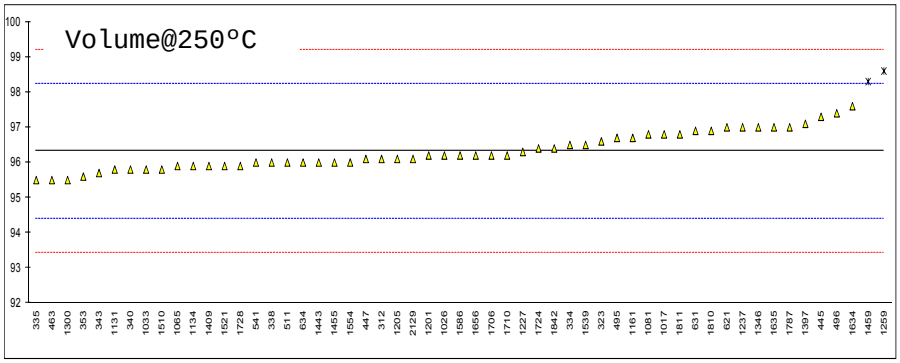

Kernel Density

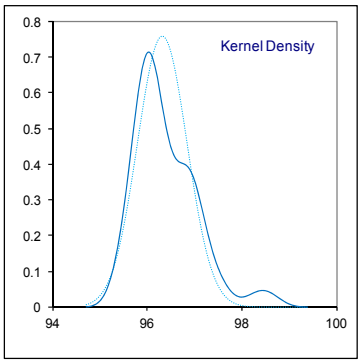








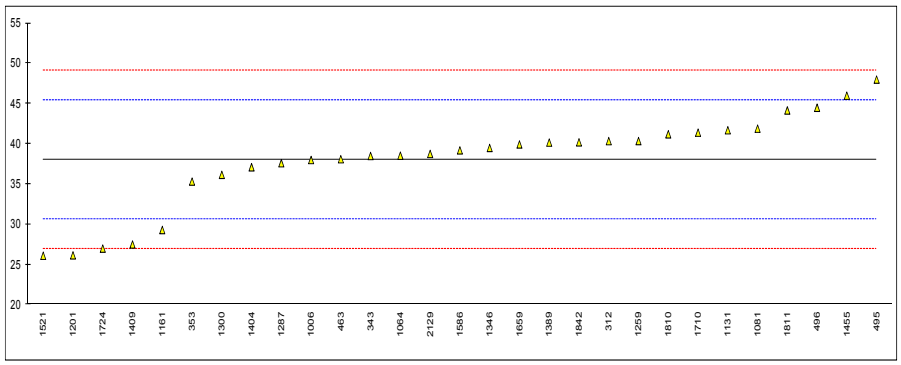


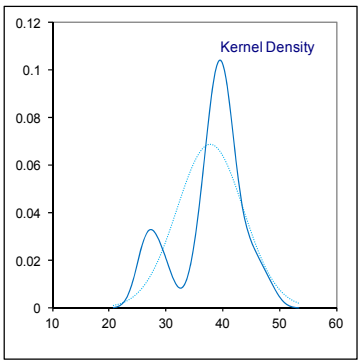


Lab 343 first reported 50% rec: 281.1
Lab 1065 first reported 50% rec: 291.8
Lab 1656 first reported IBP: 160.5

Determination of Total Contamination on sample #14071; result in mg/kg

lab	method	value	mark	z(targ)	volume	remarks
120		-----		-----	-----	
312	EN12662:14	40.35		0.63	300	
323	EN12662:14	>30		-----	320	reported +30
335		-----		-----	-----	
340		-----		-----	400.0	
343	EN12662	38.5		0.13	800	
353	IP440	35.322		-0.73	440	
445		-----		-----	400	
447		-----		-----	-----	
463	EN12662:08	38.10		0.02	800	
495	EN12662:14	48		2.70	300	
496	EN12662:14	44.5		1.75	300	
1006	EN12662	38.0		-0.01	-----	
1033		-----		-----	-----	
1064	EN12662:12	38.54		0.14	316	
1081	EN12662	41.9		1.05	395	
1095		-----		-----	-----	
1131	EN12662:08	41.70		0.99	800	
1134		-----		-----	-----	
1161	EN12662	29.3	C	-2.36	800	first reported: 28.4
1201	EN12662:08	26.15		-3.21	540	
1259	EN12662:98	40.3529		0.63	340	
1287	EN12662:14	37.60		-0.11	-----	
1300	EN12662:14	36.16		-0.50	270	
1346	EN12662:08	39.50		0.40	830.0	
1389	EN12662:14	40.17		0.58	300	
1404	EN12662	37.10		-0.25	800	
1409	EN12662	27.5		-2.84	-----	
1455	EN12662:14	46		2.16	309	
1510		-----		-----	-----	
1521	EN12662:08	26.1		-3.22	400	
1586	EN12662:08	39.2		0.32	800	
1635		-----		-----	-----	
1659	EN12662:08	39.94		0.52	383	
1710	EN12662:08	41.4		0.91	800	
1724	EN12662	26.99		-2.98	825	
1810	EN12662:14	41.2		0.86	300	
1811	EN12662	44.16		1.66	300	
1842	IP440:08	40.2		0.59	800	
2129	EN12662:08	38.76		0.20	425	
			Only EN12662:14 data	Spike		
	normality	OK	OK			
	n	29	8			
	outliers	0	0			
	mean (n)	38.024	41.748	15.31		
	st.dev. (n)	5.7470	4.1043			
	R(calc.)	16.092	11.492			
	R(EN12662:14)	10.362	10.974			Application range: 12 – 30 mg/kg





APPENDIX 2

z-scores Distillation

lab	IBP	10% rec	50% rec	90% rec	95% rec	FBP
120	-1.04	-1.62	-0.94	0.18	0.50	-1.64
150	-0.04	2.37	-0.56	-1.22	-0.96	-2.19
312	0.34	2.43	1.33	-0.04	0.24	-0.61
323	0.81	1.14	0.48	0.07	0.14	-0.06
334	0.66	-1.10	-0.09	0.41	-0.15	0.93
335	0.51	-1.39	0.19	0.69	1.05	1.32
338	1.04	1.55	0.67	0.29	0.24	0.81
340	2.13	-0.16	-0.09	0.52	0.69	0.33
343	0.69	2.02	0.85	1.47	0.92	0.45
353	-2.33	-0.98	0.67	1.19	0.95	1.24
444	-----	-----	-----	-----	-----	-----
445	-0.75	0.61	0.67	-0.94	-0.80	-1.13
447	-0.54	0.14	0.29	0.29	0.31	0.45
463	-0.66	0.43	1.51	1.47	1.08	1.71
495	0.25	0.20	0.38	-0.16	-0.02	0.18
496	-1.39	0.78	-0.65	-0.77	-0.54	-0.34
511	0.72	-1.21	-2.26	-0.72	-0.28	-0.22
541	0.89	0.20	1.04	0.13	0.21	0.14
621	-2.51	0.26	0.57	0.41	-0.12	-1.20
631	0.43	-2.09	0.10	-0.72	-0.60	-0.61
634	0.43	-2.68	0.10	0.97	1.18	0.77
1006	0.01	0.78	0.01	-1.00	-1.02	-1.68
1017	-0.78	-0.45	-1.60	0.01	-0.12	0.02
1026	0.78	0.43	-0.65	-0.10	0.18	0.49
1033	1.45	0.90	1.61	0.91	0.21	0.81
1065	0.84	1.20	1.51	1.08	0.66	1.48
1081	-1.57	1.43	0.48	-0.04	-0.34	-1.13
1131	1.72	0.49	0.10	0.18	0.50	0.22
1134	-0.81	-0.39	0.10	1.02	0.95	0.53
1161	-1.42	-2.09	-0.94	0.29	-0.12	-0.73
1194	-1.86	-3.72	-0.41	0.16	-0.17	-2.57
1201	-1.04	-0.10	-0.37	0.35	0.44	-0.49
1205	1.22	0.78	0.85	0.24	0.21	0.85
1227	0.31	0.55	1.42	0.63	0.05	0.22
1237	2.51	-0.86	0.29	-1.17	-0.05	0.45
1259	-0.43	-0.27	-2.07	-1.62	-2.00	-2.35
1292	-----	-----	-----	-----	-----	-----
1300	-0.01	1.31	0.95	0.74	0.60	1.16
1346	-0.40	-0.04	-1.22	-1.28	-0.99	-0.77
1389	-----	-----	-----	-----	-----	-----
1397	1.04	0.14	-0.18	-0.94	-0.96	0.53
1404	-----	-----	-----	-----	-----	-----
1409	-0.01	1.90	1.04	0.58	0.63	-0.38
1443	-0.45	-1.51	0.57	0.41	0.37	1.16
1455	0.60	0.84	0.19	0.13	0.24	0.41
1459	0.04	-0.45	-0.18	-1.78	-1.12	-1.20
1510	0.57	-0.68	-0.37	0.29	0.82	0.06
1521	1.07	0.67	0.29	-0.10	0.34	-0.10
1539	0.87	-0.74	-0.09	-0.55	-0.37	0.45
1554	-0.16	-0.33	1.04	0.97	0.53	-0.02
1569	-0.45	0.55	-1.50	-0.44	-0.99	-3.41
1586	-1.16	-1.57	-1.50	-0.38	0.08	0.10
1631	-----	-----	-----	-----	-----	-----
1634	-0.66	0.02	-0.47	-0.77	-0.70	0.49
1635	0.43	0.26	-2.73	-1.28	-1.41	0.37
1656	-1.04	-1.33	-0.37	0.35	0.31	-0.14
1659	-----	-----	-----	-----	-----	-----
1706	0.63	-0.10	0.57	0.07	0.08	0.33
1710	-0.01	1.31	0.29	0.13	0.27	0.29
1724	-0.43	-0.33	-0.18	-0.10	-0.08	-0.02
1728	-0.28	-0.21	1.23	0.80	0.92	0.65
1771	-----	-----	-----	-----	-----	-----
1776	-0.89	-0.57	-1.50	-0.60	-0.31	-1.24
1787	-0.45	-0.92	-0.84	-0.72	-0.76	-1.20
1810	-0.37	0.49	0.10	-0.21	-0.50	-0.46
1811	0.04	-0.33	-0.28	-0.38	-0.60	0.37
1842	-0.78	0.20	-0.56	-0.32	-0.12	0.77
2129	1.72	1.84	1.14	0.91	0.27	1.95

APPENDIX 3

Number of participants per country

1 lab in	ARGENTINA
1 lab in	AUSTRIA
4 labs in	BELGIUM
3 labs in	BULGARIA
3 labs in	CROATIA
1 lab in	CYPRUS
2 labs in	CZECH REPUBLIC
2 labs in	ESTONIA
6 labs in	FRANCE
3 labs in	GERMANY
1 lab in	GREECE
2 labs in	HUNGARY
1 lab in	INDONESIA
1 lab in	IRELAND
1 lab in	ISRAEL
1 lab in	ITALY
1 lab in	LITHUANIA
1 lab in	MALTA
5 labs in	NETHERLANDS
1 lab in	PERU
2 labs in	PHILIPPINES
2 labs in	POLAND
2 labs in	PORTUGAL
1 lab in	ROMANIA
1 lab in	SLOVENIA
4 labs in	SPAIN
2 labs in	SWEDEN
1 lab in	TAIWAN
1 lab in	TUNISIA
3 labs in	TURKEY
9 labs in	UNITED KINGDOM
2 labs in	UNITED STATES OF AMERICA

APPENDIX 4

Abbreviations:

C	= final result after checking of first reported suspect 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 outlier test
R(0.05)	= straggler in Rosner outlier test
ex	= excluded from calculations
E	= error in calculations
n.a.	= not applicable
n.a.	= not evaluated
W	= result withdrawn
SDS	= Safety Data Sheet

Literature:

1	iis Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, April 2014
2	ASTM E178-08
3	ASTM E1301-03
4	ISO 5725-86
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7	M. Thompson and R. Wood, J. AOAC Int, 76, 926, (1993)
8	W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)
9	ISO4259:06
10	DIN 38402 T41/42
11	P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)
12	J.N. Miller, Analyst, 118, 455, (1993)
13	Analytical Methods Committee Technical Brief, No4 January 2001
14	The Royal Society of Chemistry 2002, Analyst 2002, 127 page1359-1364, P.J. Lowthian and M. Thompson. (see http://www.rsc.org/suppdata/an/b2/b205600n/)
15	Bernard Rosner, Percentage Points for a Generalized ESD Many-Outlier Procedure, *Technometrics*, 25(2), pp. 165-172, (1983)