Results of Proficiency Test
Biodiesel 100% FAME (B100)
October 2013

Organised by: Institute for Interlaboratory Studies
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1 INTRODUCTION

Since 2001, a proficiency test for Fatty Acid Methyl Esters (FAME) used as Biodiesel B100 is organised every year by the Institute for Interlaboratory Studies (iis).
In this interlaboratory study 63 laboratories from 25 different countries have participated. See appendix 2 for a list of number of participants per country. In this report the results of the Biodiesel B100 proficiency test are presented and discussed.

2 SET UP

In this proficiency test Biodiesel B100, esterified fat from offal (distilled) was used for the regular and the total contamination proficiency test. For the metals a sample Rapeseed methyl esters was used. Sample analyses for fit-for-use and homogeneity testing were subcontracted. In this proficiency test, the participants received, depending on the registration, from one up to three different samples of Biodiesel B100, see table below.

Samples	Amount in mL	Purpose	Spiked
#13180	1000	For regular analysis	-
#13181	1000	Total Contamination test	Quartz material
#13182	100	Analysis of Phosphorus, Potassium, Sodium and Calcium & Magnesium	Phosphorus

table 1: three different Biodiesel B100 samples used in iis13G05

The test scopes were set up according to both EN14214:12 and ASTM D6751:12 specifications. Participants were requested to report the analytical results as “rounded and unrounded results” and to use the indicated units on the report form(s). The unrounded results were preferably used for statistical evaluation.

2.1 QUALITY SYSTEM

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, has implemented a quality system based on ISO/IEC 17043:2010. 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 organization of this proficiency test was the one as described for proficiency testing in the report ‘iis Interlaboratory Studies: Protocol for the Organization, Statistics and Evaluation’ of January 2010 (iis-protocol, version 3.2), which can be downloaded from www.iisnl.com.

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 of Biodiesel B100 was obtained from a European producer. After fit-for-use testing and homogenisation in a precleaned metal drum, the B100 was transferred to 75 brown glass bottles of 1 litre and labelled #13180.
The homogeneity of the subsamples #13180 was checked by the determination of Water in accordance with ISO12937:00 and Density in accordance with ASTM D4052:11 on 8 stratified randomly selected samples:

	Water in mg/kg	Density at 15ºC in kg/m^3
sample 1 #13180-1	35	874.75
sample 2 #13180-2	30	874.74
sample 3 #13180-3	30	874.74
sample 4 #13180-4	40	874.74
sample 5 #13180-5	35	874.74
sample 6 #13180-6	35	874.73
sample 7 #13180-7	30	874.74
sample 8 #13180-8	35	874.74

table 2: homogeneity test of subsamples #13180

	Water in mg/kg	Density at 15ºC in kg/m^3
r (sample #13180)	11	0.01
reference test	ISO12937:00	ISO12185:96
$0.3*R_{(reference\ test)}$	12	0.15

table 3: repeatabilities of subsamples #13180

For Total Contamination, out of the same batch of Biodiesel B100, another 50 amber glass bottles of 1 litre with inner and outer caps were filled.
Each sample bottle was spiked (approx 15 mg/kg) with a fresh prepared and well shaken particulate quartz material BCR-067 (∅ 2.4-3.2 µm) in oil suspension.
Therefore, an amount of the quartz suspension was weighed in the bottle, filled up to 850 mL and subsequently labelled #13181.
After homogenization, a random sample was taken to check the Total Contamination.

For Subsample #13182, 10 litre Biodiesel from rapeseed was spiked with Phosphorus (approx 15 mg/kg). After homogenization the material was subsequently divided over 75 glass bottles of 0.1L and labelled #13182. The homogeneity of the subsamples #13182 was checked by determination of Phosphorus on 8 stratified randomly selected samples:.

	Phosphorus in mg/kg
sample 1 #13182-1	15.0
sample 2 #13182-2	15.2
sample 3 #13182-3	15.6
sample 4 #13182-4	15.3
sample 5 #13182-5	15.6
sample 6 #13182-6	15.4
sample 7 #13182-7	15.6
sample 8 #13182-8	15.5

table 4: homogeneity test of subsamples #13182

	Phosphorus in mg/kg
r (sample #13182)	0.6
reference test	EN14107:03
$0.3*R_{(reference\ test)}$	0.9

table 5: repeatability of subsamples #13182

Each calculated repeatability for samples #13180 and #13182 was equal or less than 0.3 times the corresponding reproducibility of the respective reference method. Therefore, homogeneity of the subsamples was assumed.

Depending on the registration of the participant, one bottle labelled #13180 (1x1 L), and/or one 1 litre bottle labelled #13181, and/or one 1 litre bottle labelled #13055, and/or one 0.1 litre bottle labelled #13182 were dispatched to each of the participating laboratories on September 18, 2013.

2.5 STABILITY OF THE SAMPLES

The stability of the Biodiesel B100, packed in the brown glass bottles, was checked. The material was found sufficiently stable for the period of the proficiency test.

2.6 ANALYSES

The tests methods to be used by the participating laboratories should be in accordance with the requirements of EN14214:12 and/or ASTM D6751:12, e.g.:

Parameter	EN14214:12	Parameter	ASTM
Acid Value	EN14104	Acid Number	ASTM D664
Carbon Residue on 10% dist.	ISO10370*		
CFPP	EN116*		
		Cloud Point	ASTM D2500
Copper Strip Corrosion	ISO2160	Copper Strip Corrosion	ASTM D130
Density @ 15°C	ISO12185		
Flash Point	ISO3679	Flash Point	ASTM D93-C
Flash Point (PMcc)	ISO2719	Flash Point	ASTM D93
Iodine Value	EN14111		
Kin. Visc. @ 40°C	ISO3104	Kin. Visc. @ 40°C	ASTM D445
Oxidation Stability	EN14112	Oxidation Stability	EN15751
Sulphated Ash	ISO3987	Sulphated Ash	ASTM D874
Sulphur	ISO20846	Sulphur	ASTM D5453
Water	ISO12937	Water and Sediment	ASTM D2709
Calcium + Magnesium	EN14538	Calcium + Magnesium	EN14538
Phosphorus	EN14107	Phosphorus	ASTM D4951
Polyunsaturated esters	EN15779		
Potassium + Sodium	EN14108/14109	Potassium + Sodium	EN14538
Methanol	EN14110	Methanol	EN14110
mono-, di-, tri-Glycerides	EN14105		
Free + Total Glycerol	EN14105	Free + Total Glycerol	ASTM D6584
Total ester content	EN14103		
Linolenic Acid	EN14103		
Total Contamination	EN12662		

table 6: requirements and test methods acc. to specifications EN14214:12 and ASTM D6751:12
* = not applicable for B100 according to EN14214:12

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 test 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 Organization, Statistics and Evaluation' of January 2010 (iis-protocol, version 3.2).

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. After removal of outliers, this check was repeated. Not all data sets proved to have a normal distribution, in which cases the conclusions of statistical evaluation should be used with due care.
In accordance with ISO 5725 (1986 and 1994) the original results per determination were submitted subsequently to Dixon and Grubbs 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. Stragglers are marked by D(0.05) for the Dixon test, by G(0.05) or DG(0.05) for the Grubbs test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

For each assigned value the uncertainty was determined in accordance with ISO13528. Subsequently the calculated uncertainty was evaluated against the respective requirement based on the target reproducibility in accordance with ISO13528. 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 cross. Accepted data are represented as a triangle.
Furthermore, Kernel Density Graphs were made. This is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms (see appendix 3, nr.13-14).

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. En, ISO, ASTM reproducibilities, the z-scores were calculated using a target standard deviation. 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 the fit-for-useness of the reported test result.

The z-scores were calculated according to:

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

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 is as follows:

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

4 EVALUATION

In this proficiency test some problems with couriers and/or custom clearance were encountered during the execution. Nine laboratories in four different countries had trouble receiving the samples on time.
For the regular Biodiesel PT: 10 participants reported test results after the final reporting date and 8 participants did not report any test results at all.
For the Total Contamination PT: 10 participants reported the test results after the final reporting date and 9 participants did not report any test results at all.
For the Metals in Biodiesel PT: 3 participants reported the test results after the final reporting date and 4 participants did not report any test results at all.
Finally, 58 participants reported in total 768 numerical results. Observed were 44 outlying results, which is 5.7%. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

Not all original data sets proved to have a normal distribution. Not Gaussian distributions were found for the following determinations: Carbon Residue, Cold Filter Plugging Point, Cloud Point, Density, Kinematic viscosity @40ºC, Oxidation Stability, Glyceriden (mono-, di, tri-), Total Glycerol and Total Ester. In these cases the results of the statistical evaluations should be used with care.

4.1 EVALUATION PER TEST

In this section, the results are discussed per test. The specified test methods and requirements acc. to EN14214:12 and ASTM D6751:12 were taken into account for explaining the observed differences when possible and applicable. These methods are also in the tables together with the original data in appendix 1. The abbreviations, used in these tables, are listed in appendix 3.
The specification EN14214:12 refers for the determinations on mono-Glycerides, di-Glycerides, tri-Glycerides, Free Glycerol, Total Glycerol, to EN14105:**11** and for Total Ester Content and Linolenic Acid Methyl Ester to EN14103:**11** .

For Biodiesel B100 sample #13180

Acid Value (EN)	This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of EN14104:03.
Acid Number (ASTM)	This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D664:11 (method b).
Carbon Residue on 10% distillation residue	The consensus value found was near or below the applicable lower limit of ISO10370 (<0.1%M/M). Therefore no significant conclusions were drawn. In the latest version (2012) of EN14214, Conradson Carbon Residue is not mentioned.
CFPP	This determination may be problematic. Only one statistical outlier was detected. However, the calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of EN116:97. One should keep in mind that according to EN14214:12, no reproducibility requirements are available for the EN116:97 test method applied on Biodiesel B100.
Cloud Point	This determination was problematic for a number of laboratories. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ASTM D2500:11.
Copper Corrosion D130 / ISO2160	No problems have been observed. In this determination all participants agreed on a result of 1 or 1A, except for two. These participants reported the copper corrosion result as 1B.
Density @15°C	This determination was not problematic. No statistical outliers were observed and the calculated reproducibility is in good agreement with the requirements of ISO12185:96.

Flash Point conform EN spec.	This determination was not problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is in full agreement with the requirements of EN14214:12 (Annex A)
Flash Point PMcc ISO2719 / D93	This determination was not problematic. Only one statistical outlier was observed. The calculated reproducibility after rejection of the outlier is in full agreement with the requirements of ASTM D93:13.
Iodine Number	This determination was problematic. Only one statistical outlier was observed. However, the calculated reproducibility, after rejection of the statistical outlier, is not in agreement with the requirements of EN14111:03.
Kin.Visco. @ 40°C ISO3104 / D445	This determination was problematic. Three statistical outliers were observed. The calculated reproducibility, after rejection of the statistical outliers, is not in agreement with the requirements of both ISO3104:96 and ASTM D445:12.
Oxidation Stability	This determination was very problematic as the group appears to be divided bimodally. Therefore, the results for EN14112 and EN15751 were evaluated separately. It was surprising to see that the data sets differ significantly for this high level (12.6 vs 19.5 hours). The calculated reproducibility for EN15751 data meets the requirement of EN15751:09. However, the calculated reproducibility of the EN14112 data after rejection of the statistical outliers, is not in agreement with the requirements of the EN14112:03.
Sulphated Ash	All reported results, except two were near or below the applicable lower limit of ASTM D874:13a and/or ISO3987:10 (0.005% M/M). Therefore no significant conclusions were drawn.
Sulphur ISO20846	This determination was problematic. Only one statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ISO20846:11.
Sulphur ASTM D5453	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 ASTM D5453:12.
Water	This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ISO12937:00.

Methanol	All reported results, except one, were near or below the lower application range of EN14110:03 (0.01%M/M). Therefore no conclusions were drawn.
mono-Glycerides	All reported results, except three, were near or below the lower application range of EN14105:11 (0.1%M/M). Therefore no conclusions were drawn.
di-Glycerides	All reported results, except two, were near or below the lower application range of EN14105:11 (0.1%M/M). Therefore no conclusions were drawn.
tri-Glycerides	All reported results, except two, were near or below the lower application range of EN14105:11 (0.1%M/M). Therefore no conclusions were drawn.
Free Glycerol	This determination was problematic for a number of laboratories. Four statistical outliers were observed. However, the calculated reproducibility after rejection of statistical outliers is in full agreement with the requirements of EN14105:11.
Total Glycerol	This determination was very problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not at all in agreement with the requirements of EN14105:11.
Total Ester content	This determination was problematic. Only one statistical outlier was observed. Seven results were excluded from statistical evaluation as the laboratory reported to have used the 2003 version of EN14103 instead of the 2011 version. The 2011 version of EN14103 is mentioned in EN14214:2012 as the test method to be used. The calculated reproducibility, after rejection of the suspect data is not in agreement with the requirements of EN14103:11.
Linolenic Acid Methyl Ester	This determination was problematic. Two statistical outliers were observed. Five results were excluded from statistical evaluation as the laboratory reported to have used the 2003 version of EN14103 instead of the 2011 version. The 2011 version of EN14103 is mentioned in EN14214:2012 as the test method to be used. The calculated reproducibility, after rejection of the suspect data is not in agreement with the requirements of EN14103:11.
Polyunsaturated Methyl Esters	This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of EN15779:09.

For Biodiesel B100 sample #13181

Total Contamination	This determination was very problematic. The samples were spiked with particulate quartz material BCR. Therefore the minimum contamination concentration to be found was known (added amount = 15.04 mg/kg). The laboratories should be able to find at least 7.71 mg/kg [15.04 mg/kg$_{(added\ amount)}$ – 7.33 mg/kg$_{(R\ EN12662:08)}$]. No laboratories reported lower amounts than 9.7 mg/kg. Only one statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier, is not at all in agreement with the requirements of EN12662:08

For Biodiesel B100 sample #13182

Calcium and Magnesium	All reported results were far above the application range of EN14538:06 (1 – 10 mg/kg). Therefore no conclusions were drawn.
Phosphorus	This determination was very problematic. Three statistical outliers and one false negative test result was observed. The samples were spiked with Phosphorus. The average recovery of 89% Phosphorus (theoretical increment of 15.3 mg/kg) can be considered as satisfactory. The calculated reproducibility, after rejection of statistical outliers, is not at all in agreement with the requirements of EN14107:03.
Potassium	All reported results were near or below the lower application limit of EN14109:03 (0.5 mg/kg). Therefore no significant conclusions were drawn.
Sodium	This determination may be somewhat problematic for a number of laboratories. No statistical outliers and one false negative test result was observed. The calculated reproducibility is nearly in agreement with the requirements of EN14108:03.

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 laboratories that participated. The reproducibilities derived from literature standards (in casu the ASTM, EN, ISO and IP standards) and the calculated reproducibilities of the samples (see appendix 1) are compared in the next table.

Parameter	unit	n	average	R (Calc.)	R (lit)
Acid Value (EN14104)	mg KOH/g	36	0.565	0.090	0.060
Acid Number (D664-B)	mg KOH/g	14	0.550	0.205	0.139
Carbon Residue on 10% dist.	%M/M	13	0.06	0.15	(0.04)
Cold Filter Plugging Point	°C	41	11.1	2.6	1.4
Cloud Point	°C	33	14.3	2.6	3.0
Copper Strip Corrosion		40	1(1a)	n.a.	n.a.
Density @ 15°C	kg/m^3	50	874.7	0.4	0.5
Flash Point EN spec.	°C	18	174.2	9.9	11.4
Flash Point (PMcc) ISO/ASTM	°C	29	172.9	12.3	12.3
Iodine Value	g I_2/100g	35	53.3	6.5	5.0
Kin. Viscosity @ 40°C	mm^2/s	42	4.559	0.046	0.035
Oxidation Stability acc EN14112	hours	27	12.65	4.65	3.52
Oxidation Stability acc EN15751	hours	7	19.51	3.49	4.09
Sulphated Ash	%M/M	13	0.0006	0.0011	(0.0004)
Sulphur (ISO20846)	mg/kg	27	11.59	3.13	2.42
Sulphur (D5453)	mg/kg	11	10.95	3.18	3.49
Water	%M/M	46	50.4	47.1	48.8
Methanol	%M/M	32	<0.01	n.a.	n.a.
mono-Glycerides	%M/M	15	0.02	0.09	(0.07)
di-Glycerides	%M/M	21	<0.02	n.a.	n.a.
tri-Glycerides	%M/M	20	<0.02	n.a.	n.a.
Free Glycerol	%M/M	23	0.009	0.007	(0.008)
Total Glycerol	%M/M	28	0.015	0.033	0.014
Total Ester Content	%M/M	29	97.64	5.64	4.16
Linolenic Acid Methyl Ester	%M/M	27	1.04	0.60	0.42
Polyunsat. Methyl esters	%M/M	17	0.24	0.38	0.27

table 7: comparison of the observed and target reproducibilities of Biodiesel B100 sample #13180

Parameter	unit	n	average	R (Calc.)	R (lit)
Total Contamination	mg/kg	31	24.4	22.2	7.3

table 8: comparison of the observed and target reproducibilities of Biodiesel B100 sample #13181

Parameter	unit	n	average	R (Calc.)	R (lit)
Calcium & Magnesium	mg/kg	11	23.8	11.0	(4.7)
Phosphorus	mg/kg	8	13.5	5.9	2.6
Potassium	mg/kg	5	0.43	1.02	(1.47)
Sodium	mg/kg	10	8.4	5.4	4.7

table 9: comparison of the observed and target reproducibilities of Biodiesel B100 sample #13182

* Values between brackets were below the application range of the respective reference test method, therefore results should be used with care

Without further statistical calculations it can be concluded that for many tests there is not 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 PROFICIENCY TEST OF OCTOBER 2013 WITH PREVIOUS PTS

	October 2013	April 2013	October 2012	April 2012
Type of FAME	Fat of Offal	Rapeseed	Used cooking oil	Mix of FAME
Number of reporting labs	58	75	46	71
Number of results reported	768	1010	728	1079
Number of statistical outliers	44	67	40	45
Percentage statistical outliers	5.7%	6.6%	5.5%	4.2%

table 10: comparison with previous proficiency tests

In proficiency tests, outlier percentages of 3% - 7.5% are quite normal.
The performance of the determinations of the proficiency tests was compared against the requirements of the respective standards. The conclusions are given the following table:

Determination	October 2013	April 2013	October 2012	April 2012
Acid Value (EN14104)	--	+	+/-	+
Acid Number (D664-B)	--	+	+	+
Carbon Residue on 10% dist.	(--)	--	--	--
Carbon Residue on 100% mat.	n.e.	++	n.e.	n.e.
Cold Filter Plugging Point	--	+	-	++
Cloud Point	+	+	+	+/-
Density @15°C	++	++	++	++
Flash Point EN spec.	++	-	++	-
Flash Point PMcc ISO/ASTM	+/-	-	+/-	-
Iodine Value	--	+/-	-	+/-
Kin. Viscosity @ 40°C	--	-	-	+
Oxidation Stability	-- | +	++	+/-	+
Sulphated Ash	(-)	(--)	(--)	(--)
Sulphur (EN spec.)	--	-	-	++
Sulphur (D5453)	+	+	-	++
Water	+	++	+	++
Methanol	n.e.	--	--	--
mono-Glycerides	(-)	+	-	-
di-Glycerides	(-)	+	+/-	-
tri-Glycerides	(+)	+	--	+/-
Free Glycerol	+	+	++	-
Total Glycerol	--	+/-	+/-	-
Total Ester content	--	++	-	-
Linolenic Acid Methyl Ester	--	-	++	++
Polyunsat. Methyl esters	--	(--)	-	(--)
Total Contamination	--	--	(--)	--
Cold Soak Filter Test	n.e.	(--)	n.e.	--
Filter Blocking Tendency	n.e.	(--)	n.e.	n.e.
Calcium and Magnesium	(--)	(--)	(++)	(++)
Phosphorus	--	--	(--)	(--)
Potassium	(++)	+/-	(++)	(++)
Sodium	-	+/-	+	

table 11: comparison of group performances against the standard requirements

* Signs between brackets are for assigned values below the application range of the respective reference test method and therefore should be used with due care

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

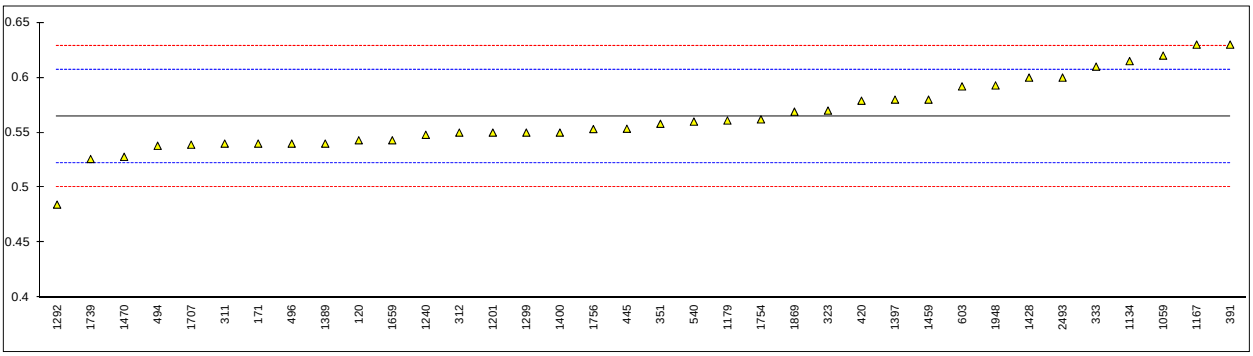
++:	group performed much better than the standard
+ :	group performed better than the standard
+/-:	group performance equals the standard
- :	group performed worse than the standard
-- :	group performed much worse than the standard
n.e.:	not evaluated

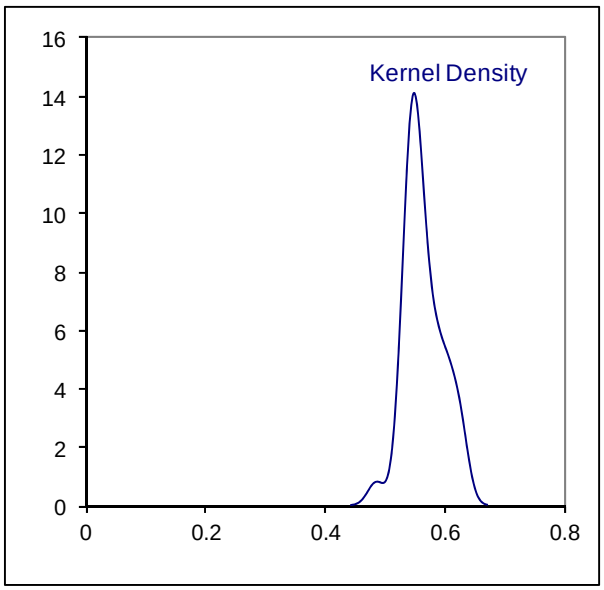
APPENDIX 1

Determination of Acid Value conform EN spec. on sample #13180; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
120	EN14104	0.543		-1.01	
171	EN14104	0.54		-1.15	
311	EN14104	0.54		-1.15	
312	EN14104	0.55		-0.68	
323	EN14104	0.57		0.25	
333	EN14104	0.61		2.12	
334		-----		-----	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351	EN14104	0.558		-0.31	
370		-----		-----	
391	EN14104	0.630		3.05	
420	EN14104	0.579		0.67	
445	EN14104	0.5535		-0.52	
447		-----		-----	
494	EN14104	0.538		-1.24	
495		-----		-----	
496	EN14104	0.54		-1.15	
540	EN14104	0.56		-0.21	
551		-----		-----	
554		-----		-----	
603	EN14104	0.592		1.28	
631		-----		-----	
1017		-----		-----	
1033		-----		-----	
1059	EN14104	0.62		2.59	
1107		-----		-----	
1134	EN14104	0.615		2.35	
1167	EN14104	0.63		3.05	
1179	EN14104	0.561		-0.17	
1199		-----		-----	
1201	EN14104	0.55		-0.68	
1240	EN14104	0.548		-0.77	
1268		-----		-----	
1271		-----		-----	
1286		-----		-----	
1292	EN14104	0.4845	C	-3.74	First reported 0.4415
1299	EN14104	0.55		-0.68	
1389	EN14104	0.54		-1.15	
1397	D974	0.58		0.72	
1400	EN14104	0.55		-0.68	
1428	EN14104	0.60		1.65	
1459	EN14104	0.58		0.72	
1470	EN14104	0.528		-1.71	
1557		-----		-----	
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634		-----		-----	
1659	EN14104	0.543		-1.01	
1707	EN14104	0.539		-1.19	
1710		-----		-----	
1739	EN14104	0.526		-1.80	
1744		-----		-----	
1754	EN14104	0.562		-0.12	
1756	EN14104	0.5532		-0.53	
1769		-----		-----	
1807		-----		-----	
1869	EN14104	0.569		0.21	
1948	EN14104	0.5929		1.32	
2493	EN14104	0.60		1.65	
4043		-----		-----	

normality	OK
n	36
outliers	0
mean (n)	0.5646
st.dev. (n)	0.03227
R(calc.)	0.0903
R(EN14104:03)	0.0600

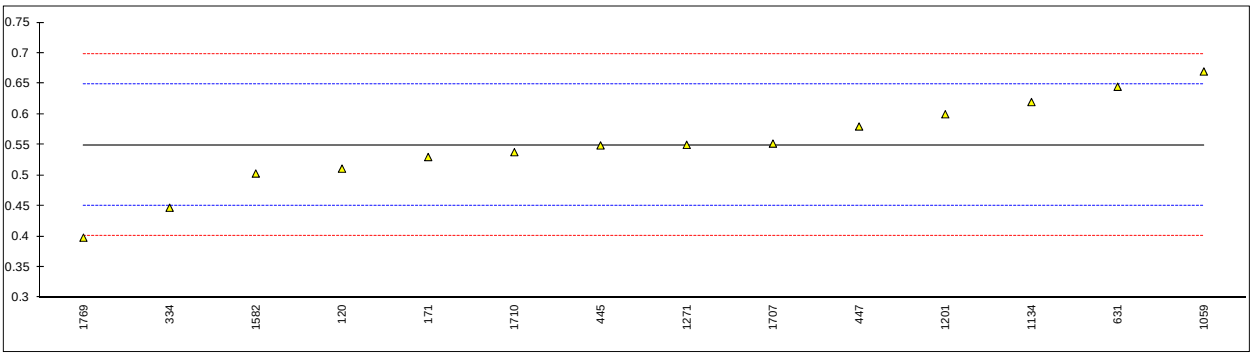

0.65
0.6
0.55
0.5
0.45
0.4
1292
1739
1470
494
1707
311
171
496
1389
120
1659
1240
312
1201
1299
1400
1756
445
351
540
1179
1754
1869
323
420
1397
1459
603
1948
1428
2493
333
1134
1059
1167
391

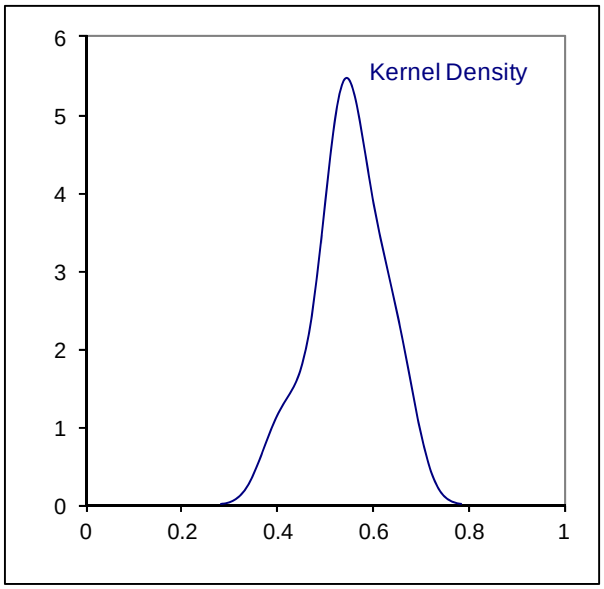

Kernel Density
16
14
12
10
8
6
4
2
0
0
0.2
0.4
0.6
0.8

Determination of Acid Number conform ASTM spec. on sample #13180; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
120	D664-B	0.511		-0.77	
171	D664-B	0.53		-0.39	
311		-----		-----	
312		-----		-----	
323		-----		-----	
333		-----		-----	
334	D664-B	0.447		-2.06	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351		-----		-----	
370		-----		-----	
391		-----		-----	
420		-----		-----	
445	D664-B	0.549		-0.01	
447	D664-B	0.58		0.61	
494		-----		-----	
495		-----		-----	
496		-----		-----	
540		-----		-----	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631	D974	0.645		1.92	
1017		-----		-----	
1033		-----		-----	
1059	ISO6619	0.67		2.42	
1107		-----		-----	
1134	D664	0.620		1.42	
1167		-----		-----	
1179		-----		-----	
1199		-----		-----	
1201	D664-B	0.60		1.02	
1240		-----		-----	
1268		-----		-----	
1271	D974	0.55		0.01	
1286		-----		-----	
1292		-----		-----	
1299		-----		-----	
1389		-----		-----	
1397		-----		-----	
1400		-----		-----	
1428		-----		-----	
1459		-----		-----	
1470		-----		-----	
1557		-----		-----	
1566		-----		-----	
1582	D664-B	0.503		-0.93	
1588		-----		-----	
1634		-----		-----	
1659		-----		-----	
1707	D664-B	0.552		0.05	
1710	D664-B	0.538		-0.23	
1739		-----		-----	
1744		-----		-----	
1754		-----		-----	
1756		-----		-----	
1769	D664-B	0.398		-3.05	
1807		-----		-----	
1869		-----		-----	
1948		-----		-----	
2493		-----		-----	
4043		-----		-----	

normality	OK
n	14
outliers	0
mean (n)	0.5495
st.dev. (n)	0.07323
R(calc.)	0.2050
R(D664B:11)	0.1393

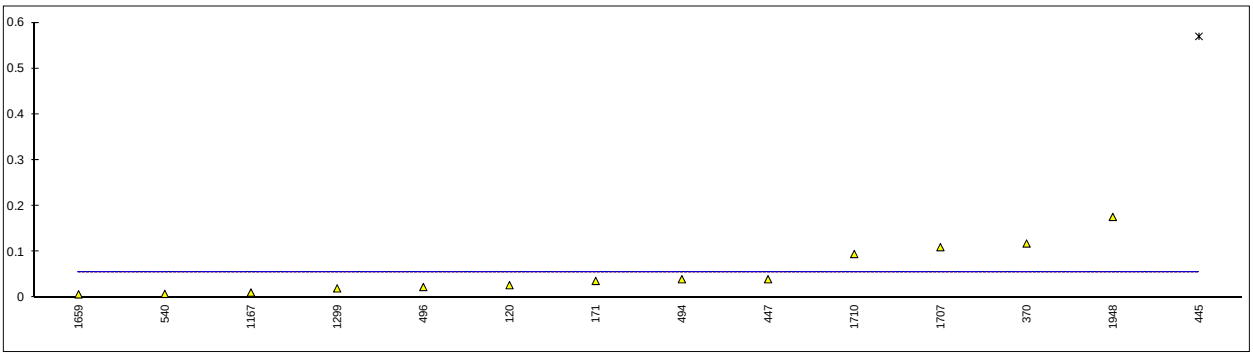

0.75
0.7
0.65
0.6
0.55
0.5
0.45
0.4
0.35
0.3
1769
334
1582
120
171
1710
445
1271
1707
447
1201
1134
631
1059

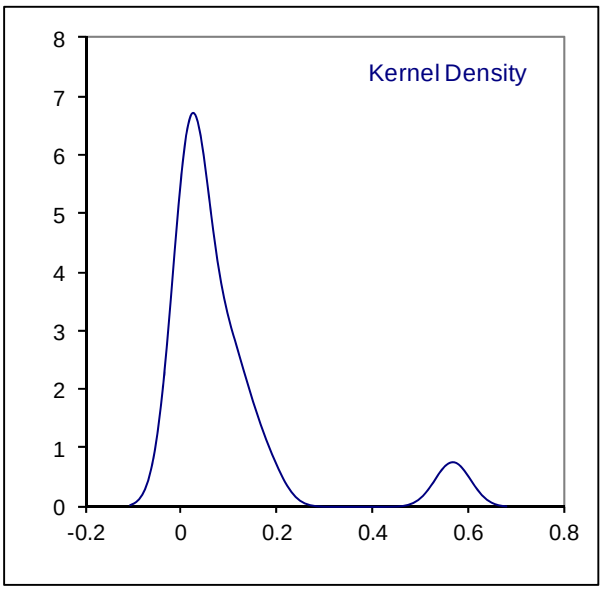

Kernel Density
6
5
4
3
2
1
0
0
0.2
0.4
0.6
0.8
1

Determination of Carbon Residue on 10% distillation residue on sample #13180; results in %M/M

lab	method	value	mark	z(targ)	remarks
120	ISO10370	0.027		-----	
171	ISO10370	0.0363		-----	
311		-----		-----	
312		-----		-----	
323		-----		-----	
333		-----		-----	
334	ISO10370	<0.10		-----	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351		-----		-----	
370	ISO10370	0.118		-----	
391		-----		-----	
420		-----		-----	
445	ISO10370	0.57	G(0.01)	-----	False positive result?
447	IP398	0.04		-----	
494	ISO10370	0.04		-----	
495		-----		-----	
496	ISO10370	0.023		-----	
540	ISO10370	0.008		-----	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631		-----		-----	
1017		-----		-----	
1033		-----		-----	
1059		-----		-----	
1107		-----		-----	
1134		-----		-----	
1167	ISO10370	0.011		-----	
1179		-----		-----	
1199		-----		-----	
1201	ISO10370	<0.10		-----	
1240		-----		-----	
1268		-----		-----	
1271		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	ISO10370	0.02		-----	
1389		-----		-----	
1397		-----		-----	
1400		-----		-----	
1428		-----		-----	
1459		-----		-----	
1470		-----		-----	
1557		-----		-----	
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634		-----		-----	
1659	ISO10370	0.007		-----	
1707	ISO10370	0.11		-----	
1710	ISO10370	0.095		-----	
1739		-----		-----	
1744		-----		-----	
1754		-----		-----	
1756		-----		-----	
1769		-----		-----	
1807		-----		-----	
1869		-----		-----	
1948	ISO10370	0.1759		-----	
2493		-----		-----	
4043		-----		-----	

normality	not OK
n	13
outliers	1
mean (n)	0.055
st.dev. (n)	0.0528
R(calc.)	0.148
R(ISO10370:95)	(0.035)

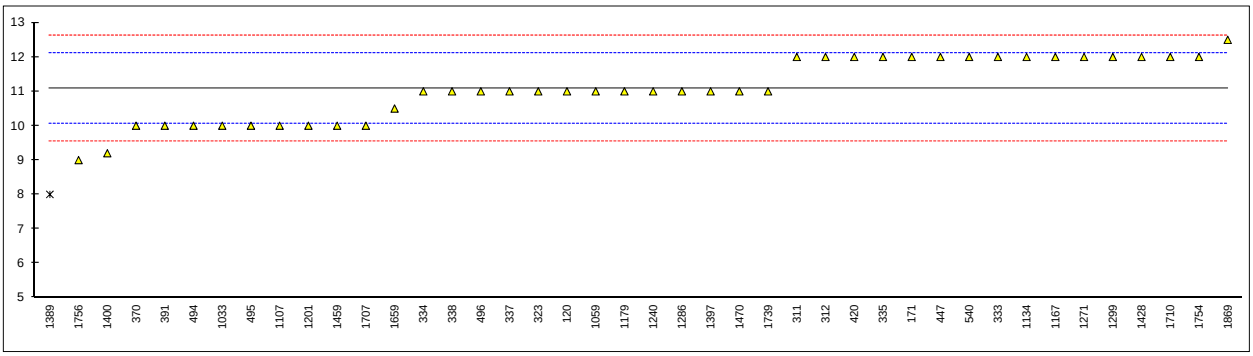

0.6
0.5
0.4
0.3
0.2
0.1
0
1659
540
1167
1299
496
120
171
494
447
1710
1707
370
1948
445

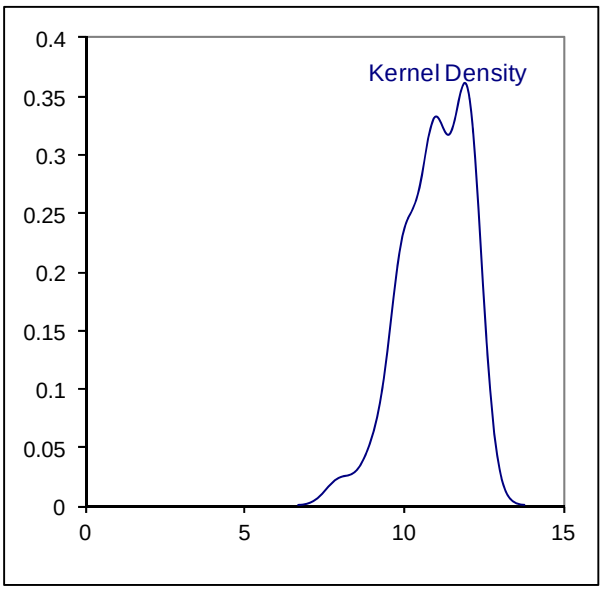

Kernel Density
8
7
6
5
4
3
2
1
0
-0.2
0
0.2
0.4
0.6
0.8

Determination of Cold Filter Plugging Point on sample #13180; results in °C

lab	method	value	mark	z(targ)	remarks
120	EN116	11		-0.15	
171	EN116	12.0		1.80	
311	EN116	12		1.80	
312	EN116	12		1.80	
323	EN116	11		-0.15	
333	EN116	12		1.80	
334	EN116	11		-0.15	
335	EN116	12		1.80	
337	EN116	11		-0.15	
338	EN116	11		-0.15	
351		-----		-----	
370	EN116	10		-2.11	
391	EN116	10		-2.11	
420	EN116	12	C	1.80	First reported 0
445		-----		-----	
447	IP309	12		1.80	
494	EN116	10		-2.11	
495	EN116	10		-2.11	
496	EN116	11.0		-0.15	
540	EN116	12		1.80	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631		-----		-----	
1017		-----		-----	
1033	IP309	10.0		-2.11	
1059	EN116	11		-0.15	
1107	IP309	10		-2.11	
1134	EN116	12		1.80	
1167	EN116	12		1.80	
1179	EN116	11		-0.15	
1199		-----		-----	
1201	EN116	10		-2.11	
1240	EN116	11.0		-0.15	
1268		-----		-----	
1271	EN116	12		1.80	
1286	EN116	11.0		-0.15	
1292		-----		-----	
1299	EN116	12		1.80	
1389	EN116	8	G(0.01)	-6.01	
1397	EN116	11		-0.15	
1400	EN116	9.2		-3.67	
1428	EN116	12		1.80	
1459	EN116	10		-2.11	
1470	EN116	11		-0.15	
1557		-----		-----	
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634		-----		-----	
1659	EN116	10.5		-1.13	
1707	EN116	10		-2.11	
1710	EN116	12		1.80	
1739	EN116	11		-0.15	
1744		-----		-----	
1754	EN116	12		1.80	
1756	EN116	9		-4.06	
1769		-----		-----	
1807		-----		-----	
1869	EN116	12.5		2.78	
1948		-----		-----	
2493		-----		-----	
4043		-----		-----	

	normality	not OK	
	n	41	
	outliers	1	
	mean (n)	11.08	
	st.dev. (n)	0.915	
	R(calc.)	2.56	
	R(EN116:97)	1.43	Reproducibility not available for B100 according to EN14214:12

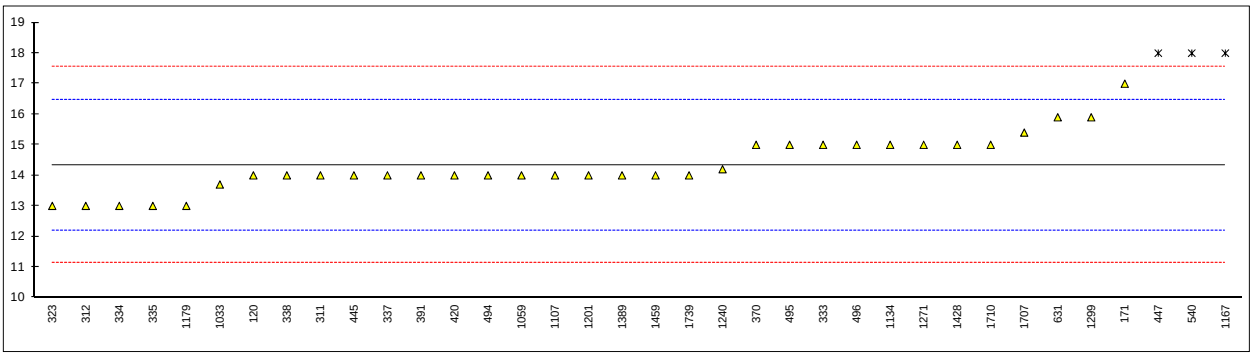

13
12
11
10
9
8
7
6
5
1389
1756
1400
370
391
494
1033
495
1107
1201
1459
1707
1659
334
338
496
337
323
120
1059
1179
1240
1286
1397
1470
1739
311
312
420
335
171
447
540
333
1134
1167
1271
1299
1428
1710
1754
1869

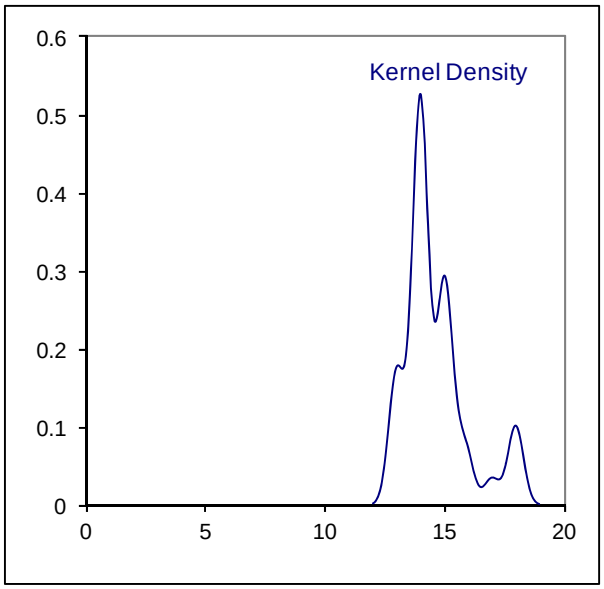

Kernel Density
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
5
10
15

Determination of Cloud Point on sample #13180; results in °C

lab	method	value	mark	z(targ)	remarks
120	D2500	14		-0.31	
171	D2500	17.0		2.49	
311	D2500	14		-0.31	
312	D2500	13		-1.25	
323	D2500	13		-1.25	
333	D2500/EN23015	15		0.62	
334	EN23015	13		-1.25	
335	D2500/EN23015	13		-1.25	
337	D2500/EN23015	14		-0.31	
338	EN23015	14		-0.31	
351		-----		-----	
370	D2500	15		0.62	
391	D2500/EN23015	14		-0.31	
420	EN23015	14		-0.31	
445	EN23015	14		-0.31	
447	D2500	18	DG(0.01)	3.42	
494	D2500/EN23015	14		-0.31	
495	D2500/EN23015	15		0.62	
496	EN23015	15.0		0.62	
540	D2500	18	DG(0.01)	3.42	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631	D2500	15.9		1.46	
1017		-----		-----	
1033	IP219	13.7		-0.59	
1059	EN23015	14		-0.31	
1107	D2500	14		-0.31	
1134	D2500	15		0.62	
1167	D2500/EN23015	18	G(0.01)	3.42	
1179	D2500	13		-1.25	
1199		-----		-----	
1201	D2500/EN23015	14		-0.31	
1240	EN23015	14.2		-0.13	
1268		-----		-----	
1271	D2500	15	C	0.62	First reported 23
1286		-----		-----	
1292		-----		-----	
1299	D2500/EN23015	15.9		1.46	
1389	D2500/EN23015	14		-0.31	
1397		-----		-----	
1400		-----		-----	
1428	D2500/EN23015	15		0.62	
1459	ISO3015	14		-0.31	
1470		-----		-----	
1557		-----		-----	
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634		-----		-----	
1659		-----		-----	
1707	D2500	15.4		0.99	
1710	EN23015	15		0.62	
1739	EN23015	14		-0.31	
1744		-----		-----	
1754		-----		-----	
1756		-----		-----	
1769		-----		-----	
1807		-----		-----	
1869		-----		-----	
1948		-----		-----	
2493		-----		-----	
4043		-----		-----	

normality	not OK
n	33
outliers	3
mean (n)	14.34
st.dev. (n)	0.928
R(calc.)	2.60
R(D2500:11)	3.00


19
18
17
16
15
14
13
12
11
10
323
312
334
335
1179
1033
120
338
311
445
337
391
420
494
1059
1107
1201
1389
1459
1739
1240
370
495
333
496
1134
1271
1428
1710
1707
631
1299
171
447
540
1167


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

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Determination of Copper Strip Corrosion 3 hrs/50°C on sample #13180

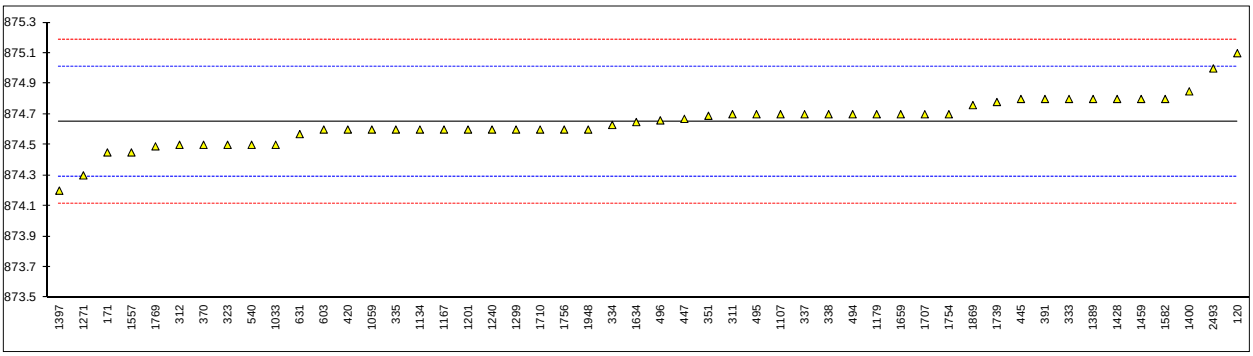
lab	method	value	mark	z(targ)	remarks
120	D130	1A		-----	
171	D130	1A		-----	
311	ISO2160	1A		-----	
312		-----		-----	
323	D130	1A		-----	
333	D130/ISO2160	1		-----	
334	ISO2160	1		-----	
335		-----		-----	
337	D130/ISO2160	1		-----	
338		-----		-----	
351	ISO2160	1		-----	
370	D130	1A		-----	
391	D130/ISO2160	1A		-----	
420	ISO2160	1A		-----	
445	ISO2160	1A		-----	
447	D130/ISO2160	1A		-----	
494	D130/ISO2160	1A		-----	
495	D130/ISO2160	1A		-----	
496	D130	1A		-----	
540	ISO2160	1A		-----	
551		-----		-----	
554		-----		-----	
603	D130	1A		-----	
631	D130	1A		-----	
1017		-----		-----	
1033	IP154	1B		-----	
1059	ISO2160	1A		-----	
1107	D130	1B		-----	
1134	D130	1A		-----	
1167	ISO2160	1A		-----	
1179	D130	1A		-----	
1199		-----		-----	
1201	D130/ISO2160	1A		-----	
1240		-----		-----	
1268		-----		-----	
1271	D130	1A		-----	
1286		-----		-----	
1292		-----		-----	
1299	ISO2160	1A		-----	
1389	D130/ISO2160	1A		-----	
1397	D130/ISO2160	1		-----	
1400		-----		-----	
1428	D130/ISO2160	1A		-----	
1459		-----		-----	
1470		-----		-----	
1557	D130/ISO2160	1A		-----	
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634	D130	1A		-----	
1659	ISO2160	1A		-----	
1707	D130	1A		-----	
1710	ISO2160	1A		-----	
1739	ISO2160	1A		-----	
1744		-----		-----	
1754		-----		-----	
1756	ISO2160	1A		-----	
1769		-----		-----	
1807		-----		-----	
1869	D130/ISO2160	1A		-----	
1948	D130/ISO2160	1A		-----	
2493		-----		-----	
4043		-----		-----	

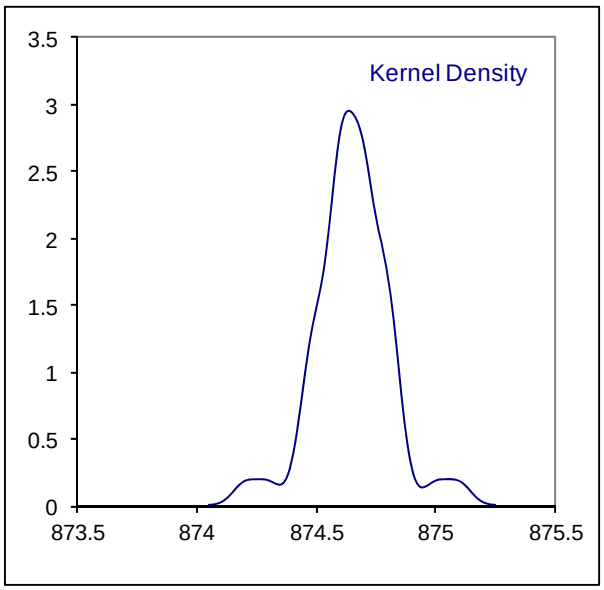
normality	unknown
n	40
outliers	0
mean (n)	1(1A)
st.dev. (n)	n.a.
R(calc.)	n.a.
R(D130:12)	n.a.

Determination of Density @ 15°C conform EN spec. on sample #13180; results in kg/m^3

lab	method	value	mark	z(targ)	remarks
120	ISO12185	875.1		2.51	
171	ISO12185	874.45		-1.13	
311	ISO12185	874.7		0.27	
312	ISO12185	874.5		-0.85	
323	ISO12185	874.5		-0.85	
333	ISO12185	874.8		0.83	
334	ISO12185	874.63		-0.12	
335	ISO12185	874.6		-0.29	
337	ISO12185	874.7		0.27	
338	ISO12185	874.7		0.27	
351	ISO12185	874.69		0.22	
370	ISO12185	874.5		-0.85	
391	ISO12185	874.8		0.83	
420	ISO12185	874.6		-0.29	
445	IP365	874.8		0.83	
447	D4052	874.67		0.11	
494	ISO12185	874.7		0.27	
495	ISO12185	874.7		0.27	
496	ISO12185	874.66		0.05	
540	ISO12185	874.5		-0.85	
551		-----		-----	
554		-----		-----	
603	ISO12185	874.6		-0.29	
631	D4052	874.57		-0.45	
1017		-----		-----	
1033	IP365	874.5		-0.85	
1059	ISO12185	874.6		-0.29	
1107	D4052	874.7	C	0.27	First reported 0.8747
1134	ISO12185	874.6		-0.29	
1167	ISO12185	874.6		-0.29	
1179	ISO12185	874.7		0.27	
1199		-----		-----	
1201	ISO12185	874.6		-0.29	
1240	ISO12185	874.6		-0.29	
1268		-----		-----	
1271	D4052	874.3	C	-1.97	First reported 873.0
1286		-----		-----	
1292		-----		-----	
1299	ISO12185	874.6		-0.29	
1389	ISO12185	874.8		0.83	
1397	ISO12185	874.2		-2.53	
1400	ISO12185	874.85		1.11	
1428	ISO12185	874.8		0.83	
1459	ISO12185	874.8		0.83	
1470		-----		-----	
1557	ISO12185	874.45		-1.13	
1566		-----		-----	
1582	ISO12185	874.8		0.83	
1588		-----		-----	
1634	ISO12185	874.649		-0.01	
1659	ISO12185	874.7		0.27	
1707	ISO12185	874.7		0.27	
1710	ISO12185	874.6		-0.29	
1739	ISO12185	874.78		0.72	
1744		-----		-----	
1754	ISO12185	874.7	C	0.27	First reported 875.62
1756	ISO12185	874.6		-0.29	
1769	D4052	874.49	C	-0.90	First reported 0.87449
1807		-----		-----	
1869	ISO12185	874.76	C	0.61	First reported 873.35
1948	ISO12185	874.6		-0.29	
2493	ISO3675	875		1.95	
4043		-----		-----	

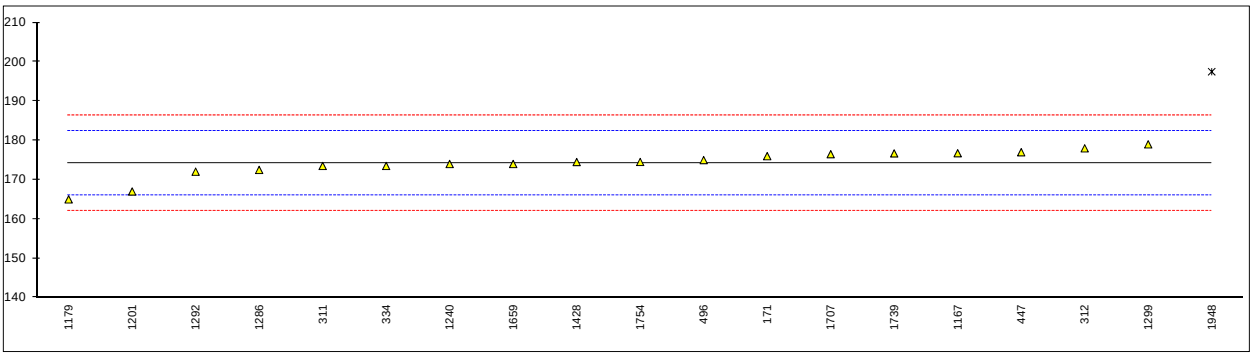
normality	not OK
n	50
outliers	0
mean (n)	874.65
st.dev. (n)	0.154
R(calc.)	0.43
R(ISO12185:96)	0.50

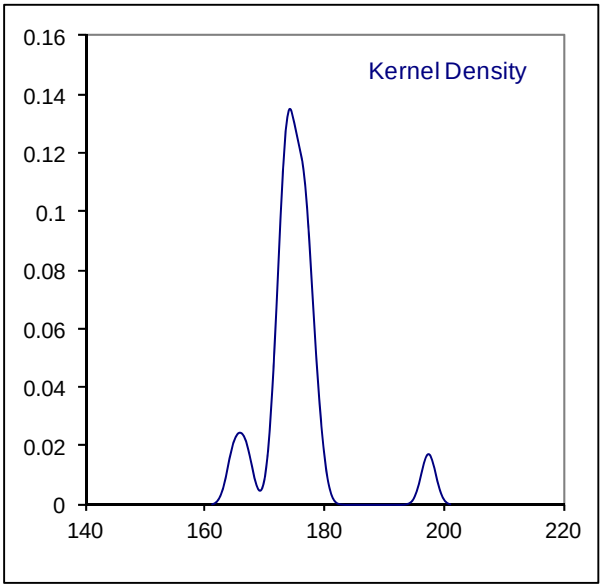

875.3
875.1
874.9
874.7
874.5
874.3
874.1
873.9
873.7
873.5
1397 1271 171 1557 1769 312 370 323 540 1033 631 603 420 1059 335 1134 1167 1201 1240 1299 1710 1756 1948 334 1634 496 447 351 311 495 1107 337 338 494 1179 1659 1707 1754 1869 1739 445 391 333 1389 1428 1459 1582 1400 2493 120


Kernel Density
3.5
3
2.5
2
1.5
1
0.5
0
873.5
874
874.5
875
875.5

Determination of Flash Point conform EN spec. on sample #13180; results in °C

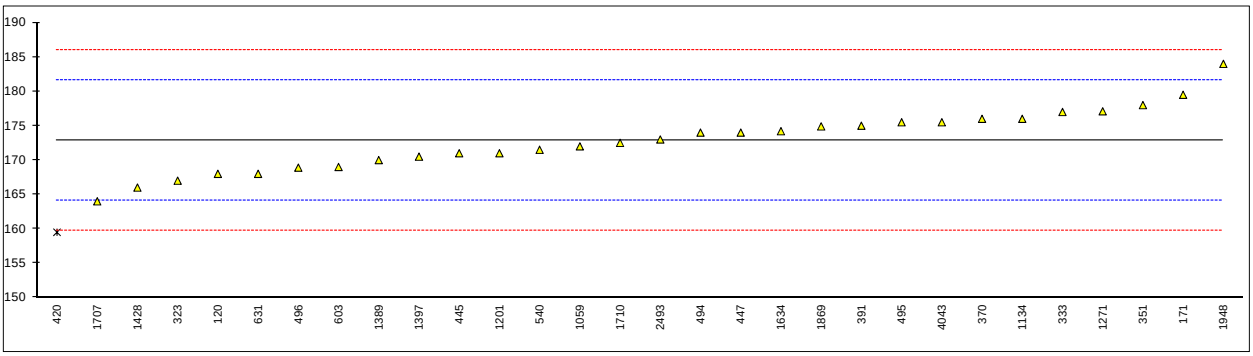
lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	ISO3679	176.0		0.44	
311	ISO3679	173.5		-0.17	
312	ISO3679	178.0		0.93	
323		-----		-----	
333		-----		-----	
334	ISO3679	173.50		-0.17	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351		-----		-----	
370		-----		-----	
391		-----		-----	
420		-----		-----	
445		-----		-----	
447	ISO3679	177.0		0.69	
494		-----		-----	
495		-----		-----	
496	ISO3679	175.0		0.20	
540		-----		-----	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631		-----		-----	
1017		-----		-----	
1033		-----		-----	
1059		-----		-----	
1107		-----		-----	
1134		-----		-----	
1167	ISO3679	176.75		0.63	
1179	ISO3679	165		-2.26	
1199		-----		-----	
1201	ISO3679	167.0		-1.77	
1240	ISO3679	174.0		-0.05	
1268		-----		-----	
1271		-----		-----	
1286	ISO3679	172.5		-0.42	
1292	ISO3679	172.05		-0.53	
1299	ISO3679	179.0		1.18	
1389		-----		-----	
1397		-----		-----	
1400		-----		-----	
1428	ISO3679	174.5		0.07	
1459		-----		-----	
1470		-----		-----	
1557		-----		-----	
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634		-----		-----	
1659	ISO3679	174.0		-0.05	
1707	ISO3679	176.5		0.57	
1710		-----		-----	
1739	ISO3679	176.70		0.62	
1744		-----		-----	
1754	ISO3679	174.52		0.08	
1756		-----		-----	
1769		-----		-----	
1807		-----		-----	
1869		-----		-----	
1948	ISO3679	197.5	G(0.01)	5.72	
2493		-----		-----	
4043		-----		-----	
	normality	OK			
	n	18			
	outliers	1			
	mean (n)	174.20			
	st.dev. (n)	3.535			
	R(calc.)	9.90			
	R(EN14214:12)	11.40			Compare R(ISO3679:04) = 8.63

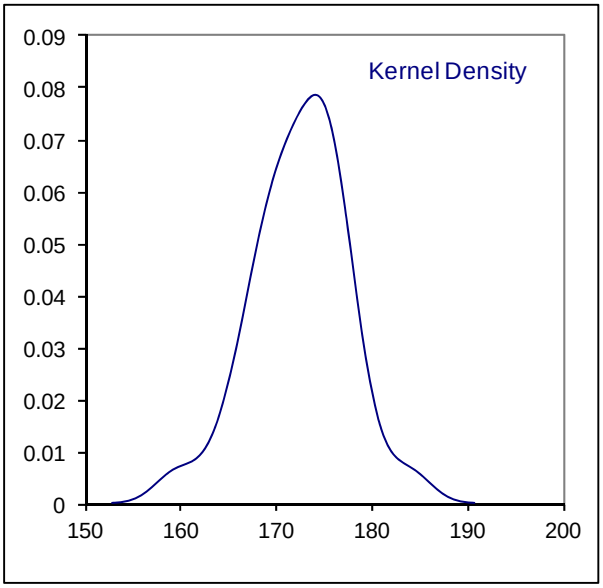

210
200
190
180
170
160
150
140
1179
1201
1292
1286
311
334
1240
1659
1428
1754
496
171
1707
1739
1167
447
312
1299
1948


Kernel Density
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
140
160
180
200
220

Determination of Flash Point (PMcc) conform ISO/ASTM spec. on sample #13180; results in °C

lab	method	value	mark	z(targ)	remarks
120	D93	168	C	-1.11	First reported 123
171	D93	179.5		1.51	
311		-----		-----	
312		-----		-----	
323	ISO2719	167.0		-1.34	
333	D93/ISO2719	177.0		0.94	
334		-----		-----	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351	ISO2719	178		1.17	
370	D93	176.0		0.72	
391	D93/ISO2719	175.0		0.49	
420	ISO2719	159.5	G(0.01)	-3.05	
445	ISO2719	171.0		-0.43	
447	D93/ISO2719	174.0		0.26	
494	D93/ISO2719	174.0		0.26	
495	D93/ISO2719	175.5		0.60	
496	ISO2719	168.9		-0.90	
540	D93	171.5		-0.31	
551		-----		-----	
554		-----		-----	
603	D93	169.0		-0.88	
631	D93	168.0		-1.11	
1017		-----		-----	
1033		-----		-----	
1059	ISO2719	172.0		-0.20	
1107		-----		-----	
1134	D93	176.0		0.72	
1167		-----		-----	
1179		-----		-----	
1199		-----		-----	
1201	D93/ISO2719	171.0		-0.43	
1240		-----		-----	
1268		-----		-----	
1271	ISO2719	177.1		0.97	
1286		-----		-----	
1292		-----		-----	
1299		-----		-----	
1389	D93/ISO2719	170.0		-0.65	
1397	D93/ISO2719	170.5		-0.54	
1400		-----		-----	
1428	D93/ISO2719	166.0		-1.57	
1459	ISO2719	>160		-----	
1470		-----		-----	
1557		-----		-----	
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634	D93	174.2		0.30	
1659		-----		-----	
1707	D93	164.0		-2.02	
1710	ISO2719	172.5		-0.08	
1739		-----		-----	
1744		-----		-----	
1754		-----		-----	
1756		-----		-----	
1769		-----		-----	
1807		-----		-----	
1869	D93/ISO2719	174.9		0.46	
1948	D93/ISO2719	184.0		2.54	
2493	ISO2719	173		0.03	
4043	ISO15267	175.5		0.60	
	normality	OK			
	n	29			
	outliers	1			
	mean (n)	172.87			
	st.dev. (n)	4.382			
	R(calc.)	12.27			
	R(D93:13)	12.27			

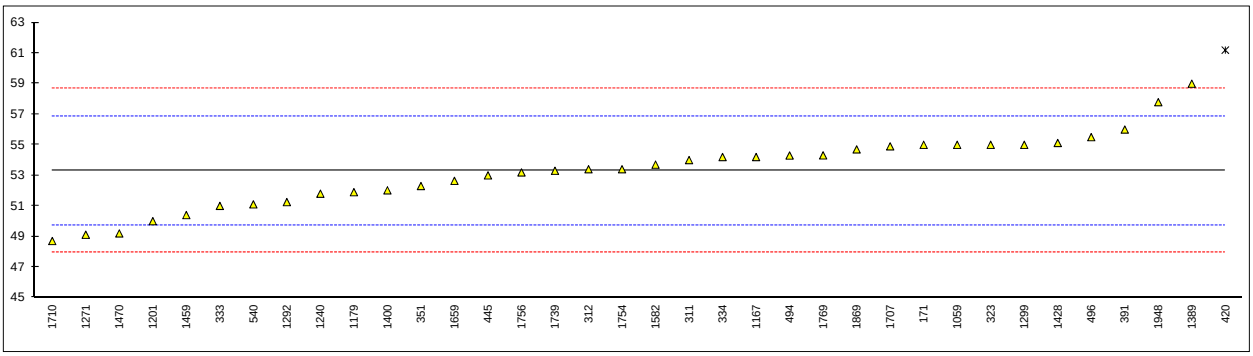

190
185
180
175
170
165
160
155
150
420
1707
1428
323
120
631
496
603
1389
1397
445
1201
540
1059
1710
2493
494
447
1634
1869
391
495
4043
370
1134
333
1271
351
171
1948

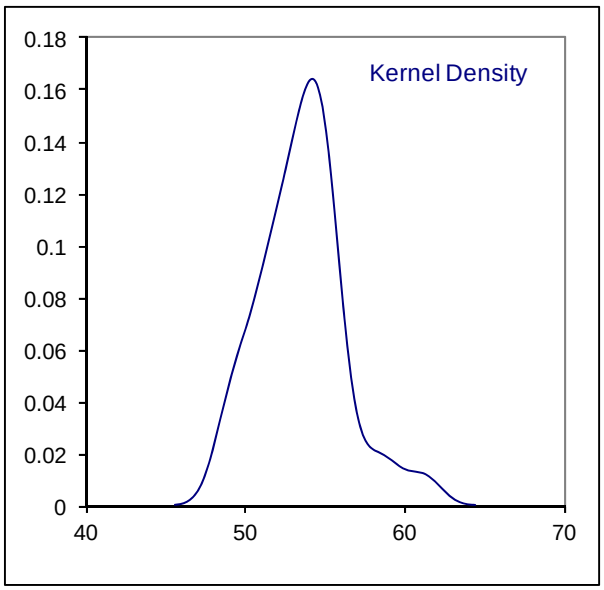

Kernel Density
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
150
160
170
180
190
200

Determination of Iodine Value conform EN spec. on sample #13180; results in g I_2/100g

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	EN14111	55		0.95	
311	EN14111	54		0.39	
312	EN14111	53.4		0.06	
323	EN14111	55		0.95	
333	EN14111	51		-1.29	
334	EN14111	54.2		0.51	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351	EN14111	52.3		-0.56	
370		-----		-----	
391	EN14111	56		1.51	
420	EN14111	61.2	G(0.05)	4.43	
445	EN14111	53		-0.17	
447		-----		-----	
494	EN14111	54.3		0.56	
495		-----		-----	
496	EN14111	55.5		1.23	
540	EN14111	51.1		-1.23	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631		-----		-----	
1017		-----		-----	
1033		-----		-----	
1059	EN14111	55		0.95	
1107		-----		-----	
1134		-----		-----	
1167	EN14111	54.2		0.51	
1179	EN14111	51.9		-0.78	
1199		-----		-----	
1201	EN14111	50		-1.85	
1240	EN16300	51.8		-0.84	
1268		-----		-----	
1271	EN14111	49.112		-2.34	
1286		-----		-----	
1292	EN14111	51.25		-1.15	
1299	EN14111	55		0.95	
1389	EN14111	59		3.19	
1397		-----		-----	
1400	EN16300	52.02		-0.72	
1428	EN14111	55.12		1.02	
1459	EN16300	50.4		-1.62	
1470	EN16300	49.2		-2.29	
1557		-----		-----	
1566		-----		-----	
1582	EN14111	53.7		0.23	
1588		-----		-----	
1634		-----		-----	
1659	EN14111	52.64		-0.37	
1707	EN14111	54.9		0.90	
1710	EN16300	48.7		-2.57	
1739	EN14111	53.3		0.00	
1744		-----		-----	
1754	EN14111	53.4		0.06	
1756	EN14111	53.19		-0.06	
1769	EN14111	54.31		0.57	
1807		-----		-----	
1869	EN14111	54.7		0.79	
1948	EN14111	57.79		2.52	
2493		-----		-----	
4043		-----		-----	

normality	OK
n	35
outliers	1
mean (n)	53.30
st.dev. (n)	2.333
R(calc.)	6.53
R(EN14111:03)	5.00

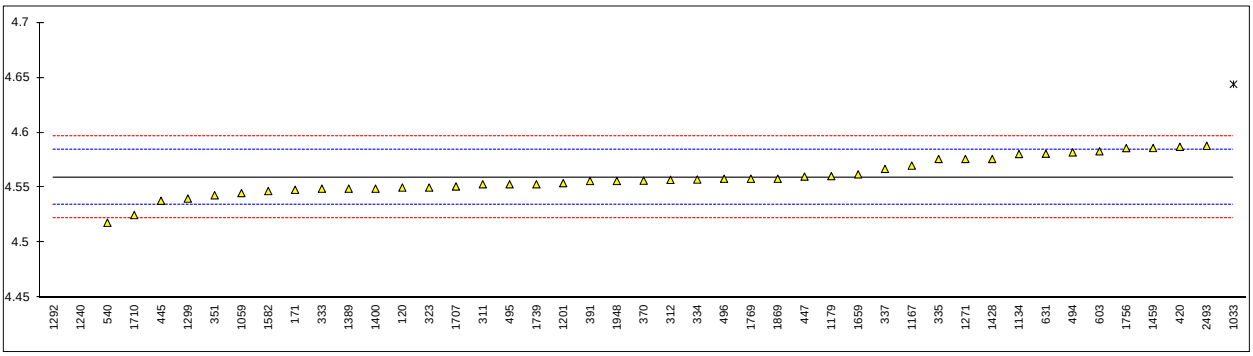

63
61
59
57
55
53
51
49
47
45
1710
1271
1470
1201
1459
333
540
1292
1240
1179
1400
351
1659
445
1756
1739
312
1754
1582
311
334
1167
494
1769
1869
1707
171
1059
323
1299
1428
496
391
1948
1389
420

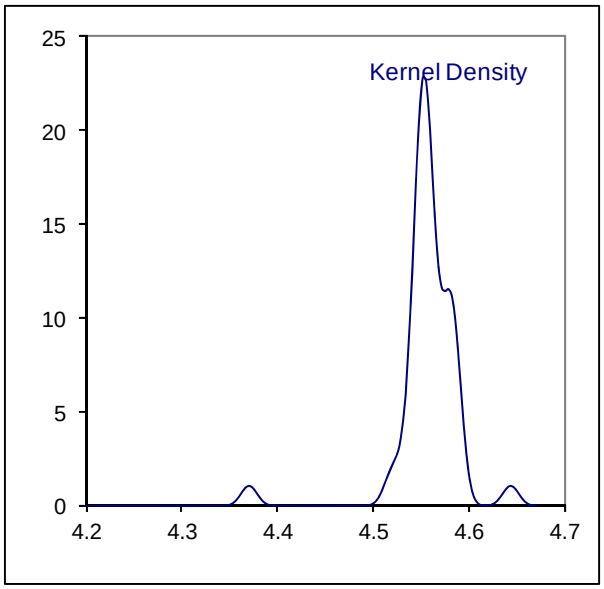

Kernel Density
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
40
50
60
70

Determination of Kinematic Viscosity @ 40°C on sample #13180; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
120	D445	4.550		-0.75	
171	D445	4.548		-0.92	
311	ISO3104	4.553		-0.51	
312	D445	4.557		-0.19	
323	D445	4.550		-0.75	
333	D445/ISO3104	4.549		-0.84	
334	ISO3104	4.5573		-0.16	
335	D445/ISO3104	4.576		1.35	
337	D445/ISO3104	4.567		0.62	
338		-----		-----	
351	ISO3104	4.543		-1.32	
370	D445	4.5563		-0.25	
391	D445/ISO3104	4.556		-0.27	
420	ISO3104	4.5871		2.24	
445	ISO3104	4.538		-1.72	
447	D445/ISO3104	4.560		0.05	
494	D445/ISO3104	4.582		1.83	
495	D445/ISO3104	4.553		-0.51	
496	ISO3104	4.558		-0.11	
540	ISO3104	4.518		-3.34	
551		-----		-----	
554		-----		-----	
603	D445	4.583		1.91	
631	D445	4.5808		1.73	
1017		-----		-----	
1033	IP71	4.644	G(0.01)	6.84	
1059	ISO3104	4.545	C	-1.16	First reported 4.637
1107		-----		-----	
1134	D445	4.5805		1.71	
1167	ISO3104	4.570		0.86	
1179	ISO3104	4.5604		0.09	
1199		-----		-----	
1201	D445/ISO3104	4.554		-0.43	
1240	ISO3104	4.370	G(0.01)	-15.30	
1268		-----		-----	
1271	D445	4.576		1.35	
1286		-----		-----	
1292	ISO3104	3.83825	C,G(0.01)	-58.27	First reported 3.91925
1299	D445/ISO3104	4.540		-1.56	
1389	D445/ISO3104	4.549		-0.84	
1397		-----		-----	
1400	ISO3104	4.5490		-0.84	
1428	D445/ISO3104	4.576		1.35	
1459	D7042	4.586		2.15	
1470		-----		-----	
1557		-----		-----	
1566		-----		-----	
1582	D445/ISO3104	4.5468		-1.01	
1588		-----		-----	
1634		-----		-----	
1659	ISO3104	4.562	C	0.22	First reported 4.648
1707	D445	4.551		-0.67	
1710	ISO3104	4.525		-2.77	
1739	ISO3104	4.553		-0.51	
1744		-----		-----	
1754		-----		-----	
1756	ISO3104	4.5859	C	2.15	First reported 4.5149
1769	D445	4.5580		-0.11	
1807		-----		-----	
1869	D445/ISO3104	4.558	C	-0.11	First reported 4.465
1948	D445/ISO3104	4.556		-0.27	
2493	ISO3104	4.588		2.32	
4043		-----		-----	

normality	not OK
n	42
outliers	3
mean (n)	4.5593
st.dev. (n)	0.01656
R(calc.)	0.0464
R(ISO3104:96)	0.0347

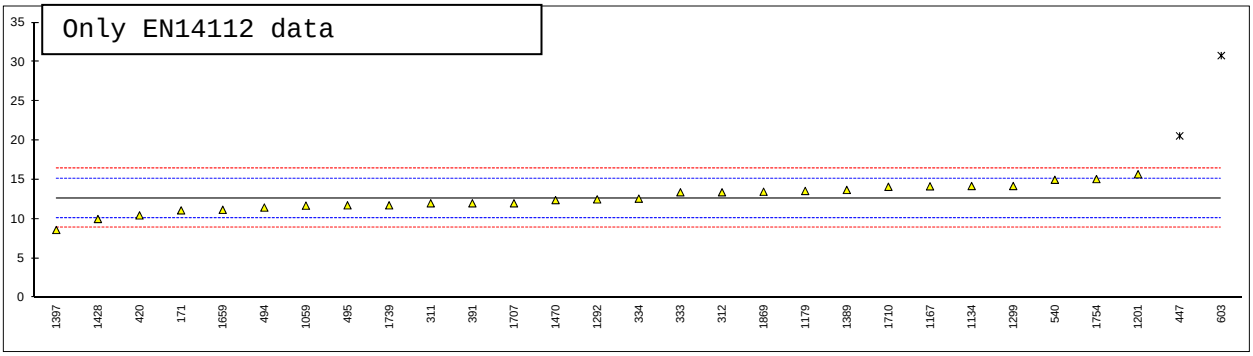

4.7
4.65
4.6
4.55
4.5
4.45
1292 1240 540 1710 445 1299 351 1059 1582 171 333 1389 1400 120 323 1707 311 495 1739 1201 391 1948 370 312 334 496 1769 1869 447 1179 1659 337 1167 335 1271 1428 1134 631 494 603 1756 1459 420 2493 1033

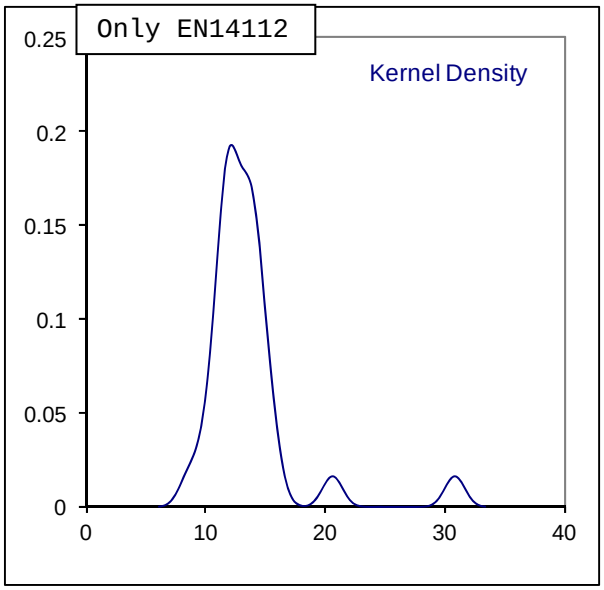

Kernel Density
25
20
15
10
5
0
4.2
4.3
4.4
4.5
4.6
4.7

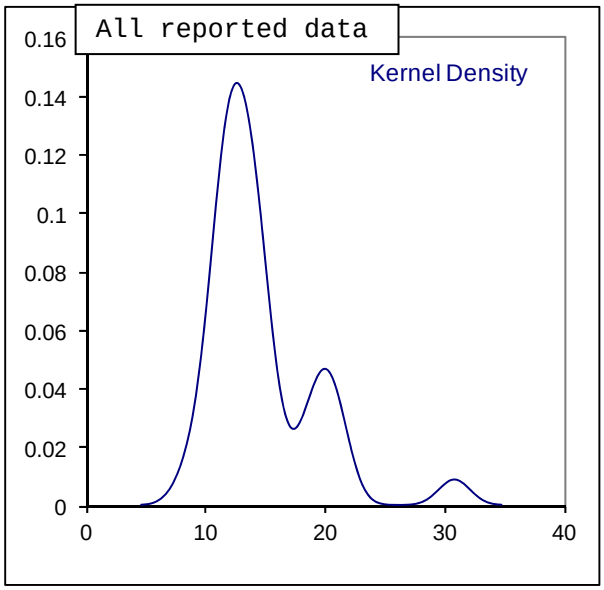
Determination of Oxidation Stability on sample #13180; results in hours

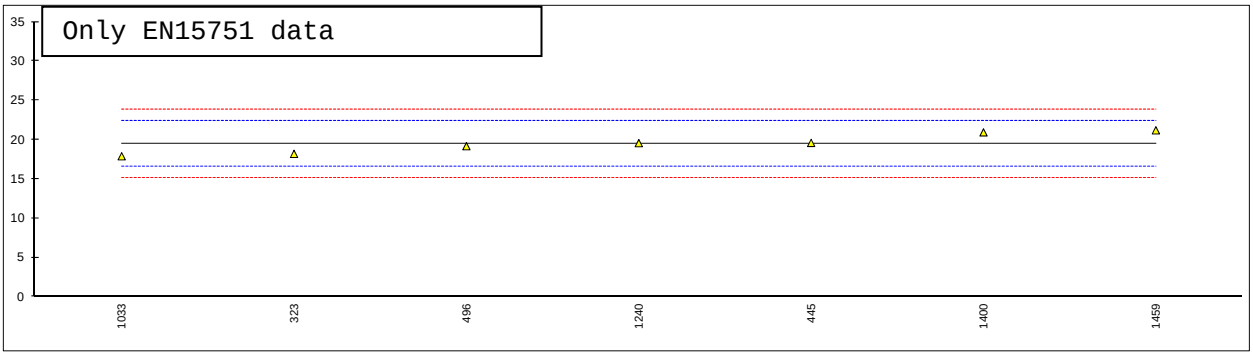
lab	method	EN14112	mark	z(targ)	EN15751	mark	z(targ)	remarks
120		-----		-----	-----		-----	
171	EN14112	11.1		-1.23	-----		-----	
311	EN14112	12.0		-0.51	-----		-----	
312	EN14112	13.4		0.60	-----		-----	
323	EN15751	-----		-----	18.2		-0.90	
333	EN14112	13.4		0.60	-----		-----	
334	EN14112	12.59		-0.04	-----		-----	
335		-----		-----	-----		-----	
337		-----		-----	-----		-----	
338		-----		-----	-----		-----	
351		-----		-----	-----		-----	
370		-----		-----	-----		-----	
391	EN14112	12.0		-0.51	-----		-----	
420	EN14112	10.46		-1.74	-----		-----	
445	EN15751	-----		-----	19.6		0.06	
447	EN14112	20.58	G(0.01)	6.32	-----		-----	
494	EN14112	11.46		-0.94	-----		-----	
495	EN14112	11.74		-0.72	-----		-----	
496	EN15751	-----		-----	19.175		-0.23	
540	EN14112	14.99		1.87	-----		-----	
551		-----		-----	-----		-----	
554		-----		-----	-----		-----	
603	EN14112	30.80	G(0.01)	14.45	-----		-----	
631		-----		-----	-----		-----	
1017		-----		-----	-----		-----	
1033	IP574	-----		-----	17.90		-1.10	
1059	EN14112	11.7		-0.75	-----		-----	
1107		-----		-----	-----		-----	
1134	EN14112	14.197		1.23	-----		-----	
1167	EN14112	14.16		1.21	-----		-----	
1179	EN14112	13.57		0.74	-----		-----	
1199		-----		-----	-----		-----	
1201	EN14112	15.7		2.43	-----		-----	
1240	EN15751	-----		-----	19.57		0.04	
1268		-----		-----	-----		-----	
1271		-----		-----	-----		-----	
1286		-----		-----	-----		-----	
1292	EN14112	12.5		-0.12	-----		-----	
1299	EN14112	14.2		1.24	-----		-----	
1389	EN14112	13.7		0.84	-----		-----	
1397	EN14112	8.6		-3.22	-----		-----	
1400	EN15751	-----		-----	20.94		0.98	
1428	EN14112	10.0		-2.11	-----		-----	
1459	EN15751	-----		-----	21.2		1.16	
1470	EN14112	12.40		-0.20	-----		-----	
1557		-----		-----	-----		-----	
1566		-----		-----	-----		-----	
1582		-----		-----	-----		-----	
1588		-----		-----	-----		-----	
1634		-----		-----	-----		-----	
1659	EN14112	11.17		-1.17	-----		-----	
1707	EN14112	12.0		-0.51	-----		-----	
1710	EN14112	14.1		1.16	-----		-----	
1739	EN14112	11.74		-0.72	-----		-----	
1744		-----		-----	-----		-----	
1754	EN14112	15.08		1.94	-----		-----	
1756		-----		-----	-----		-----	
1769		-----		-----	-----		-----	
1807		-----		-----	-----		-----	
1869	EN14112	13.47		0.66	-----		-----	
1948		-----		-----	-----		-----	
2493		-----		-----	-----		-----	
4043		-----		-----	-----		-----	

normality	OK	OK
n	27	7
outliers	2	0
mean (n)	12.645	19.512
st.dev. (n)	1.6612	1.2472
R(calc.)	4.651	3.492
R(EN14112:03)	3.518	--
R(EN15751:09)	--	4.087


Only EN14112 data
35
30
25
20
15
10
5
0
1397
1428
420
171
1659
494
1059
495
1739
311
391
1707
1470
1292
334
333
312
1869
1179
1389
1710
1167
1134
1299
540
1754
1201
447
603

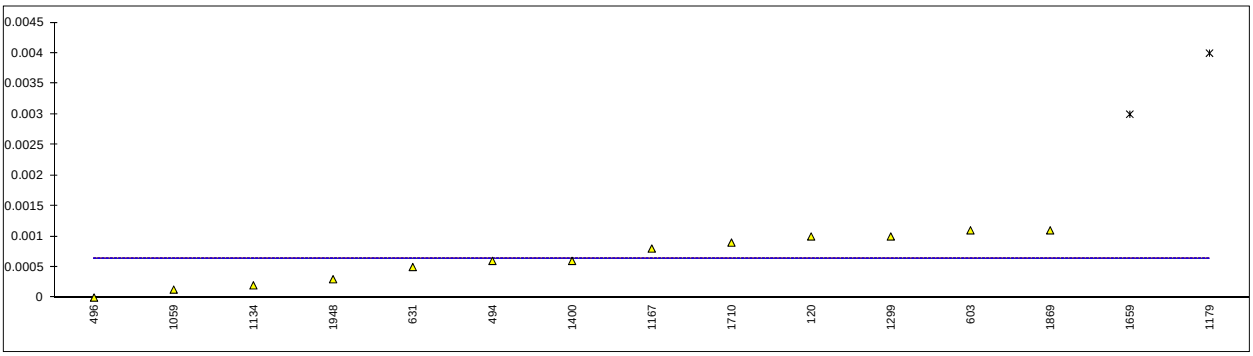

Only EN14112
Kernel Density
0.25
0.2
0.15
0.1
0.05
0
0
10
20
30
40

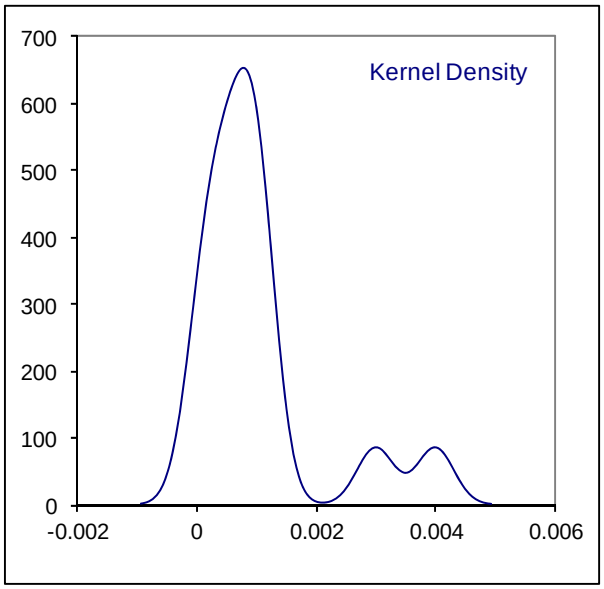

All reported data
Kernel Density
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
10
20
30
40


Only EN15751 data
35
30
25
20
15
10
5
0
1033
323
496
1240
445
1400
1459

Determination of Sulphated Ash on sample #13180; results in %M/M

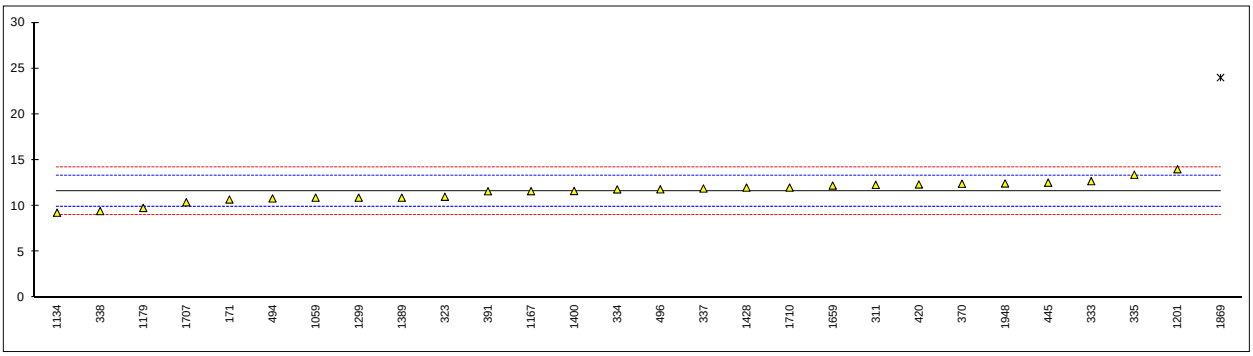
lab	method	value	mark	z(targ)	remarks
120	D874	0.001		-----	
171	D874	<0.005		-----	
311	ISO3987	<0.005		-----	
312		-----		-----	
323	D874	<0.005		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351	ISO3987	<0.005		-----	
370	D874	<0.001		-----	
391		-----		-----	
420	ISO3987	<0.005		-----	
445	ISO3987	<0.01		-----	
447		-----		-----	
494	D874/ISO3987	0.0006		-----	
495		-----		-----	
496	ISO3987	0.0000		-----	
540	ISO3987	<0.02		-----	
551		-----		-----	
554		-----		-----	
603	D874	0.0011		-----	
631	D874	0.0005		-----	
1017		-----		-----	
1033		-----		-----	
1059	ISO3987	0.00013		-----	
1107		-----		-----	
1134	D874	0.0002		-----	
1167	ISO3987	0.000802		-----	
1179	ISO3987	0.004	G(0.05)	-----	
1199		-----		-----	
1201	D874/ISO3987	<0.005		-----	
1240		-----		-----	
1268		-----		-----	
1271		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	D874/ISO3987	0.001		-----	
1389	D874/ISO3987	<0.0005		-----	
1397		-----		-----	
1400	ISO3987	0.0006		-----	
1428	D874/ISO3987	<0.005		-----	
1459	ISO3987	<0.005		-----	
1470		-----		-----	
1557		-----		-----	
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634		-----		-----	
1659	ISO3987	0.0030	G(0.01)	-----	
1707	D874	<0.005		-----	
1710	ISO3987	0.0009		-----	
1739	ISO3987	<0.01		-----	
1744		-----		-----	
1754		-----		-----	
1756		-----		-----	
1769		-----		-----	
1807		-----		-----	
1869	D874/ISO3987	0.0011	C	-----	First reported 0.0047
1948	D874/ISO3987	0.0003		-----	
2493	ISO6245	<0.001		-----	
4043		-----		-----	
	normality	OK			
	n	13			
	outliers	2			
	mean (n)	0.00063			Applicable lower limit of 0.005%M/M
	st.dev. (n)	0.000385			
	R(calc.)	0.00108			
	R(D874:13a)	(0.00036)			Compare R(ISO3987:10) = 0.00009

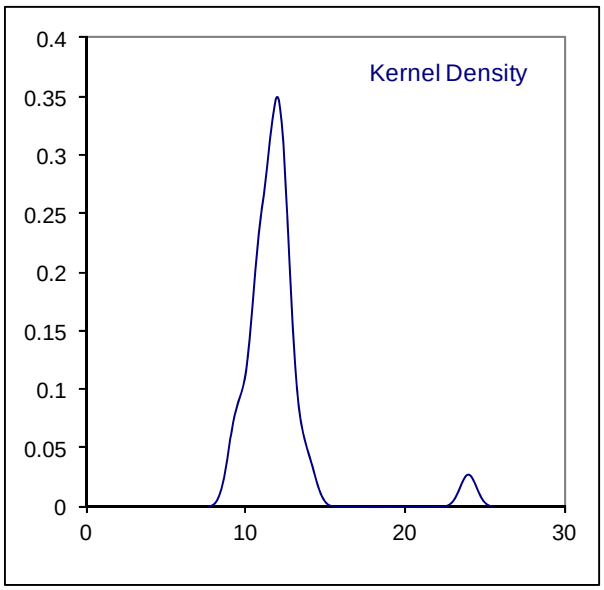

0.0045
0.004
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
496
1059
1134
1948
631
494
1400
1167
1710
120
1299
603
1869
1659
1179


Kernel Density
700
600
500
400
300
200
100
0
-0.002
0
0.002
0.004
0.006

Determination of Sulphur (EN spec.) on sample #13180; results in mg/kg

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	ISO20846	10.7		-1.03	
311	ISO20846	12.3		0.83	
312		-----		-----	
323	ISO20846	11.0		-0.68	
333	ISO20846	12.7		1.29	
334	ISO20846	11.80		0.25	
335	ISO20846	13.4		2.10	
337	ISO20846	11.9		0.36	
338	ISO20846	9.44		-2.49	
351		-----		-----	
370	ISO20846	12.42		0.97	
391	ISO20846	11.6		0.02	
420	ISO20846	12.34		0.87	
445	IP490	12.54		1.10	
447		-----		-----	
494	ISO20846	10.82		-0.89	
495		-----		-----	
496	ISO20846	11.81		0.26	
540		-----		-----	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631		-----		-----	
1017		-----		-----	
1033		-----		-----	
1059	ISO20846	10.9		-0.79	
1107		-----		-----	
1134	ISO20846	9.26		-2.69	
1167	ISO20846	11.61		0.03	
1179	ISO20846	9.78		-2.09	
1199		-----		-----	
1201	ISO20846	14.0		2.80	
1240		-----		-----	
1268		-----		-----	
1271		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	ISO20846	10.9		-0.79	
1389	ISO20846	10.9		-0.79	
1397		-----		-----	
1400	INH-16294	11.63		0.05	
1428	ISO20846	12.0		0.48	
1459		-----		-----	
1470		-----		-----	
1557		-----		-----	
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634		-----		-----	
1659	ISO20846	12.22		0.73	
1707	ISO20846	10.4		-1.37	
1710	ISO20846	12.0		0.48	
1739		-----		-----	
1744		-----		-----	
1754		-----		-----	
1756		-----		-----	
1769		-----		-----	
1807		-----		-----	
1869	in house	24	C,G(0.01)	14.38	First reported 7.25
1948	ISO20846	12.45		1.00	
2493		-----		-----	
4043		-----		-----	
	normality	OK			
	n	27			
	outliers	1			
	mean (n)	11.586			
	st.dev. (n)	1.1188			
	R(calc.)	3.133			
	R(ISO20846:11)	2.418			Application range: 3 – 500 mg/kg

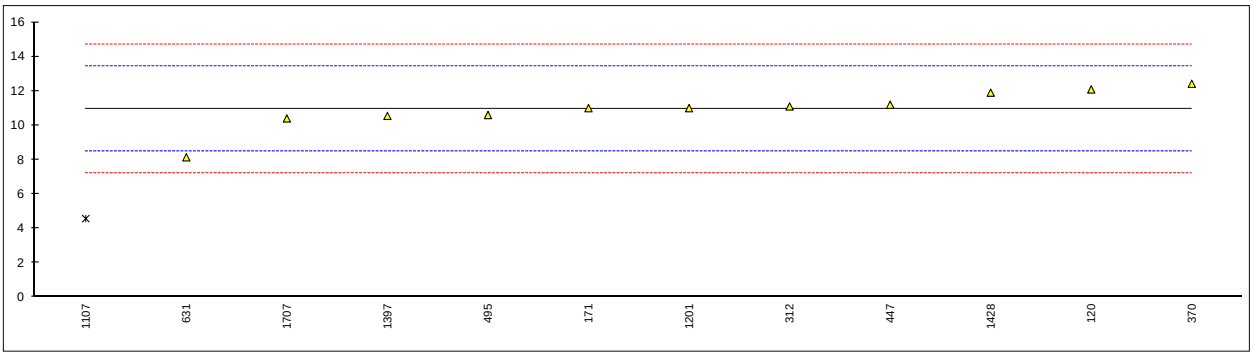

30
25
20
15
10
5
0
1134
338
1179
1707
171
494
1059
1299
1389
323
391
1167
1400
334
496
337
1428
1710
1659
311
420
370
1948
445
333
335
1201
1869

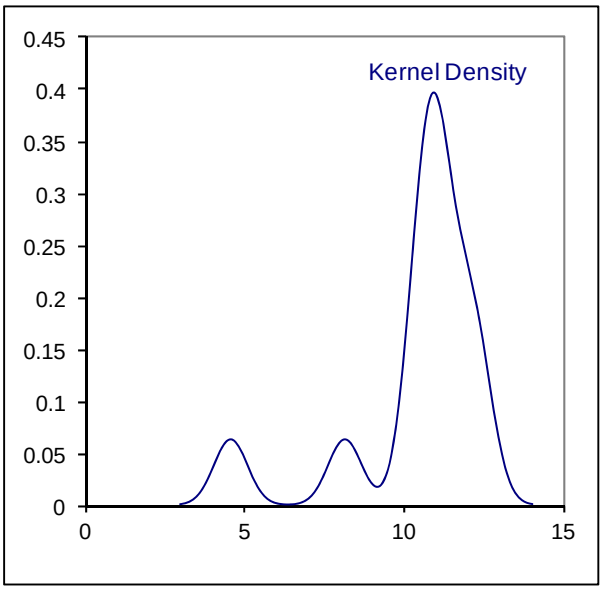

Kernel Density
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
10
20
30

Determination of Sulphur (ASTM D5453) on sample #13180; results in mg/kg

lab	method	value	mark	z(targ)	remarks
120	D5453	12.09		0.92	
171	D5453	11		0.04	
311		-----		-----	
312	D5453	11.1		0.12	
323		-----		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351		-----		-----	
370	D5453	12.42		1.18	
391		-----		-----	
420		-----		-----	
445		-----		-----	
447	D5453	11.2		0.20	
494		-----		-----	
495	D5453	10.6		-0.28	
496		-----		-----	
540		-----		-----	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631	D5453	8.14		-2.25	
1017		-----		-----	
1033		-----		-----	
1059		-----		-----	
1107	D5453	4.57	G(0.01)	-5.12	
1134		-----		-----	
1167		-----		-----	
1179		-----		-----	
1199		-----		-----	
1201	D5453	11		0.04	
1240		-----		-----	
1268		-----		-----	
1271		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299		-----		-----	
1389		-----		-----	
1397	D5453	10.55		-0.32	
1400		-----		-----	
1428	D5453	11.9		0.77	
1459		-----		-----	
1470		-----		-----	
1557		-----		-----	
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634		-----		-----	
1659		-----		-----	
1707	D5453	10.4		-0.44	
1710		-----		-----	
1739		-----		-----	
1744		-----		-----	
1754		-----		-----	
1756		-----		-----	
1769		-----		-----	
1807		-----		-----	
1869		-----		-----	
1948		-----		-----	
2493	EN14582	<20		-----	
4043		-----		-----	

normality	OK
n	11
outliers	1
mean (n)	10.945
st.dev. (n)	1.1373
R(calc.)	3.184
R(D5453:12)	3.488

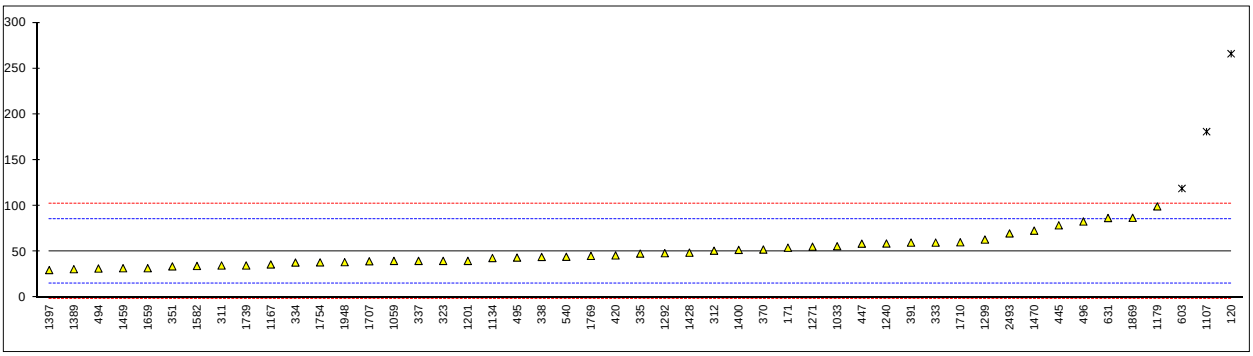

16
14
12
10
8
6
4
2
0
1107
631
1707
1397
495
171
1201
312
447
1428
120
370

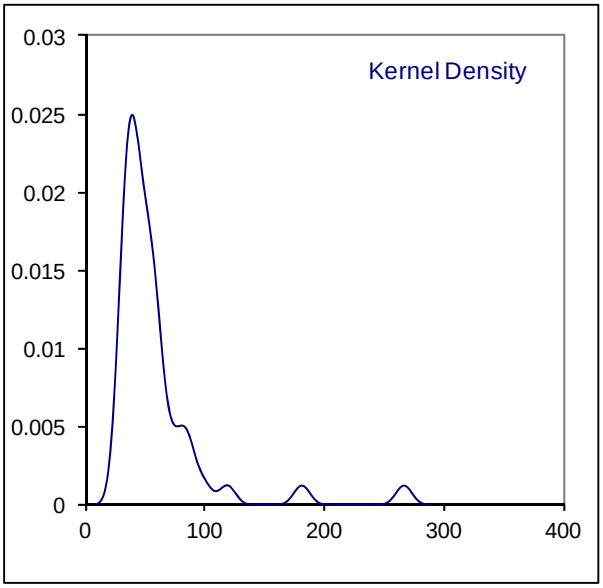

Kernel Density
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
5
10
15

Determination of Water on sample #13180; results in %M/M

lab	method	value	mark	z(targ)	remarks
120	ISO12937	266	C,G(0.01)	12.36	First reported 0.0266
171	ISO12937	54.4		0.23	
311	ISO12937	35		-0.88	
312	ISO12937	51.1		0.04	
323	ISO12937	40		-0.60	
333	ISO12937	60		0.55	
334	ISO12937	38.2		-0.70	
335	ISO12937	48		-0.14	
337	ISO12937	40		-0.60	
338	ISO12937	44.34		-0.35	
351	ISO12937	34		-0.94	
370	ISO12937	52.4		0.11	
391	ISO12937	60		0.55	
420	ISO12937	46.0		-0.25	
445	ISO12937	78.8		1.63	
447	IP438	58.8		0.48	
494	ISO12937	31.7		-1.07	
495	ISO12937	43.6		-0.39	
496	ISO12937	83		1.87	
540	ISO12937	44.5		-0.34	
551		-----		-----	
554		-----		-----	
603	ISO12937	119.0	G(0.05)	3.93	
631	D6304	86.8		2.09	
1017		-----		-----	
1033	IP438	56	C	0.32	First reported 0.006
1059	ISO12937	40		-0.60	
1107	E1064	181	G(0.01)	7.49	
1134	ISO12937	43.14		-0.42	
1167	ISO12937	36.1		-0.82	
1179	ISO12937	99.5		2.81	
1199		-----		-----	
1201	ISO12937	40		-0.60	
1240	ISO12937	59.0		0.49	
1268		-----		-----	
1271	ISO12937	55.50		0.29	
1286		-----		-----	
1292	ISO12937	48.4		-0.12	
1299	ISO12937	63.3		0.74	
1389	ISO12937	31		-1.11	
1397	ISO12937	30		-1.17	
1400	ISO12937	52	C	0.09	First reported 0.0052
1428	ISO12937	49		-0.08	
1459	ISO12937	32		-1.06	
1470	INH-13A	73		1.29	
1557		-----		-----	
1566		-----		-----	
1582	ISO12937	34.5		-0.91	
1588		-----		-----	
1634		-----		-----	
1659	ISO12937	32.0		-1.06	
1707	ISO12937	39.6		-0.62	
1710	ISO12937	60.3		0.57	
1739	ISO12937	35		-0.88	
1744		-----		-----	
1754	ISO12937	38.4		-0.69	
1756		-----		-----	
1769	ISO12937	45.430		-0.29	
1807		-----		-----	
1869	in house	87		2.10	
1948	ISO12937	38.62		-0.68	
2493	ISO12937	70		1.12	
4043		-----		-----	

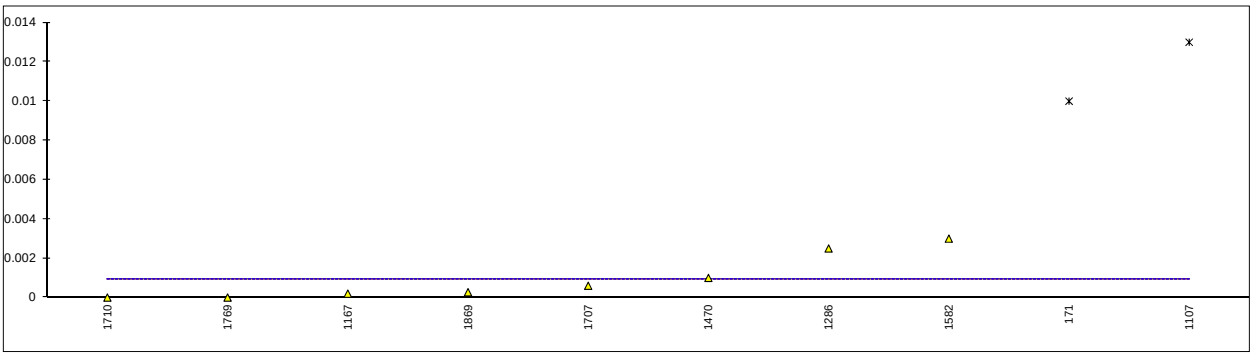
normality	OK
n	46
outliers	3
mean (n)	50.422
st.dev. (n)	16.8261
R(calc.)	47.113
R(ISO12937:00)	48.833

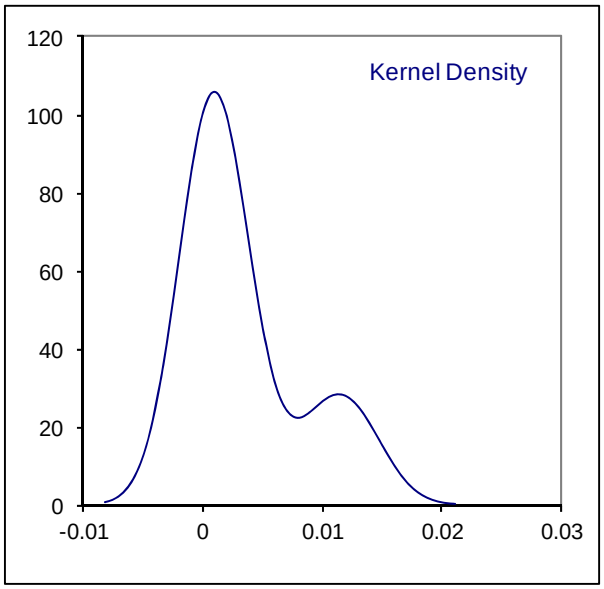

300
250
200
150
100
50
0
1397 1389 494 1459 1659 351 1582 311 1739 1167 334 1754 1948 1707 1059 337 323 1201 1134 495 338 540 1769 420 335 1292 1428 312 1400 370 171 1271 1033 447 1240 391 333 1710 1299 2493 1470 445 496 631 1869 1179 603 1107 120


Kernel Density
0.03
0.025
0.02
0.015
0.01
0.005
0
0
100
200
300
400

Determination of Methanol on sample #13180; results in %M/M

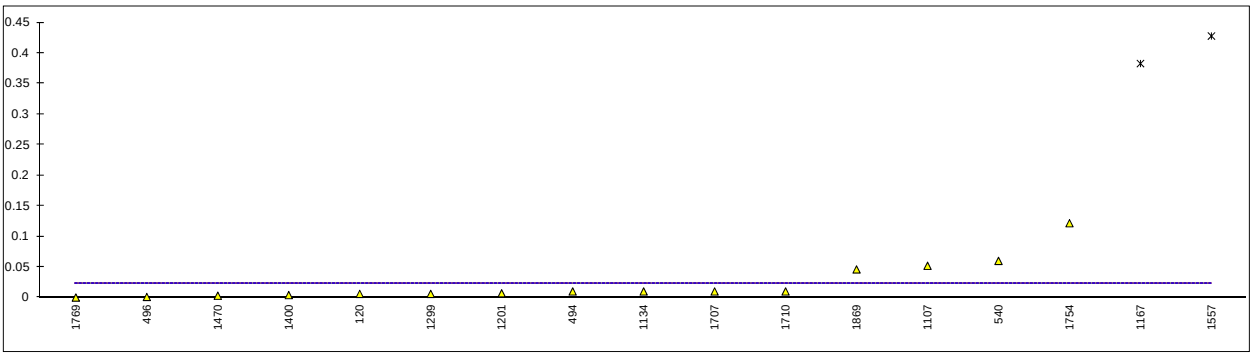
lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	EN14110	0.01		-----	
311	EN14110-B	<0.01		-----	
312	EN14110-A	<0.01		-----	
323	EN14110-B	<0.01		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351		-----		-----	
370		-----		-----	
391	EN14110-B	<0.01		-----	
420	EN14110-B	<0.001		-----	
445		-----		-----	
447		-----		-----	
494	EN14110-A	<0.01		-----	
495		-----		-----	
496	EN14110-B	<0.0001		-----	
540	EN14110-A	<0.01		-----	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631		-----		-----	
1017		-----		-----	
1033		-----		-----	
1059	EN14110-B	<0.01		-----	
1107	EN14110	0.013		-----	
1134		-----		-----	
1167	EN14110-A	0.0002		-----	
1179	EN14110-	<0.01		-----	
1199		-----		-----	
1201	EN14110	<0.01		-----	
1240	EN14110-A	<0.010		-----	
1268		-----		-----	
1271		-----		-----	
1286	EN14110-B	0.0025		-----	
1292		-----		-----	
1299	EN14110-	<0.01		-----	
1389		-----		-----	
1397	EN14110-	<0.01		-----	
1400	EN14110-B	n.d.		-----	
1428		-----		-----	
1459		-----		-----	
1470	EN14110-B	0.001		-----	
1557	EN14110-A	<0.01		-----	
1566		-----		-----	
1582	EN14110-B	0.0030		-----	
1588		-----		-----	
1634		-----		-----	
1659	EN14110-	<0.01		-----	
1707	EN14110-A	0.0006		-----	
1710	EN14110-B	0.00		-----	
1739	EN14110-A	<0.01		-----	
1744		-----		-----	
1754		-----		-----	
1756		-----		-----	
1769	EN14110-B	0.00		-----	
1807		-----		-----	
1869	EN14110-A	0.00027		-----	
1948	EN14110-	<0.001		-----	
2493		-----		-----	
4043	EN14110-B	<0.01		-----	
	normality	n.a.			
	n	32			
	outliers	0			
	mean (n)	<0.01			
	st.dev. (n)	n.a.			
	R(calc.)	n.a.			
	R(EN14110:03)	n.a.			

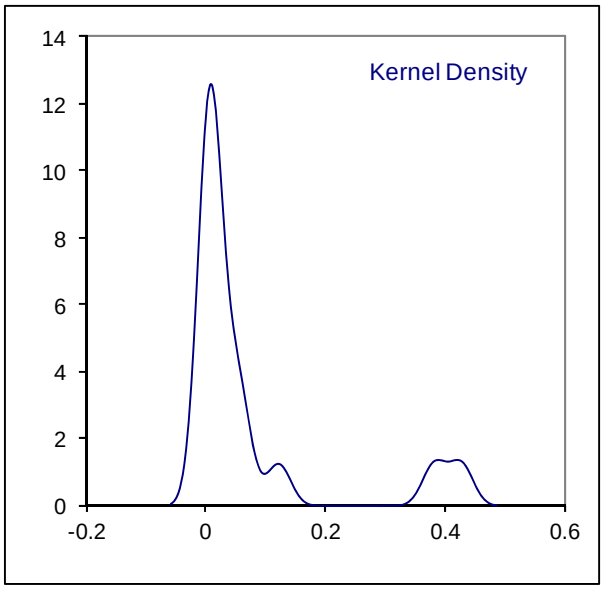

0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
1710
1769
1167
1869
1707
1470
1286
1582
171
1107


Kernel Density
120
100
80
60
40
20
0
-0.01
0
0.01
0.02
0.03

Determination of mono-Glycerides on sample #13180; results in %M/M

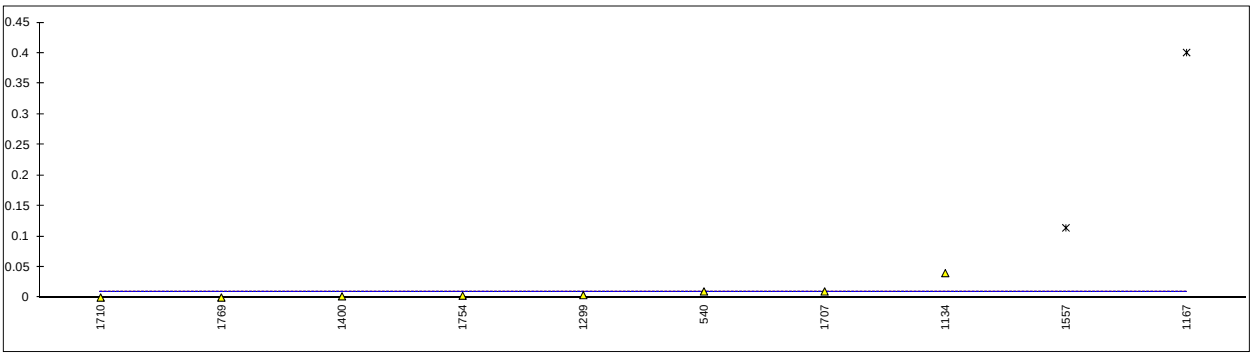
lab	method	value	mark	z(targ)	remarks
120	EN14105	0.006		-----	
171	EN14105	<0.10		-----	
311	EN14105	<0.05		-----	
312	EN14105	<0.10		-----	
323	EN14105	<0.02		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351		-----		-----	
370		-----		-----	
391	EN14105	<0.10		-----	
420	EN14105	<0.01		-----	
445		-----		-----	
447		-----		-----	
494	EN14105	0.01		-----	
495		-----		-----	
496	EN14105	0.001		-----	
540	EN14105	0.06		-----	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631		-----		-----	
1017		-----		-----	
1033		-----		-----	
1059	EN14105	<0.100		-----	
1107	EN14105	0.052		-----	
1134	EN14105	0.01		-----	
1167	EN14105	0.383	G(0.01)	-----	False positive result?
1179	EN14105	<0.01		-----	
1199		-----		-----	
1201	EN14105	0.007		-----	
1240	EN14105	<0.010		-----	
1268		-----		-----	
1271		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14105	0.006		-----	
1389	EN14105	<0.01		-----	
1397		-----		-----	
1400	EN14105	0.004		-----	
1428		-----		-----	
1459		-----		-----	
1470	EN14105	0.003		-----	
1557	EN14105	0.428	G(0.05)	-----	False positive result?
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634		-----		-----	
1659	EN14105	<0.10		-----	
1707	EN14105	0.01		-----	
1710	EN14105	0.01		-----	
1739	EN14105	<0.01		-----	
1744		-----		-----	
1754	EN14105	0.1217		-----	False positive result?
1756		-----		-----	
1769	D6584	0.000		-----	
1807		-----		-----	
1869	EN14105	0.046		-----	
1948	EN14105	<0.001		-----	
2493		-----		-----	
4043	EN14105	<0.25		-----	
	normality	not OK			
	n	15			
	outliers	2			
	mean (n)	0.023			
	st.dev. (n)	0.0336			
	R(calc.)	0.094			
	R(EN14105:11)	(0.070)			Application limit of the test method 0.10 %M/M

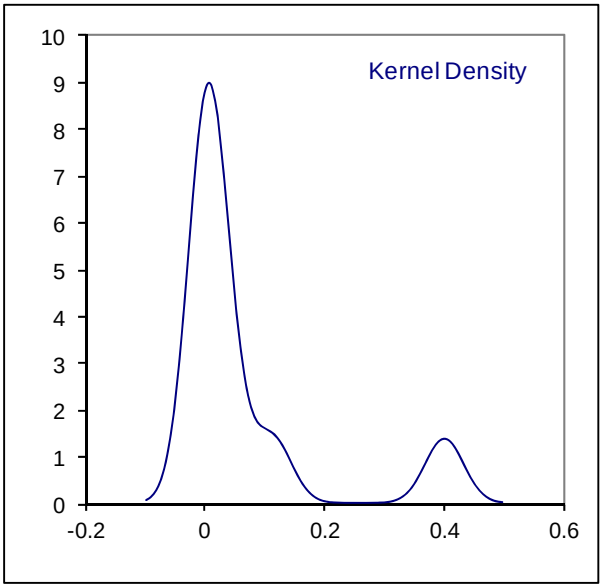

0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1769
496
1470
1400
120
1299
1201
494
1134
1707
1710
1869
1107
540
1754
1167
1557


Kernel Density
14
12
10
8
6
4
2
0
-0.2
0
0.2
0.4
0.6

Determination of di-Glycerides on sample #13180; results in %M/M

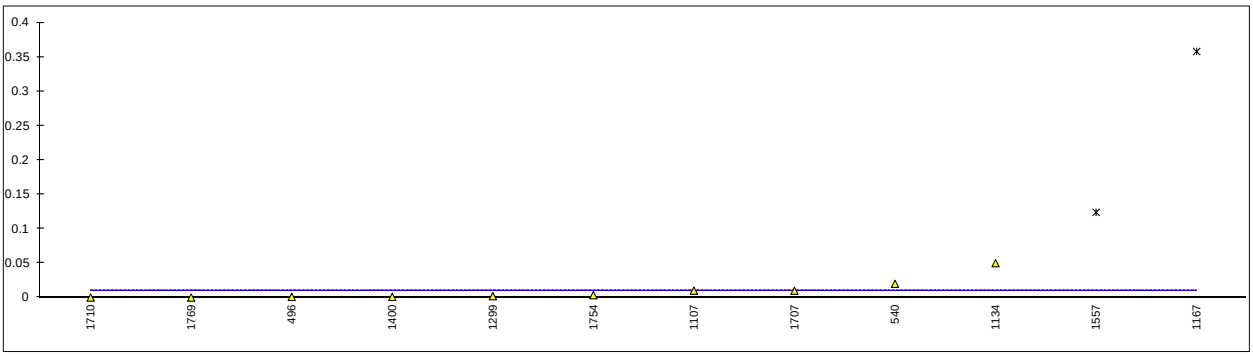
lab	method	value	mark	z(targ)	remarks
120	EN14105	<0.001		-----	
171	EN14105	<0.10		-----	
311	EN14105	<0.05		-----	
312	EN14105	<0.10		-----	
323	EN14105	<0.02		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351		-----		-----	
370		-----		-----	
391	EN14105	<0.10		-----	
420	EN14105	<0.01		-----	
445		-----		-----	
447		-----		-----	
494	EN14105	<0.01		-----	
495		-----		-----	
496	EN14105	<0.0001		-----	
540	EN14105	0.01		-----	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631		-----		-----	
1017		-----		-----	
1033		-----		-----	
1059	EN14105	<0.100		-----	
1107	EN14105	<0.01		-----	
1134	EN14105	0.04		-----	
1167	EN14105	0.401	G(0.01)	-----	False positive result?
1179	EN14105	<0.01		-----	
1199		-----		-----	
1201	EN14105	<0.01		-----	
1240	EN14105	<0.010		-----	
1268		-----		-----	
1271		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14105	0.004		-----	
1389	EN14105	<0.00		-----	
1397		-----		-----	
1400	EN14105	0.002		-----	
1428		-----		-----	
1459		-----		-----	
1470	EN14105	<0.01		-----	
1557	EN14105	0.114	G(0.01)	-----	False positive result?
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634		-----		-----	
1659	EN14105	<0.10		-----	
1707	EN14105	0.01		-----	
1710	EN14105	0.00		-----	
1739	EN14105	<0.01		-----	
1744		-----		-----	
1754	EN14105	0.0031		-----	
1756		-----		-----	
1769	D6584	0.000		-----	
1807		-----		-----	
1869	EN14105	<0.01		-----	
1948	EN14105	<0.001		-----	
2493		-----		-----	
4043	EN14105	<0.05		-----	
	normality	n.a.			
	n	21			
	outliers	2			
	mean (n)	<0.02			
	st.dev. (n)	n.a.			
	R(calc.)	n.a.			
	R(EN14105:11)	n.a.			Application limit of the test method 0.10 %M/M

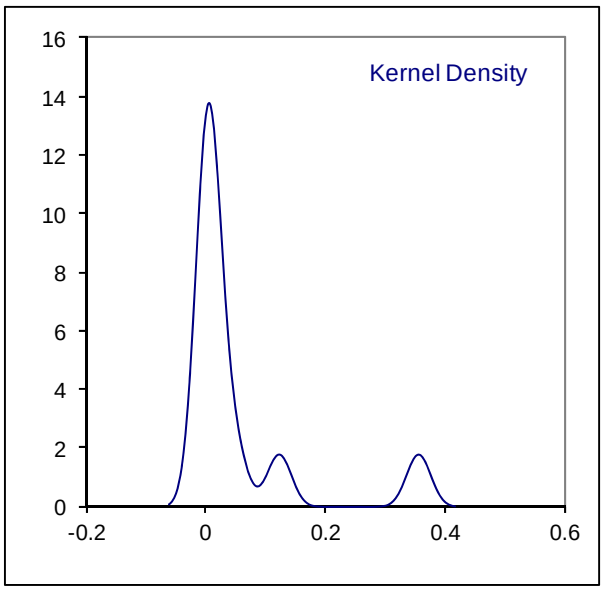

0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1710
1769
1400
1754
1299
540
1707
1134
1557
1167


Kernel Density
10
9
8
7
6
5
4
3
2
1
0
-0.2
0
0.2
0.4
0.6

Determination of tri-Glyceriden on sample #13180; results in %M/M

lab	method	value	mark	z(targ)	remarks
120	EN14105	<0.001		-----	
171	EN14105	<0.10		-----	
311	EN14105	<0.05		-----	
312	EN14105	<0.10		-----	
323	EN14105	<0.02		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351		-----		-----	
370		-----		-----	
391	EN14105	<0.10		-----	
420	EN14105	<0.01		-----	
445		-----		-----	
447		-----		-----	
494	EN14105	<0.01		-----	
495		-----		-----	
496	EN14105	0.001		-----	
540	EN14105	0.02		-----	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631		-----		-----	
1017		-----		-----	
1033		-----		-----	
1059	EN14105	<0.100		-----	
1107	EN14105	0.01		-----	
1134	EN14105	0.05		-----	
1167	EN14105	0.358	C,G(0.01)	-----	First reported 0.448, False positive result?
1179	EN14105	<0.01		-----	
1199		-----		-----	
1201	EN14105	<0.01		-----	
1240	EN14105	<0.010		-----	
1268		-----		-----	
1271		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14105	0.002		-----	
1389	EN14105	<0.01		-----	
1397		-----		-----	
1400	EN14105	0.001		-----	
1428		-----		-----	
1459		-----		-----	
1470	EN14105	<0.01		-----	
1557	EN14105	0.124	G(0.01)	-----	False positive result?
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634		-----		-----	
1659	EN14105	<0.10		-----	
1707	EN14105	0.01		-----	
1710	EN14105	0.00		-----	
1739	EN14105	<0.01		-----	
1744		-----		-----	
1754	EN14105	0.0035		-----	
1756		-----		-----	
1769	D6584	0.000		-----	
1807		-----		-----	
1869	EN14105	<0.01		-----	
1948	EN14105	<0.001		-----	
2493		-----		-----	
4043	EN14105	<0.05		-----	
	normality	n.a.			
	n	20			
	outliers	2			
	mean (n)	<0.02			
	st.dev. (n)	n.a.			
	R(calc.)	n.a.			
	R(EN14105:11)	n.a.			Application limit of the test method 0.10 %M/M


0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1710
1769
496
1400
1299
1754
1107
1707
540
1134
1557
1167

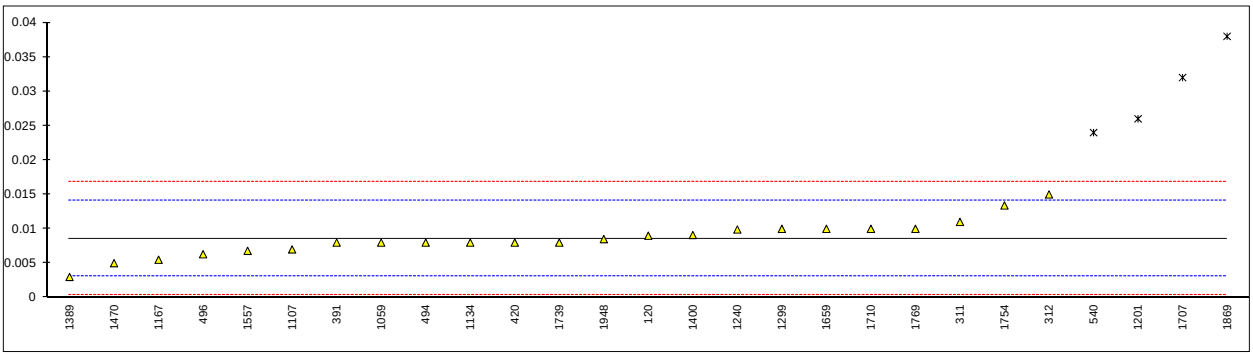

Kernel Density
16
14
12
10
8
6
4
2
0
-0.2
0
0.2
0.4
0.6

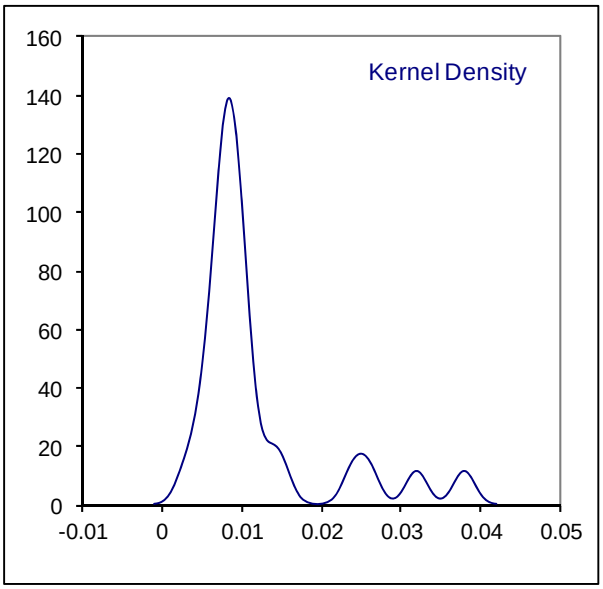
Determination of Free Glycerol on sample #13180; results in %M/M

lab	method	value	mark	z(targ)	remarks
120	EN14105	0.009		0.15	
171	EN14105	<0.001		<-2.84	
311	EN14105	0.011		0.88	
312	EN14105	0.015		2.34	
323	EN14105	<0.01		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351		-----		-----	
370		-----		-----	
391	EN14105	0.008		-0.21	
420	EN14105	0.008		-0.21	
445		-----		-----	
447		-----		-----	
494	EN14105	0.008		-0.21	
495		-----		-----	
496	EN14105	0.0063		-0.83	
540	EN14105	0.024	G(0.01)	5.62	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631		-----		-----	
1017		-----		-----	
1033		-----		-----	
1059	EN14105	0.008		-0.21	
1107	EN14105	0.007		-0.58	
1134	EN14105	0.008		-0.21	
1167	EN14105	0.0055		-1.13	
1179	EN14105	<0.01		-----	
1199		-----		-----	
1201	EN14105	0.026	G(0.05)	6.35	
1240	EN14105	0.0099		0.48	
1268		-----		-----	
1271		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14105	0.010		0.52	
1389	EN14105	0.003		-2.04	
1397		-----		-----	
1400	EN14105	0.0091		0.19	
1428		-----		-----	
1459		-----		-----	
1470	EN14105	0.005		-1.31	
1557	EN14105	0.0068		-0.65	
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634		-----		-----	
1659	EN14105	0.010		0.52	
1707	EN14105	0.032	G(0.05)	8.54	
1710	EN14105	0.01		0.52	
1739	EN14105	0.008		-0.21	
1744		-----		-----	
1754	EN14105	0.0134		1.76	
1756		-----		-----	
1769	D6584	0.010		0.52	
1807		-----		-----	
1869	EN14105	0.038	G(0.05)	10.73	
1948	EN14105	0.0085		-0.03	
2493		-----		-----	
4043		-----		-----	

normality	OK
n	23
outliers	4
mean (n)	0.0086
st.dev. (n)	0.00258
R(calc.)	0.0072
R(EN14105:11)	0.0077

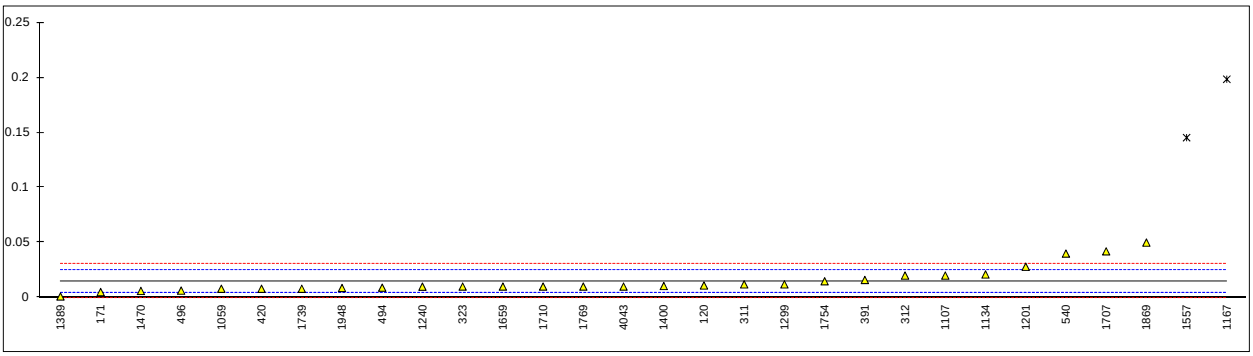
Application limit of the test method 0.001 %M/M

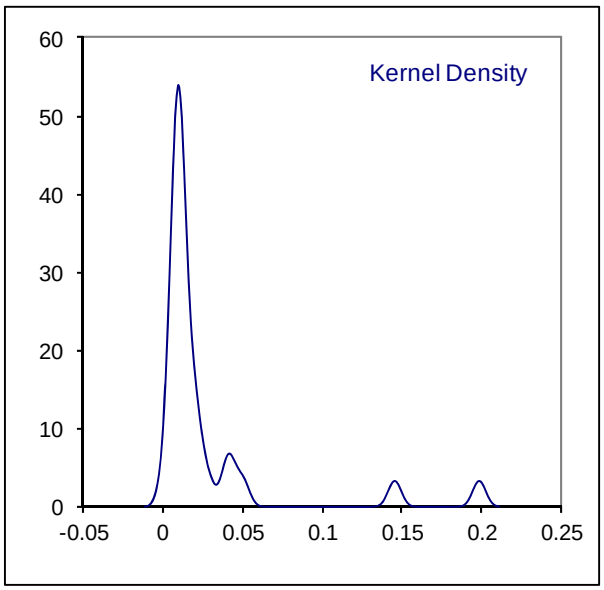

0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
1389
1470
1167
496
1557
1107
391
1059
494
1134
420
1739
1948
120
1400
1240
1299
1659
1710
1769
311
1754
312
540
1201
1707
1869


Kernel Density
160
140
120
100
80
60
40
20
0
-0.01
0
0.01
0.02
0.03
0.04
0.05

Determination of Total Glycerol on sample #13180; results in %M/M

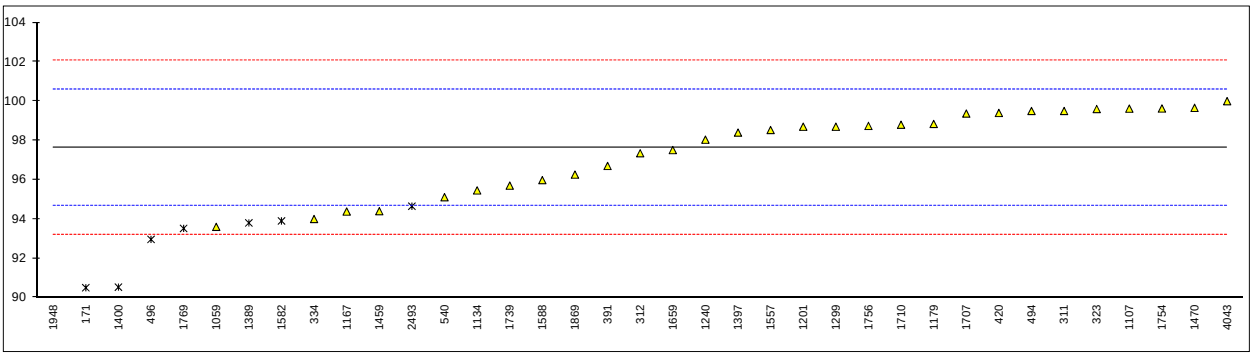
lab	method	value	mark	z(targ)	remarks
120	EN14105	0.011		-0.76	
171	EN14105	0.005		-1.93	
311	EN14105	0.012		-0.57	
312	EN14105	0.020		1.00	
323	EN14105	0.01		-0.96	
333		-----		-----	
334		-----		-----	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351		-----		-----	
370		-----		-----	
391	EN14105	0.016		0.21	
420	EN14105	0.008		-1.35	
445		-----		-----	
447		-----		-----	
494	EN14105	0.009		-1.15	
495		-----		-----	
496	EN14105	0.0063		-1.68	
540	EN14105	0.04		4.90	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631		-----		-----	
1017		-----		-----	
1033		-----		-----	
1059	EN14105	0.008		-1.35	
1107	EN14105	0.020		1.00	
1134	EN14105	0.021		1.19	
1167	EN14105	0.1985	G(0.01)	35.86	
1179	EN14105	<0.01		-----	
1199		-----		-----	
1201	EN14105	0.028		2.56	
1240	EN14105	0.0099		-0.98	
1268		-----		-----	
1271		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14105	0.012		-0.57	
1389	EN14105	0.001		-2.72	
1397		-----		-----	
1400	EN14105	0.0105		-0.86	
1428		-----		-----	
1459		-----		-----	
1470	EN14105	0.006		-1.74	
1557	EN14105	0.1454	G(0.01)	25.49	
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634		-----		-----	
1659	EN14105	0.01		-0.96	
1707	EN14105	0.042		5.29	
1710	EN14105	0.01		-0.96	
1739	EN14105	0.008		-1.35	
1744		-----		-----	
1754	EN14105	0.0148	C	-0.02	First reported 0.1244
1756		-----		-----	
1769	D6584	0.010		-0.96	
1807		-----		-----	
1869	EN14105	0.050		6.86	
1948	EN14105	0.0087		-1.21	
2493		-----		-----	
4043	EN14105	0.01		-0.96	
	normality	not OK			
	n	28			
	outliers	2			
	mean (n)	0.0149			
	st.dev. (n)	0.01173			
	R(calc.)	0.0328			
	R(EN14105:11)	0.0143			

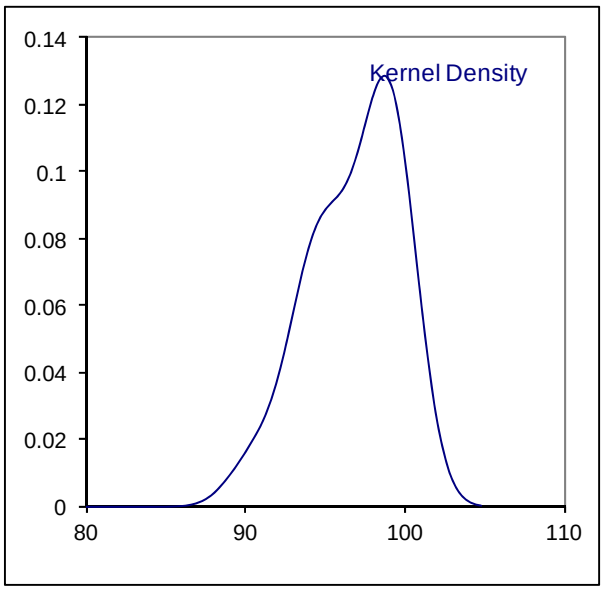

0.25
0.2
0.15
0.1
0.05
0
1389
171
1470
496
1059
420
1739
1948
494
1240
323
1659
1710
1769
4043
1400
120
311
1299
1754
391
312
1107
1134
1201
540
1707
1869
1557
1167


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

Determination of Total Ester content on sample #13180; results in %M/M

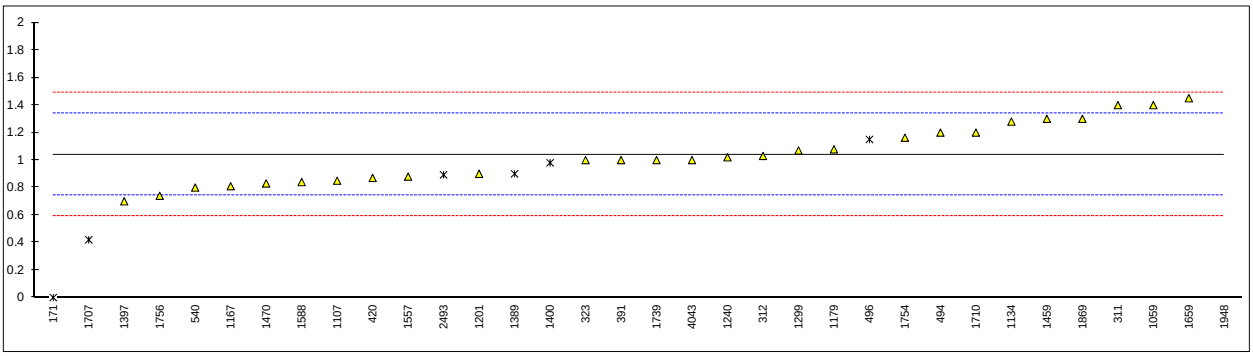
lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	EN14103:03	90.5	ex	-4.80	Result excluded, see §4.1
311	EN14103:11	99.5		1.25	
312	EN14103:11	97.35		-0.19	
323	EN14103:11	99.6		1.32	
333		-----		-----	
334	EN14103:11	94.00		-2.45	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351		-----		-----	
370		-----		-----	
391	EN14103:11	96.7		-0.63	
420	EN14103:11	99.4		1.19	
445		-----		-----	
447		-----		-----	
494	EN14103:11	99.5		1.25	
495		-----		-----	
496	EN14103:03	92.96	ex	-3.15	Result excluded, see §4.1
540	EN14103:11	95.11		-1.70	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631		-----		-----	
1017		-----		-----	
1033		-----		-----	
1059	EN14103:11	93.6		-2.72	
1107	EN14103:11	99.62		1.33	
1134	EN14103:11	95.455		-1.47	
1167	EN14103:11	94.38		-2.19	
1179	EN14103:11	98.84		0.81	
1199		-----		-----	
1201	EN14103:11	98.7		0.72	
1240	EN14103:11	98.04		0.27	
1268		-----		-----	
1271		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14103:11	98.7		0.72	
1389	EN14103:03	93.8	ex	-2.58	Result excluded, see §4.1
1397	EN14103:11	98.4		0.51	
1400	EN14103:03	90.53	ex	-4.78	Result excluded, see §4.1
1428		-----		-----	
1459	EN14103:11	94.4		-2.18	
1470	EN14103:11	99.66		1.36	
1557	EN14103:11	98.53		0.60	
1566		-----		-----	
1582	EN14103:03	93.90	ex	-2.52	Result excluded, see §4.1
1588	EN14103:11	95.98		-1.12	
1634		-----		-----	
1659	EN14103:11	97.51		-0.09	
1707	EN14103:11	99.37		1.17	
1710	EN14103:11	98.8		0.78	
1739	EN14103:11	95.7		-1.30	
1744		-----		-----	
1754	EN14103:11	99.6271		1.34	
1756	EN14103:11	98.739		0.74	
1769	EN14103:03	93.52	ex	-2.77	Result excluded, see §4.1
1807		-----		-----	
1869	EN14103:11	96.26		-0.93	
1948	EN14103:11	0.8	G(0.01)	-65.18	
2493	EN14103:03	94.650	ex	-2.01	Result excluded, see §4.1
4043	EN14103:11	100.0		1.59	
	normality	not OK			
	n	29			
	outliers	1	+7 excl		
	mean (n)	97.637			
	st.dev. (n)	2.0126			
	R(calc.)	5.635			
	R(EN14103:11)	4.160			

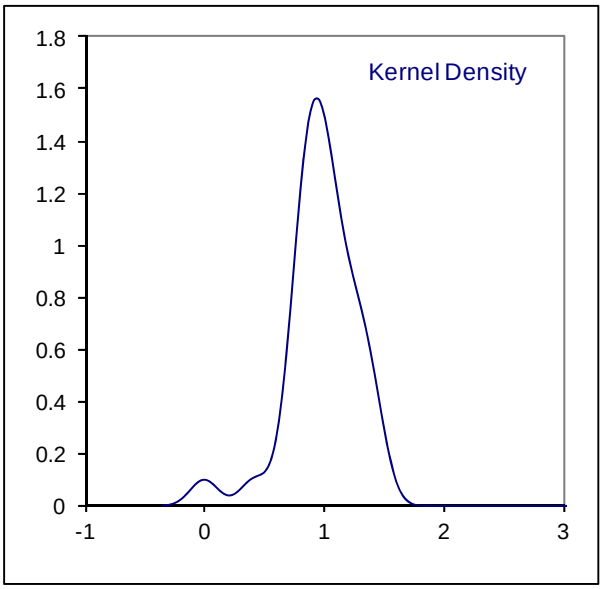

104
102
100
98
96
94
92
90
1948
171
1400
496
1769
1059
1389
1582
334
1167
1459
2493
540
1134
1739
1588
1869
391
312
1659
1240
1397
1557
1201
1299
1756
1710
1179
1707
420
494
311
323
1107
1754
1470
4043


Kernel Density
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
80
90
100
110

Determination of Linolenic Acid Methyl Ester content on sample #13180; results in %M/M

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	EN14103:03	0.0	ex	-6.99	Result excluded, see §4.1
311	EN14103:11	1.4		2.41	
312	EN14103:11	1.03		-0.07	
323	EN14103:11	1.0		-0.28	
333		-----		-----	
334		-----		-----	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351		-----		-----	
370		-----		-----	
391	EN14103:11	1.0		-0.28	
420	EN14103:11	0.87		-1.15	
445		-----		-----	
447		-----		-----	
494	EN14103:11	1.2		1.07	
495		-----		-----	
496	EN14103:03	1.15	ex	0.73	Result excluded, see §4.1
540	EN14103:11	0.80		-1.62	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631		-----		-----	
1017		-----		-----	
1033		-----		-----	
1059	EN14103:11	1.4		2.41	
1107	EN14103:11	0.85		-1.28	
1134	EN14103:11	1.28		1.60	
1167	EN14103:11	0.81		-1.55	
1179	EN14103:11	1.078		0.25	
1199		-----		-----	
1201	EN14103:11	0.9		-0.95	
1240	EN14103:11	1.02		-0.14	
1268		-----		-----	
1271		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14103:11	1.07		0.19	
1389	EN14103:03	0.90	ex	-0.95	Result excluded, see §4.1
1397	EN14103:11	0.7		-2.29	
1400	EN14103:03	0.98	ex	-0.41	Result excluded, see §4.1
1428		-----		-----	
1459	EN14103:11	1.3		1.74	
1470	EN14103:11	0.83		-1.42	
1557	EN14103:11	0.88		-1.08	
1566		-----		-----	
1582		-----		-----	
1588	EN14103:11	0.84		-1.35	
1634		-----		-----	
1659	EN14103:11	1.45		2.75	
1707	EN14103:11	0.42	G(0.01)	-4.17	
1710	EN14103:11	1.2		1.07	
1739	EN14103:11	1.0		-0.28	
1744		-----		-----	
1754	EN14103:11	1.1628		0.82	
1756	EN14103:11	0.740		-2.02	
1769		-----		-----	
1807		-----		-----	
1869	EN14103:11	1.30		1.74	
1948	EN14103:11	9.73	G(0.01)	58.36	
2493	EN14103:03	0.893	ex	-1.00	Result excluded, see §4.1
4043	EN14103:11	1.0		-0.28	
	normality	OK			
	n	27			
	outliers	2	+ 5 excl		
	mean (n)	1.0411			
	st.dev. (n)	0.21537			
	R(calc.)	0.6030			
	R(EN14103:11)	0.4169			

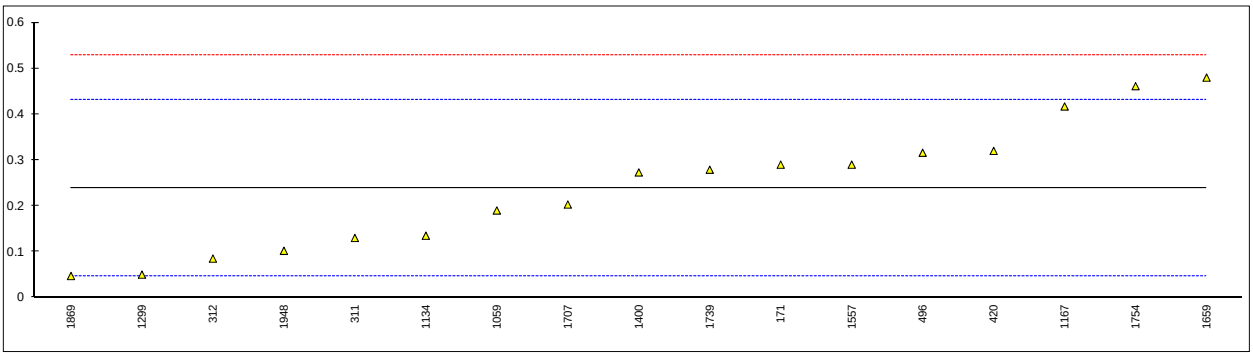

2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
171
1707
1397
1756
540
1167
1470
1588
1107
420
1557
2493
1201
1389
1400
323
391
1739
4043
1240
312
1299
1179
496
1754
494
1710
1134
1459
1869
311
1059
1659
1948

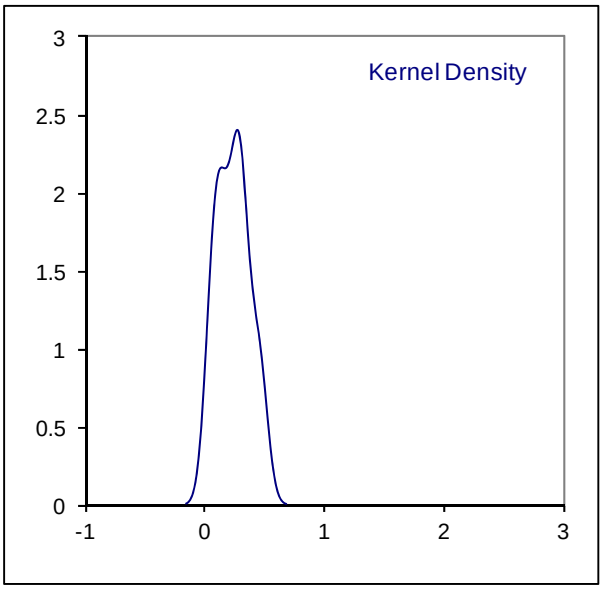

Kernel Density
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-1
0
1
2
3

Determination of Polyunsaturated Methyl Esters content on sample #13180; results in %M/M

lab	method	value	mark	z(targ)	Remarks
120		-----		-----	
171	EN15779	0.29		0.53	
311	EN15779	0.13		-1.13	
312	EN15779	0.085		-1.60	
323		-----		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
337		-----		-----	
338		-----		-----	
351		-----		-----	
370		-----		-----	
391		-----		-----	
420	EN15779	0.32		0.84	
445		-----		-----	
447		-----		-----	
494		-----		-----	
495		-----		-----	
496	EN15779	0.316		0.80	
540		-----		-----	
551		-----		-----	
554		-----		-----	
603		-----		-----	
631		-----		-----	
1017		-----		-----	
1033		-----		-----	
1059	EN15779	0.19		-0.51	
1107		-----		-----	
1134	EN14103	0.135		-1.08	
1167	EN15779	0.417		1.84	
1179	EN15779	<0.5		-----	
1199		-----		-----	
1201	EN15779	<0.60		-----	
1240		-----		-----	
1268		-----		-----	
1271		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN15779	0.05		-1.96	
1389	EN15779	<0.6		-----	
1397		-----		-----	
1400	EN15779	0.273		0.35	
1428		-----		-----	
1459		-----		-----	
1470		-----		-----	
1557	EN15779	0.29		0.53	
1566		-----		-----	
1582		-----		-----	
1588		-----		-----	
1634		-----		-----	
1659	EN15779	0.48		2.50	
1707	EN15779	0.203		-0.38	
1710		-----		-----	
1739	EN15779	0.279		0.41	
1744		-----		-----	
1754	EN15779	0.4613		2.30	
1756		-----		-----	
1769		-----		-----	
1807		-----		-----	
1869	in house	0.047		-1.99	
1948	EN15779	0.102		-1.42	
2493		-----		-----	
4043		-----		-----	

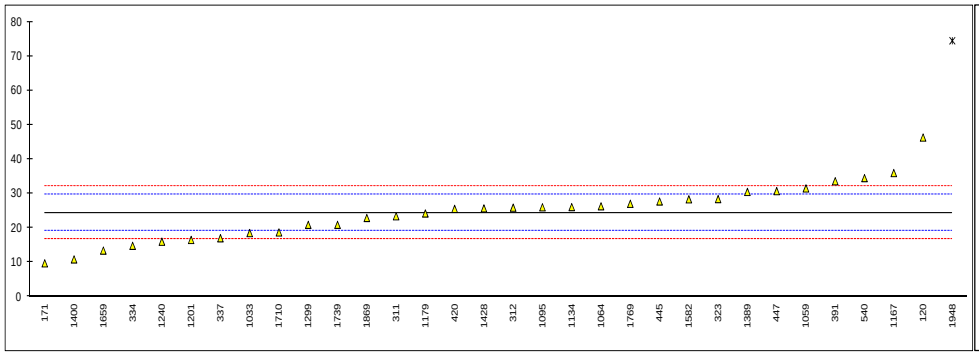
normality	OK
n	17
outliers	0
mean (n)	0.239
st.dev. (n)	0.1372
R(calc.)	0.384
R(EN15779:09)	0.270

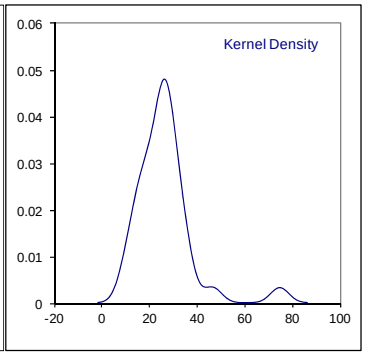

0.6
0.5
0.4
0.3
0.2
0.1
0
1869
1299
312
1948
311
1134
1059
1707
1400
1739
171
1557
496
420
1167
1754
1659


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

Determination of Total Contamination on sample #13181; results in mg/kg

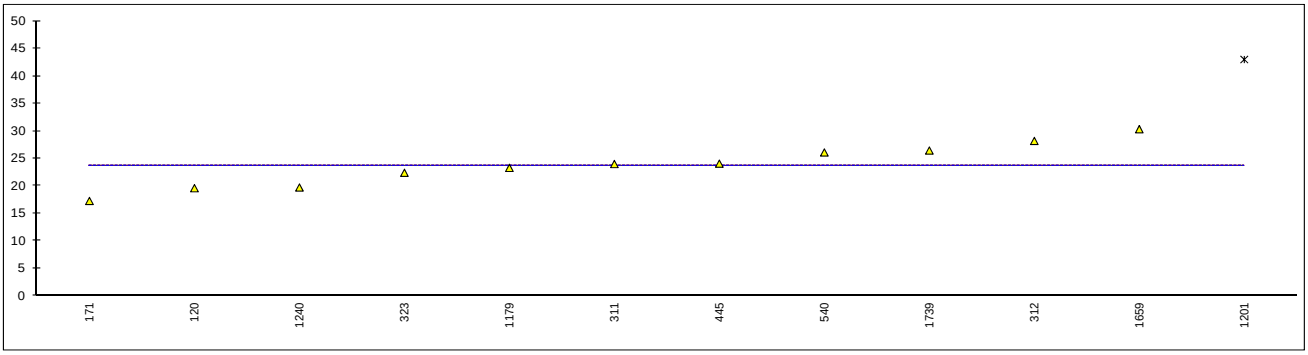
lab	method	value	mark	z(targ)	remarks
120	EN12662	46.3		8.35	
171	EN12662	9.7		-5.63	
311	EN12662	23.4		-0.40	
312	EN12662:08	25.9		0.56	
323	EN12662	28.4		1.51	
334	EN12662:08	14.79		-3.69	
335		-----		-----	
337	EN12662:08	17.0		-2.84	
391	EN12662	33.6		3.50	
420	EN12662	25.54		0.42	
445	EN12662	27.7		1.24	
447	IP440	30.7		2.39	
540	EN12662:08	34.5		3.84	
551		-----		-----	
1017		-----		-----	
1033	IP440	18.5		-2.27	
1059	EN12662:08	31.5		2.69	
1064	EN12662:08	26.30		0.71	
1095	EN12662:98	26		0.59	
1134	EN12662:08	26.06		0.62	
1167	EN12662	35.97		4.40	
1179	EN12662	24.2		-0.09	
1199		-----		-----	
1201	EN12662:98	16.5		-3.03	
1240	EN12662:08	16.0		-3.22	
1271		-----		-----	
1299	EN12662:08	20.9		-1.35	
1389	EN12662:98	30.48		2.31	
1400	EN12662:08	10.85		-5.19	
1426		-----		-----	
1428	EN12662:08	25.7		0.48	
1557		-----		-----	
1582	EN12662:08	28.32		1.48	
1659	EN12662	13.41		-4.21	
1710	EN12662:08	18.7		-2.19	
1739	EN12662:98	20.9		-1.35	
1744		-----		-----	
1769	EN12662:08	27.02		0.98	
1807		-----		-----	
1869	EN12662:98	22.9		-0.59	
1948	EN12662	74.47	G(0.01)	19.10	
	normality	OK			
	n	31			
	outliers	1	Spike:		
	mean (n)	24.44	15.0		Recovery: <163%
	st.dev. (n)	7.929			
	R(calc.)	22.20			
	R(EN12662:08)	7.33			

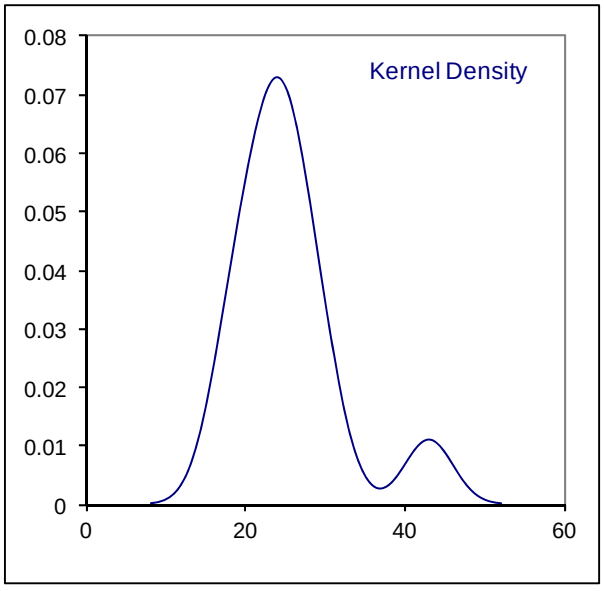




Determination of sum of Calcium and Magnesium on sample #13182; results in mg/kg

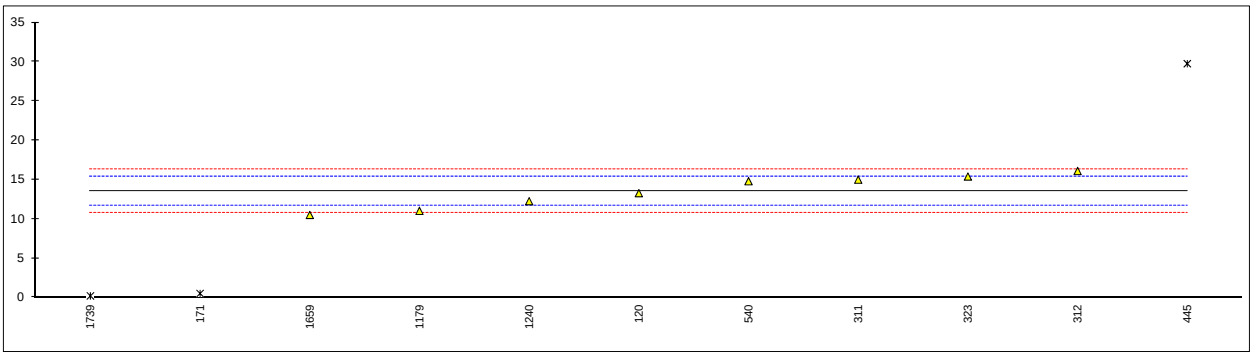
lab	method	value	mark	z(targ)	remarks
120	EN14538	19.6		-----	
171	EN14538	17.28		-----	
311	EN14538	24		-----	
312	EN14538	28.2		-----	
323	EN14538	22.4		-----	
391		-----		-----	
445	EN14538	24.06		-----	
540	EN14538	26.1		-----	
551		-----		-----	
1134		-----		-----	
1179	EN14538	23.3		-----	
1201	D5185Mod.	43	G(0.05)	-----	False positive result?
1240	EN14538	19.73		-----	
1268		-----		-----	
1659	EN14538	30.33		-----	
1739	EN14538	26.45		-----	
	normality	OK			
	n	11			
	outliers	1			
	mean (n)	23.768			
	st.dev. (n)	3.9158			
	R(calc.)	10.964			Compare R(Horwitz) = 9.347 (2 comp.)
	R(EN14538:06)	(4.727)			Application range: 1 – 10 mg/kg

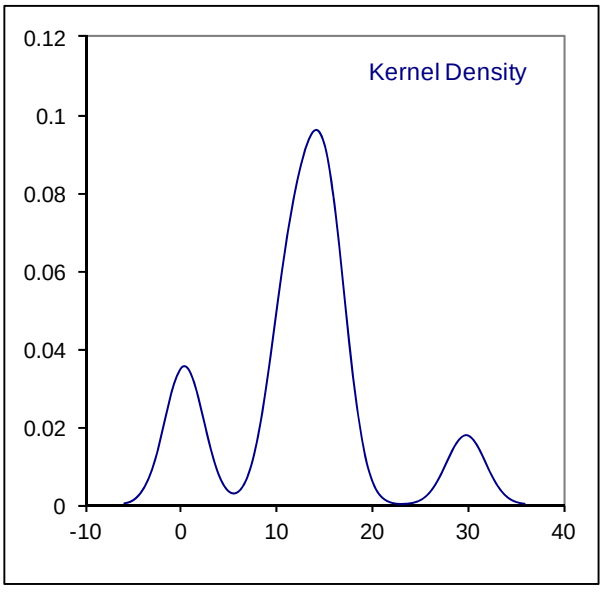




Determination of Phosphorus on sample #13182; results in mg/kg

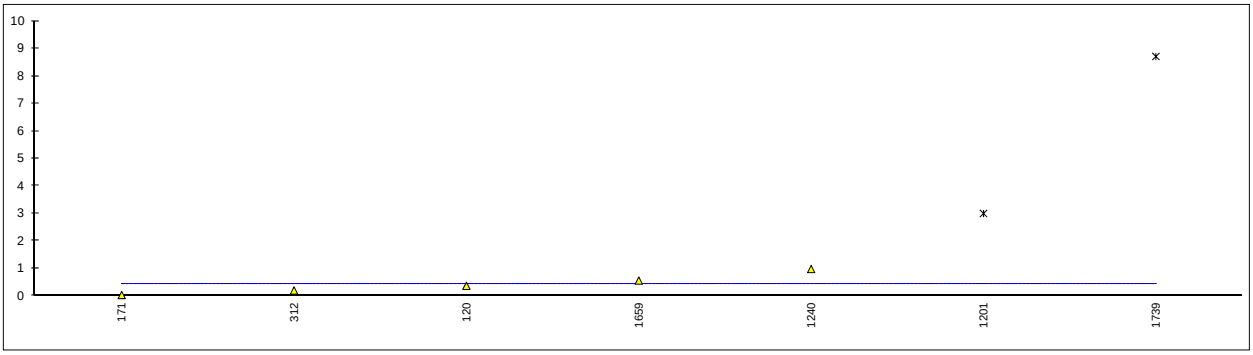
lab	method	value	mark	z(targ)	remarks
120	EN14107	13.28		-0.29	
171	EN14107	0.511	G(0.05)	-13.90	
311	EN14538	15		1.55	
312	EN14107	16.1		2.72	
323	EN14107	15.4		1.98	
391		-----		-----	
445	EN14107	29.76	G(0.01)	17.29	
540	EN14107	14.8		1.34	
551		-----		-----	
1134		-----		-----	
1179	EN14107	11.03		-2.68	
1201	D5185Mod.	<1		<-13.38	False negative?
1240	EN16294	12.26		-1.37	
1268		-----		-----	
1659	EN14107	10.51		-3.24	
1739	EN14107	0.20	G(0.05)	-14.23	
	normality	OK			
	n	8			
	outliers	3	Spike		
	mean (n)	13.548	15.28		Recovery: <89%
	st.dev. (n)	2.1017			
	R(calc.)	5.885			
	R(EN14107:03)	2.626			Application range EN14107: 4 – 20 mg/kg





Determination of Potassium on sample #13182; results in mg/kg

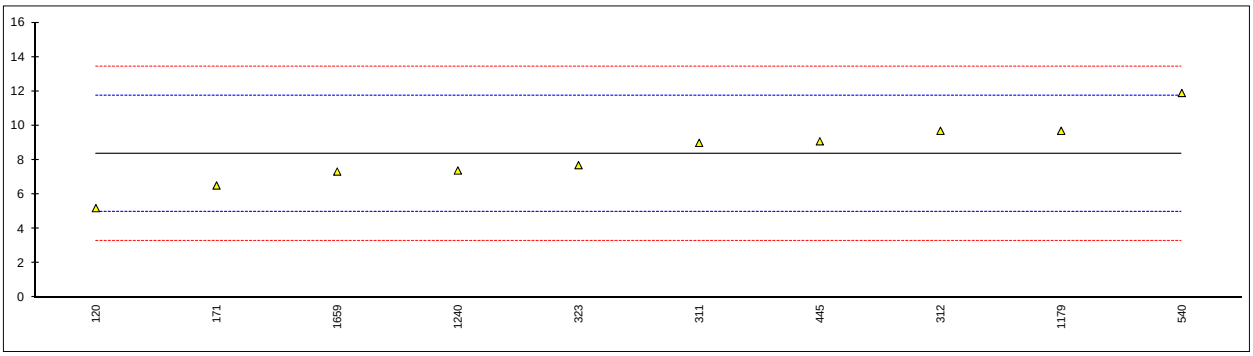
lab	method	value	mark	z(targ)	remarks
120	EN14109	0.37		-----	
171	EN14109	0.035		-----	
311	EN14538	<1		-----	
312	EN14109	0.2		-----	
323	EN14538	<1.0		-----	
391		-----		-----	
445	EN14538	<0.1		-----	
540	EN14538	<0.5		-----	
551		-----		-----	
1134		-----		-----	
1179	EN14109	<1		-----	
1201	D5185Mod.	3	G(0.05)	-----	False positive result?
1240	EN14538	0.98		-----	
1268		-----		-----	
1659	EN15538	0.56		-----	
1739	EN14538	8.71	G(0.01)	-----	False positive result?
	normality	OK			
	n	5			
	outliers	2			
	mean (n)	0.429			
	st.dev. (n)	0.3647			
	R(calc.)	1.021			
	R(EN14109:03)	(1.468)			Application range: >0.5mg/kg

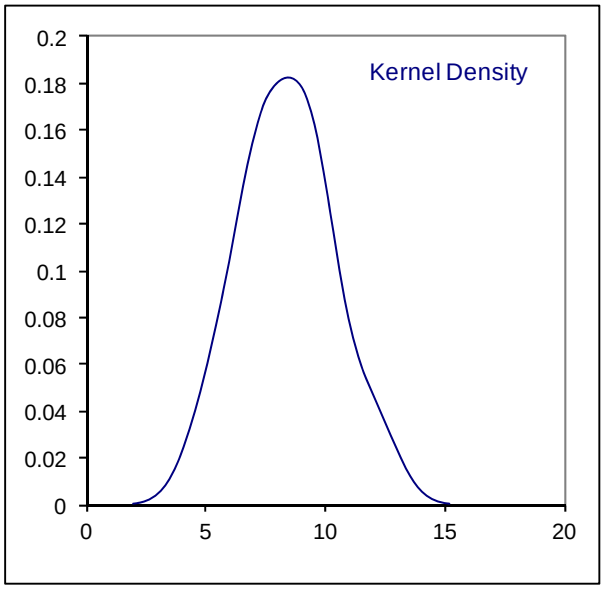


Determination of Sodium on sample #13182; results in mg/kg

lab	method	value	mark	z(targ)	remarks
120	EN14108	5.2		-1.86	
171	EN14108	6.52		-1.08	
311	EN14107	9		0.38	
312	EN14108	9.7		0.80	
323	EN14538	7.7		-0.39	
391		-----		-----	
445	EN14538	9.09		0.44	
540	EN14538	11.9		2.10	
551		-----		-----	
1134		-----		-----	
1179	EN14108	9.7		0.80	
1201	D5185Mod.	<1		<-4.34	False negative?
1240	EN14538	7.39		-0.57	
1268		-----		-----	
1659	EN14538	7.33		-0.60	
1739	EN14538	<0.1		<-4.88	False negative?

normality	OK
n	10
outliers	0
mean (n)	8.353
st.dev. (n)	1.9112
R(calc.)	5.351
R(EN14109:03)	4.740





APPENDIX 2

Number of participants per country

1 lab in ARGENTINA
4 labs in BELGIUM
1 lab in BOSNIA and HERZEGOVINA
2 labs in BRAZIL
3 labs in BULGARIA
3 labs in COLOMBIA
1 lab in CROATIA
1 lab in CZECH REPUBLIC
7 labs in FRANCE
4 labs in GERMANY
2 labs in HONG KONG
2 labs in HUNGARY
1 lab in ITALY
1 lab in LITHUANIA
1 lab in MALAYSIA
4 labs in NETHERLANDS
1 lab in NORWAY
1 lab in PHILIPPINES
3 labs in PORTUGAL
1 lab in SERBIA
1 lab in SLOVENIA
7 labs in SPAIN
4 labs in TURKEY
4 labs in UNITED KINGDOM
3 labs in UNITED STATES OF AMERICA

APPENDIX 3

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
ex	= excluded from calculations
S	= scope of the reported method is not applicable
U	= reported in different unit
n.a.	= not applicable
n.e.	= not evaluated
SDS	= Safety Data Sheet

Literature:

1 iis Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, January 2010
2 ASTM E178-02
3 ASTM E1301-03
4 ISO13528-05
5 ISO 5725-86
6 ISO 5725, parts 1-6, 1994
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