

**Results of Proficiency Test
Biodiesel 100% FAME (B100)
October 2012**

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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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 24 different countries have participated. See appendix 2 for the number of participants per country. In this report the results of the 2012 Biodiesel B100 proficiency test are presented and discussed.

2 SET UP

In this proficiency test Biodiesel B100 from Used Cooking Oil was used. Sample analyses for fit-for-use and homogeneity testing were subcontracted. It was decided to send one 0.5 litre and one 1 litre bottle of Biodiesel B100 (both labelled #12110), and separately one 1 litre bottle Biodiesel B100 (labelled #12111) specifically for Total Contamination.

The test scope was set up according to both EN14214 and ASTM D6751 specifications. The participants were requested to report rounded and unrounded results. 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 100% confidentiality of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires.

2.2 PROTOCOL

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the 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 type UCOM (Used Cooking Oil Methyl ester) was purchased from a European producer. The approximately 75 litre was spiked with 16.51 gram Methanol. After fit-for-use testing and homogenisation in a precleaned metal drum, the B100 was transferred to 50 brown glass bottles of 1 litre and 50 brown glass bottles of 500 ml. The homogeneity of the subsamples #12110 was checked by the determination of Water in accordance with ISO12937:00, Density in accordance with ISO12185:96 and Methanol in accordance with EN14110:03 on 6 stratified randomly selected samples:

	Water in mg/kg	Density at 15°C in kg/L	Methanol % wt
sample #12110-1	640	881.46	0.031
sample #12110-2	610	881.43	0.033
sample #12110-3	640	881.40	0.033
sample #12110-4	610	881.41	0.032
sample #12110-5	610	881.46	0.032
sample #12110-6	650	881.44	0.032

table 1: homogeneity test results of subsamples #12110

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 15°C in kg/L	Methanol % wt
r (sample #12110)	52	0.07	0.0021
Reference test	ISO12937:00	ISO12185:96	EN14110:03
$0.3 \cdot R_{(\text{reference test})}$	52	0.15	0.0030

table 2: repeatabilities of subsamples #12110

Each calculated repeatability was equal or less 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 50 amber glass bottles of one litre with inner and outer caps and labelled #12111. Each sample was spiked with 1 ml of a freshly prepared and ultrasonically homogenized, 8.54 g/kg particulate quartz material BCR-067 (ϕ 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, one bottle of 1 litre and one bottle of 0.5 litre, both labelled #12110, and/or one 1 litre bottle labelled #12111, were dispatched to each of the participating laboratories on September 19st, 2012.

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 are based on the requirements of EN14214:12 and/or ASTM D6751:12, e.g.:

Parameter	EN14214:12	Parameter	ASTM D6751:12
Acid Value	EN14104	Acid Number	ASTM D664
Carbon Residue (on 10% dist.)*	ISO10370*	Carbon Residue	ASTM D4530
CFPP	EN116		
Cloud Point	EN23015	Cloud Point	ASTMD2500
Copper Strip Corrosion	ISO2160	Copper Strip Corrosion	ASTM D130
Total Contamination	EN12662		
Density @ 15°C	ISO12185		
Flash Point (recc)	ISO3679		
Flah point (pmcc)	ISO2719	Flash Point	ASTM D93-C
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/ UOP389
Phosphorus	EN14107	Phosphorus	ASTM D4951
Sodium	EN14108		
Potassium	EN14109		
Sum of Sodium and Potassium	EN14538	Sum of Sodium and Potassium	EN14538
Methanol	EN14110	Methanol	EN14110
mono-, di-, tri-Glycerides	EN14105	mono-, di-, tri-Glycerides	ASTMD6584
Free + Total Glycerol	EN14105	Free and Total Glycerin	ASTM D6584
Total ester content	EN14103		
Linolenic Acid	EN14103		

table 3: requirements and test methods based on specifications EN14214:12 and ASTM D6751:12

* Carbon Residue is no longer mentioned in the last version of EN14214:12

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 appendix 1 of this report. The laboratories are represented by their code numbers.

Directly after the deadline, a reminder fax was sent to the laboratories that had not reported results at that moment. 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 results. Additional or corrected results are used for data analysis and 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 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, nos.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. 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:

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

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 $z_{(\text{target})}$ 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. Five participants did not report any test results and ten participants did report test results after the final reporting date. From 46 participants, 728 numerical results were received. Observed were 40 outlying results, which is 5.5% 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, Cloud Point, Density and Sulphated Ash. 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 based on 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.

<u>Acid Value (EN):</u>	This determination was not problematic. One statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier is in agreement with the requirements of EN14104:03.
<u>Acid Number ASTM</u>	This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers, is in agreement with the requirements of ASTM D664B:11.
<u>Carbon Residue ISO10370/D4530</u>	This determination was very problematic. Two statistical outliers were observed and the calculated reproducibility is not at all in agreement with the requirements of ISO10370:95. Two participants reported according ASTM D4530. Both ISO10370:95 and ASTM D4530:11 mention that when the samples expected to below 0.10% (M/M) residue, the samples should be distilled to remove 90% (V/V) of the flask charge. The 10% bottom remaining is then tested for carbon residue. One participant reported according IP 13. This participant was excluded because IP 13 does not mention a distillation for samples with a carbon residue below 0.10%.
<u>CFPP:</u>	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 estimated requirements of EN116:97. Evaluation should be done with care; the range of the precision data is between -35 and 0°C (EN116:fig.9). Rounding of the results may partly explain the observed spread.
<u>Cloud Point ISO23015/D2500</u>	This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility, after rejection of the statistical outliers, is in agreement with the requirements of ASTM D2500:11 and/of ISO23015:94.
<u>Copper Corrosion: ISO2160/D130</u>	No problems have been observed. All participants agreed on a result of 1 or 1A, except two. These participants reported 1B for this determination.
<u>Density @15°C:</u>	This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility, after

rejection of the statistical outliers, is in good agreement with the requirements of ISO12185:96.

Flash point:
(recc) ISO3679 The determination of the Rapid Equilibrium Closed Cup flash point was not problematic. No statistical outliers were observed and the calculated reproducibility is in good agreement with the requirements of ISO3679:04.

Flash point:
D93-C This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of D93-C:11 (specifically meant for B100), but is not in agreement with the requirements of ISO2719:02, that was developed before B100 was on the market as fuel (component).

Iodine Number: This determination was problematic. One statistical outlier was observed and the calculated reproducibility is not in agreement with the requirements of EN14111:03.

Kin.Visco. @ 40°C:
ISO3104/D445 This determination was problematic. Four statistical outliers were observed. The calculated reproducibility, after rejection of the statistical outliers, is not in agreement with the requirements of EN3104:96 and D445:09.

Oxidation Stability: This determination was not problematic. No statistical outliers were observed and the calculated reproducibility is in agreement with the requirements of EN14112:03.

Sulphated Ash:
ISO3987/D874 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): This determination was problematic. Two statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers is not in agreement with the requirements of ISO20846:11. The application range of the method is 3 – 500 mg/kg.

Sulphur
(D5453): This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D5453:09. The application range of the method is 1 – 8000 mg/kg.

Water: This determination was not problematic. No statistical outliers were observed and the calculated reproducibility is in agreement with the requirements of ISO12937:00.

<u>Calcium and Magnesium</u>	All reported results were near or below the application range of EN14538:06 (1 – 10 mg/kg). Therefore no conclusions were drawn.
<u>Phosphorus:</u>	All reported results were near or below the application range of EN14107:03 (4 – 20 mg/kg). Therefore no conclusions were drawn.
<u>Sodium:</u>	All reported results were near or below the lower application limit of EN14108:03 (1 mg/kg). Therefore no conclusions were drawn. Thirteen participants reported according to EN14538. This standard is for the sum of the sum of sodium and potassium.
<u>Potassium:</u>	This determination was not problematic. One statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier, is in agreement with the requirements of EN14109:03. Thirteen participants reported according to EN14538. This standard is for the sum of sodium and potassium.
<u>Methanol:</u>	<p>This determination was very problematic. One statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier, is not at all in agreement with the requirements of EN14110:03. In this standard procedures A and B are mentioned. Ten participants used procedure A and sixteen participants used procedure B. No significant differences between the results of the two procedures is observed.</p> <p>The average recovery of Methanol (theoretical increment of 0.025 %) may be good: “less then 156%” (the actual blank is unknown).</p>
<u>mono-Glycerides:</u>	This determination was problematic. One statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier, is not in agreement with the requirements of EN14105:11.
<u>di-Glycerides:</u>	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 EN14105:11.
<u>tri-Glycerides:</u>	This determination was very problematic. One statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier is not at all agreement with the requirements of EN14105:11.
<u>Free Glycerol:</u>	This determination was problematic for a number of laboratories. Four statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers is in good agreement with the requirements of EN14105:11.

- Total Glycerol: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier, is in agreement with the requirements of EN14105:11.
- Total Ester: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of EN14103:11.
- Linolenic Acid Methyl Ester: This determination was not problematic. No statistical outliers were observed and the calculated reproducibility is in good agreement with the requirements of EN14103:11.
- Polyunsaturated Methyl Ester This determination was problematic. One statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier, is not in agreement with the requirements of EN14103:11.
- Total Contamination: This determination was very problematic at the level of 12.4 mg/kg. The samples were spiked with 1 ml of a fresh prepared and ultrasonically homogenized, 8.5 g/kg particulate quartz material BCR-067 (\varnothing 2.4-32 μ m) in oil suspension. Therefore the minimum contamination concentration to be found was known (added amount = 9.98 mg/kg). The laboratories should be able to find at least 6.25 mg/kg [9.98 mg/kg_(added amount) – 3.73 mg/kg_(R D6217)]. Three laboratories reported lower amounts than 6.25 mg/kg and were rejected prior to data analysis. After excluding of the three laboratories, two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not at all in agreement with the requirements of ASTM EN12662:08. According to EN12662:08 a volume of 800 mL \pm 25 ml should be used for the determination of total contamination. However, the applicability of EN12662:08 is under discussion as the CEN expert group for Biodiesel test methods, recommended to use EN12662:1998 in order to generate valid test results. See also the letter on the iis website (news and reports/news/march 2012 / letter CEN/TC 19 explanation on total contamination test). According to the recently developed prEN12662:12 a dilution of pure FAME has to be performed before filtration. This standard method is applicable for FAME contents from 12 mg/kg to 30 mg/kg.

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	29	0.397	0.064	0.060
Acid Number (D664)	mg KOH/g	8	0.383	0.091	0.121
Carbon Residue on 10% dist. res.	%M/M	19	0.333	0.222	0.118
Cold Filter Plugging Point	°C	37	1.4	2.7	2.4
Cloud Point	°C	33	6.0	2.1	3.0
Copper Strip Corrosion		34	1A	n.a	n.a
Density @ 15°C	kg/m ³	40	881.4	0.2	0.5
Flash Point (EN spec)	°C	16	166.1	7.6	15.0
Flash Point (PMcc) (ASTM spec)	°C	27	155.4	14.7	14.7
Iodine Value	g I ₂ /100g	27	85.1	5.8	5.0
Kin. Viscosity @ 40°C (EN14214)	mm ² /s	35	4.655	0.041	0.035
Oxidation Stability	hours	32	6.95	2.02	2.04
Sulphated Ash (EN14214)	%M/M	13	0.0027	0.0063	(0.0005)*
Sulphur (EN14214)	mg/kg	23	8.87	2.47	2.11
Sulphur (D5453)	mg/kg	12	7.97	3.60	2.75
Water	mg/kg	40	649.6	120.0	175.3
Calcium & Magnesium	mg/kg	13	0.50	0.35	(1.26)*
Phosphorus	mg/kg	9	0.74	0.75	(0.17)*
Sodium	mg/kg	12	0.59	0.73	(1.51)*
Potassium	mg/kg	16	1.20	0.71	1.13
Methanol	%M/M	26	0.039	0.023	0.012
mono-Glycerides	%M/M	25	0.432	0.172	0.146
di-Glycerides	%M/M	23	0.134	0.056	0.054
tri-Glycerides	%M/M	24	0.19	0.22	0.11
Free Glycerol	%M/M	20	0.009	0.005	0.008
Total Glycerol	%M/M	25	0.16	0.04	0.04
Total Ester	%M/M	32	94.64	4.93	4.16
Linolenic Acid Methyl Ester	%M/M	30	2.62	0.44	0.83
Polyunsaturated Methyl Esters	%M/M	11	0.20	0.31	0.27
Total Contamination	mg/kg	24	12.4	8.4	3.7

table 4: comparison of the observed and target reproducibilities

* Values between brackets were below the application range of the respective reference test method. Therefore these 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 2012 WITH PREVIOUS PTS

	October 2012	October 2011	October 2010	October 2009
Type of FAME source	used cooking oil	Rapeseed	Rapeseed	Rapeseed
Number of reporting labs	46	49	50	35
Number of results reported	728	763	744	519
Number of statistical outliers	40	28	38	33
Percentage statistical outliers	5.5%	3.7%	5.1%	6.4%

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 2012	October 2011	October 2010	May 2010
Acid Value (EN14104)	+/-	+	++	+
Acid Number (D664)	+	+/-	--	--
Carbon Residue	--	--	--	--
Cold Filter Plugging Point	-	-	++	++
Cloud Point	+	++	+/-	++
Density @15°C	++	++	++	++
Flash Point (ISO3679)	++	--	++	+/-
Flash Point PMcc (D93)	+/-	++	++	--
Iodine Value	-	--	++	-
Kin. Viscosity @ 40°C	-	+/-	-	++
Oxidation Stability	+/-	++	++	++
Sulphated Ash	(--)	(+)	(--)	(--)
Sulphur (ISO20846)	-	++	(+)	(++)
Sulphur (D5453)	-	++	--	++
Water	+	++	++	++
Calcium and Magnesium	(++)	(++)	(++)	++
Phosphorus	(--)	n.e.	(--)	(--)
Sodium	(++)	(++)	n.e.	n.e.
Potassium	+	(++)	(++)	(++)
Methanol	--	--	--	--
mono-Glycerides	-	+	+/-	++
di-Glycerides	+/-	+/-	--	+/-
tri-Glycerides	--	+	-	+/-
Free Glycerol	++	(--)	--	+/-
Total Glycerol	+/-	--	--	++
Total Ester content	-	+/-	-	++
Linolenic Acid Methyl Ester	++	--	++	-
Poly unsaturated Methyl Esters	-	n.e.	n.e.	n.e.
Total Contamination	--	--	(--)	-

table 6: 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:

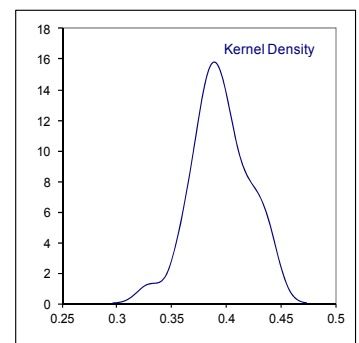
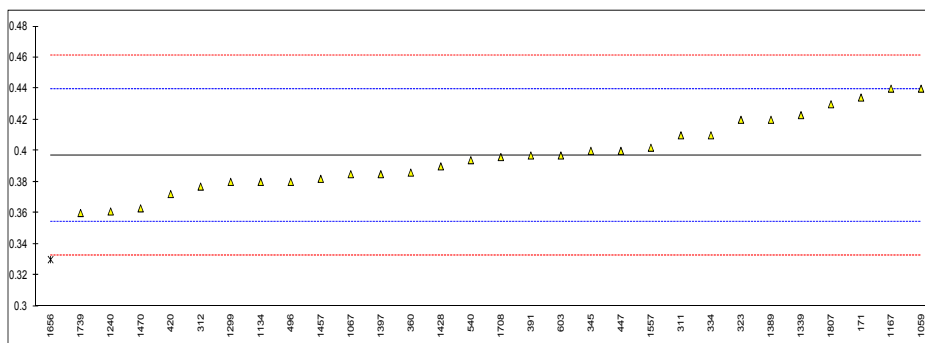
- ++: group performed much better than the standard
- + : group performed better than the standard
- +/-: group performance equals the standard
- : group performed worse than the standard
- : group performed much worse than the standard
- n.e.: not evaluated

APPENDIX 1

Determination of Acid Value conform EN spec. on sample #12110; results in mg KOH/g

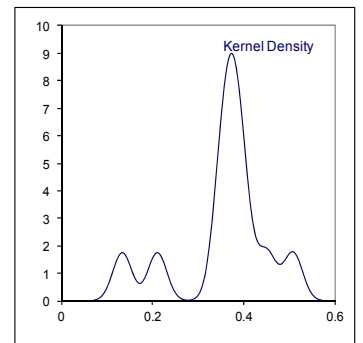
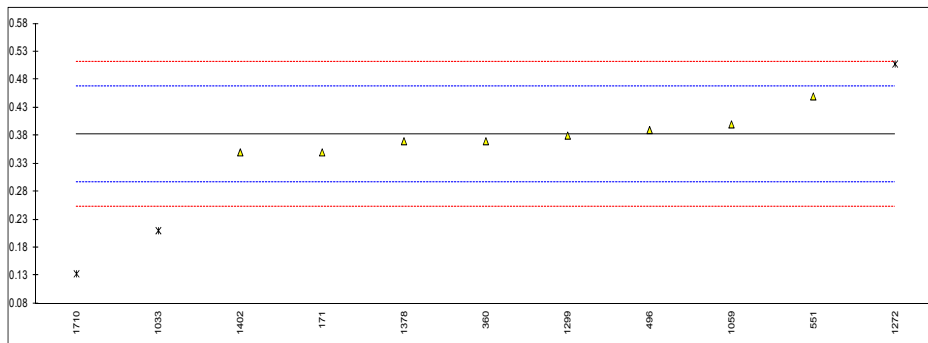
lab	method	value	mark	z(targ)	remarks
171	EN14104	0.4343		1.74	
311	EN14104	0.41		0.60	
312	EN14104	0.377		-0.94	
323	EN14104	0.42		1.07	
333		----		----	
334	EN14104	0.41		0.60	
338		----		----	
345	EN14104	0.40		0.14	
360	EN14104	0.386		-0.52	
391	EN14104	0.397		0.00	
420	EN14104	0.3722		-1.16	
447	EN14104	0.4		0.14	
495		----		----	
496	EN14104	0.380		-0.80	
511		----		----	
540	EN14104	0.394		-0.14	
551		----		----	
554		----		----	
603	EN14104	0.397		0.00	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059	EN14104	0.44		2.00	
1067	EN14104	0.385		-0.56	
1134	EN14104	0.38		-0.80	
1167	EN14104	0.44		2.00	
1179		----		----	
1199		----		----	
1240	EN14104	0.361		-1.68	
1272		----		----	
1286		----		----	
1292		----		----	
1299	EN14104	0.38		-0.80	
1339	EN14104	0.423		1.21	
1378		----		----	
1389	EN14104	0.42	C	1.07	first reported: 0.28
1397	EN14104	0.385		-0.56	
1402		----		----	
1428	EN14104	0.39		-0.33	
1457	EN14104	0.382		-0.70	
1470	EN14104	0.363		-1.59	
1490		----		----	
1557	EN14104	0.402		0.23	
1566		----		----	
1634		----		----	
1656	EN14104	0.33	G(0.05)	-3.13	
1708	EN14104	0.396		-0.05	
1710		----	W	----	result withdrawn: reported: 0.19
1739	EN14104	0.36		-1.73	
1807	EN14104	0.43		1.54	

normality OK
n 29
outliers 1
mean (n) 0.3971
st.dev. (n) 0.02290
R(calc.) 0.0641
R(EN14104:03) 0.0600



Determination of Acid Number conform ASTM spec. on sample #12110; results in mg KOH/g

lab	method	value	mark	z(targ)	Remarks
171	D664-B	0.35	C	-0.76	first reported: 0.676
311		----		----	
312		----		----	
323		----		----	
333		----		----	
334		----		----	
338		----		----	
345		----		----	
360	D664-B	0.37		-0.29	
391		----		----	
420		----		----	
447		----		----	
495		----		----	
496	D664-B	0.390		0.17	
511		----		----	
540		----		----	
551	D664-B	0.45		1.57	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033	D664	0.21	G(0.05)	-4.01	
1059	ISO6619	0.40		0.41	
1067		----		----	
1134		----		----	
1167		----		----	
1179		----		----	
1199		----		----	
1240		----		----	
1272	D664-B	0.508	DG(0.05)	2.92	
1286		----		----	
1292		----		----	
1299	D664-B	0.38		-0.06	
1339		----		----	
1378	D664	0.37		-0.29	
1389		----		----	
1397		----		----	
1402	D664	0.35		-0.76	
1428		----		----	
1457		----		----	
1470		----		----	
1490		----		----	
1557		----		----	
1566		----		----	
1634		----		----	
1656		----		----	
1708		----		----	
1710	D664-B	0.133	DG(0.05)	-5.80	
1739		----		----	
1807		----		----	
normality	OK				
n	8				
outliers	3				
mean (n)	0.3825				
st.dev. (n)	0.03240				
R(calc.)	0.0907				
R(D664B:11)	0.1205				

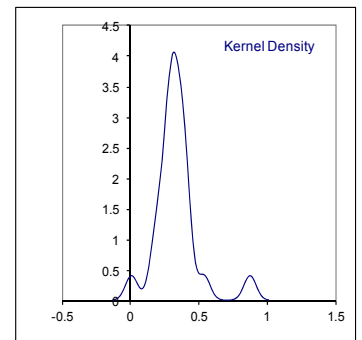
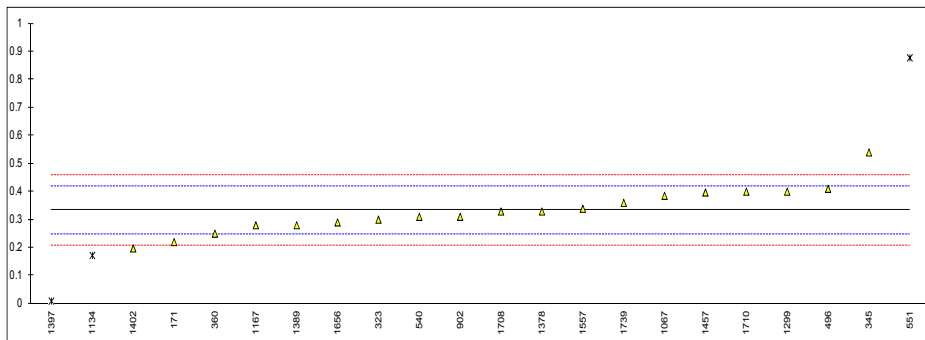


Determination of Carbon Residue on 10% distillation residue on sample #12110; results in %M/M

lab	method	value	mark	z(targ)	Remarks
171	ISO10370	0.22		-2.69	
311		----		----	
312		----		----	
323	ISO10370	0.30		-0.78	
333		----		----	
334		----		----	
338		----		----	
345	ISO10370	0.54		4.92	
360	ISO10370	0.25		-1.97	
391		----		----	
420		----		----	
447		----		----	
495		----		----	
496	ISO10370	0.41		1.83	
511		----		----	
540	ISO10370	0.31		-0.55	
551	D4530	0.8779	G(0.01)	12.96	
554		----		----	
603		----		----	
631		----		----	
902	D4530	0.31	C	-0.55	first reported: 0.095
1017		----		----	
1033		----		----	
1059		----		----	
1067	ISO10370	0.385		1.24	
1134	IP13	0.172	ex	-3.83	result excluded, see §4.1
1167	ISO10370	0.28		-1.26	
1179		----		----	
1199		----		----	
1240		----		----	
1272		----		----	
1286		----		----	
1292		----		----	
1299	ISO10370	0.40		1.59	
1339		----		----	
1378	ISO10370	0.329		-0.09	
1389	ISO10370	0.28	C	-1.26	first reported: 0.16
1397	ISO10370	0.009	G(0.05)	-7.70	
1402	ISO10370	0.197		-3.23	
1428		----		----	
1457	ISO10370	0.397		1.52	
1470		----		----	
1490		----		----	
1557	ISO10370	0.339		0.14	
1566		----		----	
1634		----		----	
1656	ISO10370	0.29		-1.02	
1708	ISO10370	0.329		-0.09	
1710	ISO10370	0.4		1.59	
1739	ISO10370	0.36		0.64	
1807		----		----	

normality OK
n 19
outliers 2
mean (n) 0.3329
st.dev. (n) 0.07927
R(calc.) 0.2220
R(ISO10370:95) 0.1177

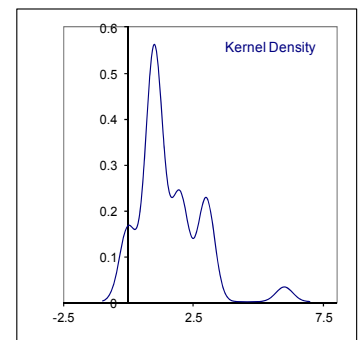
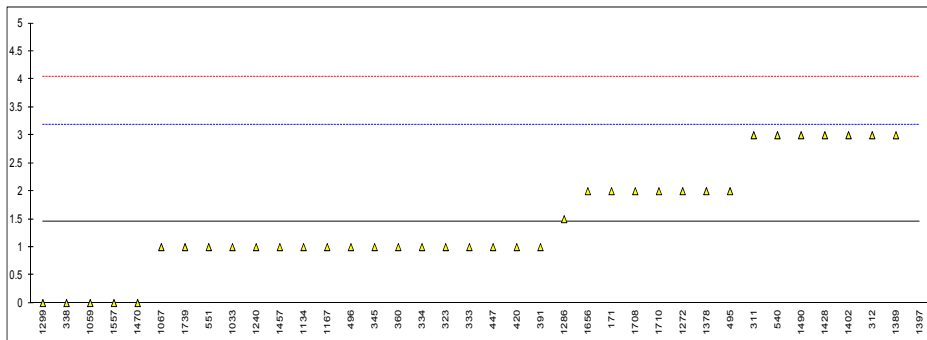
application range:: ISO10370:95>0.1 %M/M



Determination of Cold Filter Plugging Point on sample #12110; results in °C

lab	method	value	mark	z(targ)	Remarks
171	EN116	2		0.64	
311	EN116	3		1.79	
312	EN116	3		1.79	
323	EN116	1		-0.51	
333	EN116	1		-0.51	
334	EN116	1	C	-0.51	first reported: -3
338	EN116	0		-1.67	
345	EN116	1.0		-0.51	
360	EN116	1		-0.51	
391	EN116	1		-0.51	
420	EN116	1		-0.51	
447	EN116	1		-0.51	
495	EN116	2		0.64	
496	EN116	1.0		-0.51	
511		----		----	
540	EN116	3		1.79	
551	D6371	1		-0.51	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033	IP309	1		-0.51	
1059	EN116	0		-1.67	
1067	EN116	1		-0.51	
1134	EN116	1		-0.51	
1167	EN116	1		-0.51	
1179		----		----	
1199		----		----	
1240	EN116	1.0		-0.51	
1272	EN116	2		0.64	
1286	EN116	1.5		0.06	
1292		----		----	
1299	EN116	0		-1.67	
1339		----		----	
1378	EN116	2		0.64	
1389	EN116	3		1.79	
1397	EN116	6	G(0.01)	5.26	
1402	EN116	3		1.79	
1428	EN116	3		1.79	
1457	EN116	1		-0.51	
1470	EN116	0		-1.67	
1490	EN116	3.0		1.79	
1557	EN116	0	C	-1.67	first reported: -4
1566		----		----	
1634		----		----	
1656	EN116	2		0.64	
1708	EN116	2		0.64	
1710	EN116	2	C	0.64	first reported: 6
1739	EN116	1		-0.51	
1807		----		----	

normality not OK
n 37
outliers 1
mean (n) 1.45
st.dev. (n) 0.956
R(calc.) 2.68
R(EN116:97) 2.43

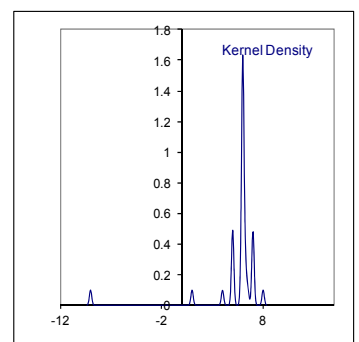
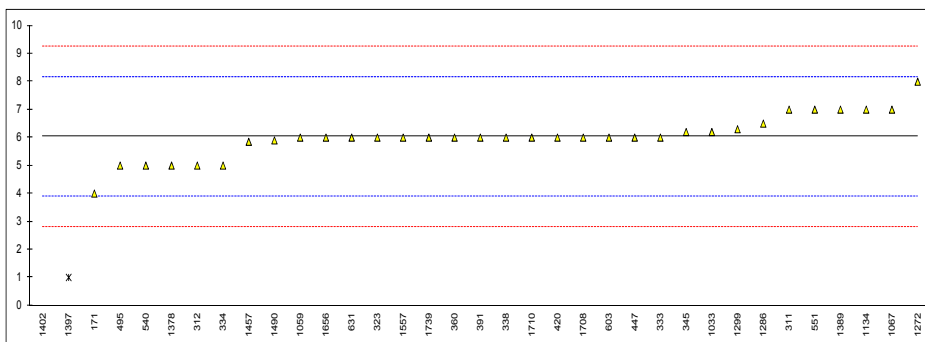


Determination of Cloud Point on sample #12110; results in °C

lab	method	value	mark	z(targ)	remarks
171	D2500-M	4		-1.89	
311	D2500-	7		0.91	
312	D2500-A	5		-0.96	
323	D2500-A	6		-0.03	
333	D2500-A	6		-0.03	
334	EN23015-A	5		-0.96	
338	EN23015-A	6.0		-0.03	
345	D5771-A	6.2		0.16	
360	EN23015-A	6		-0.03	
391	D2500-M	6		-0.03	
420	EN23015-A	6		-0.03	
447	D2500-	6		-0.03	
495	D2500-	5		-0.96	
496		----		----	
511		----		----	
540	D2500-M	5		-0.96	
551	D2500-A	7		0.91	
554		----		----	
603	D2500-M	6		-0.03	
631	D2500-M	6		-0.03	
902		----		----	
1017		----		----	
1033	D5772-A	6.2		0.16	
1059	EN23015-A	6		-0.03	
1067	D2500-A	7		0.91	
1134	ISO3015-M	7		0.91	
1167		----		----	
1179		----		----	
1199		----		----	
1240		----		----	
1272	ISO3015-M	8	C	1.84	first reported: -8
1286	EN23015-M	6.5		0.44	
1292		----		----	
1299	D7397-A	6.3		0.25	
1339		----		----	
1378	D2500-M	5		-0.96	
1389	D2500-M	7		0.91	
1397	D2500-A	1	G(0.01)	-4.69	
1402	D2500-M	-9	G(0.01)	-14.03	
1428		----		----	
1457	D2500-A	5.85		-0.17	
1470		----		----	
1490	EN23015-A	5.9		-0.12	
1557	ISO3015-M	6		-0.03	
1566		----		----	
1634		----		----	
1656	EN23015-A	6		-0.03	
1708	ISO3015-A	6		-0.03	
1710	EN23015-A	6	C	-0.03	first reported: 2
1739	EN23015-A	6		-0.03	
1807		----		----	

normality not OK
n 33
outliers 2
mean (n) 6.03
st.dev. (n) 0.759
R(calc.) 2.12
R(D2500:11) 3.00

Compare R(EN23015:94/ISO3015:92) = 4.00



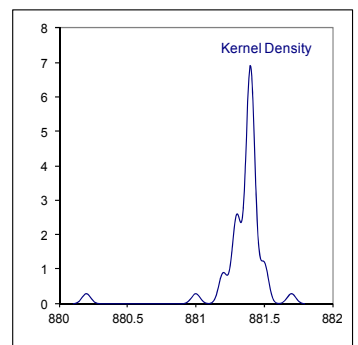
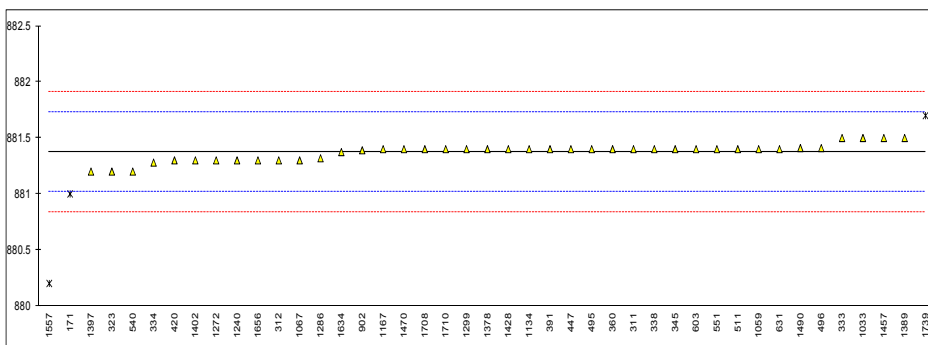
Determination of Copper Strip Corrosion 3 hrs/50°C on sample #12110

lab	method	value	mark	z(targ)	remarks
171	D130	1B		----	
311	D130	1A		----	
312	D130	1A		----	
323	ISO2160	1A		----	
333		----		----	
334		----		----	
338		----		----	
345	ISO2160	1A		----	
360	D130	1A		----	
391	D130	1A		----	
420	ISO2160	1		----	
447	D130	1A		----	
495	D130	1		----	
496	ISO2160	1A		----	
511	D130	1A		----	
540	ISO2160	1A		----	
551	D130	1A		----	
554		----		----	
603	D130	1A		----	
631	D130	1A		----	
902		----		----	
1017		----		----	
1033	IP154	1B		----	
1059	ISO2160	1A		----	
1067	D130	1A		----	
1134	IP154	1A		----	
1167	ISO2160	1A		----	
1179		----		----	
1199		----		----	
1240		----		----	
1272	ISO2160	1A		----	
1286		----		----	
1292	ISO2160	1A		----	
1299	D130	1A		----	
1339		----		----	
1378		----		----	
1389		----		----	
1397	D130	1		----	
1402	ISO2160	1A		----	
1428	D130	1A		----	
1457	D130	1A		----	
1470		----		----	
1490	ISO2160	1A		----	
1557	D130	1A		----	
1566		----		----	
1634	D130	1A		----	
1656		----		----	
1708	ISO2160	1A		----	
1710	ISO2160	1A		----	
1739	ISO2160	1A		----	
1807		----		----	
	normality	unknown			
	n	34			
	outliers	n.a			
	mean (n)	1A			
	st.dev. (n)	0			
	R(calc.)	0			
	R(D2160:98)	0			

Determination of Density @ 15°C conform EN spec. on sample #12110; results in kg/m³

lab	method	value	mark	z(targ)	remarks
171	ISO12185	881.0	G(0.01)	-2.08	
311	ISO12185	881.4		0.16	
312	D4052	881.3		-0.40	
323	ISO12185	881.2		-0.96	
333	ISO12185	881.5		0.72	
334	ISO12185	881.28		-0.52	
338	ISO12185	881.4		0.16	
345	ISO12185	881.4		0.16	
360	ISO12185	881.4		0.16	
391	ISO12185	881.4		0.16	
420	ISO12185	881.3		-0.40	
447	D4052	881.4		0.16	
495	ISO12185	881.4		0.16	
496	ISO12185	881.41		0.21	
511	D4052	881.40		0.16	
540	ISO12185	881.2		-0.96	
551	D4052	881.4		0.16	
554		----		----	
603	ISO12185	881.4		0.16	
631	D4052	881.4		0.16	
902	ISO12185	881.39		0.10	
1017		----		----	
1033	IP365	881.5		0.72	
1059	ISO12185	881.4		0.16	
1067	ISO12185	881.3		-0.40	
1134	ISO12185	881.4		0.16	
1167	ISO12185	881.4		0.16	
1179		----		----	
1199		----		----	
1240	ISO12185	881.3		-0.40	
1272	ISO12185	881.3		-0.40	
1286	ISO12185	881.319		-0.30	
1292		----		----	
1299	ISO12185	881.4		0.16	
1339		----		----	
1378	ISO12185	881.4		0.16	
1389	ISO12185	881.5	C	0.72	first reported: 882.7
1397	ISO12185	881.2	C	-0.96	first reported: 0.8812
1402	ISO12185	881.3	C	-0.40	probably unit error, reported: 0.8813
1428	ISO12185	881.4		0.16	
1457	ISO12185	881.5		0.72	
1470	ISO12185	881.4		0.16	
1490	ISO12185	881.41		0.21	
1557	ISO3675	880.2	C,G(0.01)	-6.56	first reported: 880.1
1566		----		----	
1634	ISO12185	881.374		0.01	
1656	ISO12185	881.3		-0.40	
1708	ISO12185	881.4		0.16	
1710	ISO12185	881.4		0.16	
1739	ISO3675	881.7	G(0.01)	1.84	
1807		----		----	

normality not OK
n 40
outliers 3
mean (n) 881.37
st.dev. (n) 0.075
R(calc.) 0.21
R(ISO12185:96) 0.50

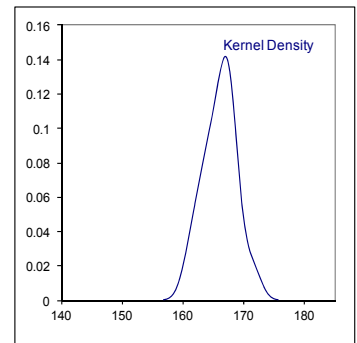
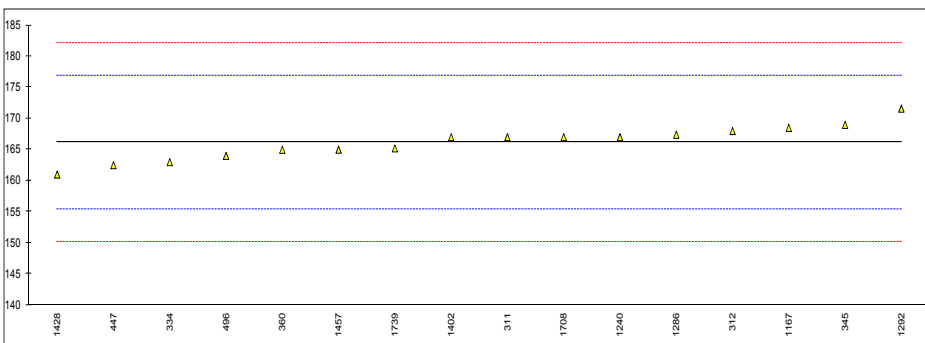


Determination of Flash Point (recc) conform EN spec. on sample #12110; results in °C

lab	method	value	mark	z(targ)	remarks
171		----		----	
311	ISO3679	167.0		0.16	
312	ISO3679	168		0.35	
323		----		----	
333		----		----	
334	ISO3679	163.0		-0.59	
338		----		----	
345	ISO3679	169.0		0.53	
360	ISO3679	164.98		-0.22	
391		----		----	
420		----		----	
447	ISO3679	162.5		-0.68	
495		----		----	
496	ISO3679	164.0		-0.40	
511		----		----	
540		----		----	
551		----		----	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059		----		----	
1067		----		----	
1134		----		----	
1167	ISO3679	168.5		0.44	
1179		----		----	
1199		----		----	
1240	ISO3679	167.0		0.16	
1272		----		----	
1286	ISO3679	167.4		0.24	
1292	ISO3679	171.6		1.02	
1299	ISO3679	>120		----	
1339	ISO3679	>160.0		----	
1378		----		----	
1389		----		----	
1397		----		----	
1402	ISO3679	167.0		0.16	
1428	ISO3679	161.0		-0.96	
1457	ISO3679	165.0		-0.21	
1470		----		----	
1490		----		----	
1557		----		----	
1566		----		----	
1634		----		----	
1656		----		----	
1708	ISO3679	167.0		0.16	
1710		----		----	
1739	ISO3679	165.2		-0.17	
1807		----		----	

normality OK
n 16
outliers 0
mean (n) 166.14
st.dev. (n) 2.698
R(calc.) 7.55
R(ISO3679:04) 15.00

Compare R(EN14214:08+A1:09) = 11.1

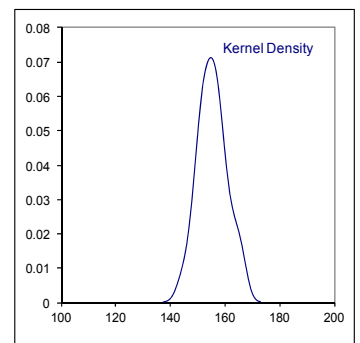
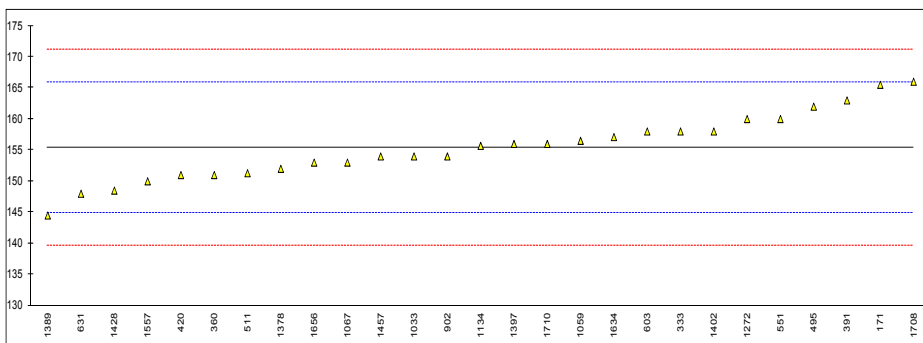


Determination of Flash Point (PMcc) conform ASTM spec. on sample #12110; results in °C

lab	method	value	mark	z(targ)	remarks
171	D93	165.5		1.92	
311		----		----	
312		----		----	
323		----		----	
333	D93	158.0		0.49	
334		----		----	
338		----		----	
345		----		----	
360	D93	151.0		-0.84	
391	D93	163		1.45	
420	ISO2719	151.0		-0.84	
447		----		----	
495	D93	162		1.26	
496		----		----	
511	D93	151.3		-0.78	
540		----		----	
551	D93	160.0		0.87	
554		----		----	
603	D93	158		0.49	
631	D93	148.0		-1.41	
902	D93	154.0		-0.27	
1017		----		----	
1033	IP34	154		-0.27	
1059	ISO2719	156.5		0.21	
1067	D93	153.0		-0.46	
1134	ISO2719	155.7		0.06	
1167		----		----	
1179		----		----	
1199		----		----	
1240		----		----	
1272	ISO2719	160		0.87	
1286		----		----	
1292		----		----	
1299		----		----	
1339		----		----	
1378	D93	152		-0.65	
1389	D93	144.5		-2.08	
1397	D93	156.0		0.11	
1402	ISO3679	158.0		0.49	
1428	D93	148.5		-1.32	
1457	D93	154.0		-0.27	
1470		----		----	
1490		----		----	
1557	D93	150.0	C	-1.03	first reported: 137.0
1566		----		----	
1634	D93	157.1		0.32	
1656	ISO2719	153.0		-0.46	
1708	ISO2719	166.0		2.02	
1710	ISO2719	156.0		0.11	
1739		----		----	
1807		----		----	

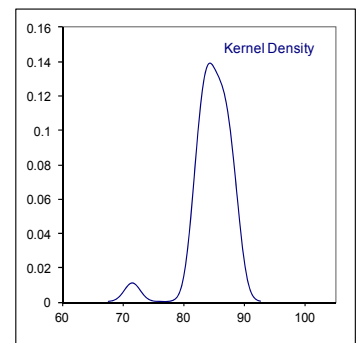
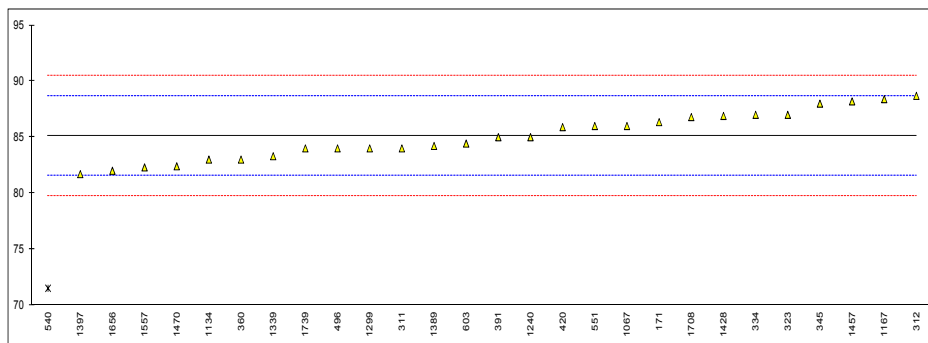
normality OK
n 27
outliers 0
mean (n) 155.41
st.dev. (n) 5.255
R(calc.) 14.70
R(D93C:11) 14.70

Compare R(ISO2719:02) = 11.4



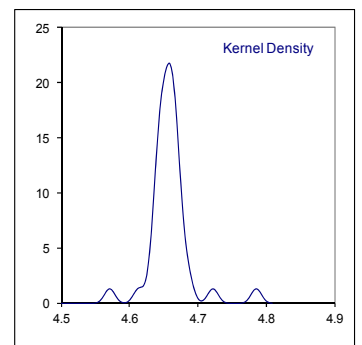
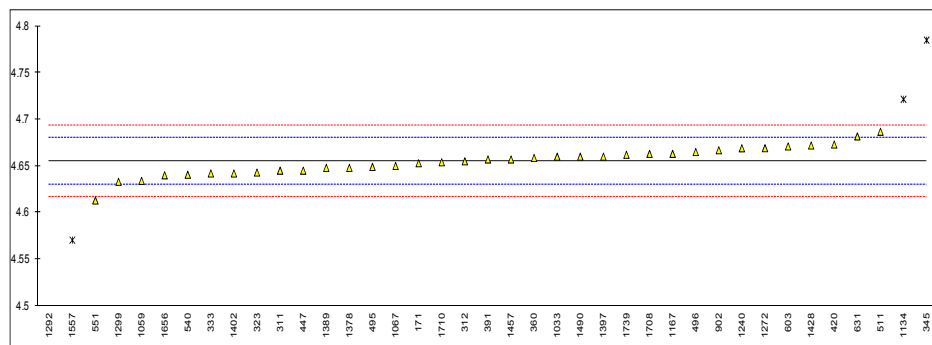
Determination of Iodine Value conform EN spec. on sample #12110; results in g I₂/100g

lab	method	value	mark	z(targ)	remarks
171	EN14111	86.35		0.70	
311	EN14111	84	C	-0.61	first reported: 106
312	EN14111	88.7		2.02	
323	EN14111	87		1.07	
333		----		----	
334	EN14111	87		1.07	
338		----		----	
345	EN14111	88		1.63	
360	EN14111	83		-1.17	
391	EN14111	85		-0.05	
420	EN14111	85.9		0.45	
447		----		----	
495		----		----	
496	EN14111	84.0		-0.61	
511		----		----	
540	EN14111	71.5	G(0.01)	-7.61	
551	EN14111	86		0.51	
554		----		----	
603	EN14111	84.43		-0.37	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059		----		----	
1067	EN14111	86.0		0.51	
1134	EN14111	83.0		-1.17	
1167	EN14111	88.4	C	1.85	first reported: 111.2
1179		----		----	
1199		----		----	
1240	EN16300	85.0		-0.05	
1272		----		----	
1286		----		----	
1292		----		----	
1299	EN14111	84		-0.61	
1339	EN14111	83.3		-1.01	
1378		----	W	----	result withdrawn, reported :78.32
1389	EN14111	84.22		-0.49	
1397	EN14111	81.7		-1.90	
1402		----		----	
1428	EN14111	86.9		1.01	
1457	EN14111	88.2		1.74	
1470	EN14214	82.4		-1.51	
1490		----		----	
1557	EN14111	82.3		-1.57	
1566		----		----	
1634		----		----	
1656	EN14111	82		-1.73	
1708	EN14111	86.8		0.95	
1710		----		----	
1739	EN14111	84		-0.61	
1807		----		----	
normality		OK			
n		27			
outliers		1			
mean (n)		85.10			
st.dev. (n)		2.089			
R(calc.)		5.85			
R(EN14111:03)		5.00			



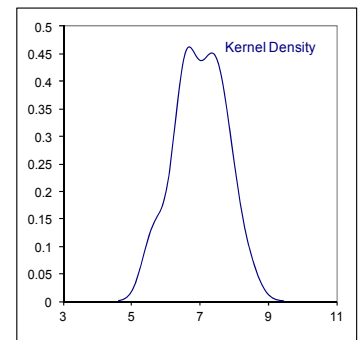
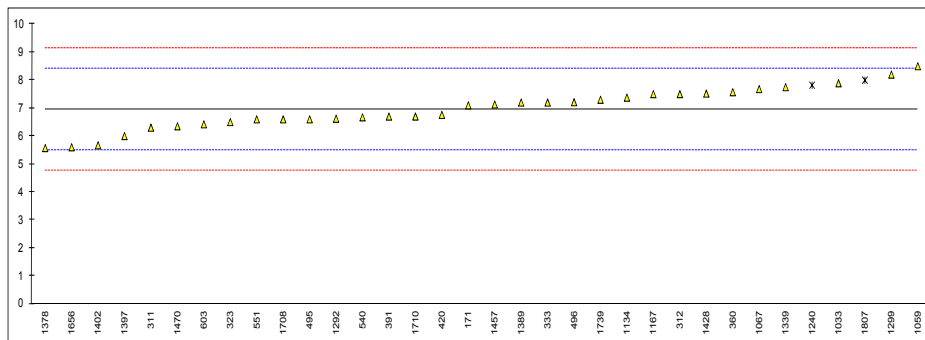
Determination of Kinematic Viscosity @ 40°C on sample #12110; results in mm²/s

lab	method	value	mark	z(targ)	Remarks
171	D445	4.653		-0.17	
311	D445	4.645		-0.80	
312	D445	4.655		-0.01	
323	ISO3104	4.643		-0.96	
333	D445	4.642		-1.04	
334		----		----	
338		----		----	
345	ISO3104	4.7849	C,G(0.01)	10.27	first reported: 4.9020
360	D445	4.6586		0.27	
391	D445	4.657		0.15	
420	ISO3104	4.673		1.41	
447	D445	4.645		-0.80	
495	D445	4.649		-0.49	
496	ISO3104	4.665		0.78	
511	D445	4.6867		2.50	
540	ISO3104	4.6406		-1.15	
551	D445	4.613		-3.33	
554		----		----	
603	D445	4.671		1.26	
631	D445	4.6817	C	2.10	first reported: 4.9288
902	D445	4.6669		0.93	
1017		----		----	
1033	IP71	4.6600		0.39	
1059	ISO3104	4.634		-1.67	
1067	D445	4.650		-0.41	
1134	ISO3104	4.7215	G(0.01)	5.25	
1167	ISO3104	4.663		0.62	
1179		----		----	
1199		----		----	
1240	ISO3104	4.669		1.10	
1272	ISO3104	4.6691		1.11	
1286		----		----	
1292	ISO3104	3.85087	G(0.01)	-63.65	
1299	D445	4.633		-1.75	
1339		----		----	
1378	D445	4.648		-0.56	
1389	D445	4.648		-0.56	
1397	D445	4.660		0.39	
1402	D445	4.642		-1.04	
1428	D445	4.672		1.33	
1457	D445	4.657		0.15	
1470		----		----	
1490	ISO3104	4.66		0.39	
1557	D445	4.5705	C,G(0.01)	-6.70	first reported: 4.2862
1566		----		----	
1634		----		----	
1656	ISO3104	4.640		-1.20	
1708	ISO3104	4.663		0.62	
1710	ISO3104	4.654		-0.09	
1739	ISO3104	4.662		0.54	
1807		----		----	
normality		OK			
n		35			
outliers		4			
mean (n)		4.6551			
st.dev. (n)		0.015			
R(calc.)		0.0415			
R(EN3104:96)		0.0354			Compare R(D445:09) = 0.0354



Determination of Oxidation Stability on sample #12110; results in hours

lab	method	value	mark	z(targ)	remarks
171	EN14112	7.1		0.21	
311	EN14112	6.3		-0.89	
312	EN14112	7.5		0.76	
323	EN14112	6.5		-0.61	
333	EN14112	7.2		0.35	
334		----		----	
338		----		----	
345		----		----	
360	EN14112	7.57		0.86	
391	EN14112	6.7		-0.34	
420	EB14112	6.76		-0.26	
447		----		----	
495	EN14112	6.6		-0.48	
496	EN14112	7.21		0.36	
511		----		----	
540	EN14112	6.67		-0.38	
551	EN14112	6.60		-0.48	
554		----		----	
603	EN14112	6.42		-0.72	
631		----		----	
902		----		----	
1017		----		----	
1033	EN14112	7.89		1.30	
1059	EN14112	8.5		2.14	
1067	EN14112	7.68		1.01	
1134	EN14112	7.375		0.59	
1167	EN14112	7.5		0.76	
1179		----		----	
1199		----		----	
1240	EN15751	7.82	ex	1.20	method not technically equivalent
1272		----		----	
1286		----		----	
1292	EN14112	6.62		-0.45	
1299	EN14112	8.2		1.72	
1339	EN14112	7.75		1.11	
1378	EN14112	5.57		-1.89	
1389	EN14112	7.2		0.35	
1397	EN14112	6.0		-1.30	
1402	EN14112	5.67		-1.76	
1428	EN14112	7.52		0.79	
1457	EN14112	7.13		0.25	
1470	EN14112	6.35		-0.82	
1490		----		----	
1557		----		----	
1566		----		----	
1634		----		----	
1656	EN14112	5.6	C	-1.85	first reported: 2.9
1708	EN14112	6.6		-0.48	
1710	EN14112	6.7		-0.34	
1739	EN14112	7.3		0.49	
1807	EN15751	8.0	ex	1.45	method not technically equivalent
normality		OK			
n		32			
outliers		0			
mean (n)		6.946			
st.dev. (n)		0.7215			
R(calc.)		2.020			
R(EN14112:03)		2.036			

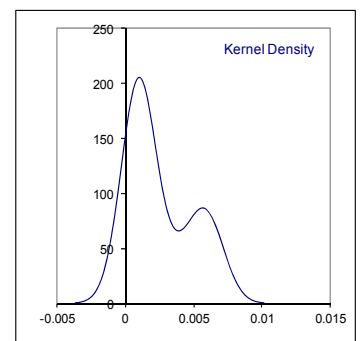
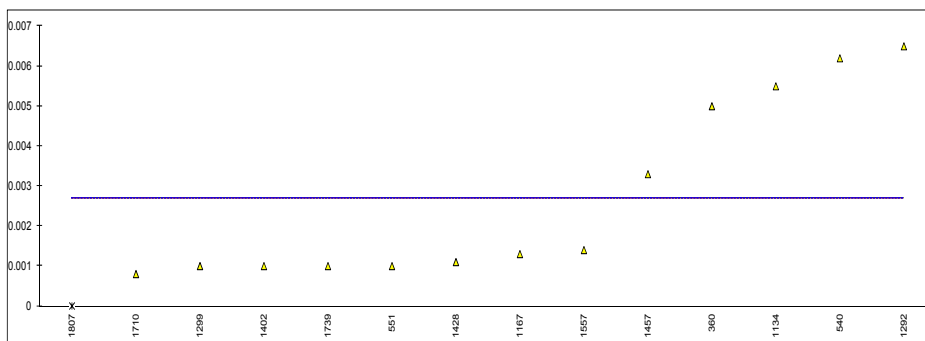


Determination of Sulphated Ash on sample #12110; results in %M/M

lab	method	value	mark	z(targ)	Remarks
171	D874	<0.001		----	
311	D874	<0.005		----	
312		----		----	
323	ISO3987	<0.01		----	
333		----		----	
334		----		----	
338		----		----	
345	ISO3987	<0.005		----	
360	ISO3987	0.005		----	
391		----		----	
420	ISO3987	<0.005		----	
447		----		----	
495		----		----	
496	ISO3987	<0.0001		----	
511		----		----	
540	ISO3987	0.0062		----	false positive?
551	D874	0.001		----	
554		----		----	
603	D874	<0.005		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059	ISO3987	<0.005		----	
1067		----		----	
1134	ISO3987	0.0055		----	false positive?
1167	ISO3987	0.0013		----	
1179		----		----	
1199		----		----	
1240		----		----	
1272		----		----	
1286		----		----	
1292	ISO3987	0.0065		----	false positive?
1299	D874	0.001		----	
1339		----		----	
1378		----		----	
1389		----		----	
1397		----		----	
1402	D874	0.001		----	
1428	D874	0.0011		----	
1457	D874	0.0033		----	
1470		----		----	
1490		----		----	
1557	D874	0.0014		----	
1566		----		----	
1634		----		----	
1656	ISO3987	<0.01		----	
1708	ISO3987	<0.005		----	
1710	ISO3987	0.0008		----	
1739	ISO3987	0.0010		----	
1807	ISO3987	0.000	ex	----	result excluded, zero is not a real value

normality not OK
n 13
outliers 0
mean (n) 0.0027
st.dev. (n) 0.00226
R(calc.) 0.0063
R(ISO3987:10) (0.00053)

Compare D874:07 = 1.2079
Applicable lower limit of 0.005%

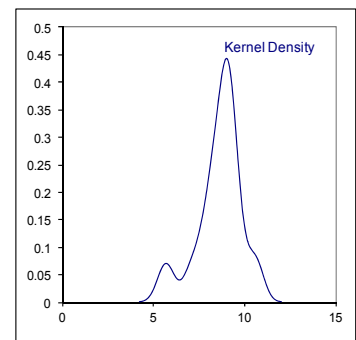
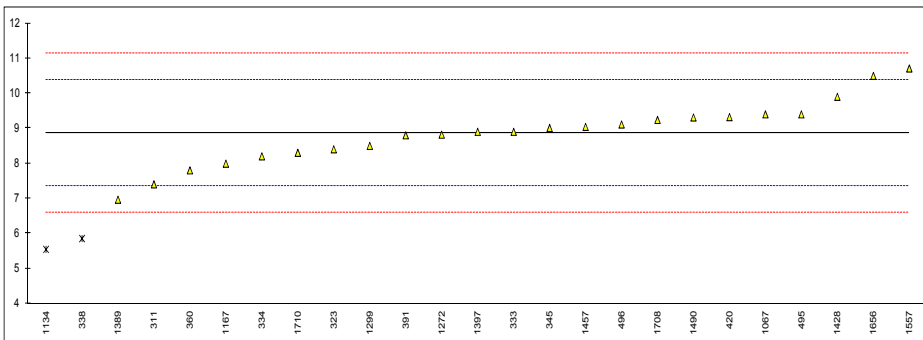


Determination of Sulphur conform EN spec. on sample #12110; results in mg/kg

lab	method	value	mark	z(targ)	remarks
171		----		----	
311	ISO20846	7.4		-1.94	
312		----		----	
323	ISO20846	8.4		-0.62	
333	ISO20846	8.9		0.05	
334	ISO20846	8.2		-0.88	
338	ISO20846	5.85	DG(0.05)	-4.00	
345	ISO20846	9.01		0.19	
360	ISO20846	7.8		-1.41	
391	ISO20846	8.8		-0.09	
420	ISO20846	9.32		0.60	
447		----		----	
495	ISO20846	9.4		0.71	
496	ISO20846	9.11		0.32	
511		----		----	
540		----		----	
551		----		----	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059		----		----	
1067	ISO20884	9.4		0.71	
1134	ISO20846	5.54	DG(0.05)	-4.41	
1167	ISO20846	7.99		-1.16	
1179		----		----	
1199		----		----	
1240		----		----	
1272	ISO20846	8.82		-0.06	
1286		----		----	
1292		----		----	
1299	ISO20846	8.5		-0.48	
1339		----		----	
1378		----		----	
1389	ISO20846	6.96		-2.53	
1397	ISO20846	8.9		0.05	
1402		----		----	
1428	ISO20846	9.9		1.37	
1457	ISO20846	9.04		0.23	
1470		----		----	
1490	ISO20846	9.31		0.59	
1557	ISO20846	10.71		2.44	
1566		----		----	
1634		----		----	
1656	ISO20846	10.5	C	2.17	first reported: 11.8
1708	ISO20846	9.24		0.50	
1710	ISO20846	8.3		-0.75	
1739		----		----	
1807		----		----	

normality OK
n 23
outliers 2
mean (n) 8.866
st.dev. (n) 0.8835
R(calc.) 2.474
R(ISO20846:11) 2.113

application range: 3 – 500 mg/kg

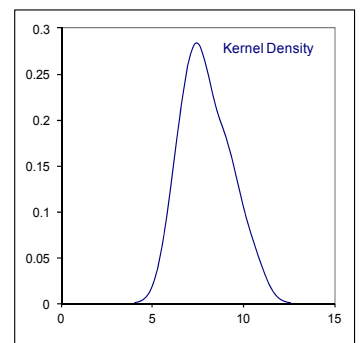
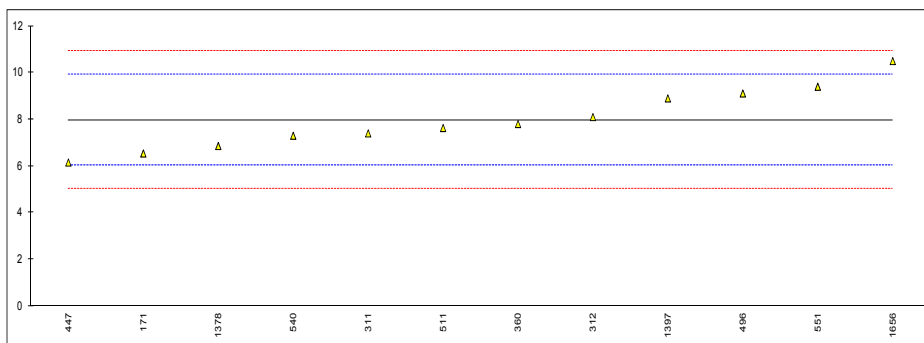


Determination of Sulphur conform ASTM spec. on sample #12110; results in mg/kg

lab	method	value	mark	z(targ)	Remarks
171	D5453	6.54		-1.46	
311	D5453	7.4		-0.58	
312	D5453	8.1		0.13	
323		----		----	
333		----		----	
334		----		----	
338		----		----	
345		----		----	
360	D5453	7.8		-0.18	
391		----		----	
420		----		----	
447	D5453	6.15		-1.86	
495		----		----	
496	D5453	9.11		1.16	
511	D5453	7.63		-0.35	
540	D5453	7.3		-0.69	
551	D5453	9.4		1.45	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059		----		----	
1067		----		----	
1134		----		----	
1167		----		----	
1179		----		----	
1199		----		----	
1240		----		----	
1272		----		----	
1286		----		----	
1292		----		----	
1299		----		----	
1339		----		----	
1378	D5453	6.86		-1.13	
1389		----		----	
1397	D5453	8.9		0.94	
1402		----		----	
1428		----		----	
1457		----		----	
1470		----		----	
1490		----		----	
1557		----		----	
1566		----		----	
1634		----		----	
1656	D5453	10.5	C	2.57	first reported: 11.8
1708		----		----	
1710		----		----	
1739		----		----	
1807		----		----	

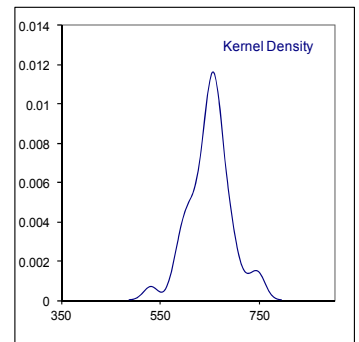
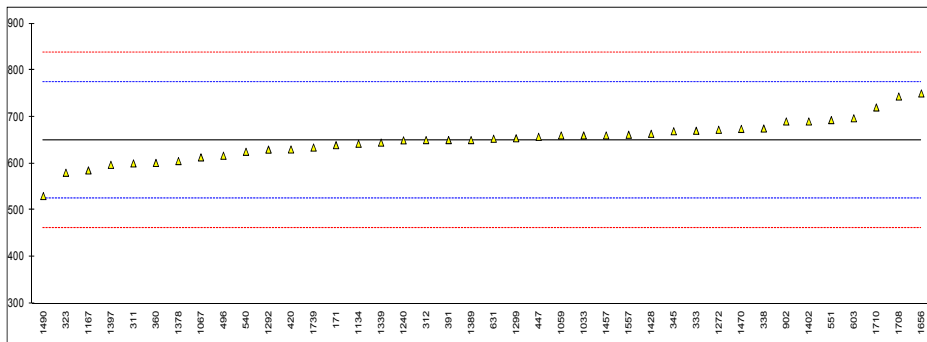
normality OK
n 12
outliers 0
mean (n) 7.97
st.dev. (n) 1.284
R(calc.) 3.60
R(D5453:09) 2.75

application range : 1 – 8000 mg/kg



Determination of Water on sample #12110; results in mg/kg

lab	method	value	mark	z(targ)	Remarks
171	ISO12937	639.1		-0.17	
311	ISO12937	600		-0.79	
312	ISO12937	650		0.01	
323	ISO12937	580		-1.11	
333	ISO12937	670		0.33	
334		----		----	
338	ISO12937	674.93		0.40	
345	ISO12937	669		0.31	
360	ISO12937	601		-0.78	
391	ISO12937	650		0.01	
420	ISO12937	630		-0.31	
447	ISO12937	657		0.12	
495		----		----	
496	ISO12937	616.5		-0.53	
511		----		----	
540	ISO12937	625.00		-0.39	
551	D6304	692.9		0.69	
554		----		----	
603	ISO12937	696.9		0.76	
631	D6304	653		0.05	
902	ISO12937	689.9		0.64	
1017		----		----	
1033	IP438	660		0.17	
1059	ISO12937	660		0.17	
1067	ISO12937	613		-0.58	
1134	ISO12937	642.245		-0.12	
1167	ISO12937	585		-1.03	
1179		----		----	
1199		----		----	
1240	ISO12937	649.4		0.00	
1272	ISO12937	672.2		0.36	
1286		----		----	
1292	ISO12937	629.65		-0.32	
1299	ISO12937	654		0.07	
1339	ISO12937	644.6		-0.08	
1378	ISO12937	605		-0.71	
1389	ISO12937	650		0.01	
1397	ISO12937	597		-0.84	
1402	ISO12937	690		0.65	
1428	ISO12937	663.5		0.22	
1457	ISO12937	660		0.17	
1470	INH-13A	674		0.39	
1490	ISO12937	530	C	-1.91	first reported: 830.0
1557	ISO12937	661.5		0.19	
1566		----		----	
1634		----		----	
1656	ISO12937	750		1.60	
1708	ISO12937	743.5		1.50	
1710	ISO12937	720		1.12	
1739	ISO3987	634		-0.25	
1807		----		----	
normality		OK			
n		40			
outliers		0			
mean (n)		649.60			
st.dev. (n)		42.866			
R(calc.)		120.02			
R(ISO12937:00)		175.28			

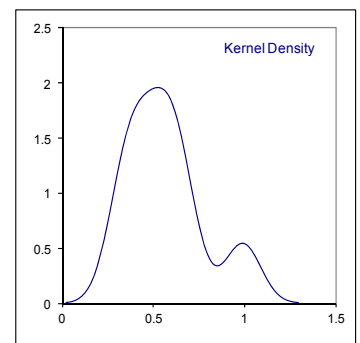
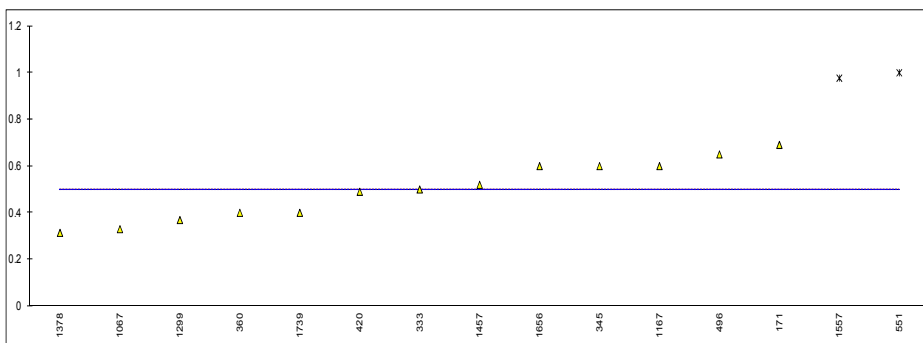


Determination of sum of Calcium and Magnesium on sample #12110; results in mg/kg

lab	method	value	mark	z(targ)	Remarks
171	EN14538	0.691		----	
311	EN14538	<1.0		----	
312	EN14538	<1		----	
323	EN14538	<2		----	
333	EN14538	0.5		----	
334		----		----	
338		----		----	
345	EN14538	0.6		----	
360	EN14538	0.4		----	
391		----		----	
420	EN14538Mod.	0.49		----	
447		----		----	
495		----		----	
496	EN14538	0.65		----	
511		----		----	
540	EN14538	<1		----	
551	INH-15553	1.0	DG(0.05)	----	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059		----		----	
1067	EN14538	0.33		----	
1134	EN14538	<2		----	
1167	EN14538	0.6		----	
1179		----		----	
1199		----		----	
1240	EN14538	<1.0		----	
1272		----		----	
1286		----		----	
1292		----		----	
1299	EN14538	0.369		----	
1339		----		----	
1378	EN14538	0.314		----	
1389		----		----	
1397		----		----	
1402		----		----	
1428	EN14538	<1		----	
1457	EN14538	0.520		----	
1470		----		----	
1490		----		----	
1557	EN14538	0.977	DG(0.05)	----	
1566		----		----	
1634		----		----	
1656	EN14538	0.6		----	
1708	EN14538	<1.0		----	
1710	EN14538	<0.6		----	
1739	EN14538	0.4		----	
1807		----		----	

normality OK
n 13
outliers 2
mean (n) 0.497
st.dev. (n) 0.1258
R(calc.) 0.352
R(EN14538:06) (1.260)

application range 1-10 mg/kg

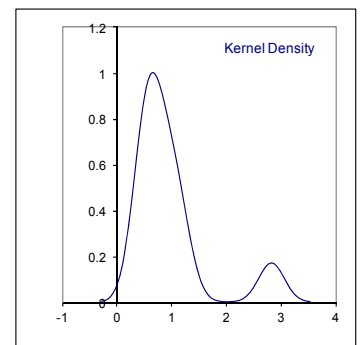
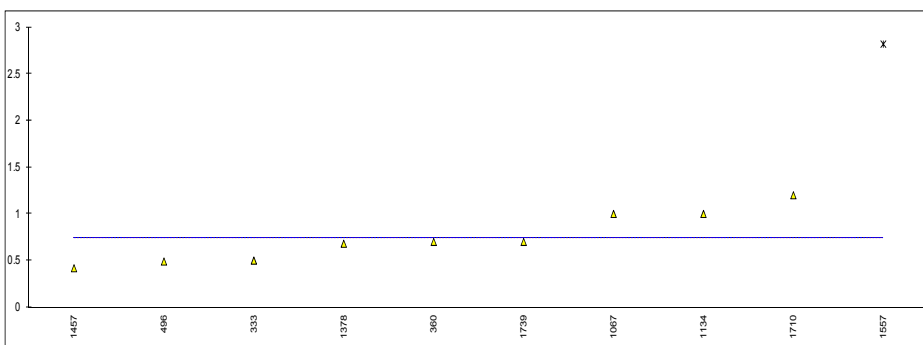


Determination of Phosphorus on sample #12110; results in mg/kg

lab	method	value	mark	z(targ)	remarks
171	EN14107	<0.1		----	
311	EN14107	<4		----	
312	EN14107	<4		----	
323	EN14107	<4		----	
333	EN14107	0.5		----	
334		----		----	
338		----		----	
345	EN14107	<4		----	
360	EN14107	0.7		----	
391		----		----	
420		----		----	
447		----		----	
495		----		----	
496	EN14107	0.49		----	
511		----		----	
540	EN14107	<4		----	
551	INH-15553	<1.0		----	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059		----		----	
1067	EN14538	1.0		----	
1134	EN14108	1		----	
1167		----		----	
1179		----		----	
1199		----		----	
1240	EN16294	<1.0		----	
1272		----		----	
1286		----		----	
1292		----		----	
1299	EN14107	<4.0		----	
1339		----		----	
1378	EN14107	0.681		----	
1389		----		----	
1397		----		----	
1402		----		----	
1428	EN14107	<4		----	
1457	EN14107	0.418		----	
1470		----		----	
1490		----		----	
1557	EN14107	2.819	G(0.01)	----	
1566		----		----	
1634		----		----	
1656	EN14107	<0.1		----	
1708	EN14107	<4.0		----	
1710	EN14107	1.2		----	
1739	EN14107	0.7		----	
1807		----		----	

normality OK
n 9
outliers 1
mean (n) 0.7432
st.dev. (n) 0.26860
R(calc.) 0.7521
R(EN14107:03) (0.1677)

application range :4 – 20 mg/kg

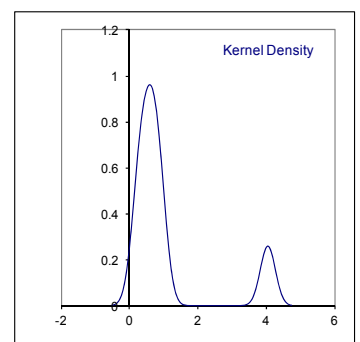
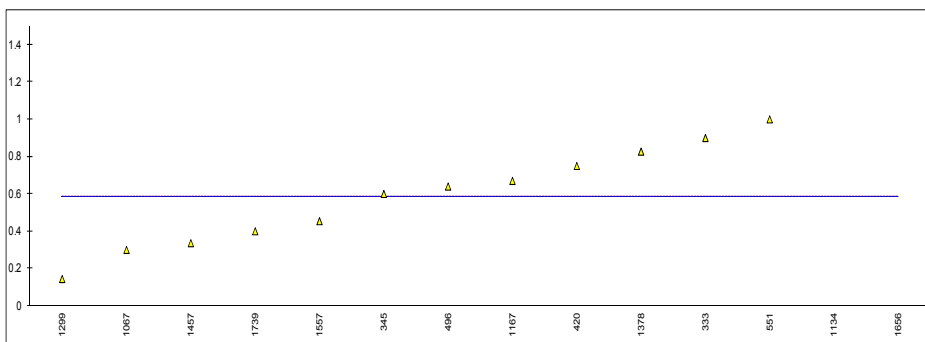


Determination of Sodium on sample #12110; results in mg/kg

lab	method	value	mark	z(targ)	remarks
171	EN14108	<0.1		----	
311	EN14108	<1.0		----	
312	EN14538	<1		----	
323	EN14108	<1.0		----	
333	EN14538	0.9		----	
334		----		----	
338		----		----	
345	EN14538	0.6		----	
360	EN14538	<1.0		----	
391		----		----	
420	EN14108	0.75		----	
447		----		----	
495		----		----	
496	EN14538	0.64		----	
511		----		----	
540	EN14538	<1		----	
551	INH-15553	1.0		----	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059		----		----	
1067	EN14538	0.3		----	
1134	EN14538	4	DG(0.01)	----	
1167	EN14108	0.67		----	
1179		----		----	
1199		----		----	
1240	EN14538	<1.0		----	
1272		----		----	
1286		----		----	
1292		----		----	
1299	EN14108	0.144		----	
1339		----		----	
1378	EN14108	0.827		----	
1389		----		----	
1397		----		----	
1402		----		----	
1428	EN14108	<1		----	
1457	EN14538	0.336		----	
1470		----		----	
1490		----		----	
1557	EN14538	0.454		----	
1566		----		----	
1634		----		----	
1656	EN14108	4.1	DG(0.01)	----	
1708	EN14108	<1.0		----	
1710	EN14538	<0.5		----	
1739	EN14538	0.4		----	
1807		----		----	

normality OK
n 12
outliers 2
mean (n) 0.585
st.dev. (n) 0.2623
R(calc.) 0.734
R(EN14108:03) (1.509)

application range : ≥ 1 mg/kg; R(EN14538) is for sum (Na+K)

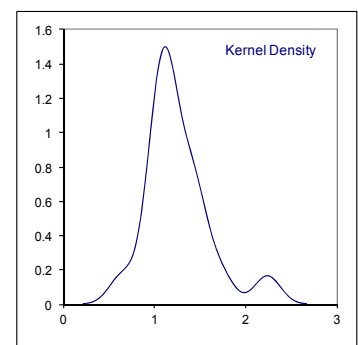
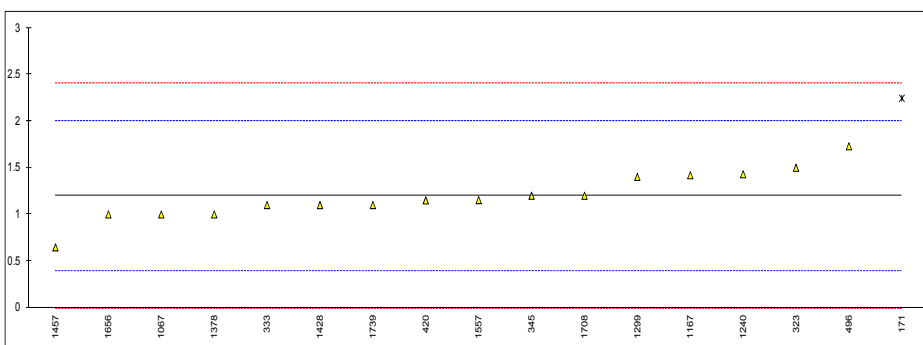


Determination of Potassium on sample #12110; results in mg/kg

lab	method	value	mark	z(targ)	remarks
171	EN14109	2.244	G(0.05)	2.61	
311	EN14109	<1.0		----	
312	EN14538	<1		----	
323	EN14109	1.5		0.76	
333	EN14538	1.1		-0.24	
334		----		----	
338		----		----	
345	EN14538	1.2		0.01	
360	EN14538	<1.0		----	
391		----		----	
420	EN14109	1.15		-0.11	
447		----		----	
495		----		----	
496	EN14538	1.73		1.33	
511		----		----	
540	EN14538	<1		----	
551	INH-15553	<2.0		----	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059		----		----	
1067	EN14538	1.0		-0.49	
1134	EN14538	<1		----	
1167	EN14109	1.42		0.56	
1179		----		----	
1199		----		----	
1240	EN141538	1.43		0.58	
1272		----		----	
1286		----		----	
1292		----		----	
1299	EN14109	1.402		0.51	
1339		----		----	
1378	EN14109	1.00		-0.49	
1389		----		----	
1397		----		----	
1402		----		----	
1428	EN14109	1.1		-0.24	
1457	EN14538	0.647		-1.36	
1470		----		----	
1490		----		----	
1557	EN14538	1.153		-0.11	
1566		----		----	
1634		----		----	
1656	EN14109	1.0		-0.49	
1708	EN14109	1.2		0.01	
1710	EN14538	<1.5		----	
1739	EN14538	1.1		-0.24	
1807		----		----	

normality OK
n 16
outliers 1
mean (n) 1.196
st.dev. (n) 0.2547
R(calc.) 0.713
R(EN14109:03) 1.126

Application range: >0.5 mg/kg, R(EN14538) is for sum (Na+K)

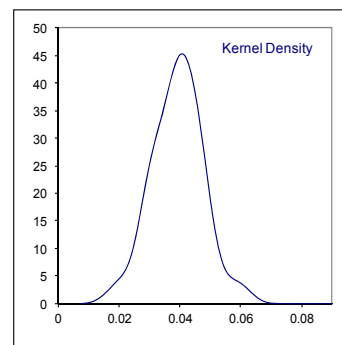
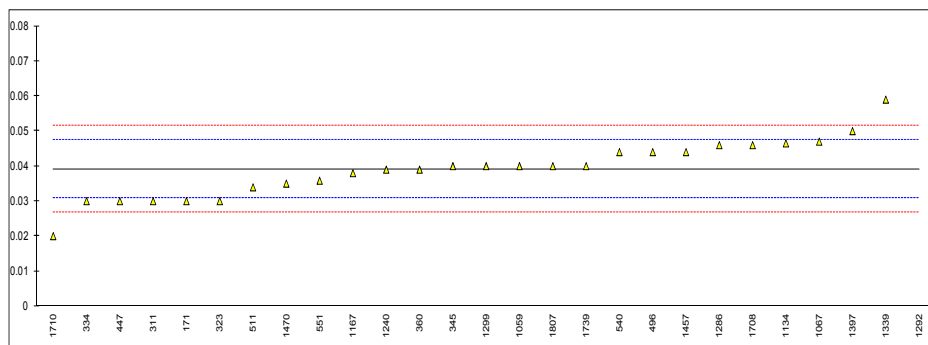


Determination of Methanol on sample #12110; results in %M/M

lab	method	value	mark	z(targ)	remarks
171	EN14110-A	0.03		-2.12	
311	EN14110-B	0.03		-2.12	
312		----		----	
323	EN14110-B	0.03		-2.12	
333		----		----	
334	EN14110-A	0.03		-2.12	
338		----		----	
345	EN14110-B	0.04		0.20	
360	EN14110-B	0.039		-0.03	
391		----		----	
420		----		----	
447	EN14110-	0.03		-2.12	
495		----		----	
496	EN14110-B	0.044		1.13	
511	EN14110-B	0.03394		-1.20	
540	EN14110-A	0.044		1.13	
551	INH-15343	0.03584		-0.76	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059	EN14110-B	0.04		0.20	
1067	EN14110-B	0.047		1.83	
1134	EN14110-A	0.0465		1.71	
1167	EN14110-A	0.038		-0.26	
1179		----		----	
1199		----		----	
1240	EN14110-A	0.039		-0.03	
1272		----		----	
1286	EN14110-B	0.046		1.60	
1292	EN14110-B	0.390	G(0.01)	81.46	
1299	EN14110-B	0.04		0.20	
1339	EN14110-A	0.059		4.61	
1378		----		----	
1389		----		----	
1397	EN14110-A	0.05		2.52	
1402		----		----	
1428		----		----	
1457	EN14110-B	0.044		1.13	
1470	EN14110-B	0.035		-0.96	
1490		----		----	
1557		----		----	
1566		----		----	
1634		----		----	
1656	EN14110-A	<0.01		<-6.51	false negative?
1708	EN14110-B	0.046		1.60	
1710	EN14110-B	0.02		-4.44	
1739	EN14110-B	0.04		0.20	
1807	EN14110-	0.04		0.20	

	A	B
normality	OK	OK
n	9	16
outliers	0	1
mean (n)	0.041	0.038
st.dev. (n)	0.0095	0.0073
R(calc.)	0.027	0.020
R(EN14110:03)	0.012	0.011

application range : 0.01 – 0.5% M/M

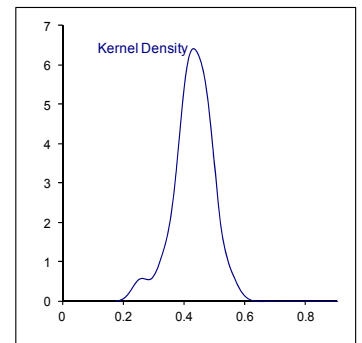
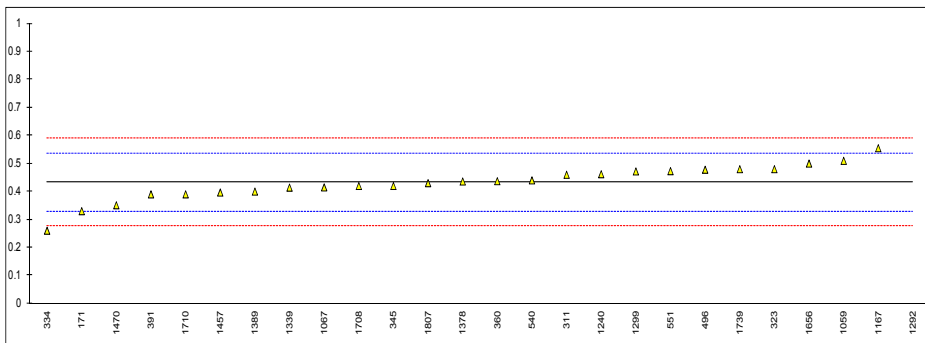


Determination of mono-Glycerides on sample #12110; results in %M/M

lab	method	value	mark	z(targ)	remarks
171	EN14105	0.330		-1.96	
311	EN14105	0.46		0.54	
312		----		----	
323	EN14105	0.48		0.92	
333		----		----	
334	EN14105	0.26		-3.30	
338		----		----	
345	EN14105	0.42		-0.23	
360	EN14105	0.437		0.10	
391	EN14105	0.39		-0.80	
420		----		----	
447		----		----	
495		----		----	
496	EN14105	0.478		0.88	
511		----		----	
540	EN14105	0.44		0.15	
551	D6584	0.473		0.79	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059	EN14105	0.510		1.50	
1067	EN14105	0.415		-0.33	
1134		----		----	
1167	EN14105	0.555		2.36	
1179		----		----	
1199		----		----	
1240	EN14105	0.462		0.58	
1272		----		----	
1286		----		----	
1292	EN14105	1.918	G(0.01)	28.49	
1299	EN14105	0.472		0.77	
1339	EN14105	0.414		-0.34	
1378	EN14105	0.436		0.08	
1389	EN14105	0.40	C	-0.61	first reported: 0.45
1397		----		----	
1402		----		----	
1428		----		----	
1457	EN14105	0.3966		-0.68	
1470	EN14105	0.351		-1.55	
1490		----		----	
1557		----		----	
1566		----		----	
1634		----		----	
1656	EN14105	0.50		1.30	
1708	EN14105	0.42		-0.23	
1710	EN14105	0.39		-0.80	
1739	EN14105	0.48		0.92	
1807	EN14105	0.43		-0.04	

normality OK
n 25
outliers 1
mean (n) 0.432
st.dev. (n) 0.0615
R(calc.) 0.172
R(EN14105:11) 0.146

Compare R(EN14105:03) = 0.187

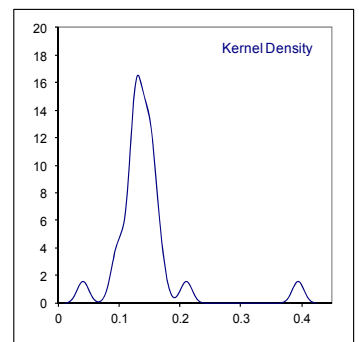
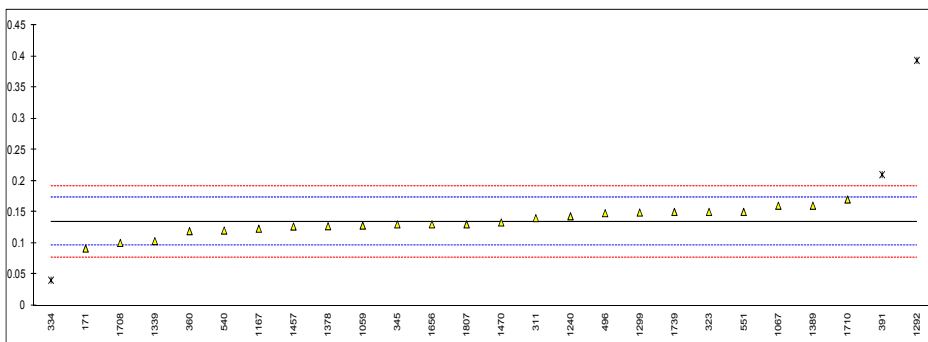


Determination of di-Glycerides on sample #12110; results in %M/M

lab	method	value	mark	z(targ)	remarks
171	EN14105	0.091		-2.22	
311	EN14105	0.14		0.31	
312		----		----	
323	EN14105	0.15		0.83	
333		----		----	
334	EN14105	0.04	G(0.05)	-4.86	
338		----		----	
345	EN14105	0.13		-0.20	
360	EN14105	0.119		-0.77	
391	EN14105	0.21	G(0.05)	3.93	
420		----		----	
447		----		----	
495		----		----	
496	EN14105	0.148		0.73	
511		----		----	
540	EN14105	0.12		-0.72	
551	D6584	0.150		0.83	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059	EN14105	0.128		-0.31	
1067	EN14105	0.160		1.35	
1134		----		----	
1167	EN14105	0.123		-0.57	
1179		----		----	
1199		----		----	
1240	EN14105	0.143		0.47	
1272		----		----	
1286		----		----	
1292	EN14105	0.394	G(0.01)	13.45	
1299	EN14105	0.149		0.78	
1339	EN14105	0.103		-1.60	
1378	EN14105	0.127		-0.36	
1389	EN14105	0.16	C	1.35	first reported: 0.22
1397		----		----	
1402		----		----	
1428		----		----	
1457	EN14105	0.1265	C	-0.38	first reported: 0.2083
1470	EN14105	0.133		-0.05	
1490		----		----	
1557		----		----	
1566		----		----	
1634		----		----	
1656	EN14105	0.13		-0.20	
1708	EN14105	0.10	C	-1.75	first reported: 0.07
1710	EN14105	0.17		1.86	
1739	EN14105	0.15	C	0.83	first reported: 0.21
1807	EN14105	0.13		-0.20	

normality OK
n 23
outliers 3
mean (n) 0.134
st.dev. (n) 0.0198
R(calc.) 0.056
R(EN14105:11) 0.054

Compare R(EN14105:03) = 0.051

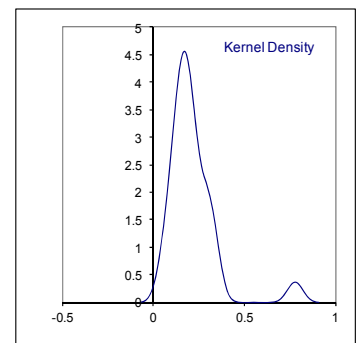
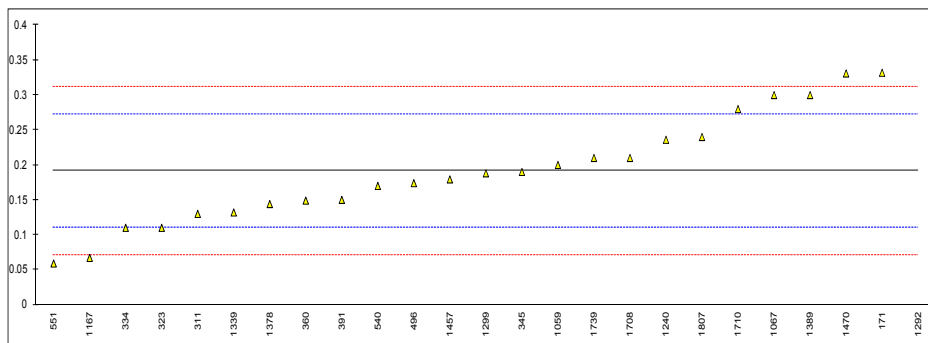


Determination of tri-Glycerides on sample #12110; results in %M/M

lab	method	value	mark	z(targ)	remarks
171	EN14105	0.332		3.49	
311	EN14105	0.13		-1.52	
312		----		----	
323	EN14105	0.11		-2.02	
333		----		----	
334	EN14105	0.11		-2.02	
338		----		----	
345	EN14105	0.19		-0.03	
360	EN14105	0.149		-1.05	
391	EN14105	0.15		-1.02	
420		----		----	
447		----		----	
495		----		----	
496	EN14105	0.174		-0.43	
511		----		----	
540	EN14105	0.17		-0.53	
551	D6584	0.059		-3.28	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059	EN14105	0.200		0.22	
1067	EN14105	0.300		2.70	
1134		----		----	
1167	EN14105	0.067		-3.08	
1179		----		----	
1199		----		----	
1240	EN14105	0.236		1.11	
1272		----		----	
1286		----		----	
1292	EN14105	0.777	G(0.01)	14.53	
1299	EN14105	0.188		-0.08	
1339	EN14105	0.132		-1.47	
1378	EN14105	0.144		-1.17	
1389	EN14105	0.30	C	2.70	first reported: 0.31
1397		----		----	
1402		----		----	
1428		----		----	
1457	EN14105	0.1793		-0.30	
1470	EN14105	0.331		3.47	
1490		----		----	
1557		----		----	
1566		----		----	
1634		----		----	
1656	EN14105	<0.01		----	
1708	EN14105	0.21		0.46	
1710	EN14105	0.28		2.20	
1739	EN14105	0.21		0.46	
1807	EN14105	0.24		1.21	

normality OK
n 24
outliers 1
mean (n) 0.191
st.dev. (n) 0.0769
R(calc.) 0.215
R(EN14105:11) 0.113

Compare R(EN14105:03) = 0.104

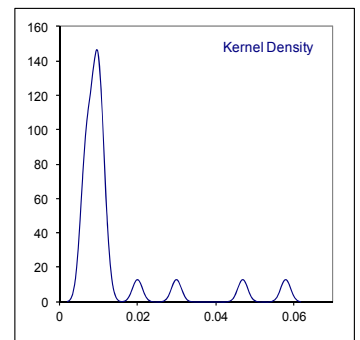
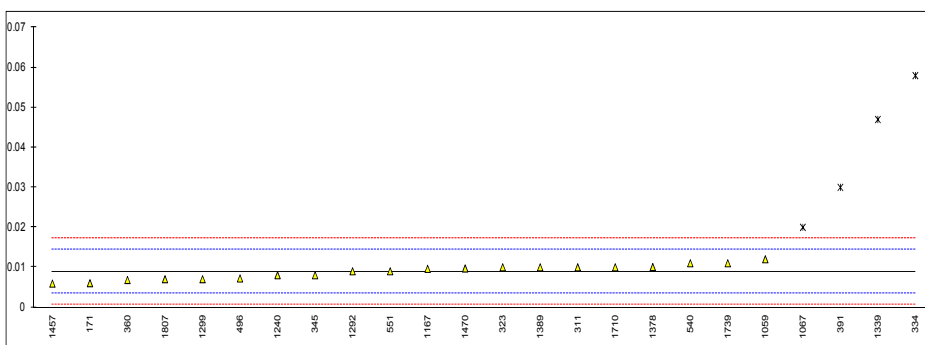


Determination of Free Glycerol on sample #12110; results in %M/M

lab	method	value	mark	z(targ)	remarks
171	EN14105	0.006		-1.04	
311	EN14105	0.01		0.41	
312		----		----	
323	EN14105	0.01		0.41	
333		----		----	
334	EN14105	0.058	G(0.01)	17.81	
338		----		----	
345	EN14105	0.008		-0.31	
360	EN14105	0.0068		-0.75	
391	EN14105	0.03	G(0.01)	7.66	
420		----		----	
447		----		----	
495		----		----	
496	EN14105	0.0072		-0.60	
511		----		----	
540	EN14105	0.011		0.77	
551	D6584	0.009		0.05	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059	EN14105	0.012		1.14	
1067	EN14105	0.020	G(0.01)	4.04	
1134		----		----	
1167	EN14105	0.0096		0.27	
1179		----		----	
1199		----		----	
1240	EN14105	0.0080		-0.31	
1272		----		----	
1286		----		----	
1292	EN14105	0.009		0.05	
1299	EN14105	0.007		-0.68	
1339	EN14105	0.047	C,G(0.01)	13.82	first reported: 0.046
1378	EN14105	0.01005		0.43	
1389	EN14105	0.01		0.41	
1397		----		----	
1402		----		----	
1428		----		----	
1457	EN14105	0.0059		-1.07	
1470	EN14105	0.0097		0.30	
1490		----		----	
1557		----		----	
1566		----		----	
1634		----		----	
1656	EN14106	<0.01		----	
1708	EN14105	<0.005		----	
1710	EN14105	0.01		0.41	
1739	EN14105	0.011		0.77	
1807	EN14105	0.007		-0.68	

normality OK
n 20
outliers 4
mean (n) 0.0089
st.dev. (n) 0.00177
R(calc.) 0.0049
R(EN14105:11) 0.0077

Compare R(EN14105:03) = 0.0083

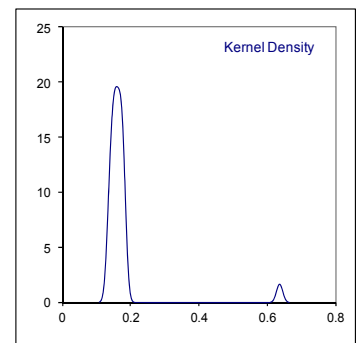
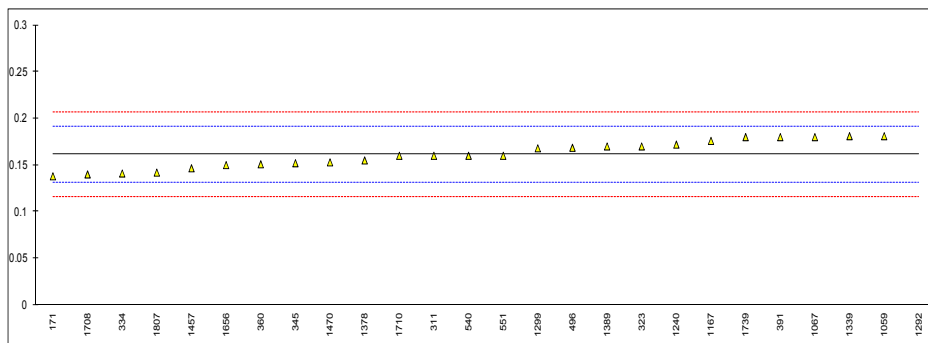


Determination of Total Glycerol on sample #12110; results in %M/M

lab	method	value	mark	z(targ)	remarks
171	EN14103	0.138		-1.55	
311	EN14105	0.16		-0.09	
312		----		----	
323	EN14105	0.17		0.57	
333		----		----	
334	EN14105	0.141		-1.35	
338		----		----	
345	EN14105	0.152		-0.62	
360	EN14105	0.1509		-0.70	
391	EN14105	0.18		1.23	
420		----		----	
447		----		----	
495		----		----	
496	EN14105	0.1686		0.48	
511		----		----	
540	EN14105	0.16		-0.09	
551	D6584	0.160		-0.09	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059	EN14105	0.181		1.30	
1067	EN14105	0.180		1.23	
1134		----		----	
1167	EN14105	0.1760		0.97	
1179		----		----	
1199		----		----	
1240	EN14105	0.1720		0.70	
1272		----		----	
1286		----		----	
1292	EN14105	0.636	G(0.01)	31.49	
1299	EN14105	0.168		0.44	
1339	EN14105	0.181		1.30	
1378	EN14105	0.155		-0.42	
1389	EN14105	0.17	C	0.57	first reported :0.19
1397		----		----	
1402		----		----	
1428		----		----	
1457	EN14105	0.1466	C	-0.98	first reported: 0.1559
1470	EN14105	0.153		-0.56	
1490		----		----	
1557		----		----	
1566		----		----	
1634		----		----	
1656	EN14105	0.15		-0.76	
1708	EN14105	0.14		-1.42	
1710	EN14105	0.16		-0.09	
1739	EN14105	0.18	C	1.23	first reported: 0.19
1807	EN14105	0.142		-1.29	

normality OK
n 25
outliers 1
mean (n) 0.1614
st.dev. (n) 0.01420
R(calc.) 0.0398
R(EN14105:11) 0.0422

Compare R(EN14105:03) = 0.0622

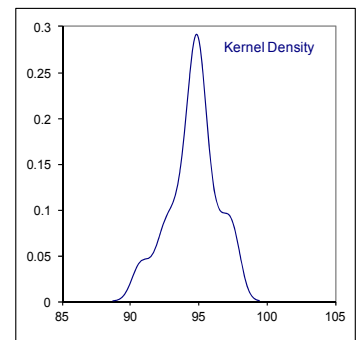
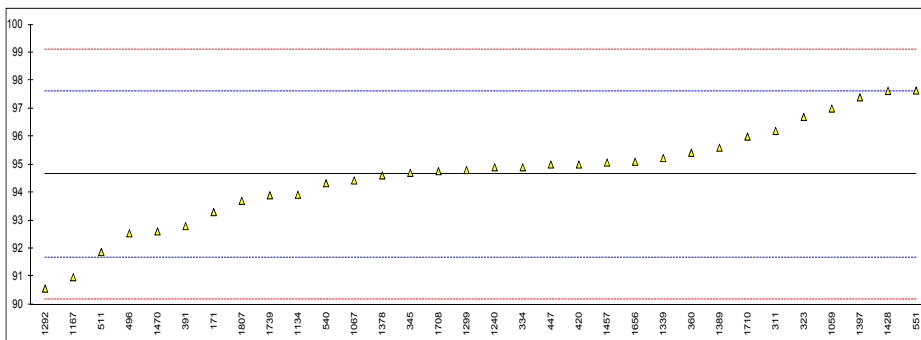


Determination of Total Ester content on sample #12110; results in %M/M

lab	method	value	mark	z(targ)	remarks
171	EN14103	93.3		-0.90	
311	EN14103	96.2		1.05	
312		----		----	
323	EN14103:11	96.7		1.38	
333		----		----	
334	EN14103:prev	94.9		0.17	
338		----		----	
345	EN14103:03	94.7		0.04	
360	EN14103:11	95.42		0.52	
391	EN14103:prev	92.8		-1.24	
420	EN14103:11	95.00		0.24	
447	EN14103	95.0		0.24	
495		----		----	
496	EN14103:03	92.54		-1.42	
511	EN14103:03	91.873	C	-1.86	first reported; 84.55
540	EN14103	94.33		-0.21	
551	INH-15764	97.645		2.02	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059	EN14103:11	97.0		1.59	
1067	EN14103:prev	94.43		-0.14	
1134	EN14103:11	93.92		-0.49	
1167	EN14103:11	90.97		-2.47	
1179		----		----	
1199		----		----	
1240	EN14103:11	94.90		0.17	
1272		----		----	
1286		----		----	
1292	EN14103:11	90.565		-2.75	
1299	EN14103	94.8		0.11	
1339	EN14103:prev	95.23		0.39	
1378	EN14103:11	94.61		-0.02	
1389	EN14103:03	95.6		0.64	
1397	EN14103	97.4		1.86	
1402		----		----	
1428	EN14103:11	97.63		2.01	
1457	EN14103:prev	95.07		0.29	
1470	EN14103:11	92.61		-1.37	
1490		----		----	
1557		----		----	
1566		----		----	
1634		----		----	
1656	EN14103Mod:03	95.1		0.31	
1708	EN14103:prev	94.76		0.08	
1710	EN14103	96.0		0.91	
1739	EN14103:03	93.9		-0.50	
1807	EN14103	93.7		-0.64	

normality OK
n 32
outliers 0
mean (n) 94.644
st.dev. (n) 1.7591
R(calc.) 4.926
R(EN14103:11) 4.160

Compare R(EN14103:03) = 3.1

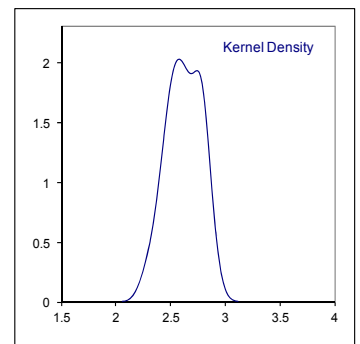
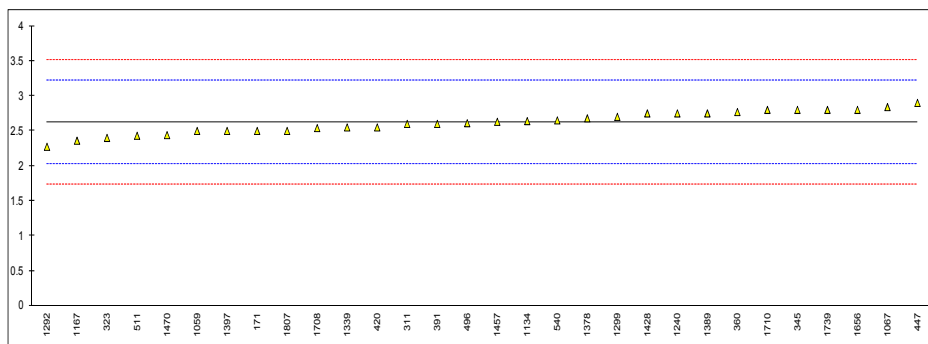


Determination of Linolenic Acid Methyl Ester content on sample #12110; results in %M/M

lab	method	value	mark	z(targ)	remarks
171	EN14103	2.5		-0.40	
311	EN14103	2.6		-0.07	
312		----		----	
323	EN14103:11	2.4		-0.74	
333		----		----	
334		----		----	
338		----		----	
345	EN14103:03	2.8		0.60	
360	EN14103:11	2.77		0.50	
391	EN14103:prev	2.6		-0.07	
420	EN14103:11	2.55		-0.24	
447	EN14103	2.9		0.94	
495		----		----	
496	EN14103:03	2.61		-0.03	
511	EN14103:03	2.43		-0.64	
540	EN14103	2.65		0.10	
551		----		----	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059	EN14103:11	2.5		-0.40	
1067	EN14103:prev	2.84		0.74	
1134	EN14103:11	2.64		0.07	
1167	EN14103:11	2.36		-0.87	
1179		----		----	
1199		----		----	
1240	EN14103:11	2.75		0.43	
1272		----		----	
1286		----		----	
1292	EN14103:11	2.273		-1.17	
1299	EN14103	2.7		0.27	
1339	EN14103:prev	2.55		-0.24	
1378	EN14103:11	2.68		0.20	
1389	EN14103:03	2.75		0.43	
1397	EN14103	2.5		-0.40	
1402		----		----	
1428	EN14103:11	2.75		0.43	
1457	EN14103:prev	2.63		0.03	
1470	EN14103:11	2.44		-0.61	
1490		----		----	
1557		----		----	
1566		----		----	
1634		----		----	
1656	EN14103Mod:03	2.80		0.60	
1708	EN14103:prev	2.54		-0.27	
1710	EN14103	2.8		0.60	
1739	EN14103:03	2.8		0.60	
1807	EN14103	2.5		-0.40	

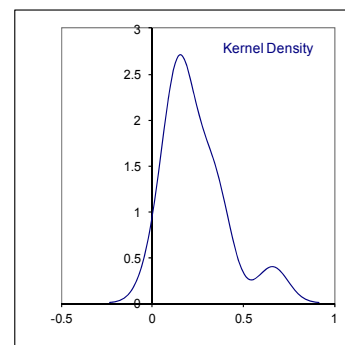
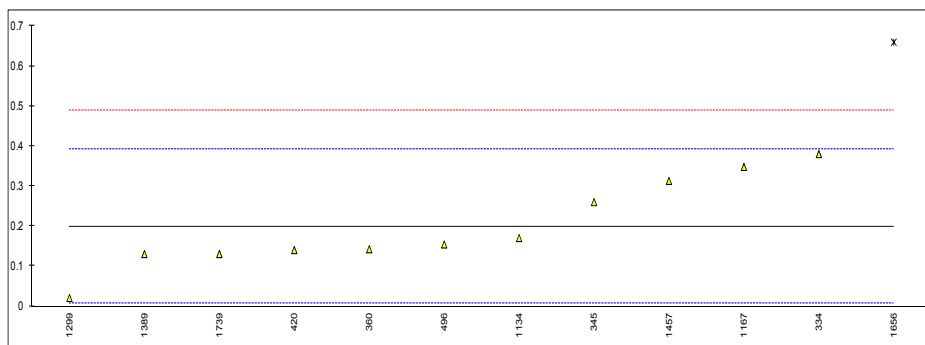
normality OK
n 30
outliers 0
mean (n) 2.620
st.dev. (n) 0.1576
R(calc.) 0.441
R(EN14103:11) 0.835

Compare R(EN14103:03) = 0.835



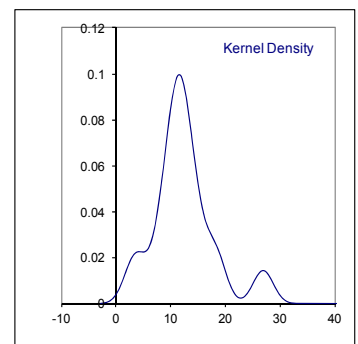
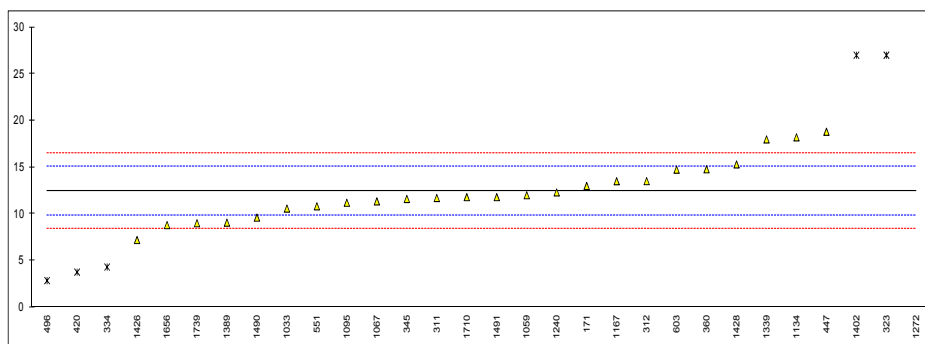
Determination of Polyunsaturated Methyl Esters content on sample #12110; results in %M/M

lab	method	value	mark	z(targ)	remarks
171		----		----	
311		----		----	
312		----		----	
323		----		----	
333		----		----	
334	EN15779	0.38		1.88	
338		----		----	
345	EN15779	0.26		0.63	
360	EN15779	0.142		-0.59	
391	EN15779	<0.3		----	
420	EN15779	0.14		-0.61	
447		----		----	
495		----		----	
496	EN15779	0.154		-0.46	
511		----		----	
540		----		----	
551		----		----	
554		----		----	
603		----		----	
631		----		----	
902		----		----	
1017		----		----	
1033		----		----	
1059		----		----	
1067		----		----	
1134	EN14103	0.170		-0.30	
1167	EN15779	0.348		1.55	
1179		----		----	
1199		----		----	
1240		----		----	
1272		----		----	
1286		----		----	
1292		----		----	
1299	EN15779	0.02		-1.85	
1339		----		----	
1378		----		----	
1389	EN15779	0.13		-0.71	
1397		----		----	
1402		----		----	
1428		----		----	
1457	EN15779	0.313		1.18	
1470		----		----	
1490		----		----	
1557		----		----	
1566		----		----	
1634		----		----	
1656	EN15779	0.66	C,G(0.05)	4.78	first reported: 0.58
1708	EN15779	<0.6		----	
1710		----		----	
1739	EN15779	0.13		-0.71	
1807		----		----	
normality		OK			
n		11			
outliers		1			
mean (n)		0.199			
st.dev. (n)		0.1108			
R(calc.)		0.310			
R(EN15779:09)		0.270			



Determination of total Contamination on sample #12111; results in mg/kg

lab	method	value	mark	z(targ)	remarks
171	EN12662	13.0		0.42	
311	EN12662:pr12	11.7		-0.56	
312	EN12662	13.51		0.80	
323	EN12662:98	27	DG(0.01)	10.92	
334	EN12662	4.3	ex	-6.11	See § 4.1
345	EN12662:98	11.6		-0.63	
360	EN12662	14.78		1.75	
391		----		----	
420	EN12662	3.76	ex	-6.51	See § 4.1
447	EN12662	18.8		4.77	
496	EN12662:98	2.850	ex	-7.20	See § 4.1
540		----		----	
551	EN12662	10.81		-1.22	
603	EN12662	14.739	C	1.72	first reported: 4.739
1017		----		----	
1033	IP440	10.57		-1.40	
1059	EN12662	12.0		-0.33	
1067	EN12662	11.34		-0.83	
1095	EN12662	11.2		-0.93	
1134	EN12662	18.2		4.32	
1167	EN12662	13.5		0.79	
1179		----		----	
1199		----		----	
1240	EN12662	12.3		-0.11	
1272	EN12662	147.62	G(0.01)	101.41	
1339	EN12662:98	17.98		4.16	
1389	EN12662:98	9.06		-2.54	
1402	IP440	27	DG(0.01)	10.92	
1426	EN12662	7.2		-3.93	
1428	EN12662	15.3		2.14	
1490	EN12662	9.6		-2.13	
1491	EN12662:98	11.8		-0.48	
1656	EN12662	8.8		-2.73	
1710	EN12662	11.8		-0.48	
1739	EN12662:98	9		-2.58	
1807		----		----	
	normality	OK		<u>Spike</u>	
	n	24			
	outliers	3			
	mean (n)	12.441		9.98	recovery: <124.6%
	st.dev. (n)	3.0149			
	R(calc.)	8.442			
	R(EN12662:08)	3.732			



APPENDIX 2

Number of participants per country

1 lab in ARGENTINA
2 labs in BELGIUM
2 labs in BRAZIL
2 labs in BULGARIA
1 lab in CROATIA
1 lab in CZECH REPUBLIC
3 labs in FRANCE
3 labs in GERMANY
1 lab in GREECE
1 lab in HONG KONG
1 lab in HUNGARY
1 lab in ITALY
1 lab in MALAYSIA
1 lab in PERU
1 lab in PHILIPPINES
1 lab in POLAND
3 labs in PORTUGAL
3 labs in SERBIA
1 lab in SLOVENIA
6 labs in SPAIN
5 labs in THE NETHERLANDS
3 labs in TURKEY
2 labs in U.S.A.
5 labs in UNITED KINGDOM

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, january 2010
- 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.
- 15 EN14214:2012 Annex A