Results of Proficiency Test
Biodiesel 100% FAME (B100)
September 2010

Author: ing. R.J. Starink
Correctors: dr. R.G. Visser & ing. L. Sweere
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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 51 laboratories from 23 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 produced from Rapeseed Oil was used. Sample analyses for fit-for-use and homogeneity testing were subcontracted. It was decided to send one ½ litre and one 1 litre bottle of Biodiesel B100 (labelled #1066), and separately a 1 litre bottle Biodiesel B100 (labelled #1067) specifically for Total Contamination test.
The test scopes were set up according to both EN14214/C1:07 and ASTM D6751:09 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 guide 43, ILAC-G13:2007 and ISO 17043:2010.
This ensures 100% confidentially of participant's data. Also customer's satisfaction is measured on regular basis by the distribution of 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 present 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 type RME "Rapeseed Methyl Ester" was purchased from a European producer. After fit-for-use testing and homogenisation in a precleaned metal drum, the B100 was transferred to 68 brown glass bottles of 1 litre and 68 brown bottles of 500 ml. Another 52 one litre bottles to be used for the Total Contamination test were filled for approx. 80% and labelled sample #1067.
The homogeneity of the subsamples #1066 was checked by the determination of Water in accordance with ISO12937:02 and Density in accordance with ASTM D4052:09 on 8 stratified randomly selected samples:

	Water in mg/kg	Density at 15ºC in kg/L
sample 1 #1066-1	470	0.8824
sample 2 #1066-2	475	0.8824
sample 3 #1066-3	455	0.8824
sample 4 #1066-4	450	0.8824
sample 1 #1066-5	445	0.8824
sample 2 #1066-6	440	0.8824
sample 3 #1066-7	435	0.8824
sample 4 #1066-8	435	0.8824

table 1: homogeneity test of subsamples #1066

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

	Water in mg/kg	Density at 15ºC in kg/L
r (sample #1066)	40.8	0.00000
Reference test	ISO12937:02	D4052:09
0.3*R$_{(reference test)}$	43.8	0.00015

table 2: repeatabilities of subsamples #1066

Each calculated repeatability was equal or less than 0.3 times the corresponding reproducibility of the respective reference method. Therefore, homogeneity of the subsamples was assumed.

For Total Contamination approx 50 litre of bulk material was used. After homogenization, the material was subsequently divided over 45 amber glass bottles of 1L with inner and outer caps and labelled #1067. Each sample was spiked with 1 ml of a freshly prepared and ultrasonically homogenized, 25 g/kg particulate quartz material BCR-067 (ø 2.4-32 µm) in oil suspension. The homogeneity was checked by weighing the bottles before and after addition of the spike.

Depending on the registration of the participant, two bottles of 1 litre and 0.5 litre labelled #1066, and/or one 1 litre bottle labelled #1067, were dispatched to each of the participating laboratories on September 22, 2010.

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 EN14214:03/C1:07 and/or ASTM D6751:09, e.g.:

Parameter	EN14214/C1:07	Parameter	ASTM D6751:09
Acid Value	EN14104	Acid Number	ASTM D664
Carbon Residue	ISO10370	Carbon Residue	ASTM D4530
CFPP	EN116		
Copper Strip Corrosion	ISO2160	Copper Strip Corrosion	ASTM D130
Total Contamination	EN12662		
Density @ 15°C	ISO12185		
Flash Point	ISO3679	Flash Point	ASTM D93-C
Iodine Value	EN14111		
Kin. Visc. @ 40°C	ISO3104	Kin. Visc. @ 40°C	ASTM D445
Oxidation Stability	EN14112	Oxidation Stability	EN14112
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
Potassium + Sodium	EN14108	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		

table 3: requirements and test methods acc. to specifications EN14214/C1:07 and ASTM D6751:09

To get comparable results a detailed report form, on which the units were prescribed as well as some of the required standards, was sent together with each set of samples. Also a letter of instructions and a SDS were added to the package.

3   RESULTS

During four weeks after sample despatch, the results of the individual laboratories were gathered. The original data are tabulated per determination in the appendix 1 of this report. The laboratories are presented by their code numbers.
Directly after deadline, a reminder fax was sent to those laboratories that had not yet reported. Shortly after the deadline, the available results were screened for suspect data. A result was called suspect in case the Huber Elimination Rule (a robust outlier test) found it to be an outlier. The laboratories that produced these suspect data were asked to check the (raw data of the) reported results. Additional or corrected results have been used for data analysis and the original results are placed under 'Remarks' in the result tables in appendix 1.

3.1 STATISTICS

Statistical calculations were performed as described in the report 'iis Interlaboratory Studies: Protocol for the 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.

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

3.2 GRAPHICS

In order to visualise 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.12-13).

3.3 Z-SCORES

To evaluate the performance of the participating laboratories the z-scores were calculated. As it was decided to evaluate the performance of the participants in this proficiency test (PT) against the literature requirements, e.g. ASTM reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the spread of this interlaboratory study.
The target standard deviation was calculated from the literature reproducibility by division with 2.8. The z-scores were calculated according to:

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

The $z_{(target)}$ scores are listed in the result tables in appendix 1.
Absolute values for z<2 are very common and absolute values for z>3 are very rare.
Therefore the usual interpretation of z-scores 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 were encountered during the execution. Two laboratories had trouble receiving the samples on time. In total 6 laboratories reported after the deadline. All but one laboratory reported test results, but not all laboratories were able to perform all analyses requested. From 50 participants, 744 numerical results were received. Observed were 38 outlying results, which is 5.1% of the numerical results. 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: Cold Filter Plugging Point, Density, Kinematic Viscosity, Sulfur *cfr*. ASTM D5453, Free glycerol, total Glycerol and Linolenic Acid Methyl 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 EN14214:03/C1:07 and ASTM D6751:09 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.

Acid Value (EN):   This determination was not problematic. Four statistical outliers were detected. However, the calculated reproducibility is in full agreement with the requirements of EN14104:03.

Acid Number (ASTM):   This determination was problematic. No statistical outliers were detected. However, the calculated reproducibility is not at all in agreement with the requirements of ASTM D664:10. Three laboratories used ASTM D974, a method that is not equivalent to ASTM D664 and that may give deviating results.

Carbon Residue   This determination was very problematic. Only one statistical outlier was observed. Also one false negative test result was reported and one test

result was withdrawn. However, the calculated reproducibility is not at all in agreement with the requirements of ISO10370.

According to the EN14214:2003 specifications, it is required to perform the analysis on a sample reduced to 10% of its volume by distillation. However, ASTM D6751:2009 specifications require the analysis to be performed on an undistilled sample. In this study it was requested to reduce the sample volume to 10% prior to the determination of the Carbon Residue. Perhaps not all participants fulfilled this request.

CFPP:
: This determination was not problematic. Two statistical outliers were detected. The calculated reproducibility is in good agreement with the requirements of EN116:97. However, please note that according to N14214:03/C1:07, no reproducibility requirements are available for the EN116:97 method applied on Biodiesel B100.

Cloud Point:
: This determination was not problematic. Two statistical outliers were detected. The calculated reproducibility is in good agreement with the requirements of ASTM D2500:09.

Copper Corrosion:
: No problems have been observed. In this determination all participants agree on a result of 1.

Density @15°C:
: This determination was not problematic. Four statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers, is in good agreement with the requirements of ISO12185:96.

Flash Point (ISO3679):
: This determination was not problematic. Two statistical outliers were detected. The calculated reproducibility is in full agreement with the requirements of ISO3679:04.

Flash Point (PMcc):
: This determination was not be problematic. No statistical outliers were detected and the calculated reproducibility is in good agreement with the requirements of ASTM D93:10-C.

Iodine Number:
: This determination was not problematic. Four statistical outliers were detected. However, the calculated reproducibility, after rejection of the statistical outliers, is in good agreement with the requirements of EN14111:03.

An estimation of the range, in which the Iodine number is likely to be expected, can be calculated. There is a relation between Iodine number and Fatty Acid composition (EN14214:2003 Annex B). The composition may be assessed by taking the reproducibility according to EN14103:03 (Linolenic Acid Methyl Ester) as a guideline.

For this sample the Iodine Number may be estimated to have a value between 97 and 121 g I_2/100 g. Therefore, Iodine Numbers reported

above or below these values are not likely to be expected, due to the kind of Biodiesel B100 (Rapeseed Methyl Ester) used for this study.

Kin.Visco. @ 40°C: This determination was problematic. One statistical outlier was observed, but the calculated reproducibility, after rejection of the statistical outlier, is not in agreement with the requirements of ISO3104:96.

Oxidation Stability: This determination was not problematic. Two statistical outliers were detected. However, the calculated reproducibility, after rejection of the statistical outliers, is in good agreement with the requirements of EN14112:03.

Sulphated Ash: All reported results were near or below the applicable lower limit of ASTM D874:07 and ISO3987:94 (0.005% M/M). Therefore no conclusions were drawn.

Sulphur (ISO20846): All reported results were near or below the application range of ISO20846 (3 – 500 mg/kg). Therefore no conclusions were drawn.

Sulphur (D5453): This determination may be problematic. Two statistical outliers were detected. The calculated reproducibility, after rejection of the statistical outliers, is not in good agreement with the requirements of ASTM D5453:09. However, the sulphur concentration was near the lower application limit of 1 mg/kg, which may explain for the relatively large spread of the test results.

Water: This determination was not problematic. Two statistical outliers were observed. After rejection of the statistical outliers, the calculated reproducibility is in agreement with the requirements of ISO12937:00.

Calcium and Magnesium: All reported results were near or below the application range of EN14538:06 (1 – 10 mg/kg). Therefore no conclusions were drawn.

Phosphorus: All reported results were near or below the application range of EN14107:03 (4 – 20 mg/kg). Therefore no conclusions were drawn.

Potassium: All reported results were near or below the lower application limit of EN14214:03/C1:07 (0.5 mg/kg). Therefore no conclusions were drawn.

Sodium: All reported results were near or below the lower application limit of EN14214:03/C1:07 (1 mg/kg). Therefore no conclusions were drawn.

Methanol: This determination may be problematic. No statistical outliers were detected. However, the calculated reproducibility is not at all in agreement with the requirements of EN14110:03. However, the methanol concentration was near the lower application limit of 0.01%M/M, which may explain for the relatively large spread of the test results.

mono-Glycerides: This determination was not problematic. Four statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers, is in agreement with the requirements of EN14105:03.

di-Glycerides: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of EN14105:03.

tri-Glycerides: This determination was problematic. Two statistical outliers and one false negative test result were observed. The calculated reproducibility, after rejection of the statistical outliers, is not in agreement with the requirements of EN14105:03.

Free Glycerol: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of EN14105:03.

Total Glycerol: This determination was 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 EN14105:03.

Total Ester: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of EN14103:03.

Total Ester corr: After correction of the C17 present in the sample, the spread appeared to be smaller than the spread of the uncorrected results. Also, the average corrected ester content is less (!) than the uncorrected ester content, while the contrary is to be expected. No statistical outliers were observed. The calculated reproducibility is in good agreement with the requirements of EN14103:03. This is remarkable because two laboratories reported corrected ester content results that are lower than the reported uncorrected ester content results, which is in principle impossible.

Linolenic Acid Methyl Ester: This determination was not problematic. No statistical outliers were detected. The calculated reproducibility is, after rejection of the statistical outlier, in good agreement with the requirements of EN14103:03.

Total Contamination: This determination was rather problematic for the sample used. In total 9 laboratories reported 'fail' or 'blockage' or a test results for a sample volume lower than 800 mL. Also one laboratory did report to have used 800 mL , but <6 mg/kg TC (false negative, because 15 mg/kg was added to the sample). When the 20 reported numerical test results were all used for the statistical evaluation, only one

statistical outlier was observed. However, the calculated reproducibility, after rejection of the statistical outlier, is not at all in agreement with the requirements of EN12662:08. This large spread is in agreement with the large number of 'fails' reported.

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 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	31	0.134	0.042	0.060
Acid Number (D664)	mg KOH/g	18	0.129	0.047	0.020
Carbon Residue	%M/M	18	0.128	0.191	0.062
Cold Filter Plugging Point	°C	37	-15.56	2.58	4.18
Cloud Point	°C	21	-5.19	3.92	4.00
Density @ 15°C	kg/m^3	42	882.42	0.25	0.50
Flash Point (ISO3679)	°C	18	158.36	12.12	15.00
Flash Point PMcc (D93)	°C	32	146.81	11.69	14.70
Iodine Value	g I$_2$/100g	32	110.49	3.53	5.00
Kin. Viscosity @ 40°C	mm^2/s	41	4.4400	0.0558	0.0446
Oxidation Stability	hours	33	6.200	0.953	1.842
Sulphated Ash	%M/M	13	0.0015	0.0021	(0.0008)
Sulphur (ISO20846)	mg/kg	18	1.83	0.68	(1.32)
Sulphur (D5453)	mg/kg	14	1.99	1.32	0.97
Water	mg/kg	42	450.5	61.4	146.0
Calcium & Magnesium	mg/kg	12	0.19	0.32	(1.21)
Phosphorus	mg/kg	10	0.77	1.85	(0.17)
Potassium	mg/kg	6	0.29	0.54	(2.07)
Sodium	mg/kg	14	0.40	0.40	(1.46)
Methanol	%M/M	32	0.014	0.012	0.006
mono-Glycerides	%M/M	28	0.550	0.214	0.201
di-Glycerides	%M/M	32	0.116	0.067	0.047
tri-Glycerides	%M/M	29	0.065	0.089	0.078
Free Glycerol	%M/M	29	0.011	0.012	0.009
Total Glycerol	%M/M	31	0.176	0.085	0.069
Total Ester	%M/M	35	96.50	3.44	3.10
Total Ester (corr. for C17)	%M/M	16	96.34	3.07	3.10
Linolenic Acid Methyl Ester	%M/M	35	9.13	0.52	2.96
Total Contamination	mg/kg	19	27.5	19.2	8.2

table 4: comparison of the observed and target reproducibilities

 * Values between brackets were below the application range of the respective reference test method, therefore results should be used with due 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 2010 WITH PREVIOUS PTS

	October 2010	October 2009	May 2009	October 2008
Type of FAME	Rapeseed	Rapeseed	Rapeseed	Palm Oil
Number of reporting labs	50	35	67	27
Number of results reported	744	519	980	417
Number of statistical outliers	38	33	61	31
Percentage statistical outliers	5.1%	6.4%	6.2%	7.4%

table 5: 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 2010	May 2010	October 2009	May 2009
Acid Value (EN14104)	++	+	-	+/-
Acid Number (D664)	--	--	--	+/-
Carbon Residue	--	--	--	--
Cold Filter Plugging Point	++	++	++	--
Cloud Point	+/-	++	n.e.	n.e.
Density @15°C	++	++	++	++
Flash Point PMcc (ISO3679)	++	+/-	+	--
Flash Point PMcc (D93)	++	--	--	--
Iodine Value	++	-	--	--
Kin. Viscosity @ 40°C	-	++	+	++
Oxidation Stability	++	++	++	++
Sulphated Ash	(--)	(--)	(--)	(--)
Sulphur (ISO20846)	(+)	(++)	(+/-)	(++)
Sulphur (D5453)	--	++	n.e.	+/-
Water	++	++	++	++
Calcium and Marnesium	(++)	++	--	(++)
Phosphorus	(--)	(--)	(--)	(--)
Potassium and Sodium	(++)	(++)	++	(++)
Methanol	--	--	+	--
mono-Glycerides	+/-	++	--	+/-
di-Glycerides	--	+/-	--	-
tri-Glycerides	-	+/-	--	--
Free Glycerol	--	+/-	--	-
Total Glycerol	--	++	+	+/-
Total Ester content	-	++	++	++
Total Ester content corrected	+/-	n.e.	n.e.	n.e.
Linolenic Acid Methyl Ester	++	-	++	++
Total Contamination	(--)	-	(--)	+

table 8: 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 #1066; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
150	EN14104	0.132		-0.09	
171		-----		-----	
311	EN14104	0.13		-0.19	
312	EN14104	0.12		-0.65	
323	EN14104	0.13		-0.19	
333		-----		-----	
334	EN14104	0.11		-1.12	
344	EN14104	0.1128		-0.99	
345	EN14104	0.14		0.28	
360	EN14104	0.136		0.09	
391		-----		-----	
447	EN14104	0.149		0.70	
496	EN14104	0.130		-0.19	
511		-----		-----	
540	EN14104	0.165		1.45	
575		-----		-----	
631		-----		-----	
1017		-----		-----	
1059	EN14104	0.17		1.68	
1067	EN14104	0.192	DG(0.05)	2.71	
1080		-----		-----	
1107	EN14104	0.121		-0.61	
1138	EN14104	0.14		0.28	
1154	EN14104	0.13		-0.19	
1161	EN14104	0.178	DG(0.05)	2.05	
1167	EN14104	0.14		0.28	
1179	EN14104	0.132		-0.09	
1199		-----		-----	
1201		-----		-----	
1203	EN14104	0.138		0.19	
1213	D974	0.128		-0.28	
1240	EN14104	0.120		-0.65	
1263		-----		-----	
1278	EN14104	0.1183		-0.73	
1286	EN14104	0.140		0.28	
1292		-----		-----	
1299	EN14104	0.13		-0.19	
1300	EN14104	0.1489		0.70	
1339	EN14104	0.203	DG(0.05)	3.22	
1402		-----		-----	
1409	EN14104	0.14		0.28	
1429	EN14104	0.15		0.75	
1634		-----		-----	
1656	EN14104	0.18	DG(0.05)	2.15	
1708		-----		-----	
1710	EN14104	0.12		-0.65	
1739	EN14104	0.11		-1.12	
1807	EN14104	0.124		-0.47	
1826	EN14104	0.14		0.28	
1948	EN14104	0.15851	C	1.14	first reported 0.2344

normality	OK	
n	31	
outliers	4	
mean (n)	0.1340	
st.dev. (n)	0.01486	
R(calc.)	0.0416	
R(EN14104:03)	0.0600	
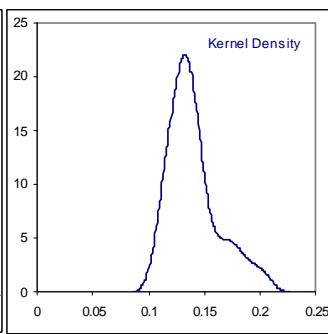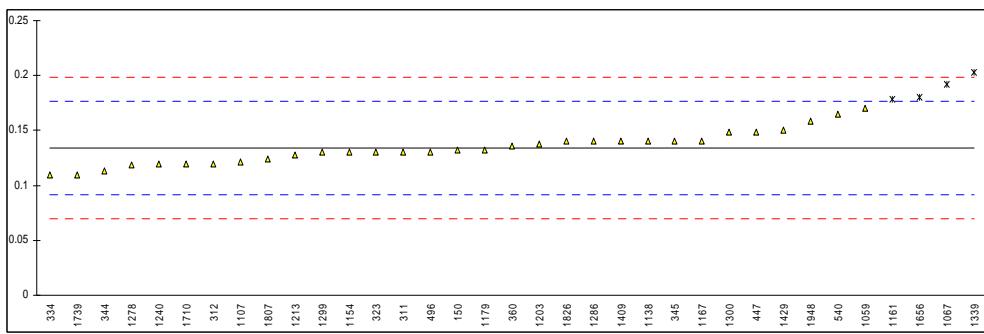
Determination of Acid Number conform ASTM spec. on sample #1066; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
62	D974	0.127		-0.30	
150		-----		-----	
171	D664	0.120		-1.28	
311	D664	0.16		4.32	
312		-----		-----	
323		-----		-----	
333		-----		-----	
334		-----		-----	
344		-----		-----	
345		-----		-----	
360	D664	0.121		-1.14	
391		-----		-----	
447	D664	0.110		-2.68	
496	D664	0.127		-0.30	
511		-----		-----	
540		-----		-----	
575		-----		-----	
631	D974	0.127		-0.30	
1017	D974	0.1386		1.32	
1059		-----		-----	
1067	D664	0.149		2.78	
1080	D664	0.13	C	0.12	first reported 0.10
1107	D664	0.117		-1.70	
1138		-----		-----	
1154		-----		-----	
1161		-----		-----	
1167		-----		-----	
1179		-----		-----	
1199		-----		-----	
1201	D664	0.123		-0.86	
1203		-----		-----	
1213	D664	0.1	C	-4.08	first reported 0.162
1240		-----		-----	
1263		-----		-----	
1278		-----		-----	
1286	D664	0.140		1.52	
1292		-----		-----	
1299	D664	0.16		4.32	
1300	D664	0.1450		2.22	
1339		-----		-----	
1402		-----		-----	
1409	D664	0.12		-1.28	
1429		-----		-----	
1634		-----		-----	
1656		-----		-----	
1708		-----		-----	
1710		-----		-----	
1739		-----		-----	
1807		-----		-----	
1826	D664	0.11		-2.68	
1948		-----		-----	

			Only D664 data:
normality	OK		OK
n	18		15
outliers	0		0
mean (n)	0.1291		0.1288
st.dev. (n)	0.01676		0.01827
R(calc.)	0.0469		0.0512
R(D664:09)	0.0200		0.0200
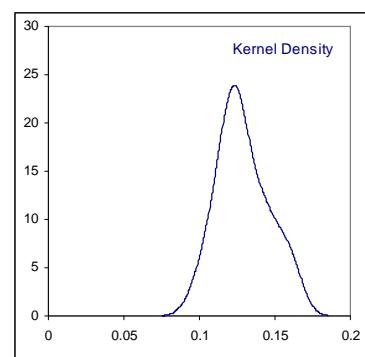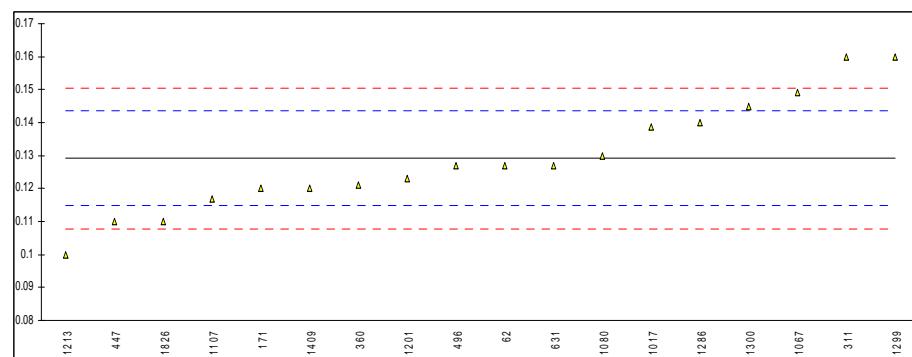
Determination of Carbon Residue on 10% distillation residue on sample #1066; results in %M/M

lab	method	value	mark	z(targ)	remarks
62	D4530	<0.1	C	-----	first reported 0.01
150	ISO10370	0.103		-1.12	
171		-----		-----	
311	ISO10370	<0.10		-----	
312		-----		-----	
323		-----		-----	
333		-----		-----	
334		-----		-----	
344		-----		-----	
345		-----		-----	
360	ISO10370	0.101		-1.21	
391		-----		-----	
447	ISO10370	2.542	G(0.01)	108.70	
496	ISO10370	0.17		1.90	
511		-----		-----	
540		-----		-----	
575		-----		-----	
631		-----		-----	
1017		-----		-----	
1059	ISO10370	0.18		2.35	
1067	ISO10370	0.194		2.98	
1080	D4530	0.103		-1.12	
1107		-----		-----	
1138	IP13	0.04		-3.95	
1154		-----		-----	
1161		-----		-----	
1167	ISO10370	0.201		3.30	
1179		-----		-----	
1199		-----		-----	
1201	ISO10370	0.04		-3.95	
1203	ISO10370	0.05		-3.50	
1213	D4530	0.0288		-4.46	
1240		-----		-----	
1263		-----		-----	
1278		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	ISO10370	0.26		5.95	
1300	ISO10370	0.1237		-0.18	
1339	ISO10370	0.069		-2.65	
1402	ISO10370	<0.01		<-5.30	false negative?
1409		-----	W	-----	result withdrawn, reported 0.33
1429		-----		-----	
1634		-----		-----	
1656	ISO10370	0.18		2.35	
1708		-----		-----	
1710	ISO10370	0.21		3.70	
1739	ISO10370	0.15		1.00	
1807		-----		-----	
1826		-----		-----	
1948	ISO10370	0.097	C	-1.39	first reported 0.2672

normality	OK	
n	18	
outliers	1	
mean (n)	0.128	
st.dev. (n)	0.0683	
R(calc.)	0.191	
R(ISO10370:95)	0.062	

Kernel Density
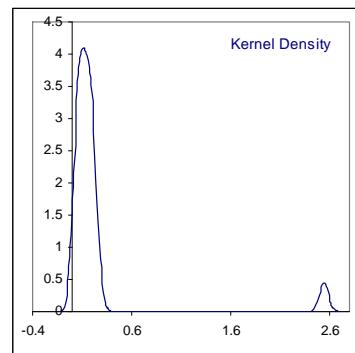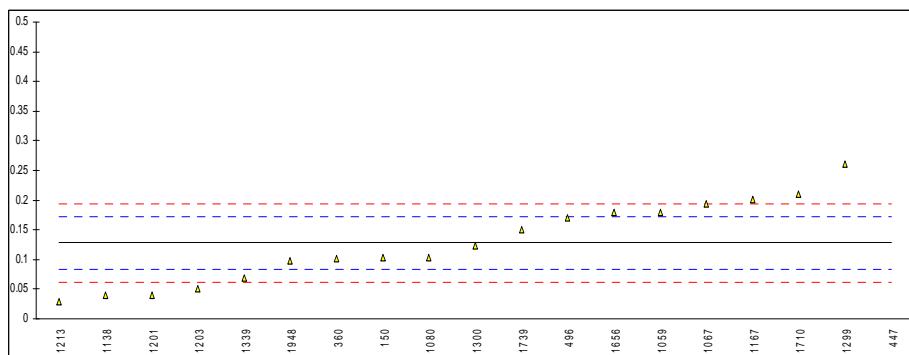
Determination of Cold Filter Plugging Point on sample #1066; results in °C

lab	method	value	mark	z(targ)	remarks
62	IP309	-16		-0.29	
150	EN116	-16		-0.29	
171	EN116	-15.8		-0.16	
311	EN116	-16		-0.29	
312	EN116	-16		-0.29	
323	EN116	-15		0.38	
333	EN116	-15		0.38	
334	EN116	-15		0.38	
344	EN116	-12	DG(0.01)	2.39	
345	EN116	-16		-0.29	
360	EN116	-15		0.38	
391	EN116	-16		-0.29	
447	IP309	-15		0.38	
496	EN116	-17		-0.96	
511		-----		-----	
540		-----		-----	
575		-----		-----	
631		-----		-----	
1017	EN116	-16		-0.29	
1059	EN116	-15		0.38	
1067	EN116	-16		-0.29	
1080	EN116	-16		-0.29	
1107	IP309	-16		-0.29	
1138	EN116	-13		1.72	
1154	EN116	-16		-0.29	
1161		-----		-----	
1167	EN116	-14		1.05	
1179	EN116	-14		1.05	
1199		-----		-----	
1201	EN116	-15		0.38	
1203	EN116	-15		0.38	
1213		-----		-----	
1240	EN116	-15.0		0.38	
1263		-----		-----	
1278	EN116	-12	DG(0.01)	2.39	
1286	EN116	-16		-0.29	
1292		-----		-----	
1299	EN116	-16		-0.29	
1300	EN116	-16.5		-0.63	
1339	EN116	-16.5		-0.63	
1402	EN116	-16		-0.29	
1409	EN116	-14		1.05	
1429	EN116	-15		0.38	
1634		-----		-----	
1656	EN116	-16		-0.29	
1708		-----		-----	
1710	EN116	-15		0.38	
1739	EN116	-16		-0.29	
1807	EN116	-18		-1.63	
1826	EN116	-16		-0.29	
1948		-----		-----	

normality	not OK	
n	37	
outliers	2	
mean (n)	-15.56	
st.dev. (n)	0.920	
R(calc.)	2.58	
R(EN116:97)	4.18	
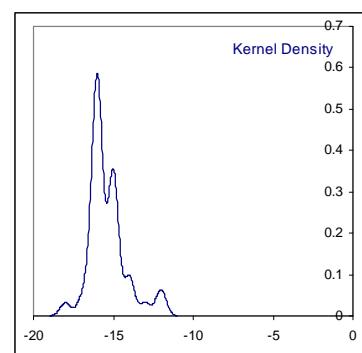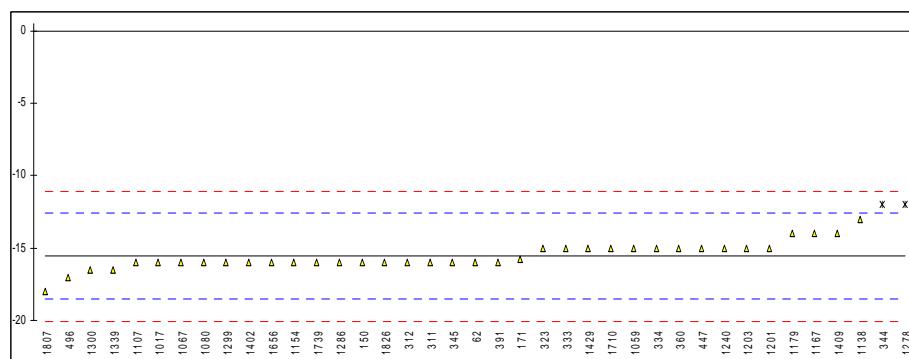
Determination of Cloud Point on sample #1066; results in °C

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
150		-----		-----	
171		-----		-----	
311		-----		-----	
312	D2500A	-5		0.13	
323		-----		-----	
333		-----		-----	
334		-----		-----	
344	D2500A	-4		0.83	
345		-----		-----	
360	EN23015A	-5.7		-0.36	
391		-----		-----	
447		-----		-----	
496	D2500A	-6		-0.57	
511		-----		-----	
540	D2500M	-6		-0.57	
575		-----		-----	
631	D2500M	-2		2.23	
1017		-----		-----	
1059		-----		-----	
1067		-----		-----	
1080	D2500A	-7		-1.27	
1107		-----		-----	
1138		-----		-----	
1154	EN23015A	-6		-0.57	
1161		-----		-----	
1167		-----		-----	
1179	D2500A	-7		-1.27	
1199		-----		-----	
1201		-----		-----	
1203	D2500M	-2	C	2.23	first reported -1
1213	D2500M	-4		0.83	
1240		-----		-----	
1263		-----		-----	
1278	D2500	0	D0.05)	3.63	
1286	D2500M	-6		-0.57	
1292		-----		-----	
1299	D5772A	-4.7		0.34	
1300	EN23015M	-5		0.13	
1339	D2500	-5.57		-0.27	
1402		-----		-----	
1409		-----		-----	
1429	D2500M	-11	G0.05)	-4.07	
1634		-----		-----	
1656	IP444A	-4		0.83	
1708		-----		-----	
1710	INH-1721	-6		-0.57	
1739	EN23015	-7		-1.27	
1807	EN23015A	-5		0.13	
1826	D2500A	-5		0.13	
1948	EN23015A	-6		-0.57	
	normality	OK			
	n	21			
	outliers	2			
	mean (n)	-5.19			
	st.dev. (n)	1.399			
	R(calc.)	3.92			
	R(D2500:09)	4.00			
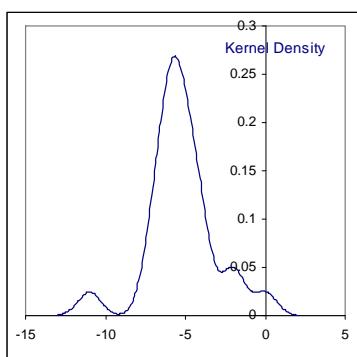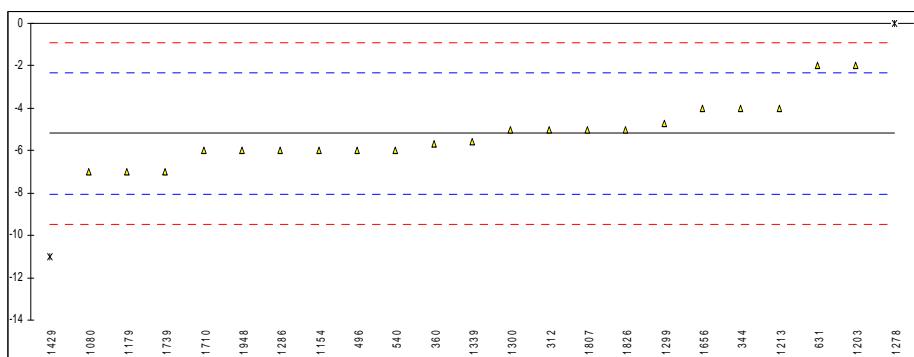
Determination of Copper Strip Corrosion 3 hrs/50°C on sample #1066

lab	method	value	mark	z(targ)	remarks
62	D130	1B		-----	
150	D130	1A		-----	
171	D130	1A		-----	
311	D130	1A		-----	
312	D130	1A		-----	
323	ISO2160	1A		-----	
333	D130	1		-----	
334		-----		-----	
344	ISO2160	1A		-----	
345	ISO2160	1A		-----	
360	ISO2160	1A		-----	
391	D130	1A		-----	
447	IP154	1A		-----	
496	D130	1A		-----	
511	D130	1A		-----	
540	ISO2160	1A		-----	
575	D130	1A		-----	
631	D130	1A		-----	
1017	D130	1A		-----	
1059	ISO2160	1A		-----	
1067	D130	1A		-----	
1080	D130	1A		-----	
1107	D130	1A		-----	
1138	D130	1A		-----	
1154		-----		-----	
1161	EN2160	1		-----	
1167	D130	1A		-----	
1179	ISO2160	1B		-----	
1199		-----		-----	
1201	D130	1A		-----	
1203	D130	1		-----	
1213	D130	1A		-----	
1240		-----		-----	
1263		-----		-----	
1278	ISO2160	1A		-----	
1286	D130	1A		-----	
1292		-----		-----	
1299	ISO2160	1A		-----	
1300	ISO2160	1A		-----	
1339		-----		-----	
1402	D130	1B		-----	
1409	D130	1A		-----	
1429	D130	1A		-----	
1634	D130	1A		-----	
1656	ISO2160	1A		-----	
1708		-----		-----	
1710	ISO2160	1A		-----	
1739	ISO2160	1A		-----	
1807	ISO2160	1A		-----	
1826	D130	1A		-----	
1948	D130	1A		-----	

normality	n.a.	
n	43	
outliers	n.a.	
mean (n)	1	
st.dev. (n)	n.a.	
R(calc.)	n.a.	
R(D130:04e1)	n.a.	

Determination of Density @ 15°C conform EN spec. on sample #1066; results in kg/m³

lab	method	value	mark	z(targ)	remarks
62	D4052	882.5		0.44	
150	ISO12185	882.5		0.44	
171	D4052	882.52		0.55	
311	ISO12185	882.5		0.44	
312	D4052	882.0	G(0.05)	-2.36	
323	ISO12185	882.2		-1.24	
333	ISO12185	882.4		-0.12	
334	ISO12185	882.4		-0.12	
344	ISO12185	882.3		-0.68	
345	ISO3675	881.0	G(0.01)	-7.96	
360	ISO12185	882.4		-0.12	
391	ISO12185	882.5		0.44	
447	ISO12185	882.41		-0.07	
496	ISO12185	882.39		-0.18	
511	D4052	882.45		0.16	
540	ISO12185	882.3		-0.68	
575		-----		-----	
631	D4052	882.4		-0.12	
1017	ISO12185	882.51		0.49	
1059	ISO12185	882.4		-0.12	
1067	ISO12185	882.4		-0.12	
1080	ISO12185	882.5		0.44	
1107	D4052	882.4		-0.12	
1138	ISO12185	882.6		1.00	
1154	ISO12185	882.3		-0.68	
1161	ISO12185	882.4		-0.12	
1167	ISO12185	882.4		-0.12	
1179	ISO12185	882.6		1.00	
1199		-----		-----	
1201	D4052	882.3		-0.68	
1203	ISO12185	882.4		-0.12	
1213	D4052	882.65	C	1.28	first reported 0.88265
1240	ISO12185	882.4		-0.12	
1263	ISO12185	882.4043		-0.10	
1278		-----		-----	
1286	ISO12185	882.393		-0.16	
1292		-----		-----	
1299	ISO12185	882.3		-0.68	
1300	ISO12185	882.35		-0.40	
1339	ISO12185	882.4		-0.12	
1402	ISO12185	882.1	DG(0.05)	-1.80	
1409	ISO12185	882.4		-0.12	
1429	ISO12185	882.5	C	0.44	reported in a different unit 0.8825
1634	ISO12185	882.415		-0.04	
1656	ISO12185	882.1	DG(0.05)	-1.80	
1708		-----		-----	
1710	ISO12185	882.4		-0.12	
1739	ISO3675	882.5		0.44	
1807	ISO12185	882.33		-0.52	
1826	ISO12185	882.4		-0.12	
1948	ISO12185	882.5		0.44	

normality	not OK	
n	42	
outliers	4	
mean (n)	882.42	
st.dev. (n)	0.090	
R(calc.)	0.25	
R(ISO12185:96)	0.50	
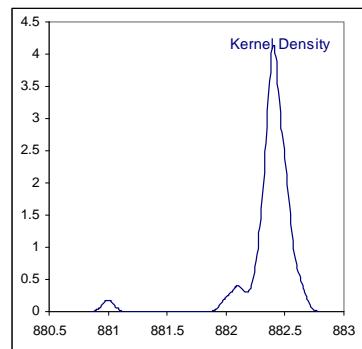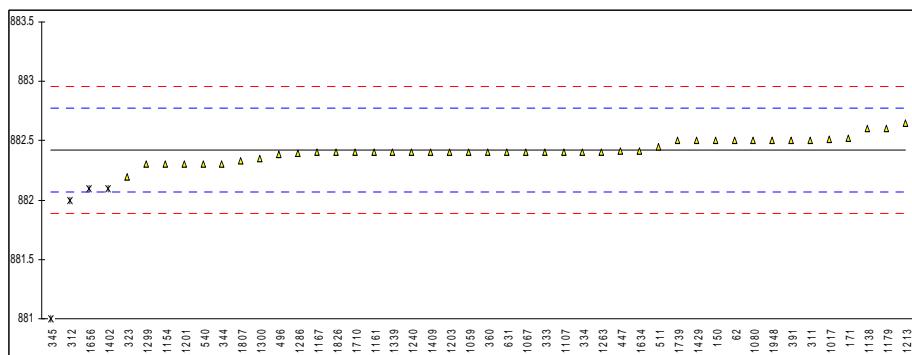
Determination of Flash Point conform EN spec. on sample #1066; results in °C

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
150		-----		-----	
171		-----		-----	
311	ISO3679	143.0	G(0.05)	-2.87	
312	ISO3679	157.0		-0.25	
323		-----		-----	
333		-----		-----	
334	ISO3679	155.0		-0.63	
344		-----		-----	
345	ISO3679	153.5		-0.91	
360	ISO3679	156.7		-0.31	
391		-----		-----	
447	ISO3679	165.0		1.24	
496	ISO3679	159.2		0.16	
511		-----		-----	
540		-----		-----	
575		-----		-----	
631		-----		-----	
1017		-----		-----	
1059		-----		-----	
1067	ISO3679	160.0		0.31	
1080		-----		-----	
1107		-----		-----	
1138	ISO3679	168.0		1.80	
1154		-----		-----	
1161	ISO3679	155	C	-0.63	first reported 169.6
1167	ISO3679	159		0.12	
1179	ISO3679	160.0		0.31	
1199		-----		-----	
1201	ISO3679	>120.0		-----	
1203		-----		-----	
1213		-----		-----	
1240	ISO3679	174	C,D(0.05)	2.92	first reported 144.0
1263		-----		-----	
1278	ISO3679	163.3		0.92	
1286	ISO3679	154.7		-0.68	
1292		-----		-----	
1299	ISO3679	156.5		-0.35	
1300	ISO3679	164.1		1.07	
1339	ISO3679	155		-0.63	
1402		-----		-----	
1409		-----		-----	
1429	ISO3679	>101		-----	
1634		-----		-----	
1656		-----		-----	
1708		-----		-----	
1710		-----		-----	
1739	ISO3679	155.7		-0.50	
1807		-----		-----	
1826		-----		-----	
1948	ISO3679	152.72		-1.05	

normality	OK
n	18
outliers	2
mean (n)	158.36
st.dev. (n)	4.330
R(calc.)	12.12
R(ISO3679:04)	15.00

Determination of Flash Point (PMcc) conform ASTM spec. on sample #1066; results in °C

lab	method	value	mark	z(targ)	remarks
62	D93C	142.0		-0.92	
150	D93	146		-0.15	
171	D93	143.3		-0.67	
311	D93	145.0		-0.34	
312		-----		-----	
323	ISO2719A	147.0		0.04	
333	D93	152.0		0.99	
334		-----		-----	
344	ISO2719	141		-1.11	
345		-----		-----	
360	ISO2719	145.5		-0.25	
391	D93	152.2		1.03	
447		-----		-----	
496	ISO2719	150.2		0.65	
511	D93	141.0		-1.11	
540		-----		-----	
575		-----		-----	
631	D93	143.0		-0.72	
1017	ISO2719C	141.0		-1.11	
1059	ISO2719	144.0		-0.53	
1067	D93	143.0		-0.72	
1080	D93	145.0		-0.34	
1107	D93A	149.0		0.42	
1138		-----		-----	
1154		-----		-----	
1161	ISO2719	151.0		0.80	
1167		-----		-----	
1179		-----		-----	
1199		-----		-----	
1201	D93C	142.0		-0.92	
1203	D93	145.5		-0.25	
1213	D93	156		1.75	
1240		-----		-----	
1263		-----		-----	
1278		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	D93	146.5		-0.06	
1300	ISO2719	147.5		0.13	
1339	ISO2719	151.86		0.96	
1402	D93	155.0		1.56	
1409	D93	149.5		0.51	
1429		-----		-----	
1634	ISO2719	142.4		-0.84	
1656	ISO2719	146.3		-0.10	
1708		-----		-----	
1710	ISO2719	150		0.61	
1739		-----		-----	
1807	ISO2719	151.5		0.89	
1826	D93	144.5		-0.44	
1948	D93	148		0.23	
	normality	OK			
	n	32			
	outliers	0			
	mean (n)	146.81			
	st.dev. (n)	4.177			
	R(calc.)	11.69			
	R(D93:10-C)	14.70			
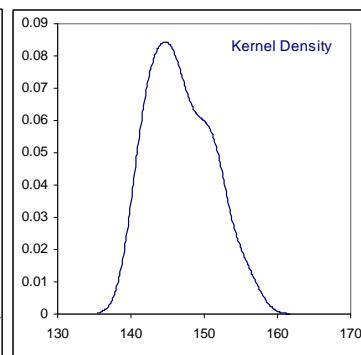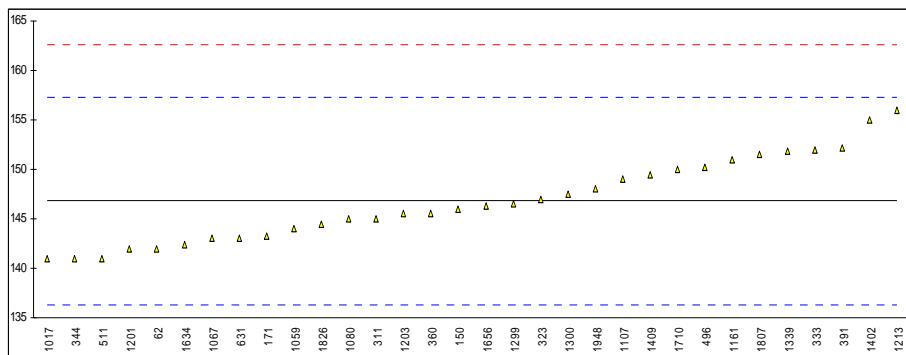
Determination of Iodine Value conform EN spec. on sample #1066; results in g I$_2$/100g

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
150	EN14111	110.75		0.14	
171	EN14111	108.6		-1.06	
311	EN14111	109		-0.84	
312	EN14111	110.5		0.00	
323	EN14111	109		-0.84	
333		-----		-----	
334	EN14111	112		0.84	
344	EN14111	107.6		-1.62	
345	EN14111	112		0.84	
360	EN14111	109.8		-0.39	
391		-----		-----	
447		-----		-----	
496	EN14111	112.1		0.90	
511		-----		-----	
540	EN14111	111.274		0.44	
575		-----		-----	
631		-----		-----	
1017		-----		-----	
1059	EN14111	112		0.84	
1067	EN14111	111.6		0.62	
1080	EN3961	105	G(0.05)	-3.08	
1107	EN14111	111		0.28	
1138	EN14111	110		-0.28	
1154	EN14111	123	G(0.01)	7.00	
1161		-----		-----	
1167	EN14111	112.4		1.07	
1179	EN14111	110.3		-0.11	
1199		-----		-----	
1201	EN14111	111		0.28	
1203	EN14111	110		-0.28	
1213	EN14111	111		0.28	
1240	EN14111	110.1		-0.22	
1263		-----		-----	
1278	EN14111	111.34		0.47	
1286	EN14111	109.5		-0.56	
1292		-----		-----	
1299	EN14111	110		-0.28	
1300	EN14111	107.868	C	-1.47	first reported 105
1339	EN14111	105.9	G(0.05)	-2.57	
1402	EN14111	111		0.28	
1409	EN14111	111		0.28	
1429	EN14111	110		-0.28	
1634		-----		-----	
1656	EN14111	101	C,G(0.01)	-5.32	first reported 105.8
1708		-----		-----	
1710		-----		-----	
1739	EN14111	112		0.84	
1807	EN14111	109.8		-0.39	
1826	EN14111	112		0.84	
1948	EN14111	109.30		-0.67	

	normality	OK	
	n	32	
	outliers	4	
	mean (n)	110.49	
	st.dev. (n)	1.261	
	R(calc.)	3.532	
	R(EN14111:03)	5.000	

Kernel Density
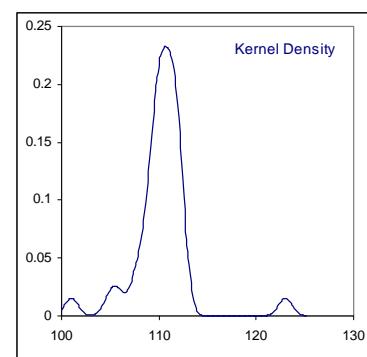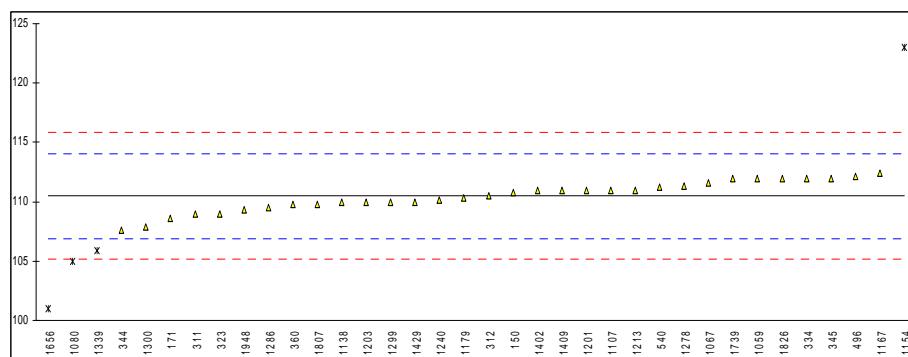
Determination of Kinematic Viscosity @ 40°C on sample #1066; results in mm²/s

lab	method	value	mark	z(targ)	remarks
62	D445	4.457		1.06	
150	D445	4.435		-0.32	
171	D445	4.428		-0.76	
311	D445	4.4830		2.70	
312	D445	4.420		-1.26	
323	ISO3104	4.419		-1.32	
333	D445	4.445		0.31	
334	D445	4.447		0.44	
344		-----		-----	
345	ISO3104	4.480		2.51	
360	ISO3104	4.4371		-0.18	
391	D445	4.439		-0.07	
447		-----		-----	
496	ISO3104	4.438		-0.13	
511	D445	4.4597		1.23	
540	D445	4.451		0.69	
575	D445	4.4403		0.02	
631	D445	4.485	C	2.82	first reported 4.5065
1017		-----		-----	
1059	ISO3104	4.418		-1.38	
1067	D445	4.436		-0.25	
1080	ISO3104	4.434		-0.38	
1107	D445	4.408		-2.01	
1138	D445	4.440		0.00	
1154		-----		-----	
1161	ISO3104	4.456		1.00	
1167	ISO3104	4.417		-1.45	
1179	ISO3104	4.4338		-0.39	
1199		-----		-----	
1201	D445	4.440		0.00	
1203	ISO3104	4.418		-1.38	
1213	D445	4.430		-0.63	
1240	ISO3104	4.411		-1.82	
1263		-----		-----	
1278	ISO3104	5.7214	G(0.01)	80.43	
1286	D445	4.4439		0.24	
1292		-----		-----	
1299	ISO3104	4.432		-0.50	
1300	ISO3104	4.4574		1.09	
1339	ISO3104	4.4136		-1.66	
1402	ISO3104	4.424		-1.01	
1409	D445	4.433		-0.44	
1429	D445	4.482		2.63	
1634		-----		-----	
1656	ISO3104	4.431		-0.57	
1708		-----		-----	
1710	ISO3104	4.432		-0.50	
1739	ISO3104	4.431		-0.57	
1807	ISO3104	4.4357		-0.27	
1826	D445	4.444		0.25	
1948	D445	4.4762		2.27	
	normality	not OK			
	n	41			
	outliers	1			
	mean (n)	4.4400			
	st.dev. (n)	0.01994			
	R(calc.)	0.0558			
	R(ISO3104:96)	0.0446			

Kernel Density
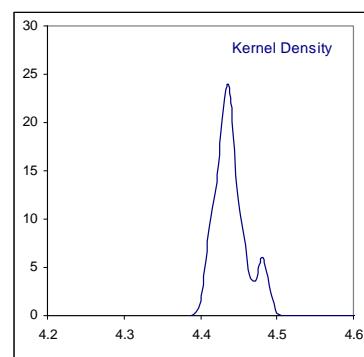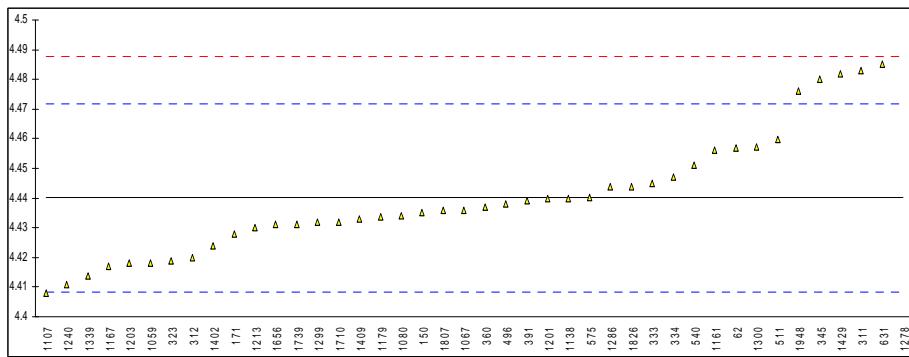
Determination of Oxidation Stability on sample #1066; results in hours

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
150	EN14112	5.96		-0.36	
171	EN14112	5.87		-0.50	
311	EN14112	5.7		-0.76	
312	EN14112	6.38		0.27	
323	EN14112	6.0		-0.30	
333		-----		-----	
334		-----		-----	
344		-----		-----	
345		-----		-----	
360	EN14112	6.43		0.35	
391		-----		-----	
447	EN14112	6.2		0.00	
496	EN14112	6.19		-0.01	
511		-----		-----	
540	EN14112	6.34		0.21	
575		-----		-----	
631		-----		-----	
1017	EN14112	6.57		0.56	
1059	EN14112	6.4		0.30	
1067	EN14112	6.66		0.70	
1080	EN14112	6.3		0.15	
1107	EN14112	5.96		-0.36	
1138	EN14112	6.8		0.91	
1154	EN15751	6.85		0.99	
1161	EN14112	4.4	C,G(0.01)	-2.74	first reported 8.8
1167	EN14112	10.70	G(0.01)	6.84	
1179	EN14112	6.43		0.35	
1199		-----		-----	
1201	EN14112	6.0		-0.30	
1203	EN14112	6.15		-0.08	
1213		-----		-----	
1240	EN14112	6.36		0.24	
1263		-----		-----	
1278	EN14112	6.04		-0.24	
1286	EN14112	5.81		-0.59	
1292		-----		-----	
1299	EN14112	5.8		-0.61	
1300	EN14112	7.00555		1.23	
1339	EN14112	6.36		0.24	
1402	EN14112	6.0		-0.30	
1409	EN14112	5.81		-0.59	
1429	EN14112	5.69		-0.77	
1634		-----		-----	
1656	EN14112	5.78		-0.64	
1708		-----		-----	
1710	EN14112	6.21		0.02	
1739	EN14112	6.2		0.00	
1807	EN14112	6.43		0.35	
1826	EN14112	5.9		-0.46	
1948		-----		-----	

normality	OK	
n	33	
outliers	2	
mean (n)	6.200	
st.dev. (n)	0.3402	
R(calc.)	0.953	
R(EN14112:03)	1.842	

Kernel Density

Determination of Sulphur conform EN spec. on sample #1066; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
150		-----		-----	
171		-----		-----	
311	ISO20846	<3		-----	
312		-----		-----	
323	ISO20846	<3.0		-----	
333	ISO20846	<3		-----	
334	ISO20846	1.8		-----	
344		-----		-----	
345		-----		-----	
360	ISO20846	1.86		-----	
391	ISO20846	<3		-----	
447	ISO20846	1.7		-----	
496	ISO20846	1.83		-----	
511		-----		-----	
540		-----		-----	
575		-----		-----	
631		-----		-----	
1017		-----		-----	
1059	ISO20846	<3.0		-----	
1067		-----		-----	
1080		-----		-----	
1107		-----		-----	
1138	ISO20846	1.6		-----	
1154		-----		-----	
1161	ISO20846	1.4		-----	
1167	ISO20846	1.94		-----	
1179	ISO20846	1.89		-----	
1199		-----		-----	
1201		-----		-----	
1203	ISO20846	1.8		-----	
1213	D4294	<5		-----	
1240		-----		-----	
1263	ISO20846	1.477		-----	
1278		-----		-----	
1286	ISO20846	2.023		-----	
1292		-----		-----	
1299		-----		-----	
1300	ISO20846	1.857		-----	
1339		-----		-----	
1402	ISO20846	1.7		-----	
1409	ISO20846	2.4		-----	
1429		-----		-----	
1634		-----		-----	
1656	ISO20846	2.07		-----	
1708		-----		-----	
1710	ISO20846	1.8		-----	
1739		-----		-----	
1807	ISO20846	1.62		-----	
1826	ISO20846	<3		-----	
1948	ISO20846	2.17		-----	

|				
normality	OK			
n	18			
outliers	0			
mean (n)	1.83			
st.dev. (n)	0.242			
R(calc.)	0.68	Compare R(ISO20884) = 1.72		
R(EN14214:08)	(1.32)	Lower application limit is 3 mg/kg		
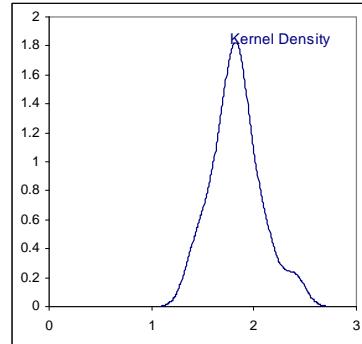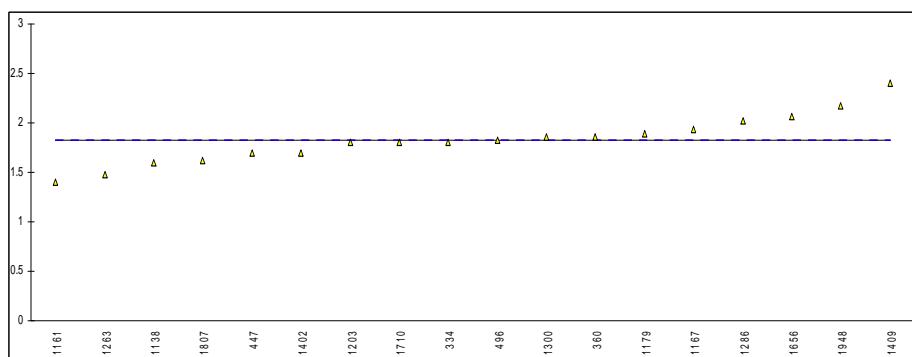
Determination of Sulphur conform ASTM spec. on sample #1066; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62	D5453	1.5		-1.42	
150	D5453	1.8		-0.55	
171	D5453	2		0.02	
311	D5453	1.4		-1.71	
312	D5453	2.0		0.02	
323		-----		-----	
333		-----		-----	
334		-----		-----	
344	D5453	0.31	G(0.05)	-4.85	
345		-----		-----	
360	D5453	1.86		-0.38	
391		-----		-----	
447		-----		-----	
496	D5453	1.83		-0.47	
511		-----		-----	
540		-----		-----	
575		-----		-----	
631	D5453	2.89		2.59	
1017		-----		-----	
1059	ISO20846	<5.0		-----	
1067	D5453	2.0		0.02	
1080	D5453	2.9		2.62	
1107	D5453	3.6	C,D(0.05)	4.64	first reported 5.4
1138		-----		-----	
1154		-----		-----	
1161	D5453	1.4		-1.71	
1167	D5453	1.94		-0.15	
1179		-----		-----	
1199		-----		-----	
1201	D5453	1.9		-0.27	
1203		-----		-----	
1213		-----		-----	
1240		-----		-----	
1263		-----		-----	
1278		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	ISO20844	<5		-----	
1300		-----		-----	
1339		-----		-----	
1402		-----		-----	
1409		-----		-----	
1429	D5453	2.47		1.38	
1634		-----		-----	
1656		-----		-----	
1708		-----		-----	
1710		-----		-----	
1739		-----		-----	
1807		-----		-----	
1826	D5453	<1		<-2.86	false negative?
1948		-----		-----	

normality	not OK	
n	14	
outliers	2	
mean (n)	1.99	
st.dev. (n)	0.472	
R(calc.)	1.32	
R(D5453:09)	0.97	application range 1-8000 mg/kg

Kernel Density
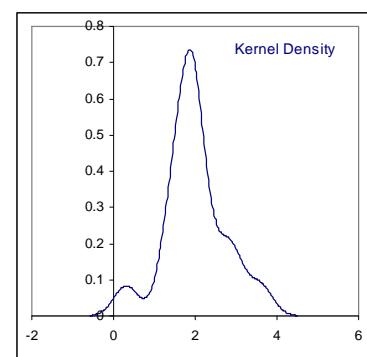
Determination of Sulphated Ash on sample #1066; results in %M/M

lab	method	value	mark	z(targ)	remarks
62	D874	<0.001		-----	
150	D874	<0.001		-----	
171	D874	<0.0010		-----	
311	D874	<0.005		-----	
312		-----		-----	
323	ISO3987	<0.005		-----	
333		-----		-----	
334		-----		-----	
344		-----		-----	
345		-----		-----	
360	ISO3987	0.0010		-----	
391		-----		-----	
447		-----		-----	
496	D874	<0.0001		-----	
511		-----		-----	
540	D874	<0.02		-----	
575		-----		-----	
631	D874	0.00248		-----	
1017	D874	0.0014		-----	
1059	ISO3987	<0.005		-----	
1067	D874	0.0006		-----	
1080	ISO3987	0.003		-----	
1107		-----		-----	
1138	ISO3987	<0.001		-----	
1154		-----		-----	
1161	ISO3987	0.007	G(0.05)	-----	
1167	ISO3987	0.0013		-----	
1179	ISO3987	0.0009		-----	
1199		-----		-----	
1201	D874	<0.005		-----	
1203	D874	0.005	C,G(0.05)	-----	first reported 0.014
1213	D874	0.0008		-----	
1240		-----		-----	
1263		-----		-----	
1278		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	ISO3987	0.001		-----	
1300	ISO3987	0.002378		-----	
1339		-----		-----	
1402	D874	<0.005		-----	
1409	D874	<0.01	C	-----	first reported 0.13
1429	D874	<0.01		-----	
1634		-----		-----	
1656	ISO3987	<0.01		-----	
1708		-----		-----	
1710	ISO3987	0.001		-----	
1739	ISO3987	0.0019		-----	
1807	ISO3987	<0.005		-----	
1826	D874	<0.001		-----	
1948	INH-1985	0.0021		-----	

normality	OK		
n	13		
outliers	2		
mean (n)	0.0015		
st.dev. (n)	0.00076		
R(calc.)	0.0021	Compare R(D874):	
R(EN14214:03)	(0.0008)	Lower application limit is 0.005%M/M	
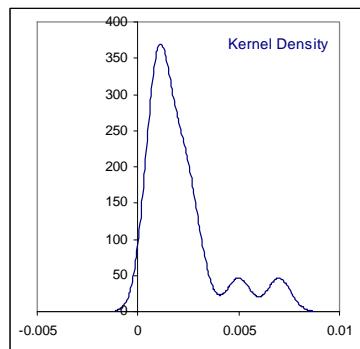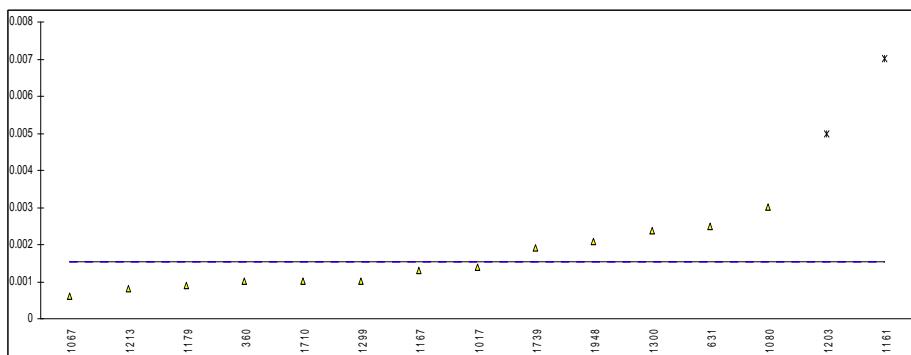
Determination of Water on sample #1066; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62	D6304	403		-0.91	
150	ISO12937	460		0.18	
171	D6304	435.7	C	-0.28	first reported 363
311	ISO12937	485		0.66	
312	ISO12937	455		0.09	
323	ISO12937	432		-0.36	
333	ISO12937	440		-0.20	
334	ISO12937	439		-0.22	
344	ISO12937	461.2		0.20	
345	ISO12937	470		0.37	
360	ISO12937	434.6		-0.31	
391	ISO12937	460		0.18	
447	ISO12937	464.95		0.28	
496	ISO12937	457.8		0.14	
511		-----		-----	
540	ISO12937	436.1		-0.28	
575	ISO12937	445		-0.11	
631	D6304	468		0.34	
1017	ISO12937	492		0.80	
1059	ISO12937	460		0.18	
1067	ISO12937	450		-0.01	
1080	ISO12937	444		-0.13	
1107	E1064	412		-0.74	
1138	ISO12937	430		-0.39	
1154		-----		-----	
1161	ISO12937	521.7369	DG(0.05)	1.37	
1167	ISO12937	408.90		-0.80	
1179	ISO12937	464.2		0.26	
1199		-----		-----	
1201	ISO12937	445		-0.11	
1203	ISO12937	399		-0.99	
1213	D6304	486		0.68	
1240	ISO12937	436.2		-0.27	
1263	ISO12937	493.1		0.82	
1278	ISO12937	534	DG(0.05)	1.60	
1286	ISO12937	448.90		-0.03	
1292		-----		-----	
1299	ISO12937	443		-0.14	
1300	ISO12937	455.028		0.09	
1339		-----		-----	
1402	ISO12937	450		-0.01	
1409	ISO12937	475		0.47	
1429	ISO12937	457		0.12	
1634		-----		-----	
1656	ISO12937	452		0.03	
1708		-----		-----	
1710	ISO12937	485		0.66	
1739	ISO12937	448		-0.05	
1807	ISO12937	453.1		0.05	
1826	ISO12937	440		-0.20	
1948	INH-6147	447.32		-0.06	

|		
normality	OK	
n	42	
outliers	2	
mean (n)	450.53	
st.dev. (n)	21.915	
R(calc.)	61.36	
R(ISO12937:00)	145.97	

Kernel Density

Determination of sum of Calcium and Magnesium on sample #1066; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
150	EN14538	0.2		-----	
171	EN14538	0.2		-----	
311	EN14538	<1		-----	
312		-----		-----	
323	EN14538	<2		-----	
333		-----		-----	
334		-----		-----	
344		-----		-----	
345		-----		-----	
360	EN14538	<1.0		-----	
391		-----		-----	
447		-----		-----	
496	EN14538	0.13		-----	
511		-----		-----	
540	EN14538	<1		-----	
575		-----		-----	
631		-----		-----	
1017		-----		-----	
1059		-----		-----	
1067	EN14538	0.31		-----	
1080	EN14538	<1		-----	
1107	IP470/IP377	<1		-----	
1138	EN14538	<2		-----	
1154		-----		-----	
1161	EN14538	0.4329		-----	
1167	EN14538	0.14		-----	
1179	EN14538	<1		-----	
1199		-----		-----	
1201	EN14538	<5		-----	
1203	EN14538	<0.28		-----	
1213	D4951	0.1		-----	
1240	EN14538	<1.0		-----	
1263		-----		-----	
1278	EN14538	<0.007		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14538	0.1		-----	
1300		-----		-----	
1339		-----		-----	
1402		-----		-----	
1409	EN14538	<1		-----	
1429	EN14538	0.3		-----	
1634		-----		-----	
1656	EN14538	0.1		-----	
1708	EN14538	<1.0		-----	
1710	EN14538	<0.28		-----	
1739	EN14538	<1		-----	
1807		-----		-----	
1826	EN14538	0.2		-----	
1948	EN14538	0.036		-----	

normality	OK	
n	12	
outliers	0	
mean (n)	0.19	
st.dev. (n)	0.113	
R(calc.)	0.32	
R(EN14538:06)	(1.21)	application range 1–10 mg/kg
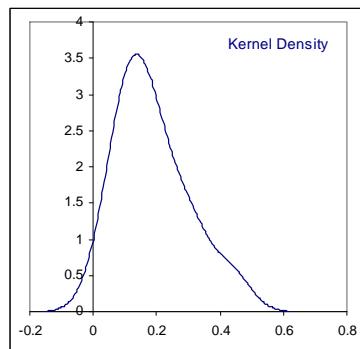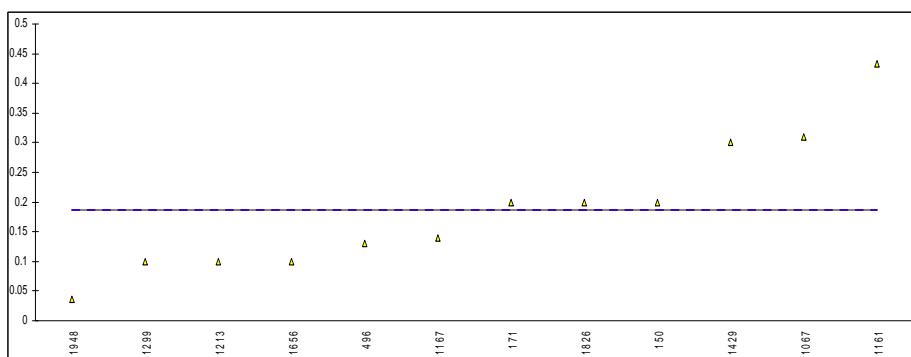
Determination of Phosphorus on sample #1066; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
150	EN14107	<0.1		-----	
171	EN14107	<0.1		-----	
311	EN14107	<4		-----	
312		-----		-----	
323	EN14107	<4		-----	
333		-----		-----	
334		-----		-----	
344		-----		-----	
345		-----		-----	
360	EN14107	<4.0		-----	
391		-----		-----	
447		-----		-----	
496	EN14107	0.46		-----	
511		-----		-----	
540	EN14107	<1		-----	
575		-----		-----	
631		-----		-----	
1017		-----		-----	
1059	in house	<3		-----	
1067	EN14107	1.37		-----	
1080	EN14107	<4		-----	
1107		-----		-----	
1138	EN14107	<1		-----	
1154		-----		-----	
1161	EN14107	2.070		-----	
1167	EN14107	1.11		-----	
1179	EN14107	0.16		-----	
1199		-----		-----	
1201	EN14107	<4		-----	
1203	EN14107	<1.0		-----	
1213	D4951	<0.1		-----	
1240	EN14107	0.29		-----	
1263		-----		-----	
1278	EN14107	<0.54		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14107	<0.1		-----	
1300	EN14107	<1		-----	
1339		-----		-----	
1402		-----		-----	
1409	EN14107	<1		-----	
1429	EN14107	1.23		-----	
1634		-----		-----	
1656	EN14107	0.21		-----	
1708	EN14107	<4.0		-----	
1710	EN14107	<0.5		-----	
1739	EN14107	0.8		-----	
1807		-----		-----	
1826	EN14107	<0.1		-----	
1948	EN14107	0.036		-----	
	normality	OK			
	n	10			
	outliers	0			
	mean (n)	0.77			
	st.dev. (n)	0.661			
	R(calc.)	1.85			
	R(EN14107:03)	(0.17)		application range 4-20 mg/kg	
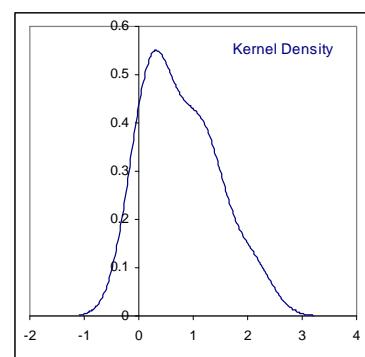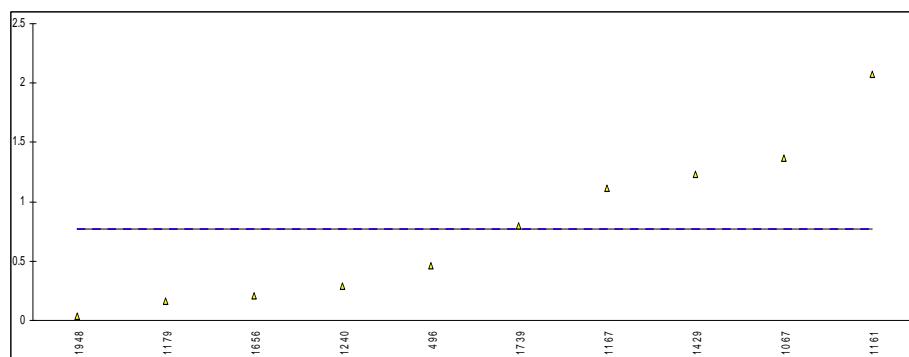
Determination of Sodium on sample #1066; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
150	EN14108	0.4		-----	
171	EN14108	0.2		-----	
311	EN14108	<1		-----	
312		-----		-----	
323	EN14108	<1.0		-----	
333		-----		-----	
334				-----	
344		-----		-----	
345		-----		-----	
360	EN14538	<1.0		-----	
391		-----		-----	
447		-----		-----	
496	EN14538	0.38		-----	
511		-----		-----	
540	EN14538	<1		-----	
575		-----		-----	
631		-----		-----	
1017		-----		-----	
1059		-----		-----	
1067	EN14108	0.35		-----	
1080	EN14538	<1		-----	
1107	IP470	<1		-----	
1138	EN14538	<1		-----	
1154		-----		-----	
1161	EN14108	<1		-----	
1167	EN14108	0.4		-----	
1179	EN14108	0.70		-----	
1199		-----		-----	
1201	EN14538	<5		-----	
1203	EN14108	<0.5		-----	
1213	EN14108	0.2		-----	
1240	EN14538	2.06	C,G(0.01)	-----	first reported 2.97
1263		-----		-----	
1278	EN14538	0.3		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14108	<0.1		-----	
1300	EN14108	0.5493		-----	
1339	EN14108	0.6		-----	
1402		-----		-----	
1409	EN14538	1	DG(0.05)	-----	
1429	EN14108	0.38		-----	
1634		-----		-----	
1656	EN14108	0.3		-----	
1708	EN14108	<1.0		-----	
1710	EN14538	<0.5		-----	
1739	EN14538	<1		-----	
1807		-----		-----	
1826	EN14538	0.3		-----	
1948	EN14108	0.480		-----	

normality	OK	
n	14	
outliers	2	
mean (n)	0.40	
st.dev. (n)	0.145	
R(calc.)	0.40	
R(EN14107:03)	(1.46)	lower application limit is 1 mg/kg
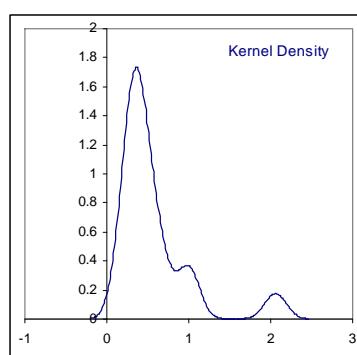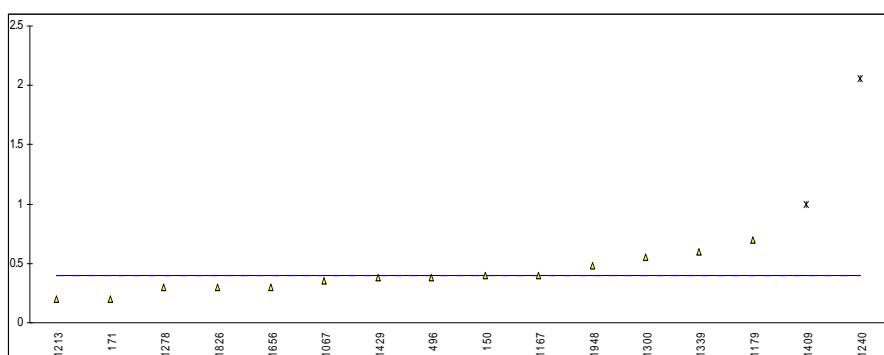
Determination of Potassium on sample #1066; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
150	EN14108	<0.1		-----	
171	EN14109	<0.1		-----	
311	EN14109	<1		-----	
312		-----		-----	
323	EN14109	<0.5		-----	
333		-----		-----	
334		-----		-----	
344		-----		-----	
345		-----		-----	
360	EN14538	<1.0		-----	
391		-----		-----	
447		-----		-----	
496	EN14538	<0.1		-----	
511		-----		-----	
540	EN14538	<1		-----	
575		-----		-----	
631		-----		-----	
1017		-----		-----	
1059		-----		-----	
1067	EN14109	0.43		-----	
1080	EN14538	<1		-----	
1107	IP228Mod.	<1		-----	
1138	EN14538	<1		-----	
1154		-----		-----	
1161	EN14109	0.4951		-----	
1167	EN14109	0.1		-----	
1179	EN14109	<0.5		-----	
1199		-----		-----	
1201	EN14538	<5		-----	
1203	EN14109	<1.5		-----	
1213	EN14109	<0.1		-----	
1240	EN14538	<1.0		-----	
1263		-----		-----	
1278	EN14538	<0.0001		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14109	<0.1		-----	
1300	EN14109	0.4513		-----	
1339	EN14109	<0.5		-----	
1402		-----		-----	
1409		-----		-----	
1429	EN14109	<0.1		-----	
1634		-----		-----	
1656	EN14109	<0.1		-----	
1708	EN14109	<0.5		-----	
1710	EN14538	<1.5		-----	
1739	EN14538	<1		-----	
1807		-----		-----	
1826	EN14538	0.1		-----	
1948	EN14109	0.137		-----	
	normality	n.a.			
	n	6			
	outliers	0			
	mean (n)	0.29			
	st.dev. (n)	0.191			
	R(calc.)	0.54			
	R(EN14214:08)	(2.07)			lower application limit is 0.5 mg/kg

Determination of Methanol on sample #1066; results in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
150	EN14110	0.0179		1.79	
171	EN14110A	0.0185		2.06	
311	EN14110	0.02		2.75	
312		-----		-----	
323	EN14110B	0.01		-1.84	
333		-----		-----	
334	EN14110	0.02		2.75	
344		-----		-----	
345	EN14110B	0.012		-0.92	
360	EN14110B	0.0149		0.41	
391		-----		-----	
447		-----		-----	
496	EN14110B	0.011		-1.38	
511	EN14110B	0.014		0.00	
540		-----		-----	
575	EN14110	0.010		-1.84	
631		-----		-----	
1017		-----		-----	
1059		-----		-----	
1067	EN14110A	0.01		-1.84	
1080		-----		-----	
1107	EN14110	0.023		4.13	
1138	EN14110A	0.02		2.75	
1154		-----		-----	
1161	EN14110A	0.015		0.46	
1167	EN14110	0.0113		-1.24	
1179	EN14110B	0.0097		-1.98	
1199		-----		-----	
1201	EN14110B	0.02		2.75	
1203	EN14110A	0.0141		0.04	
1213	EN14110A	0.009		-2.30	
1240	EN14110A	0.004	C	-4.60	first reported 0.006
1263		-----		-----	
1278		-----		-----	
1286	EN14110B	<0.01		<-1.84	
1292		-----		-----	
1299	EN14110B	0.01		-1.84	
1300	EN14110A	0.0145		0.23	
1339	EN14110A	0.014		0.00	
1402		-----		-----	
1409	EN14110	0.01		-1.84	
1429	EN14110B	0.0138		-0.09	
1634		-----		-----	
1656	EN14110A	0.011		-1.38	
1708	EN14110B	0.012		-0.92	
1710	EN14110	0.02		2.75	
1739	EN14110B	0.01		-1.84	
1807	EN14110	0.014		0.00	
1826	EN14110	0.02		2.75	
1948	EN14110B	0.0145		0.23	

	normality	OK			
	n	32			
	outliers	0			
	mean (n)	0.0140			
	st.dev. (n)	0.00443			
	R(calc.)	0.0124			
	R(EN14110:03)	0.0061			
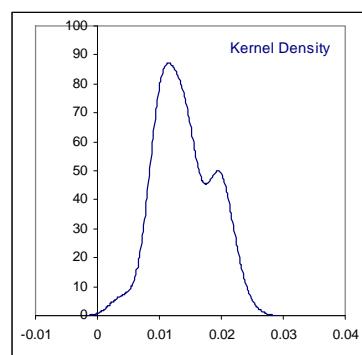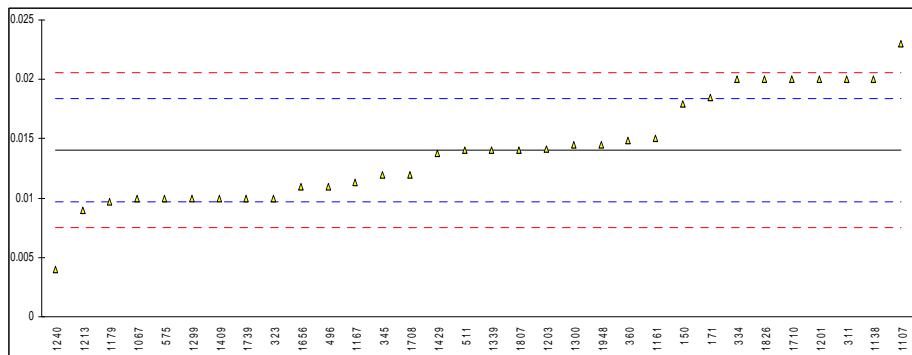
Determination of mono-Glycerides on sample #1066; results in %M/M

lab	method	value	mark	z(targ)	remarks
62	D6584	0.495	C	-0.76	first reported
150	EN14105	0.50		-0.69	
171	EN14105	0.3552	C	-2.71	first reported
311	EN14105	0.51		-0.56	
312		-----		-----	
323	EN14105	0.58		0.42	
333		-----		-----	
334	EN14105	0.53		-0.28	
344		-----		-----	
345	EN14105	0.457		-1.29	
360	EN14105	0.466		-1.17	
391		-----		-----	
447		-----		-----	
496	EN14105	0.624		1.03	
511	EN14105	0.670		1.67	
540		-----		-----	
575	EN14105	0.540		-0.14	
631		-----		-----	
1017		-----		-----	
1059		-----		-----	
1067	EN14105	0.53		-0.28	
1080		-----		-----	
1107	EN14105	0.30	G(0.05)	-3.48	
1138	EN14105	0.53		-0.28	
1154		-----		-----	
1161	EN14105	0.57		0.28	
1167	EN14105	0.779	DG(0.05)	3.19	
1179	EN14105	0.6211		0.99	
1199		-----		-----	
1201	EN14105	0.56		0.14	
1203	EN14105	0.604		0.75	
1213	D6584	1.357	G(0.01)	11.23	
1240	EN14105	0.633		1.16	
1263		-----		-----	
1278		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14105	0.84	DG(0.05)	4.04	
1300	EN14105	0.5134		-0.51	
1339	EN14105	0.466		-1.17	
1402		-----		-----	
1409		-----		-----	
1429	EN14105	0.53		-0.28	
1634		-----		-----	
1656	EN14105	0.71		2.23	
1708	EN14105	0.528		-0.30	
1710	EN14105	0.57		0.28	
1739	EN14105	0.60		0.70	
1807	EN14105	0.452		-1.36	
1826	EN14105	0.65		1.39	
1948	EN14105	0.6019		0.72	

normality	OK
n	28
outliers	4
mean (n)	0.550
st.dev. (n)	0.0766
R(calc.)	0.214
R(EN14105:03)	0.201

Kernel Density
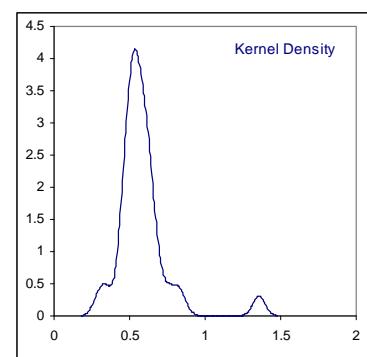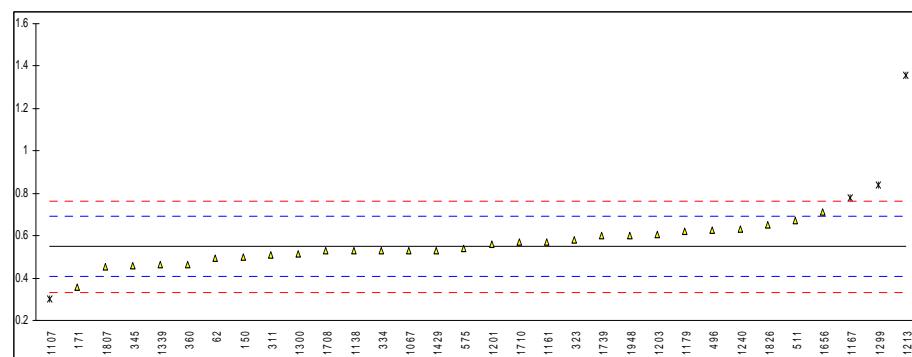
Determination of di-Glycerides on sample #1066; results in %M/M

lab	method	value	mark	z(targ)	remarks
62	D6584	0.109	C	-0.41	first reported 0.4996
150	EN14105	0.12		0.24	
171	EN14105	0.1036	C	-0.73	first reported 0.065
311	EN14105	0.09		-1.53	
312		-----		-----	
323	EN14105	0.13		0.84	
333		-----		-----	
334	EN14105	0.12		0.24	
344		-----		-----	
345	EN14105	0.130		0.84	
360	EN14105	0.084		-1.89	
391		-----		-----	
447		-----		-----	
496	EN14105	0.141		1.49	
511	EN14105	0.176		3.56	
540		-----		-----	
575	EN14105	0.111		-0.29	
631		-----		-----	
1017		-----		-----	
1059		-----		-----	
1067	EN14105	0.14		1.43	
1080		-----		-----	
1107	EN14105	0.079		-2.19	
1138	EN14105	0.12		0.24	
1154		-----		-----	
1161	EN14105	0.107		-0.53	
1167	EN14105	0.094		-1.30	
1179	EN14105	0.0791		-2.18	
1199		-----		-----	
1201	EN14105	0.07		-2.72	
1203	EN14105	0.135		1.13	
1213	D6584	0.128		0.72	
1240	EN14105	0.129		0.78	
1263		-----		-----	
1278		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14105	0.12		0.24	
1300	EN14105	0.1213		0.32	
1339	EN14105	0.113		-0.17	
1402		-----		-----	
1409		-----		-----	
1429	EN14105	0.09		-1.53	
1634		-----		-----	
1656	EN14105	0.15		2.02	
1708	EN14105	0.117		0.07	
1710	EN14105	0.14		1.43	
1739	EN14105	0.13		0.84	
1807	EN14105	0.143		1.61	
1826	EN14105	0.08		-2.13	
1948	EN14105	0.1085		-0.44	

	normality	OK	
	n	32	
	outliers	0	
	mean (n)	0.116	
	st.dev. (n)	0.0241	
	R(calc.)	0.067	
	R(EN14105:03)	0.047	
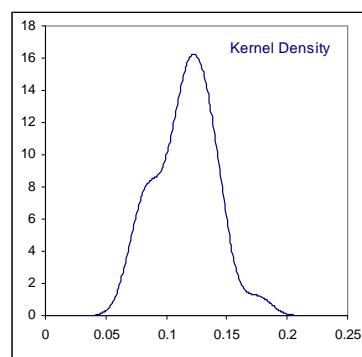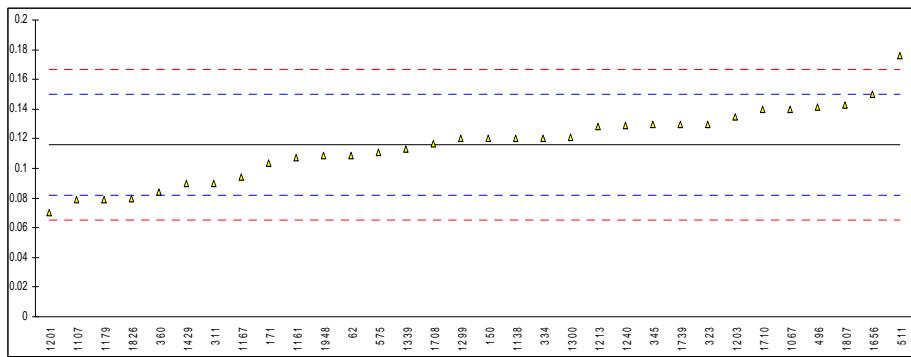
Determination of tri-Glycerides on sample #1066; results in %M/M

lab	method	value	mark	z(targ)	remarks
62	D6584	0.092	C	0.96	first reported 0.2268
150	EN14105	0.09		0.89	
171	EN14105	0.0604	C	-0.17	first reported 0.004
311	EN14105	0.05		-0.55	
312		-----		-----	
323	EN14105	0.04		-0.91	
333		-----		-----	
334	EN14105	0.10		1.25	
344		-----		-----	
345	EN14105	0.080		0.53	
360	EN14105	0.092		0.96	
391		-----		-----	
447		-----		-----	
496	EN14105	0.082		0.60	
511	EN14105	0.064		-0.04	
540		-----		-----	
575	EN14105	0.273	C,G(0.01)	7.48	first reported 0.325
631		-----		-----	
1017		-----		-----	
1059		-----		-----	
1067	EN14105	0.07		0.17	
1080		-----		-----	
1107	EN14105	0.073		0.28	
1138	EN14105	0.15		3.05	
1154		-----		-----	
1161	EN14105	0.018		-1.70	
1167	EN14105	0.037		-1.02	
1179	EN14105	0.0301		-1.26	
1199		-----		-----	
1201	EN14105	<0.01		<-1.99	
1203	EN14105	0.064		-0.04	
1213	D6584	0.253	G(0.01)	6.76	
1240	EN14105	0.090		0.89	
1263		-----		-----	
1278		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14105	0.08		0.53	
1300	EN14105	0.0900		0.89	
1339	EN14105	0.058		-0.26	
1402		-----		-----	
1409		-----		-----	
1429	EN14105	0.02		-1.63	
1634		-----		-----	
1656	EN14105	0.05		-0.55	
1708	EN14105	0.102		1.32	
1710	EN14105	0.01		-1.99	
1739	EN14105	0.09		0.89	
1807	EN14105	0.030		-1.27	
1826	EN14105	0.06		-0.19	
1948	EN14105	0.0195		-1.65	

normality	OK	
n	29	
outliers	2	
mean (n)	0.0652	
st.dev. (n)	0.03181	
R(calc.)	0.0891	
R(EN14105:03)	0.0778	
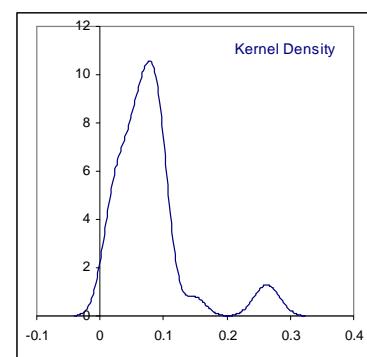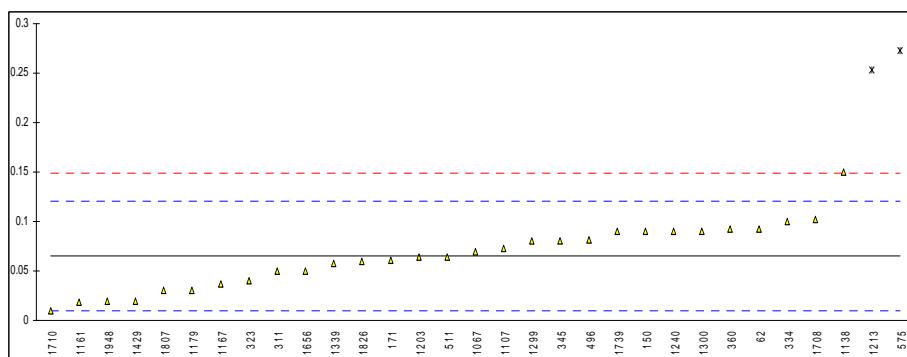
Determination of Free Glycerol on sample #1066; results in %M/M

lab	method	value	mark	z(targ)	remarks
62	D6584	0.016	C	1.63	first reported 0.0131
150	EN14105	0.01		-0.17	
171	EN14105	0.003		-2.27	
311	EN14105	0.01		-0.17	
312		-----		-----	
323	EN14105	<0.01		-----	
333		-----		-----	
334	EN14105	0.01	C	-0.17	first reported 0
344		-----		-----	
345	EN14105	0.001		-2.87	
360	EN14105	0.0097		-0.26	
391		-----		-----	
447		-----		-----	
496	EN14105	0.0133		0.82	
511	EN14105	0.0097		-0.26	
540		-----		-----	
575	EN14105	0.011		0.13	
631		-----		-----	
1017		-----		-----	
1059		-----		-----	
1067	EN14105	<0.01		-----	
1080		-----		-----	
1107	EN14105	0.012		0.43	
1138	EN14105	0.02		2.83	
1154		-----		-----	
1161	EN14105	0.004		-1.97	
1167	EN14105	0.008		-0.77	
1179	EN14105	0.0031		-2.24	
1199		-----		-----	
1201	EN14105	0.01		-0.17	
1203	EN14105	0.0145		1.18	
1213	D6584	0.016		1.63	
1240	EN14105	0.013		0.73	
1263		-----		-----	
1278		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14105	0.005		-1.67	
1300	EN14105	0.0107		0.04	
1339	EN14105	0.012		0.43	
1402		-----		-----	
1409		-----		-----	
1429	EN14105	0.014		1.03	
1634		-----		-----	
1656	EN14105	0.0106		0.01	
1708	EN14105	0.009		-0.47	
1710		-----	C	-----	first reported 0.00
1739	EN14105	0.016		1.63	
1807	EN14105	0.012		0.43	
1826	EN14105	0.01		-0.17	
1948	EN14105	0.0131		0.76	

normality	not OK	
n	29	
outliers	0	
mean (n)	0.0106	
st.dev. (n)	0.00432	
R(calc.)	0.0121	
R(EN14105:03)	0.0093	
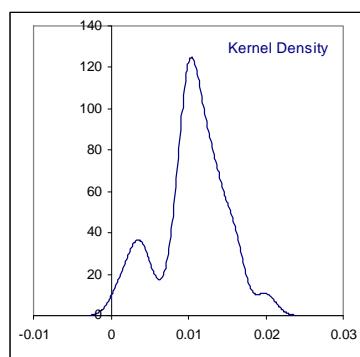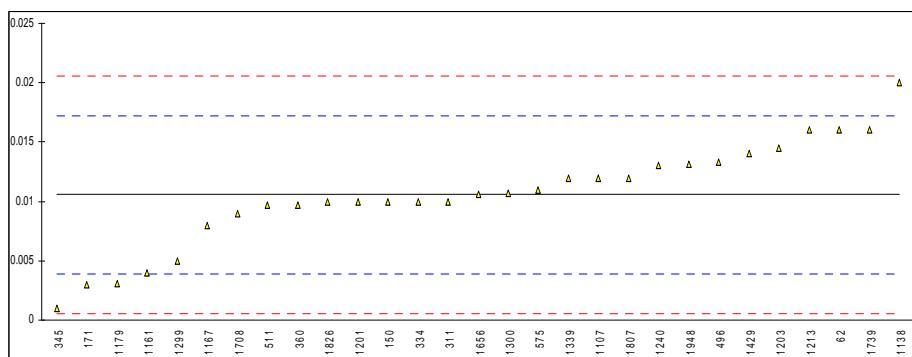
Determination of Total Glycerol on sample #1066; results in %M/M

lab	method	value	mark	z(targ)	remarks
62	D6584	0.171	C	-0.20	first reported 0.1914
150	EN14105	0.16		-0.65	
171	EN14105	0.1147	C	-2.50	first reported 0.082
311	EN14105	0.16		-0.65	
312		-----		-----	
323	EN14105	0.17		-0.24	
333		-----		-----	
334	EN14105	0.17		-0.24	
344		-----		-----	
345	EN14105	0.145		-1.26	
360	EN14105	0.150		-1.06	
391		-----		-----	
447		-----		-----	
496	EN14105	0.222		1.88	
511	EN14105	0.213		1.51	
540		-----		-----	
575	EN14105	0.198		0.90	
631		-----		-----	
1017		-----		-----	
1059		-----		-----	
1067	EN14105	0.16		-0.65	
1080		-----		-----	
1107	EN14105	0.11		-2.69	
1138	EN14105	0.18		0.16	
1154		-----		-----	
1161	EN14105	0.167		-0.37	
1167	EN14105	0.224		1.96	
1179	EN14105	0.1702		-0.23	
1199		-----		-----	
1201	EN14105	0.16		-0.65	
1203	EN14105	0.195		0.78	
1213	D6584	0.413	G(0.01)	9.66	
1240	EN14105	0.199		0.94	
1263		-----		-----	
1278		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299	EN14105	0.24		2.61	
1300	EN14105	0.1686		-0.30	
1339	EN14105	0.152		-0.98	
1402		-----		-----	
1409		-----		-----	
1429	EN14105	0.16		-0.65	
1634		-----		-----	
1656	EN14105	0.23		2.20	
1708	EN14105	0.171		-0.20	
1710	EN14105	0.17		-0.24	
1739	EN14105	0.20		0.98	
1807	EN14105	0.15		-1.06	
1826	EN14105	0.19		0.57	
1948	EN14105	0.1844		0.34	

|		
normality	not OK	
n	31	
outliers	1	
mean (n)	0.176	
st.dev. (n)	0.0304	
R(calc.)	0.085	
R(EN14105:03)	0.069	

Kernel Density
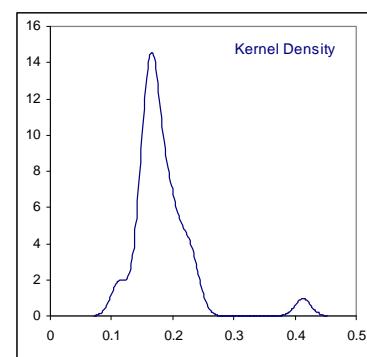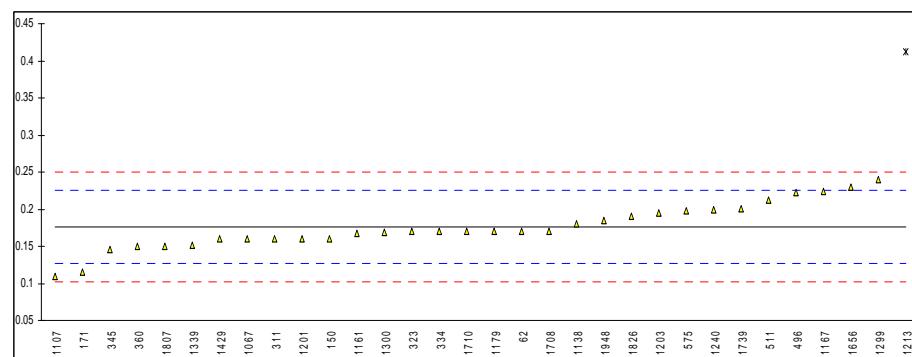
Determination of Total Ester content (uncorrected) on sample #1066; results in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
150		-----		-----	
171	EN14103	97.6		0.99	
311	EN14103	94.1		-2.17	
312		-----		-----	
323	EN14103	93.6		-2.62	
333		-----		-----	
334	EN14103	98.3	C	1.63	first reported 99.5
344		-----		-----	
345	EN14103	97.1		0.54	
360	EN14103	94.301		-1.99	
391		-----		-----	
447	EN14103	96.2		-0.27	
496	EN14103	96.86		0.33	
511	EN14103	95.51		-0.89	
540	EN14103	98.3		1.63	
575	EN14103	97.4		0.81	
631		-----		-----	
1017		-----		-----	
1059	EN14103	95.6		-0.81	
1067	EN14103	95.98		-0.47	
1080	in house	97.94		1.30	
1107	EN14103	97.69		1.08	
1138	EN14103	96.3		-0.18	
1154		-----		-----	
1161	EN14103	98.13		1.47	
1167	EN14103	95.26		-1.12	
1179	EN14103	97.04		0.49	
1199		-----		-----	
1201	EN14103	95.2		-1.17	
1203	EN14103	97.06		0.51	
1213	EN14103	96.07		-0.39	
1240	EN14103	98.89		2.16	
1263		-----		-----	
1278		-----		-----	
1286	EN14103	96.179		-0.29	
1292	EN14103	96.6		0.09	
1299	EN14103	96.2		-0.27	
1300	EN14103	98.115		1.46	
1339	EN14103	96.84		0.31	
1402		-----		-----	
1409	EN14103	97.1	C	0.54	first reported 93.9
1429	EN14103	96.5		0.00	
1634		-----		-----	
1656	EN14103	95.7		-0.72	
1708		-----		-----	
1710		-----	C	-----	first reported 99.6
1739	EN14103	95.7		-0.72	
1807	EN14103	95.8		-0.63	
1826	EN14103	96		-0.45	
1948	EN14103	96.31		-0.17	
	normality	OK			
	n	35			
	outliers	0			
	mean (n)	96.499			
	st.dev. (n)	1.2296			
	R(calc.)	3.443			
	R(EN14103:03)	3.100			
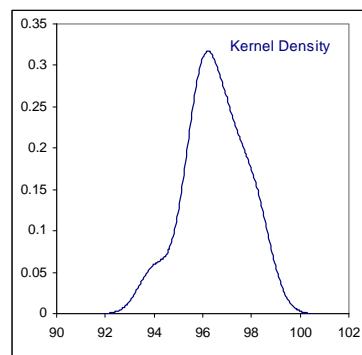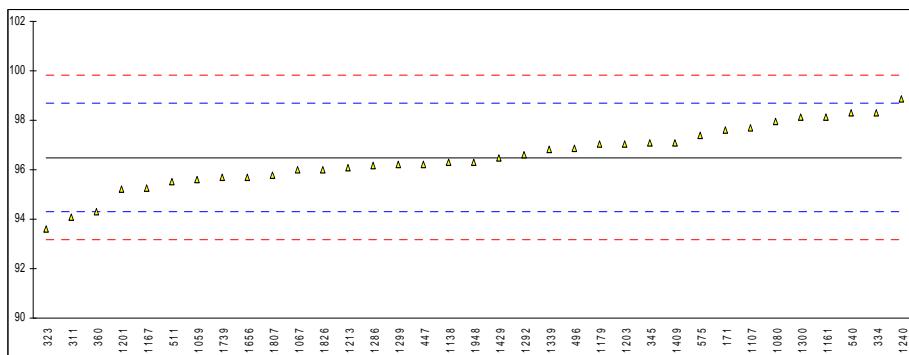
Determination of Total Ester content (corr. Acc. CEN rev. TF/N39) on sample #1066; results in %M/M

| lab	method	value	mark	z(targ)	remarks
62		-----		-----	
150	EN14103	95.9		-0.40	
171	EN14103	97.8		1.32	
311	EN14103	94.3		-1.85	
312		-----		-----	
323	EN14103	93.9		-2.21	
333		-----		-----	
334		-----		-----	
344		-----		-----	
345		-----		-----	
360		-----		-----	
391		-----		-----	
447		-----		-----	
496	INH-1248	97.24		0.81	
511		-----		-----	
540		-----		-----	
575		-----		-----	
631		-----		-----	
1017		-----		-----	
1059		-----		-----	
1067	EN14103	96.28		-0.06	
1080		-----		-----	
1107	EN14103	97.63		1.16	corrected result > uncorrected result?
1138	EN14103	96.7		0.32	
1154		-----		-----	
1161		-----		-----	
1167		-----		-----	
1179	EN14103	96.88		0.48	corrected result > uncorrected result?
1199		-----		-----	
1201	EN14103	95.6		-0.67	
1203	EN14103	97.33		0.89	
1213		-----		-----	
1240		-----		-----	
1263		-----		-----	
1278		-----		-----	
1286		-----		-----	
1292		-----		-----	
1299		-----		-----	
1300		-----		-----	
1339		-----		-----	
1402		-----		-----	
1409		-----	C	-----	first reported 93.4
1429	EN14103	96.7		0.32	
1634		-----		-----	
1656	EN14103Mod.	96.3		-0.04	
1708	EN14103	97.13		0.71	
1710		-----		-----	
1739	EN14103	96.0		-0.31	
1807	EN14103	95.8		-0.49	
1826		-----		-----	
1948		-----		-----	

normality	OK	
n	16	
outliers	0	
mean (n)	96.343	
st.dev. (n)	1.0963	
R(calc.)	3.070	
R(EN14103:03)	3.100	
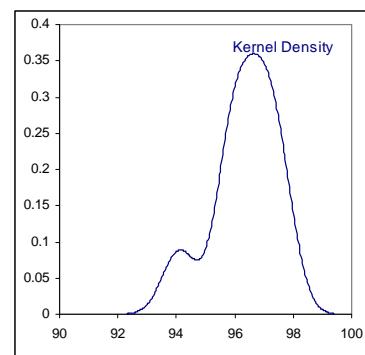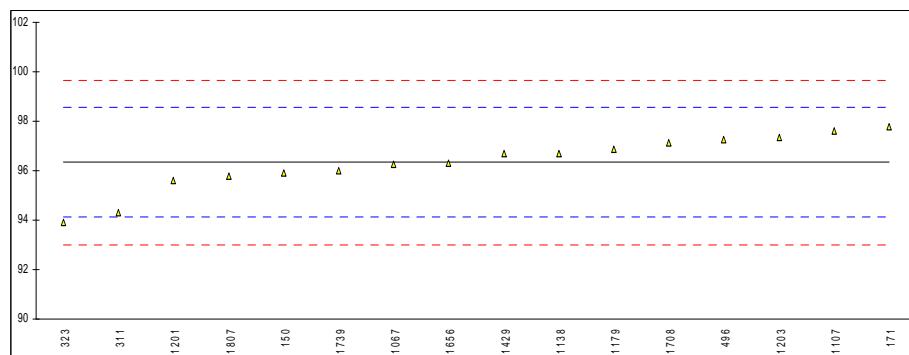
Determination of Linolenic Acid Methyl Ester content on sample #1066; results in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
150	EN14103	9.2		0.07	
171	EN14103	9.1		-0.03	
311	EN14103	9.1		-0.03	
312		-----		-----	
323	EN14103	9.1		-0.03	
333		-----		-----	
334	EN14103	9.8	G(0.05)	0.65	
344		-----		-----	
345	EN14103	8.9		-0.23	
360	EN14103	8.824		-0.30	
391		-----		-----	
447	EN14103	9.2		0.07	
496	EN14103	9.18		0.05	
511	EN14103	8.96		-0.17	
540	EN14103	9.2		0.07	
575		-----		-----	
631		-----		-----	
1017		-----		-----	
1059	EN14103	9.2		0.07	
1067	EN14103	9.12		-0.01	
1080	in house	9.17		0.04	
1107	EN14103	9.06		-0.07	
1138	EN14103	8.7		-0.42	
1154		-----		-----	
1161	EN14103	9.40	C	0.26	first reported 6.80
1167	EN14103	9.51		0.37	
1179	EN14103	9.18		0.05	
1199		-----		-----	
1201	EN14103	9.1		-0.03	
1203	EN14103	9.22		0.09	
1213	EN14103	8.85		-0.28	
1240	EN14103	1.33	C,G(0.01)	-7.64	first reported 0.51
1263		-----		-----	
1278		-----		-----	
1286	EN14103	9.241		0.11	
1292	EN14103	9.2		0.07	
1299	EN14103	9.2		0.07	
1300	EN14103	9.26		0.13	
1339	EN14103	9.11		-0.02	
1402		-----		-----	
1409	EN14103	8.7		-0.42	
1429	EN14103	9.5		0.36	
1634		-----		-----	
1656	EN14103	9.12		-0.01	
1708	EN14103	9.05		-0.08	
1710	EN14103	9.4		0.26	
1739	EN14103	9.1		-0.03	
1807	EN14103	9.2		0.07	
1826	EN14103	9.0		-0.13	
1948	EN14103	9.25		0.12	

normality	not OK	
n	35	
outliers	2	
mean (n)	9.132	
st.dev. (n)	0.1860	
R(calc.)	0.521	
R(EN14103:03)	2.860	

Kernel Density
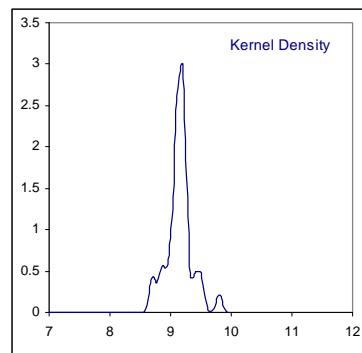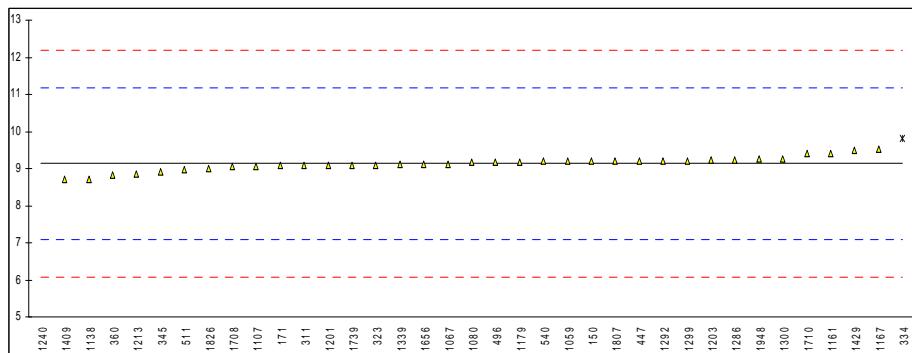
Determination of total Contamination on sample #1067; results in mg/kg and mL

lab	method	value	mark	z(targ)	volume used	remarks
171	EN12662	Blockage		-----	150	Filter blocking at 150ml
311	EN12662	21		-2.20	500	
312	EN12662	FAIL		-----	300	
323	EN12662	Blockage		-----	-----	Extreme filter time; test discontinued
333	EN12662	<6		<-7.30	800	false negative?
334	EN12662	FAIL		-----	800	
345	EN12662	40.9		4.55	800	
360	EN12662	24.5		-1.01	800	
447	IP440	18.73		-2.97	800	
496	EN12662	39.2		3.98	800	
540	EN12662	NO PASS		-----	375	
575	D6217	22.68		-1.63	-----	
1059	EN12662	-----		-----	400	Filter blocking at 400ml
1067	EN12662	28.42		0.32	778	
1080	EN12662	54.2	G(0.05)	9.07	200	Filter blocking at 200ml
1095		-----		-----	-----	
1107		-----		-----	-----	
1138		-----		-----	-----	
1154		-----		-----	-----	
1161	EN12662	28.24		0.26	800	
1167		-----		0.48	-----	
1199		-----		-----	-----	
1201	EN12662	18.9		-2.92	580	
1203	EN12662	17.0		-3.56	800	
1240	EN12662	28.1		0.21	800	
1290	EN12662	30.81		1.13	2x250g	
1300	EN12662	19.383		-2.75	840.5	
1339	EN12662	31.7		1.43	-----	
1402	EN12662	25.1		-0.81	200	
1409	EN12662	31.3		1.29	657g	
1429	EN12662	FAIL		-----	250	
1710		-----	C	-----	827	first reported 10.7
1739	EN12662	35		2.55	300	
1807	EN12662	NO PASS		-----	302	
1948	EN12662	32.4		1.67	-----	
	normality	OK				
	n	19				
	outliers	1				
	mean (n)	27.49		9 x FAIL		Spike 15 mg/kg
	st.dev. (n)	6.875				
	R(calc.)	19.25				
	R(EN12662:08)	8.25				

APPENDIX 2

Number of participants per country

1 lab in ARGENTINA

1 lab in AUSTRIA

4 labs in BELGIUM

2 labs in BULGARIA

1 lab in CANADA

1 lab in COLOMBIA

1 lab in ESTONIA

3 labs in FRANCE

1 lab in GERMANY

1 lab in HONG KONG

3 labs in HUNGARY

1 lab in ITALY

1 lab in PERU

1 lab in PHILIPPINES

1 lab in POLAND

3 labs in PORTUGAL

1 lab in SLOVENIA

7 labs in SPAIN

6 labs in THE NETHERLANDS

3 labs in TURKEY

2 labs in U.S.A.

5 labs in UNITED KINGDOM

1 lab in VIETNAM

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
SDS   = Safety Data Sheet

Literature:

1   iis Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, November 2008
2   ASTM E178-02
3   ASTM E1301-03
4   ISO13528-05
5   ISO 5725-86
6   ISO 5725, parts 1-6, 1994
7   M. Thompson and R. Wood, J. AOAC Int, 76, 926, (1993)
8   W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)
9   IP 367/84
10   DIN 38402 T41/42
11   P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)
12   J.N. Miller, Analyst, 118, 455, (1993)
13   Analytical Methods Committee Technical Brief, No4 January 2001
14   The Royal Society of Chemistry 2002, Analyst 2002, 127 page1359-1364, P.J. Lowthian and M.
          Thompson. (see http://www.rsc.org/suppdata/an/b2/b205600n/)
15   EN14214:2003 Annex B