Institute for
Interlaboratory Studies

Results of Proficiency Test
Biodiesel B100 (100% FAME)
November 2023

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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1 INTRODUCTION

Since 2008 the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for the analysis of Fatty Acid Methyl Esters (FAME) used as Biodiesel B100 twice a year. During the annual proficiency testing program of 2023 it was decided to continue with the round robin for the analysis of Biodiesel B100 based on the latest version of ASTM D6751 and EN14214.

In this interlaboratory study registered for participation:
- 64 laboratories in 28 countries for regular analyzes in Biodiesel B100 iis23G07
- 20 laboratories in 10 countries on the Cetane Number analyzes iis23G07CN
- 34 laboratories in 19 countries on the Metal analyzes iis23G07M
- 40 laboratories in 22 countries on the Total Contamination analyzes iis23G07TC

In total 65 laboratories in 29 countries registered for participation in one or more proficiency tests, see appendix 2 for the number of participants per country. In this report the results of this Biodiesel B100 proficiency tests are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test (PT). Sample analyzes for fit-for-use and homogeneity testing were subcontracted to a laboratory that has performed the tests in accordance with for ISO/IEC17043 relevant requirements of ISO/IEC17025.
In this proficiency test the participants received, depending on the registration, from one up to four different samples of Biodiesel B100, see table below.

Sample ID	PT ID	Quantity	Purpose
#23205	iis23G07	1x 1 L + 1x 0.5 L	Regular analyzes
#23206	iis23G07CN	2x 1 L	Cetane Number & DCN
#23207	iis23G07M	1x 100 mL	Metal analyzes
#23208	iis23G07TC	1x 1 L	Total Contamination

Table 1: Biodiesel B100 samples used in PT iis23G07

Participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in agreement with ISO/IEC17043:2010 (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This PT falls under the accredited scope. This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentiality of participant’s data. Feedback from the participants on the reported data is encouraged and customer’s satisfaction is measured on regular basis by sending out questionnaires.

2.2 PROTOCOL

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of June 2018 (iis-protocol, version 3.5). This protocol is electronically available through the iis website www.iisnl.com, from the FAQ page.

2.3 CONFIDENTIALITY STATEMENT

All data presented in this report must be regarded as confidential and for use by the participating companies only. Disclosure of the information in this report is only allowed by means of the entire report. Use of the contents of this report for third parties is only allowed by written permission of the Institute for Interlaboratory Studies. Disclosure of the identity of one or more of the participating companies will be done only after receipt of a written agreement of the companies involved.

2.4 SAMPLES

For the preparation of the sample for the regular analyzes in Biodiesel B100 a batch of approximately 140 liters of Rapeseed Methyl Ester (RME) was obtained from a third party. After homogenization 70 amber glass bottles of 1 L and 70 amber glass bottles of 0.5 L were filled and labelled #23205.
The homogeneity of the subsamples was checked by determination of Density at 15 °C in accordance with ISO12185 on 8 stratified randomly selected subsamples.

	Density at 15 °C in kg/m^3
sample #23205-1	883.67
sample #23205-2	883.67
sample #23205-3	883.69
sample #23205-4	883.68
sample #23205-5	883.69
sample #23205-6	883.68
sample #23205-7	883.69
sample #23205-8	883.68

Table 2: homogeneity test results of subsamples #23205

From the above test results the repeatability was calculated and compared with 0.3 times the reproducibility of the reference test method in agreement with the procedure of ISO13528, Annex B2 in the next table.

	Density at 15 °C in kg/m^3
r (observed)	0.02
reference test method	ISO12185:96
0.3 x R (reference test method)	0.15

Table 3: evaluation of the repeatability of subsamples #23205

The calculated repeatability is in agreement with 0.3 times the reproducibility of the reference test method. Therefore, homogeneity of the subsamples was assumed.

For the preparation of the sample for the Cetane Number and DCN analyzes in Biodiesel B100 a batch of approximately 80 liters of Rapeseed Methyl Ester (RME) was obtained from a third party. After homogenization 65 amber glass bottles of 1 L were filled and labelled #23206.
The homogeneity of the subsamples was checked by the determination of Density at 15 °C in accordance with ISO12185 on 8 stratified randomly selected subsamples.

	Density at 15 °C in kg/m^3
sample #23206-1	883.83
sample #23206-2	883.85
sample #23206-3	883.85
sample #23206-4	883.83
sample #23206-5	883.83
sample #23206-6	883.84
sample #23206-7	883.83
sample #23206-8	883.83

Table 4: homogeneity test results of subsamples #23206

From the above test results the repeatability was calculated and compared with 0.3 times the reproducibility of the reference test method in agreement with the procedure of ISO13528, Annex B2 in the next table.

	Density at 15 °C in kg/m^3
r (observed)	0.03
reference test method	ISO12185:96
0.3 x R (reference test method)	0.15

Table 5: evaluation of the repeatability of subsamples #23206

The calculated repeatability is in agreement with 0.3 times the reproducibility of the reference test method. Therefore, homogeneity of the subsamples was assumed.

For the preparation of the sample for the analyzes of Metals in Biodiesel B100 a batch of approximately 6 L of Rapeseed Methyl Ester (RME) was selected and spiked with some metals. After homogenization 55 PE bottles of 100 mL were filled and labelled #23207.
The homogeneity of the subsamples was checked by determination of Sodium in accordance with EN14538 on 8 stratified randomly selected subsamples.

	Sodium in mg/kg
sample #23207-1	12.6
sample #23207-2	13.2
sample #23207-3	12.6
sample #23207-4	12.9
sample #23207-5	13.2
sample #23207-6	13.2
sample #23207-7	12.7
sample #23207-8	13.0

Table 6: homogeneity test results of subsamples #23207

From the above test results the repeatability was calculated and compared with 0.3 times the reproducibility of the reference test method in agreement with the procedure of ISO13528, Annex B2 in the next table.

	Sodium in mg/kg
r (observed)	0.7
reference test method	EN14108:03
0.3 x R (reference test method)	1.4

Table 7: evaluation of the repeatabilities of subsamples #23207

The calculated repeatability is in agreement with 0.3 times the reproducibility of the reference test method. Therefore, homogeneity of the subsamples was assumed.

For the preparation of the sample for Total Contamination determination in Biodiesel B100 a batch of approximately 75 liters of Rapeseed Methyl Ester (RME) was obtained from a third party. A defined volume of freshly prepared and well shaken dust suspension of Arizona Dust material in a lubricating oil was added to empty bottle of 1 L by means of a calibrated pipette. The addition was checked by weighing the bottle before and after the addition. In total 55 bottles were prepared and subsequently filled up with 1 L Biodiesel B100 and homogenized. The subsamples were labelled #23208. A random subsample and a blank B100 sample from the batch were taken to check the Total Contamination.

Depending on the registration of the participant the appropriate set of PT samples was sent on October 4, 2023. An SDS was added to the sample package.

2.5 STABILITY OF THE SAMPLES

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

2.6 ANALYZES

The requested analyzes for the Biodiesel B100 samples are in accordance with the requirements of EN14214:12+A2:19 and/or ASTM D6751:23a.

Parameter	EN14214:12+A2:19	Parameter	ASTM D6751:23a
Acid Value	EN14104	Total Acid Number	ASTM D664
Calorific Value	DIN51900		
		Carb. Res. 100% FAME	ASTM D4530
CFPP	EN116		
Cloud Point	EN23015	Cloud Point	ASTM D2500
Copper Strip Corrosion	ISO2160	Copper Strip Corrosion	ASTM D130
Density at 15°C	ISO12185		
		Distillation	ASTM D1160
Flash Point (Recc)	ISO3679		
Flash Point (PMcc)	ISO2719	Flash Point (PMcc)	ASTM D93
Iodine Value	EN14111		
Kin. Viscosity at 40 °C	ISO3104	Kin. Viscosity at 40 °C	ASTM D445
Oxidation Stability	EN14112	Oxidation Stability	EN15751
Sulfated Ash	ISO3987	Sulfated Ash	ASTM D874
Sulfur	ISO20846	Sulfur	ASTM D5453
Water	ISO12937		
		Water and Sediment	ASTM D2709
Cetane Number	EN5165	Cetane Number	ASTM D613
		Derived Cetane Number	ASTM D7668
Calcium + Magnesium	EN14538	Calcium + Magnesium	EN14538
Phosphorus	EN14107	Phosphorus	ASTM D4951
Potassium + Sodium	EN14109/EN14108	Potassium + Sodium	EN14538
Polyunsat. methyl ester	EN15779		
Methanol	EN14110	Methanol	EN14110
Mono-, Di-, Triglycerides	EN14105	Monoglyceride content	ASTM D6584
Free + Total Glycerol	EN14105	Free + Total Glycerol	ASTM D6584
Total ester content (FAME)	EN14103		
Linolenic acid methyl ester	EN14103		
Total Contamination	EN12662		
		Cold Soak Filterability	ASTM D7501

Table 8: requirements and test methods acc. to specifications EN14214:12+A2:19 and/or ASTM D6751:23a.

It was explicitly requested to treat the samples as if they were routine samples and to report the test results using the indicated units on the report form and not to round the test results, but report as much significant figures as possible. It was also requested not to report ‘less than’ test results, which are above the detection limit, because such test results cannot be used for meaningful statistical evaluations.

To get comparable test results a detailed report form and a letter of instructions are prepared. On the report form the reporting units are given as well as the reference test methods (when applicable) that will be used during the evaluation. The detailed report form and the letter of instructions are both made available on the data entry portal www.kpmd.co.uk/sgs-iis/. The participating laboratories are also requested to confirm the sample receipt on this data entry portal. The letter of instructions can also be downloaded from the iis website www.iisnl.com.

3 RESULTS

During five weeks after sample dispatch, the test results of the individual laboratories were gathered via the data entry portal www.kpmd.co.uk/sgs-iis/. The reported test results are tabulated per determination in appendix 1 of this report. The laboratories are presented by their code numbers.

Directly after the deadline, a reminder was sent to those laboratories that had not reported test results at that moment. Shortly after the deadline, the available test results were screened for suspect data. A test result was called suspect in case the Huber Elimination Rule (a robust outlier test) found it to be an outlier. The laboratories that produced these suspect data were asked to check the reported test results (no reanalyzes). Additional or corrected test results are used for data analysis and the original test results are placed under 'Remarks' in the result tables in appendix 1. Test results that came in after the deadline were not taken into account in this screening for suspect data and thus these participants were not requested for checks.

3.1 STATISTICS

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report ‘iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation’ of June 2018 (iis-protocol, version 3.5).
For the statistical evaluation the *unrounded* (when available) figures were used instead of the rounded test results. Test results reported as ‘<…’ or ‘>…’ were not used in the statistical evaluation.

First, the normality of the distribution of the various data sets per determination was checked by means of the Lilliefors-test, a variant of the Kolmogorov-Smirnov test and by the calculation of skewness and kurtosis. Evaluation of the three normality indicators in combination with the visual evaluation of the graphic Kernel density plot, lead to judgement of the normality being either ‘unknown’, ‘OK’, ‘suspect’ or ‘not OK’. After removal of outliers, this check was repeated. If a data set does not have a normal distribution, the (results of the) statistical evaluation should be used with due care.

The assigned value is determined by consensus based on the test results of the group of participants after rejection of the statistical outliers and/or suspect data.

According to ISO13528 all (original received or corrected) results per determination were submitted to outlier tests. In the iis procedure for proficiency tests, outliers are detected prior to calculation of the mean, standard deviation and reproducibility. For small data sets, Dixon (up to 20 test results) or Grubbs (up to 40 test results) outlier tests can be used. For larger data sets (above 20 test results) Rosner's outlier test can be used. Outliers are marked by D(0.01) for the Dixon's test, by G(0.01) or DG(0.01) for the Grubbs' test and by R(0.01) for the Rosner's test. Stragglers are marked by D(0.05) for the Dixon's test, by G(0.05) or DG(0.05) for the Grubbs' test and by R(0.05) for the Rosner's test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

For each assigned value the uncertainty was determined in accordance with ISO13528. Subsequently the calculated uncertainty was evaluated against the respective requirement based on the target reproducibility in accordance with ISO13528. In this PT, the criterion of ISO13528, paragraph 9.2.1. was met for all evaluated tests, therefore, the uncertainty of all assigned values may be negligible and need not be included in the PT report.

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

3.2 GRAPHICS

In order to visualize the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported test results are plotted. The corresponding laboratory numbers are on the X-axis. The straight horizontal line presents the consensus value (a trimmed mean). The four striped lines, parallel to the consensus value line, are the +3s, +2s, -2s and -3s target reproducibility limits of the selected reference test method. Outliers and other data, which were excluded from the calculations, are represented as a cross. Accepted data are represented as a triangle.

Furthermore, Kernel Density Graphs were made. This is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms. Also, a normal Gauss curve (dotted line) was projected over the Kernel Density Graph (smooth line) for reference. The Gauss curve is calculated from the consensus value and the corresponding standard deviation.

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 (derived from e.g. ISO or ASTM test methods), the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation in this interlaboratory study.

The target standard deviation was calculated from the literature reproducibility by division with 2.8. In case no literature reproducibility was available, other target values were used, like Horwitz or an estimated reproducibility based on former iis proficiency tests.

When a laboratory did use a test method with a reproducibility that is significantly different from the reproducibility of the reference test method used in this report, it is strongly advised to recalculate the z-score, while using the reproducibility of the actual test method used, this in order to evaluate whether the reported test result is fit-for-use.

The z-scores were calculated according to:

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

The $z_{(target)}$ scores are listed in the test result tables in appendix 1.

Absolute values for z<2 are very common and absolute values for z>3 are very rare. Therefore, the usual interpretation of z-scores is as follows:

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

4 EVALUATION

In this proficiency test no problems were encountered with the dispatch of the samples.
In the Biodiesel B100 regular round one participant reported test results after the final reporting date and one other participant did not report any test results.
In the Cetane Number and DCN PT four participants did not report any test results.
In the Metals in Biodiesel B100 PT one participant reported test results after the final reporting date and eight other participants did not report any test results.
In the Total Contamination PT three participants did not report any test results.
Not all participants were able to report all analyzes requested.

In total 64 participants reported 1097 numerical test results. Observed were 36 outlying test results, which is 3.3%. In proficiency tests outlier percentages of 3% - 7.5% are quite normal.

Not all data sets proved to have a normal Gaussian distribution. These are referred to as “not OK” or “suspect”. The statistical evaluation of these data sets should be used with due care, see also paragraph 3.1.

4.1 EVALUATION PER SAMPLE AND PER TEST

In this section the reported test results are discussed per sample and per test. The test methods which were used by the various laboratories were taken into account for explaining the observed differences when possible and applicable. These test methods are also in the tables together with the original data in appendix 1. The abbreviations, used in these tables, are explained in appendix 3.

In the iis PT reports ASTM test methods are referred to with a number (e.g. D4530) and an added designation for the year that the test method was adopted or revised (e.g. D4530:15). When a method has been reapproved an “R” will be added and the year of approval (e.g. D4530:15R20).

sample #23205

Acid Value: The group of participants had difficulty to meet the target requirements. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of EN14104:21 and EN14214:12+A2:19.

Total Acid Number: The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D664-B:18e2.

Cloud Point: The group of participants met the target requirements. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D2500:23 and EN14214:12+A2:19.

CFPP: The group of participants met the target requirements. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN116:15 and EN14214:12+A2:19.

Carbon Residue on 100% sample: The majority of the participants agreed on a test result near or below the application range of ASTM D4530:15R20 or ISO10370:14. Therefore, no z-scores are calculated.

Copper Corrosion: All reporting participants agreed on a test result of 1 (1a/1b).

Density at 15 °C: The group of participants met the target requirements. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO12185:96.

Flash Point PMcc: The group of participants had difficulty to meet the target requirements. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D93-C:20 and ISO2719-C:16.

Flash Point recc: The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ISO3679:22.

Iodine Value: The group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of EN14111:22.

Kinematic Viscosity at 40 °C: The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ISO3104-A:23 and D445:23.

Oxidation Stability: The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of EN15751:14 and EN14112:20.

Pour Point: The group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO3016:19.

Sulfated Ash: All reporting participants agreed on a test result near or below the application limit of ASTM D874:23. Therefore, no z-scores are calculated.

Sulfur: The group of participants met the target requirements. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO20846:19 and ASTM D5453:19a.

Water: The group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO12937:00 and ASTM D6304-A:20.

Water and Sediment: All reporting participants agreed on a test result near or below the application limit of ASTM D2709:22. Therefore, no z-scores are calculated.

Calorific Value Gross: The group of participants had difficulty to meet the target requirements. One statistical outlier wase observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D240:19.

Distillation at 10 mmHg: Only a few test results were reported per test parameter. Therefore, no evaluation was performed.

Methanol: The group of participants had difficulty to meet the target requirements. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of EN14110:19.

Monoglycerides: The group of participants met the target requirements. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN14105:20.

Diglycerides: The group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of EN14105:20.

Triglycerides: The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of EN14105:20.

Free Glycerol: The group of participants met the target requirements. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of EN14105:20.

Total Glycerol: The group of participants met the target requirements. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN14105:20.

Total Ester content (FAME): The group of participants met the target requirements. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN14103:20.

Linolenic Acid Methyl Ester: The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of EN14103:20.

Polyunsaturated Methyl Esters: The group of participants had difficulty to meet the target requirements. One statistical outlier was observed. The calculated reproducibility is not in agreement with the requirements EN15779:09+A1:13.

sample #23206

Cetane Number: The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D613:18ae1 and with the requirements of EN14214:12+A2:19 and ISO5165:20.

DCN (D7668): The group of participants had difficulty to meet the target requirements. One statistical outlier was observed and five other test results were excluded over three parameters. The calculated reproducibilities of Derived Cetane Number, Ignition Delay and Combustion Delay after rejection of the suspect data are not in agreement with the requirements of ASTM D7668:17 and ASTM D7668:23. The variation of the reported test results for Derived Cetane Number and Combustion Delay is large compared to

the requirements. Therefore, no z-scores are calculated for these two parameters.

sample #23207

Sum Ca + Mg: The group of participants had difficulty to meet the target requirements. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of EN141538:06.

Phosphorus: The group of participants had difficulty to meet the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of EN14107:03.

Potassium: The group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of EN14109:03.

Sodium: The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of EN14108:03.

Sum K + Na: The group of participants had difficulty to meet the target requirements. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of EN14538:06.

sample #23208

Some years ago, there was some discussion about method EN12662 version 2014 for determining Total Contamination in Biodiesel (neat FAME or B100). The CEN/TC 19 working group published a letter in September 2015 (see lit. 13) about this issue. In short, for FAME blends (B100) either EN12662:1998 or EN12662:2008 should be used and not EN12662:14. Also, the latest version of EN14214:12+A2:19 (February 2019) states that EN12662 version 2008 should be used or EN12662:1998 as alternative. The method EN12662:14 is not mentioned anymore in the specification (see also iis memo 1903, lit 14). It was therefore decided to exclude the test results which were determined according EN12662:14.

Total Contamination: The group of participants had difficulty to meet the target requirements. One outlier was observed and four other test results were excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of EN12662:08.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the reference test method and the reproducibility as found for the group of participating laboratories. The number of significant test results, the average, the calculated reproducibility (2.8 * standard deviation) and the target reproducibility derived from reference methods are presented in the next tables.

Parameter	unit	n	average	2.8 * sd	R(lit)
Acid Value	mg KOH/g	43	0.52	0.07	0.06
Total Acid Number	mg KOH/g	20	0.51	0.07	0.13
Cloud Point	°C	50	-4.8	2.6	5
Cold Filter Plugging Point	°C	54	-15.6	2.8	3.9
Carbon Residue on 100% sample	%M/M	25	<0.1	n.e.	n.e.
Copper Corrosion 3 hrs at 50 °C		41	1 (1a/1b)	n.a.	n.a.
Density at 15 °C	kg/m^3	58	883.7	0.2	0.5
Flash Point PMcc	°C	39	145.6	21.6	14.7
Flash Point recc	°C	13	171.6	6.5	15.0
Iodine Value	g I_2/100 g	38	113.7	3.5	5
Kinematic Viscosity at 40 °C	mm^2/s	49	4.487	0.040	0.037
Oxidation Stab. Induction period	hours	45	3.4	0.7	1.0
Pour Point	°C	25	-38.0	4.3	9
Sulfated Ash	%M/M	33	<0.005	n.e.	n.e.
Sulfur	mg/kg	42	2.2	0.9	1.4
Water	mg/kg	57	405	100	138
Water and Sediment	%V/V	10	<0.01	n.e.	n.e.
Calorific Value Gross	MJ/kg	9	39.9	0.6	0.4
80% recovered, as AET	°C	3	352.9	0.2	(4.6)
90% recovered, as AET	°C	3	359.0	14.4	(4.6)
95% recovered, as AET	°C	3	379.6	67.5	(4.6)
Methanol	%M/M	40	0.044	0.020	0.013
Monoglycerides	%M/M	37	0.333	0.083	0.128
Diglycerides	%M/M	34	0.113	0.040	0.050
Triglycerides	%M/M	30	0.055	0.029	0.069
Free Glycerol	%M/M	29	0.001	0.002	0.006
Total Glycerol	%M/M	36	0.109	0.027	0.032
Total Ester content (FAME)	%M/M	44	97.61	3.01	4.16
Linolenic Acid Methyl Ester	%M/M	40	9.57	0.59	0.66
Polyunsaturated Methyl Esters	%M/M	18	0.23	0.44	0.27

Table 9: reproducibilities of tests on sample #23205

For results between brackets no z-scores are calculated

Parameter	unit	n	average	2.8 * sd	R(lit)
Cetane Number		8	55.3	5.0	4.7
Derived Cetane Number		7	57.7	7.2	(1.7)
Ignition Delay		6	3.0	0.4	0.2
Combustion Delay		5	4.2	0.3	(0.1)

Table 10: reproducibilities of tests on sample #23206

For results between brackets no z-scores are calculated

Parameter	unit	n	average	2.8 * sd	R(lit)
Sum Calcium and Magnesium	mg/kg	24	14.8	5.9	3.4
Phosphorus	mg/kg	23	10.1	3.3	2.0
Potassium	mg/kg	21	9.3	2.7	5.2
Sodium	mg/kg	21	9.3	3.5	3.8
Sum Potassium and Sodium	mg/kg	19	19.0	5.4	4.6

Table 11: reproducibilities of tests on sample #23207

Parameter	unit	n	average	2.8 * sd	R(lit)
Total Contamination	mg/kg	31	12.1	8.3	3.6

Table 12: reproducibility of test on sample #23208

For results between brackets no z-scores are calculated

Without further statistical calculations it can be concluded that for many tests there is a good compliance of the group of participants with the reference test methods. The problematic tests have been discussed in paragraph 4.1.

4.3 COMPARISON OF THE PROFICIENCY TEST OF NOVEMBER 2023 WITH PREVIOUS PTS

	November 2023	April 2023	November 2022	April 2022	October 2021
Number of reporting laboratories	64	57	63	61	63
Number of test results	1097	748	948	892	962
Number of statistical outliers	3	34	23	38	31
Percentage statistical outliers	3.3%	4.5%	2.4%	4.3%	3.2%

Table 13: comparison with previous proficiency tests

In proficiency tests outlier percentages of 3% - 7.5% are quite normal.

The performance of the determinations of the proficiency tests was compared to the requirements of the reference test methods. The conclusions are given in the following table.

Parameter	November 2023	April 2023	November 2022	April 2022	October 2021
Acid Value	-	+/-	+	+	+/-
Total Acid Number	+	++	+	++	+
Cloud Point	+	+	+	+	++
Cold Filter Plugging Point	+	++	+	+	+
Density at 15 °C	++	++	++	+	+
Flash Point PMcc	-	-	+/-	-	-
Flash Point recc.	++	n.e.	+	++	+
Iodine Value	+	-	-	+	+/-
Kinematic Viscosity at 40 °C	+/-	-	+/-	+	-
Oxidation Stab. Induction period	+	+	+	+	+/-

Parameter	November 2023	April 2023	November 2022	April 2022	October 2021
Pour Point	++	+	++	++	+
Sulfur	+	+/-	+	+	+
Water	+	+	+	+	++
Calorific Value Gross	-	+/-	+	-	--
Distillation at 10 mmHg	--	+/-	n.e.	-	--
Methanol	-	-	-	-	-
Monoglycerides	+	+	+	+	-
Diglycerides	+	+	-	+/-	+
Triglycerides	++	+/-	+	++	++
Free Glycerol	++	++	+	+	++
Total Glycerol	+	+/-	-	+	-
Total Ester content (FAME)	+	+	+	+	+/-
Linolenic Acid Methyl Ester	+	+	+	+/-	--
Polyunsaturated Methyl Esters	-	--	-	--	-
Cetane Number	+/-	n.e.	-	n.e.	-
Derived Cetane Number	(--)	n.e.	(--)	n.e.	(--)
Sum of Calcium and Magnesium	-	--	-	-	-
Phosphorus	-	-	--	--	--
Potassium	+	-	+	+	+
Sodium	+/-	-	+/-	-	-
Sum of Potassium and Sodium	-	--	-	--	+/-
Total Contamination	--	--	(--)	-	--

Table 14: comparison of determinations to the reference test methods.

For results between brackets no z-scores are calculated.

The following performance categories were used:

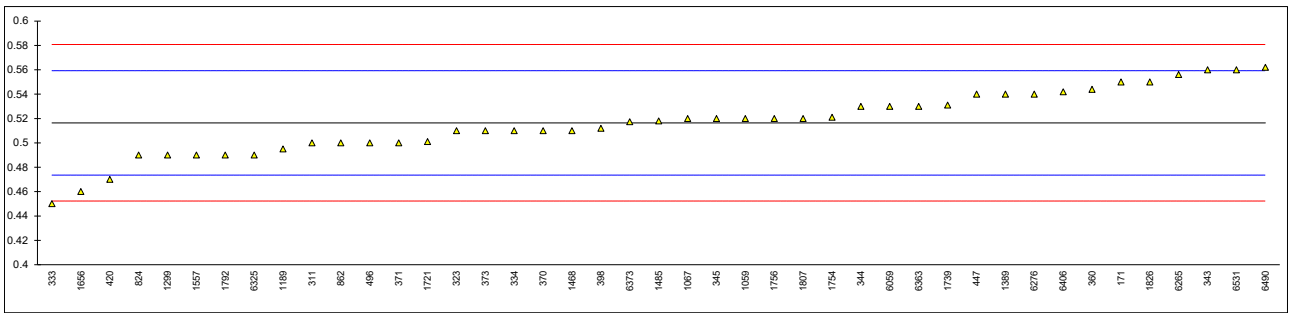
- ++ : group performed much better than the reference test method
- + : group performed better than the reference test method
- +/- : group performance equals the reference test method
- - : group performed worse than the reference test method
- -- : group performed much worse than the reference test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

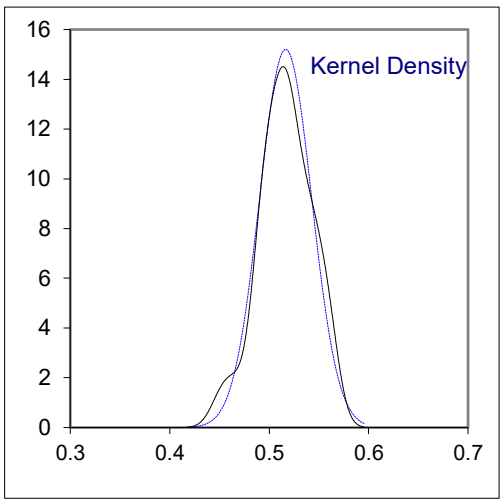
APPENDIX 1

Determination of Acid Value on sample #23205; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	EN14104	0.55		1.56	
311	EN14104	0.50		-0.77	
312		-----		-----	
323	EN14104	0.51		-0.30	
328		-----		-----	
333	EN14104	0.45		-3.10	
334	EN14104	0.51		-0.30	
335		-----		-----	
338		-----		-----	
343	EN14104	0.56		2.03	
344	EN14104	0.53		0.63	
345	EN14104	0.52		0.16	
360	EN14104	0.544		1.28	
370	EN14104	0.51		-0.30	
371	EN14104	0.50		-0.77	
373	EN14104	0.51		-0.30	
398	EN14104	0.512		-0.21	
420	EN14104	0.47		-2.17	
447	EN14104	0.54		1.10	
496	EN14104	0.5		-0.77	
663		-----		-----	
824	EN14104	0.49		-1.24	
862	EN14104	0.50		-0.77	
1059	EN14104	0.52		0.16	
1067	EN14104	0.52		0.16	
1091		-----		-----	
1099		-----		-----	
1189	EN14104	0.495		-1.00	
1199		-----		-----	
1299	EN14104	0.49		-1.24	
1389	EN14104	0.54		1.10	
1429		-----		-----	
1459		-----		-----	
1468	EN14104	0.510		-0.30	
1485	EN14104	0.518		0.07	
1557	EN14104	0.49		-1.24	
1586		-----		-----	
1656	EN14104	0.46		-2.64	
1721	EN14104	0.501		-0.72	
1739	EN14104	0.531		0.68	
1740		-----		-----	
1744		-----		-----	
1754	EN14104	0.521		0.21	
1756	EN14104	0.52		0.16	
1792	EN14104	0.49		-1.24	
1807	EN14104	0.52		0.16	
1826	EN14104	0.55		1.56	
1984		-----		-----	
6001		-----		-----	
6059	EN14104	0.53		0.63	
6259		-----		-----	
6265	EN14104	0.5562		1.85	
6276	EN14104	0.54		1.10	
6325	EN14104	0.49		-1.24	
6337		-----		-----	
6363	EN14104	0.53		0.63	
6373	EN14104	0.5174		0.04	
6406	EN14104	0.5419		1.19	
6447		-----		-----	
6490	EN14104	0.5621		2.13	
6499		-----		-----	
6505		-----		-----	
6531	EN14104	0.56		2.03	

	normality	OK
	n	43
	outliers	0
	mean (n)	0.5165
	st.dev. (n)	0.02623
	R(calc.)	0.0734
	st.dev.(EN14104:21)	0.02143
	R(EN14104:21)	0.06
compare		
	R(EN14214:12+A2:19)	0.06

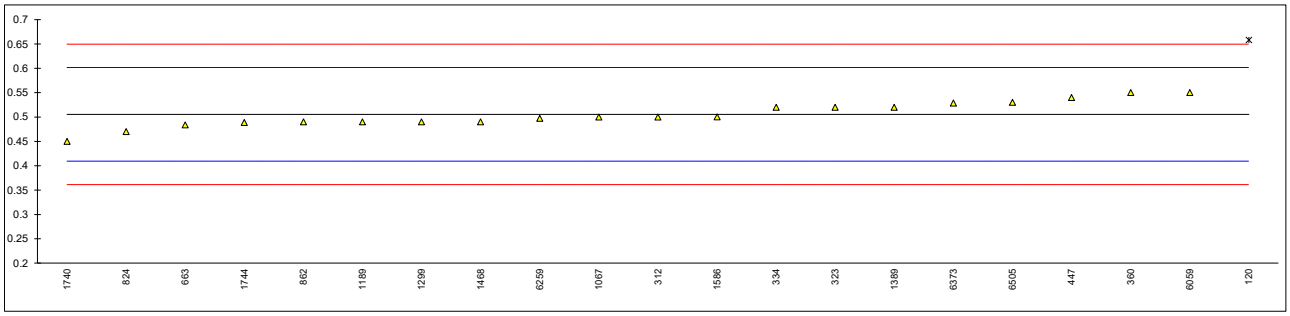

0.6
0.58
0.56
0.54
0.52
0.5
0.48
0.46
0.44
0.42
0.4
333
1656
420
824
1299
1557
1792
6325
1189
311
862
496
371
1721
323
373
334
370
1468
398
6373
1485
1067
345
1059
1756
1807
1754
344
6059
6363
1739
447
1389
6276
6406
360
171
1826
6265
343
6531
6490

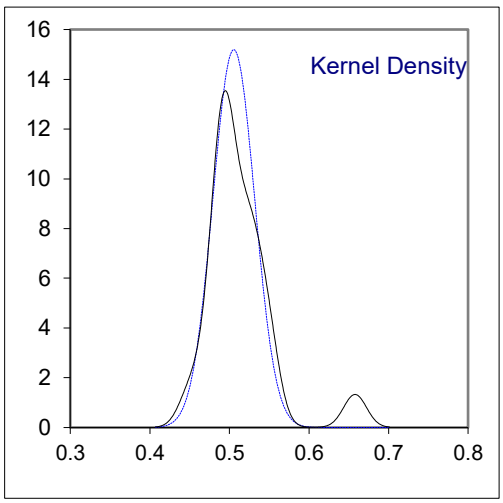

Kernel Density
16
14
12
10
8
6
4
2
0
0.3
0.4
0.5
0.6
0.7

Determination of Total Acid Number on sample #23205; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
120	D664-B	0.658	C,R(0.01)	3.17	First reported 0.695
171		-----		-----	
311		-----		-----	
312	D974	0.50		-0.11	
323	D664-B	0.52		0.30	
328		-----		-----	
333		-----		-----	
334	D664-B	0.52		0.30	
335		-----		-----	
338		-----		-----	
343		-----		-----	
344		-----		-----	
345		-----		-----	
360	D664-B	0.550		0.93	
370		-----		-----	
371		-----		-----	
373		-----		-----	
398		-----		-----	
420		-----		-----	
447	D974	0.54		0.72	
496		-----		-----	
663	D664-B	0.484		-0.45	
824	D664-B	0.47		-0.74	
862	D664-B	0.49		-0.32	
1059		-----		-----	
1067	D664-B	0.50		-0.11	
1091		-----		-----	
1099		-----		-----	
1189	D664-B	0.49		-0.32	
1199		-----		-----	
1299	D664-B	0.490		-0.32	
1389	D664-B	0.52		0.30	
1429		-----		-----	
1459		-----		-----	
1468	D664-B	0.49		-0.32	
1485		-----		-----	
1557		-----		-----	
1586	D664-B	0.5003		-0.11	
1656		-----		-----	
1721		-----		-----	
1739		-----		-----	
1740	D664-B	0.45		-1.15	
1744	D664-B	0.489		-0.34	
1754		-----		-----	
1756		-----		-----	
1792		-----		-----	
1807		-----		-----	
1826		-----		-----	
1984		-----		-----	
6001		-----		-----	
6059	D664-B	0.55		0.93	
6259	D664-B	0.4972		-0.17	
6265		-----		-----	
6276		-----		-----	
6325		-----		-----	
6337		-----		-----	
6363		-----		-----	
6373	D664-B	0.5287		0.48	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505	ISO660	0.53		0.51	
6531		-----		-----	

normality	OK
n	20
outliers	1
mean (n)	0.5055
st.dev. (n)	0.02627
R(calc.)	0.0736
st.dev.(D664-B:18e2)	0.04812
R(D664-B:18e2)	0.1347

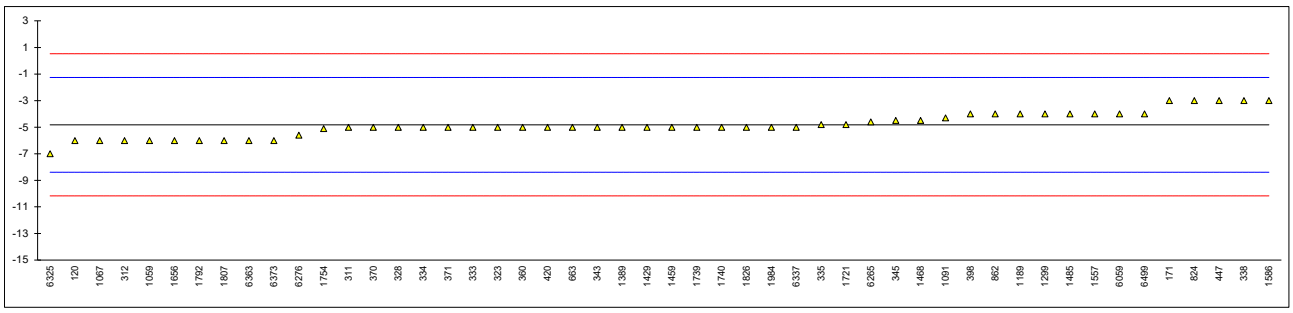

0.7
0.65
0.6
0.55
0.5
0.45
0.4
0.35
0.3
0.25
0.2
1740
824
663
1744
862
1189
1299
1468
6259
1067
312
1586
334
323
1389
6373
6505
447
360
6059
120

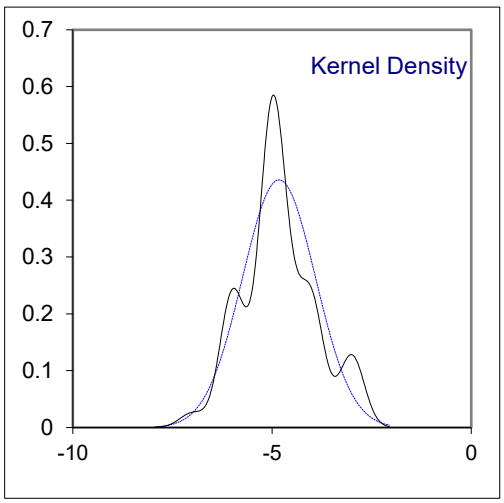

Kernel Density
16
14
12
10
8
6
4
2
0
0.3
0.4
0.5
0.6
0.7
0.8

Determination of Cloud Point on sample #23205; results in °C

lab	method	value	mark	z(targ)	remarks
120	D2500	-6.0		-0.66	
171	D2500	-3		1.02	
311	D2500	-5		-0.10	
312	EN23015	-6		-0.66	
323	D2500	-5		-0.10	
328	D2500	-5		-0.10	
333	EN23015	-5		-0.10	
334	D2500	-5		-0.10	
335	D2500	-4.8		0.01	
338	ISO3015	-3		1.02	
343	D2500	-5		-0.10	
344		-----		-----	
345	D2500	-4.5		0.18	
360	ISO3015	-5		-0.10	
370	ISO3015	-5		-0.10	
371	ISO3015	-5		-0.10	
373		-----		-----	
398	D2500	-4		0.46	
420	ISO3015	-5		-0.10	
447	IP219	-3		1.02	
496		-----		-----	
663	D2500	-5		-0.10	
824	D2500	-3		1.02	
862	D2500	-4.0		0.46	
1059	ISO3015	-6		-0.66	
1067	EN23015	-6		-0.66	
1091	D2500	-4.3		0.29	
1099		-----		-----	
1189	D2500	-4.0		0.46	
1199		-----		-----	
1299	D2500	-4		0.46	
1389	D2500	-5		-0.10	
1429	D2500	-5		-0.10	
1459	EN23015	-5.0		-0.10	
1468	ISO3015	-4.5		0.18	
1485	D2500	-4.0		0.46	
1557	ISO3015	-4		0.46	
1586	D2500	-3		1.02	
1656	D2500	-6		-0.66	
1721	D2500	-4.8		0.01	
1739	EN23015	-5.0		-0.10	
1740	D2500	-5		-0.10	
1744		-----		-----	
1754	ISO3015	-5.1		-0.15	
1756		-----		-----	
1792	D2500	-6		-0.66	
1807	D2500	-6		-0.66	
1826	D2500	-5		-0.10	
1984	ISO3015	-5		-0.10	
6001		-----		-----	
6059	D2500	-4		0.46	
6259		-----		-----	
6265	ISO3015	-4.6		0.13	
6276	ISO22995	-5.6		-0.43	
6325	D2500	-7		-1.22	
6337	ISO3015	-5		-0.10	
6363	D2500	-6		-0.66	
6373	D2500	-6		-0.66	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499	D2500	-4		0.46	
6505		-----		-----	
6531		-----		-----	

	normality	OK
	n	50
	outliers	0
	mean (n)	-4.82
	st.dev. (n)	0.915
	R(calc.)	2.56
	st.dev.(D2500:23)	1.786
	R(D2500:23)	5
Compare		
	R(EN14214:12+A2:19)	4

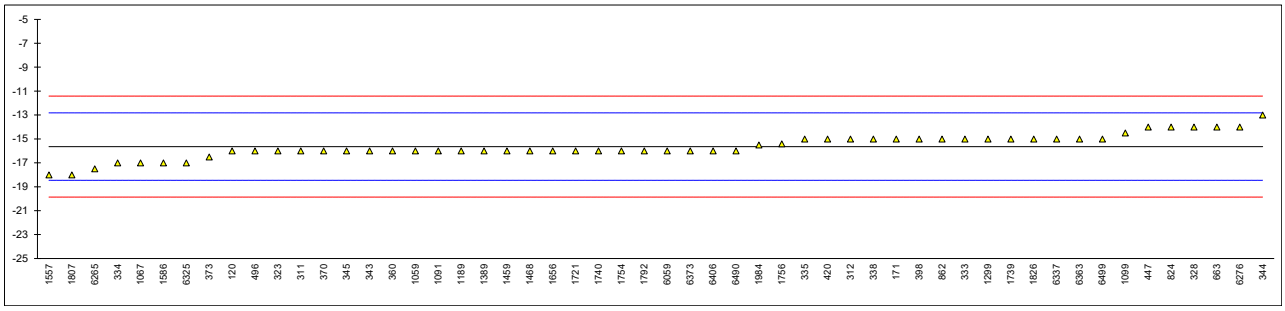

3
1
-1
-3
-5
-7
-9
-11
-13
-15
6325
120
1067
312
1059
1656
1792
1807
6363
6373
6276
1754
311
370
328
334
371
333
323
360
420
663
343
1389
1429
1459
1739
1740
1826
1984
6337
335
1721
6265
345
1468
1091
398
862
1189
1299
1485
1557
6059
6499
171
824
447
338
1586

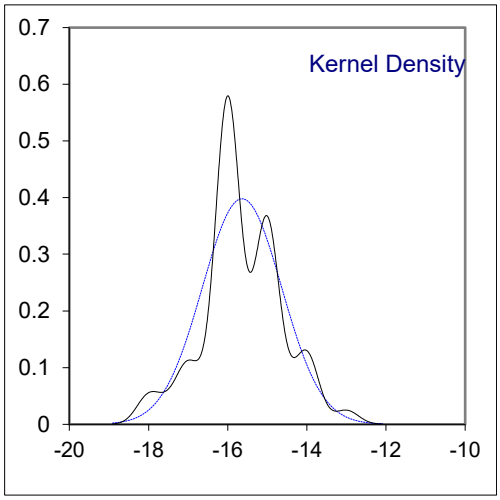

Kernel Density
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-10
-5
0

Determination of Cold Filter Plugging Point (CFPP) on sample #23205; results in °C

lab	method	value	mark	z(targ)	remarks
120	EN116	-16.0		-0.26	
171	D6371	-15		0.45	
311	EN116	-16		-0.26	
312	EN116	-15		0.45	
323	EN116	-16.0		-0.26	
328	EN116	-14		1.16	
333	EN116	-15		0.45	
334	EN116	-17		-0.97	
335	EN116	-15		0.45	
338	EN116	-15		0.45	
343	EN116	-16		-0.26	
344	EN116	-13		1.87	
345	EN116	-16		-0.26	
360	D6371	-16		-0.26	
370	EN116	-16		-0.26	
371		-----		-----	
373	EN116	-16.5		-0.61	
398	EN116	-15		0.45	
420	EN116	-15		0.45	
447	IP309	-14		1.16	
496	EN116	-16		-0.26	
663	EN116	-14		1.16	
824	EN116	-14		1.16	
862	EN116	-15		0.45	
1059	EN116	-16		-0.26	
1067	EN116	-17		-0.97	
1091	EN116	-16		-0.26	
1099	EN116	-14.5	C	0.81	First reported 14.5
1189	EN116	-16.0		-0.26	
1199		-----		-----	
1299	EN116	-15		0.45	
1389	EN116	-16		-0.26	
1429		-----		-----	
1459	EN116	-16.0		-0.26	
1468	EN116	-16		-0.26	
1485		-----		-----	
1557	EN116	-18	C	-1.68	First reported -21
1586	EN116	-17		-0.97	
1656	EN116	-16		-0.26	
1721	EN116	-16		-0.26	
1739	EN116	-15.0		0.45	
1740	EN116	-16		-0.26	
1744		-----		-----	
1754	EN116	-16.0		-0.26	
1756	EN116	-15.4		0.17	
1792	EN116	-16		-0.26	
1807	EN116	-18		-1.68	
1826	EN116	-15		0.45	
1984	EN116	-15.5		0.10	
6001		-----		-----	
6059	EN116	-16		-0.26	
6259		-----		-----	
6265	EN116	-17.5		-1.32	
6276	EN116	-14		1.16	
6325	EN116	-17		-0.97	
6337	EN116	-15		0.45	
6363	EN116	-15		0.45	
6373	EN116	-16		-0.26	
6406	EN116	-16		-0.26	
6447		-----		-----	
6490	EN116	-16		-0.26	
6499	D6371	-15		0.45	
6505		-----		-----	
6531		-----		-----	

	normality	OK
	n	54
	outliers	0
	mean (n)	-15.64
	st.dev. (n)	1.002
	R(calc.)	2.81
	st.dev.(EN116:15)	1.407
	R(EN116:15)	3.94
compare		
	R(EN14214:12+A2:19)	3.94


-5
-7
-9
-11
-13
-15
-17
-19
-21
-23
-25
1557 1807 6265 334 1067 1586 6325 373 120 496 323 311 370 345 343 360 1059 1091 1189 1389 1459 1468 1656 1721 1740 1754 1792 6059 6373 6406 6490 1984 1756 335 420 312 338 171 398 862 333 1299 1739 1826 6337 6363 6499 1099 447 824 328 663 6276 344


Kernel Density
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-20
-18
-16
-14
-12
-10

Determination of Carbon Residue on 100% sample on sample #23205; results in %M/M

lab	method	value	mark	z(targ)	remarks
120	D4530	0.02		-----	
171	D4530	<0.10		-----	
311		-----		-----	
312		-----		-----	
323	D4530	0.05		-----	
328		-----		-----	
333		-----		-----	
334	D4530	<0.01		-----	
335		-----		-----	
338		-----		-----	
343		-----		-----	
344		-----		-----	
345		-----		-----	
360	ISO10370	0.009		-----	
370	ISO10370	0.015		-----	
371		-----		-----	
373		-----		-----	
398	EN10370	0.006		-----	
420	ISO6615	0.01		-----	
447	EN10370	<0.10		-----	
496		-----		-----	
663	D4530	<0.01		-----	
824	ISO10370	<0.10		-----	
862	D4530	<0.1		-----	
1059	ISO10370	0.02		-----	
1067		-----		-----	
1091		-----		-----	
1099		-----		-----	
1189	D4530	<0.10		-----	
1199		-----		-----	
1299		-----		-----	
1389	D4530	0.011		-----	
1429	D4530	0.00		-----	
1459		-----		-----	
1468	ISO10370	<0,01		-----	
1485		-----		-----	
1557	EN10370	0.012		-----	
1586	D4530	0.026		-----	
1656	D4530	<0.10		-----	
1721		-----		-----	
1739		-----		-----	
1740	D4530	0.04		-----	
1744		-----		-----	
1754		-----		-----	
1756	ISO10370	0.007		-----	
1792	D4530	0.01		-----	
1807		-----		-----	
1826	D4530	0.008		-----	
1984		-----		-----	
6001		-----		-----	
6059	D4530	0.0		-----	
6259		-----		-----	
6265		-----		-----	
6276		-----		-----	
6325		-----		-----	
6337		-----		-----	
6363		-----		-----	
6373		-----		-----	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505		-----		-----	
6531		-----		-----	
	n	25			
	mean (n)	<0.10			Application range ASTM D4530:15R20: 0.1 – 30%M/M Application range ISO 10370:14: 0.10 – 30%M/M

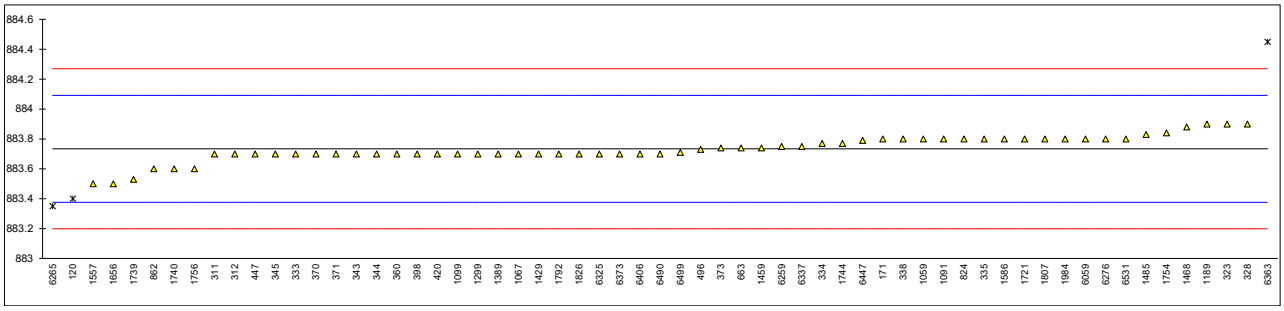
Determination of Copper Corrosion 3 hrs at 50 °C on sample #23205

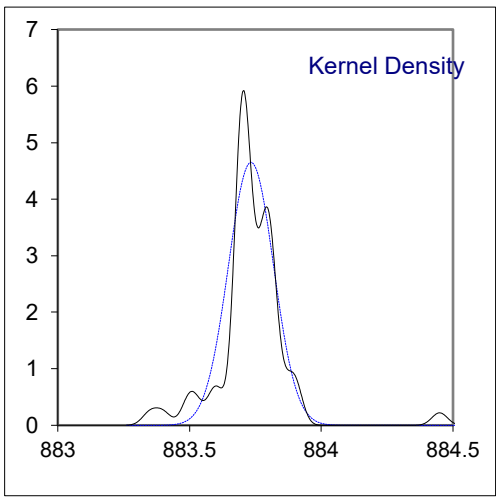
lab	method	value	mark	z(targ)	remarks
120	D130	1A		-----	
171	D130	1a		-----	
311	D130	1A		-----	
312		-----		-----	
323	D130	1A		-----	
328	D130	1		-----	
333		-----		-----	
334	D130	1 a		-----	
335	D130	1b		-----	
338		-----		-----	
343	D130	1a		-----	
344	D130	1a		-----	
345	ISO2160	1a		-----	
360	ISO2160	1A		-----	
370	ISO2160	1A		-----	
371	ISO2160	1a		-----	
373		-----		-----	
398	D130	1a		-----	
420	ISO2160	1a		-----	
447	IP154	1a		-----	
496	ISO2160	1a		-----	
663	D130	1a		-----	
824	D130	1a		-----	
862	D130	1a		-----	
1059	ISO2160	1a		-----	
1067	ISO2160	1A		-----	
1091		-----		-----	
1099	ISO2160	1a		-----	
1189	D130	1A		-----	
1199		-----		-----	
1299	D130	1a		-----	
1389	D130	1A		-----	
1429	D130	1A		-----	
1459		-----		-----	
1468		-----		-----	
1485		-----		-----	
1557	ISO2160	1a		-----	
1586	D130	1A		-----	
1656	ISO2160	1A		-----	
1721	ISO2160	1a		-----	
1739	ISO2160	1a		-----	
1740	D130	1A		-----	
1744		-----		-----	
1754	ISO2160	1A		-----	
1756	ISO2160	1a		-----	
1792	ISO2160	1A		-----	
1807	ISO2160	1a		-----	
1826		-----		-----	
1984		-----		-----	
6001		-----		-----	
6059	D130	1a		-----	
6259		-----		-----	
6265		-----		-----	
6276		-----		-----	
6325		-----		-----	
6337	ISO2160	1		-----	
6363		-----		-----	
6373	D130	1A		-----	
6406	D130	1A		-----	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505		-----		-----	
6531		-----		-----	
	n	41			
	mean (n)	1 (1a/1b)			

Determination of Density at 15 °C on sample #23205; results in kg/m^3

lab	method	Value	mark	z(targ)	remarks
120	D4052	883.4	C,R(0.05)	-1.87	First reported 0.8834 without unit
171	D4052	883.8		0.37	
311	ISO12185	883.7		-0.19	
312	ISO12185	883.7		-0.19	
323	ISO12185	883.9		0.93	
328	ISO12185	883.9		0.93	
333	ISO12185	883.7		-0.19	
334	ISO12185	883.77		0.20	
335	ISO12185	883.8		0.37	
338	ISO12185	883.8		0.37	
343	ISO12185	883.7		-0.19	
344	D4052	883.7		-0.19	
345	ISO12185	883.7		-0.19	
360	D4052	883.7		-0.19	
370	ISO12185	883.7		-0.19	
371	ISO12185	883.7		-0.19	
373	ISO12185	883.74		0.03	
398	ISO12185	883.7		-0.19	
420	ISO12185	883.7		-0.19	
447	IP365	883.7		-0.19	
496	ISO12185	883.73		-0.02	
663	D4052	883.74		0.03	
824	ISO12185	883.8		0.37	
862	ISO12185	883.6		-0.75	
1059	ISO12185	883.8		0.37	
1067	ISO12185	883.7		-0.19	
1091	D4052	883.8		0.37	
1099	ISO12185	883.70		-0.19	
1189	ISO12185	883.9		0.93	
1199		-----		-----	
1299	D4052	883.7		-0.19	
1389	ISO12185	883.7		-0.19	
1429	ISO12185	883.7		-0.19	
1459	ISO12185	883.74		0.03	
1468	ISO12185	883.88		0.82	
1485	ISO12185	883.83		0.54	
1557	ISO3675	883.5		-1.31	
1586	D4052	883.8		0.37	
1656	ISO12185	883.5		-1.31	
1721	ISO12185	883.8	C	0.37	First reported 0.88379 kg/m^3
1739	ISO3675	883.53		-1.14	
1740	ISO12185	883.6		-0.75	
1744	D4052	883.77		0.20	
1754	ISO12185	883.84		0.59	
1756	ISO12185	883.6		-0.75	
1792	ISO12185	883.7		-0.19	
1807	ISO12185	883.8		0.37	
1826	ISO12185	883.7		-0.19	
1984	ISO12185	883.8		0.37	
6001		-----		-----	
6059	ISO12185	883.8		0.37	
6259	D4052	883.75		0.09	
6265	ISO12185	883.35	R(0.05)	-2.15	
6276	ISO12185	883.8		0.37	
6325	ISO12185	883.7		-0.19	
6337	ISO12185	883.75		0.09	
6363	ISO12185	884.45	R(0.01)	4.01	
6373	ISO12185	883.7		-0.19	
6406	ISO12185	883.7		-0.19	
6447	D4052	883.79		0.31	
6490	D4052	883.7		-0.19	
6499	D4052	883.71		-0.13	
6505		-----		-----	
6531	ISO12185	883.8		0.37	

normality	suspect
n	58
outliers	3
mean (n)	883.734
st.dev. (n)	0.0858
R(calc.)	0.240
st.dev.(ISO12185:96)	0.1786
R(ISO12185:96)	0.5

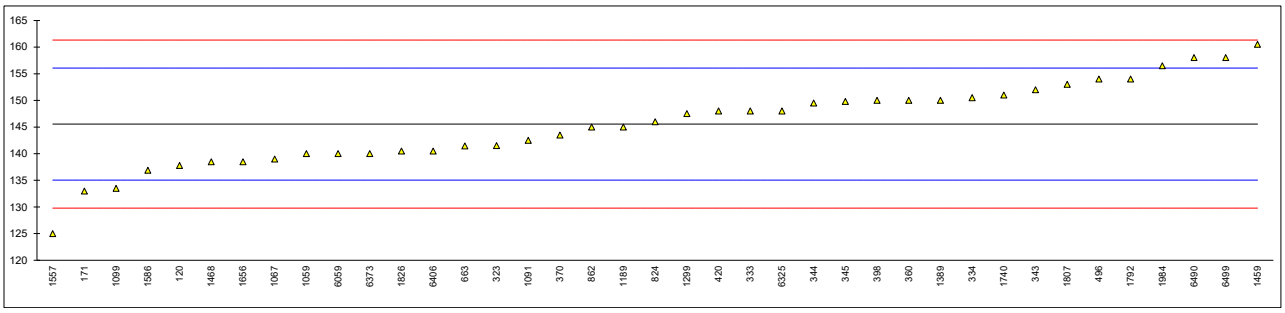

884.6
884.4
884.2
884
883.8
883.6
883.4
883.2
883
6265 120 1557 1656 1739 862 1740 1756 311 312 447 345 333 370 371 343 344 360 398 420 1099 1299 1389 1067 1429 1792 1826 6325 6373 6406 6490 6499 496 373 663 1459 6259 6337 334 1744 6447 171 338 1059 1091 824 335 1586 1721 1807 1984 6059 6276 6531 1485 1754 1468 1189 323 328 6363

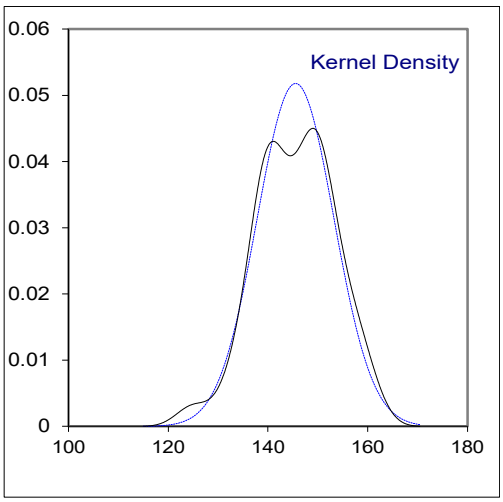

Kernel Density
7
6
5
4
3
2
1
0
883
883.5
884
884.5

Determination of Flash Point PMcc on sample #23205; results in °C

lab	method	value	mark	z(targ)	remarks
120	D93-C	137.8		-1.48	
171	D93-C	133.0		-2.39	
311		-----		-----	
312		-----		-----	
323	D93-C	141.5		-0.77	
328		-----		-----	
333	D93-C	148.0		0.47	
334	D93-C	150.5		0.94	
335		-----		-----	
338		-----		-----	
343	ISO2719-C	152		1.23	
344	D93-C	149.5		0.75	
345	D93-C	149.8		0.81	
360	ISO2719-C	150.0		0.85	
370	D93-C	143.5		-0.39	
371		-----		-----	
373		-----		-----	
398	D93-C	150		0.85	
420	ISO2719-C	148.0		0.47	
447		-----		-----	
496	D93-C	154		1.61	
663	D93-C	141.45		-0.78	
824	D93-C	146.0		0.09	
862	D93-C	145.0		-0.10	
1059	ISO2719-C	140.0		-1.06	
1067	D93-C	139.0		-1.25	
1091	D93-C	142.5		-0.58	
1099	ISO2719-C	133.5		-2.30	
1189	D93-C	145.0		-0.10	
1199		-----		-----	
1299	D93-C	147.5		0.37	
1389	D93-C	150.0		0.85	
1429		-----		-----	
1459	ISO2719-C	160.5		2.85	
1468	ISO2719-C	138.5		-1.34	
1485		-----		-----	
1557	ISO2719-C	125.0	C	-3.91	First reported 170.5
1586	D93-C	136.9		-1.65	
1656	D93-C	138.5		-1.34	
1721		-----		-----	
1739		-----		-----	
1740	D93-C	151		1.04	
1744		-----		-----	
1754		-----		-----	
1756		-----		-----	
1792	ISO2719-C	154.0		1.61	
1807	ISO2719-C	153		1.42	
1826	D93-C	140.5		-0.96	
1984	ISO2719-C	156.5		2.09	
6001		-----		-----	
6059	D93-C	140		-1.06	
6259		-----		-----	
6265		-----		-----	
6276		-----		-----	
6325	ISO2719-C	148		0.47	
6337		-----		-----	
6363		-----		-----	
6373	D93-C	140.0		-1.06	
6406	ISO2719-C	140.5		-0.96	
6447		-----		-----	
6490	D93-C	158.0		2.37	
6499	D93-C	158		2.37	
6505		-----		-----	
6531		-----		-----	

	normality	OK
	n	39
	outliers	0
	mean (n)	145.55
	st.dev. (n)	7.704
	R(calc.)	21.57
	st.dev.(D93-C:20)	5.250
	R(D93-C:20)	14.7
compare		
	R(ISO2719-C:16)	14.7

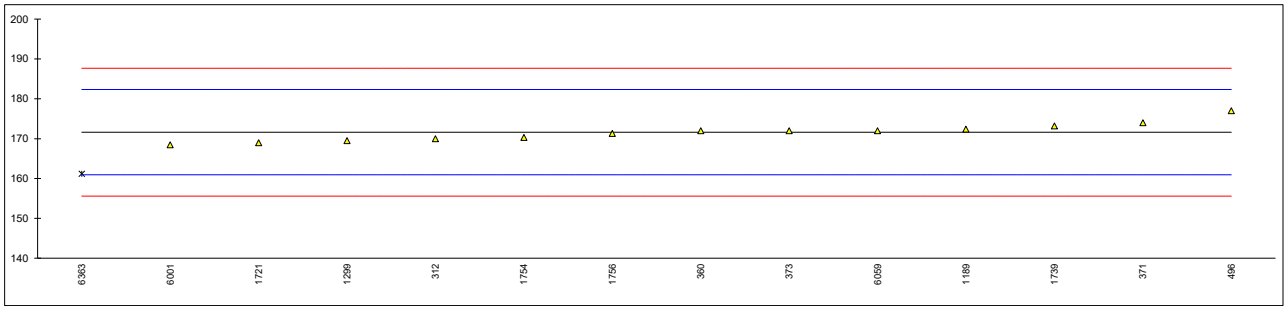

165
160
155
150
145
140
135
130
125
120
1557
171
1099
1586
120
1468
1656
1067
1059
6059
6373
1826
6406
663
323
1091
370
862
1189
824
1299
420
333
6325
344
345
398
360
1389
334
1740
343
1807
496
1792
1984
6490
6499
1459

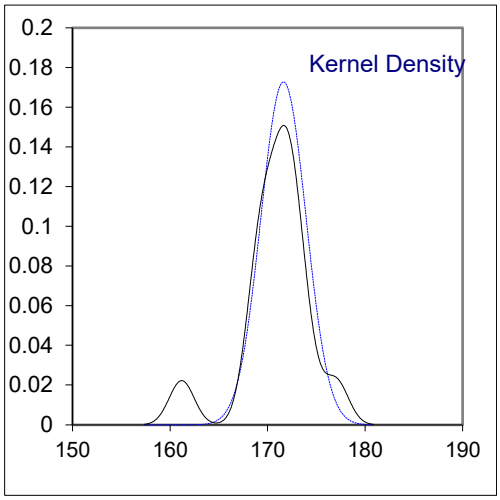

Kernel Density
0.06
0.05
0.04
0.03
0.02
0.01
0
100
120
140
160
180

Determination of Flash Point recc on sample #23205; results in °C

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171		-----		-----	
311		-----		-----	
312	ISO3679	170		-0.30	
323		-----		-----	
328		-----		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
343		-----		-----	
344		-----		-----	
345		-----		-----	
360	ISO3679	172.0		0.07	
370		-----		-----	
371	ISO3679	174.0		0.44	
373	ISO3679	172		0.07	
398		-----		-----	
420		-----		-----	
447		-----		-----	
496	ISO3679	177		1.00	
663		-----		-----	
824		-----		-----	
862		-----		-----	
1059		-----		-----	
1067		-----		-----	
1091		-----		-----	
1099		-----		-----	
1189	ISO3679	172.4		0.14	
1199		-----		-----	
1299	ISO3679	169.5		-0.40	
1389		-----		-----	
1429		-----		-----	
1459		-----		-----	
1468		-----		-----	
1485		-----		-----	
1557		-----		-----	
1586		-----		-----	
1656		-----		-----	
1721	ISO3679	169.0		-0.49	
1739	ISO3679	173.22		0.30	
1740		-----		-----	
1744		-----		-----	
1754	ISO3679	170.32		-0.24	
1756	ISO3679	171.3		-0.06	
1792		-----		-----	
1807		-----		-----	
1826		-----		-----	
1984		-----		-----	
6001	ISO3679	168.455		-0.59	
6059	ISO3679	172		0.07	
6259		-----		-----	
6265		-----		-----	
6276		-----		-----	
6325		-----		-----	
6337		-----		-----	
6363	ISO3679	161.2	G(0.05)	-1.95	
6373		-----		-----	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505		-----		-----	
6531		-----		-----	

normality	suspect
n	13
outliers	1
mean (n)	171.63
st.dev. (n)	2.309
R(calc.)	6.47
st.dev.(ISO3679:22)	5.357
R(ISO3679:22)	15.0

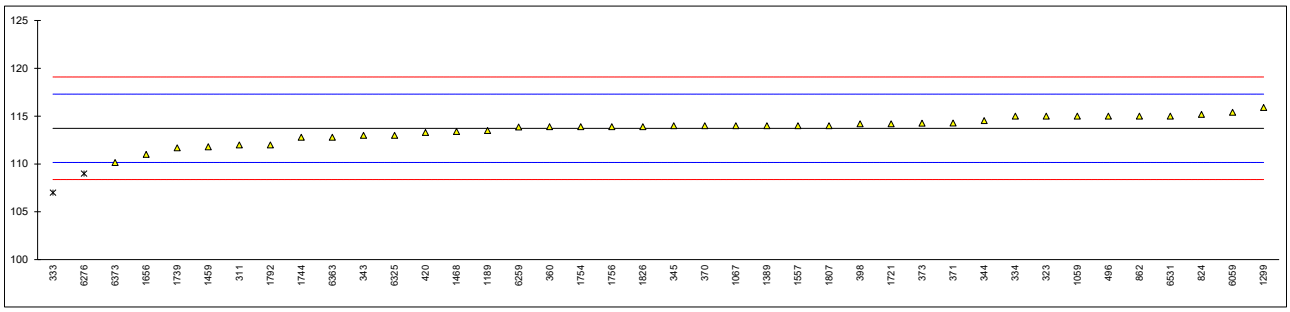

200
190
180
170
160
150
140
6363
6001
1721
1299
312
1754
1756
360
373
6059
1189
1739
371
496

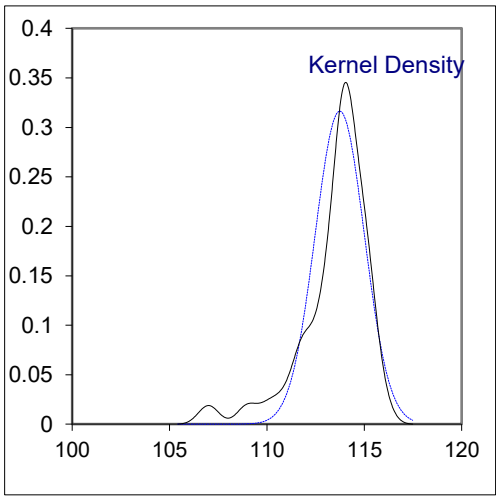

Kernel Density
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
150
160
170
180
190

Determination of Iodine Value on sample #23205; results in g I_2/100 g

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171		-----		-----	
311	EN14111	112		-0.97	
312		-----		-----	
323	EN14111	115		0.71	
328		-----		-----	
333	EN14111	107	R(0.01)	-3.77	
334	EN14111	115		0.71	
335		-----		-----	
338		-----		-----	
343	EN14111	113		-0.41	
344	EN14111	114.55		0.46	
345	EN14111	114		0.15	
360	EN14111	113.9		0.09	
370	EN14111	114		0.15	
371	EN14111	114.3		0.32	
373	EN14111	114.27		0.30	
398	EN14111	114.2		0.26	
420	EN14111	113.3		-0.24	
447		-----		-----	
496	EN14111	115		0.71	
663		-----		-----	
824	EN14111	115.2		0.82	
862	EN14111	115		0.71	
1059	EN14111	115		0.71	
1067	EN14111	114		0.15	
1091		-----		-----	
1099		-----		-----	
1189	EN14111	113.5		-0.13	
1199		-----		-----	
1299	EN14111	115.9		1.21	
1389	EN14111	114		0.15	
1429		-----		-----	
1459	EN16300	111.8		-1.08	
1468	EN14111	113.4		-0.19	
1485		-----		-----	
1557	EN14111	114		0.15	
1586		-----		-----	
1656	EN14111	111		-1.53	
1721	EN14111	114.2		0.26	
1739	EN14111	111.7		-1.14	
1740		-----		-----	
1744	EN14111	112.8		-0.52	
1754	EN14111	113.9		0.09	
1756	EN14111	113.9		0.09	
1792	EN14111	112		-0.97	
1807	EN16300	114		0.15	
1826	EN14111	113.9		0.09	
1984		-----		-----	
6001		-----		-----	
6059	EN14111	115.4		0.93	
6259	EN14111	113.86		0.07	
6265		-----		-----	
6276	EN16300	109	R(0.05)	-2.65	
6325	EN14111	113		-0.41	
6337		-----		-----	
6363	EN14111	112.8		-0.52	
6373	EN14111	110.15		-2.01	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505		-----		-----	
6531	EN14111	115		0.71	

normality	OK
n	38
outliers	2
mean (n)	113.74
st.dev. (n)	1.261
R(calc.)	3.53
st.dev.(EN14111:22)	1.786
R(EN14111:22)	5

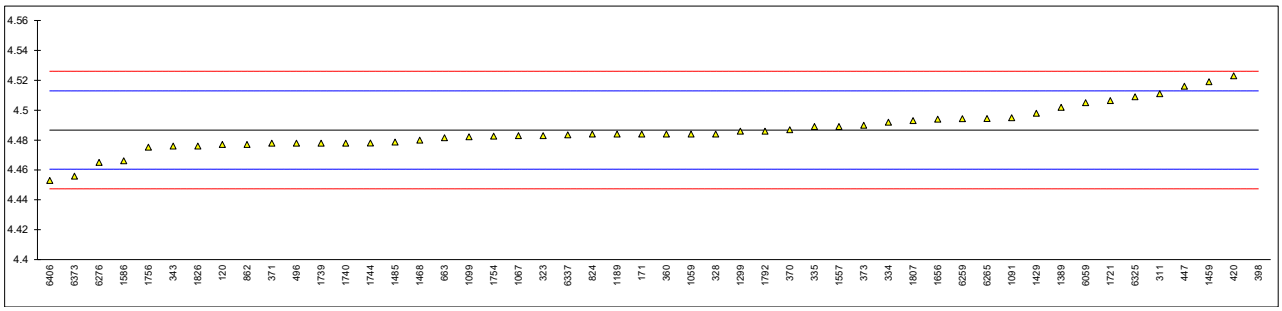

125
120
115
110
105
100
333
6276
6373
1656
1739
1459
311
1792
1744
6363
343
6325
420
1468
1189
6259
360
1754
1756
1826
345
370
1067
1389
1557
1807
398
1721
373
371
344
334
323
1059
496
862
6531
824
6059
1299

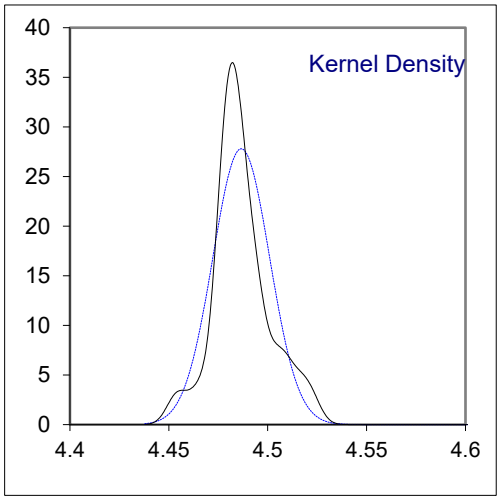

Kernel Density
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
100
105
110
115
120

Determination of Kinematic Viscosity at 40 °C on sample #23205; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
120	D445	4.477		-0.74	
171	D445	4.484		-0.21	
311	D445	4.511		1.85	
312		-----		-----	
323	ISO3104-B	4.483		-0.28	
328	ISO3104-A	4.484		-0.21	
333		-----		-----	
334	ISO3104-A	4.492		0.40	
335	ISO3104-A	4.489		0.17	
338		-----		-----	
343	ISO3104-B	4.476		-0.82	
344		-----		-----	
345		-----		-----	
360	D445	4.484		-0.21	
370	ISO3104-A	4.487		0.02	
371	ISO3104-A	4.478		-0.66	
373	ISO3104-A	4.490		0.25	
398	ISO3104-A	4.7132	R(0.01)	17.27	
420	ISO3104-A	4.523		2.77	
447	IP71	4.516		2.23	
496	ISO3104-B	4.478		-0.66	
663	D445	4.4816		-0.39	
824	ISO3104-B	4.484		-0.21	
862	ISO3104-A	4.477		-0.74	
1059	ISO3104-B	4.484	C	-0.21	First reported 3.484
1067	ISO3104-A	4.483		-0.28	
1091	ISO3104-B	4.495		0.63	
1099	ISO3104-A	4.4822	C	-0.34	First reported 4.5702
1189	ISO3104-A	4.484		-0.21	
1199		-----		-----	
1299	D445	4.486		-0.05	
1389	D445	4.502		1.17	
1429	D445	4.498		0.86	
1459	D7042	4.5191		2.47	
1468	EN16896	4.480		-0.51	
1485	D445	4.4786		-0.62	
1557	ISO3104-A	4.489		0.17	
1586	D445	4.4662		-1.56	
1656	ISO3104	4.494		0.56	
1721	ISO3104-A	4.5064		1.50	
1739	ISO3104-A	4.4780		-0.66	
1740	ISO3104-A	4.478		-0.66	
1744	D445	4.4781		-0.66	
1754	ISO3104-A	4.4826		-0.31	
1756	ISO3104-A	4.4752		-0.88	
1792	ISO3104-B	4.486		-0.05	
1807	ISO3104-A	4.493		0.48	
1826	ISO3104-A	4.476		-0.82	
1984		-----		-----	
6001		-----		-----	
6059	ISO3104-B	4.505		1.39	
6259	D445	4.4943		0.58	
6265	ISO16896	4.4944		0.59	
6276	ISO16896	4.465		-1.66	
6325	D445	4.509		1.70	
6337	ISO3104-B	4.4835		-0.25	
6363		-----		-----	
6373	D445	4.4559		-2.35	
6406	D445	4.453		-2.57	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505		-----		-----	
6531		-----		-----	

	normality	OK
	n	49
	outliers	1
	mean (n)	4.4867
	st.dev. (n)	0.01435
	R(calc.)	0.0402
	st.dev.(ISO3104-A:23)	0.01311
	R(ISO3104-A:23)	0.0367
compare		
	R(D445:23)	0.1005

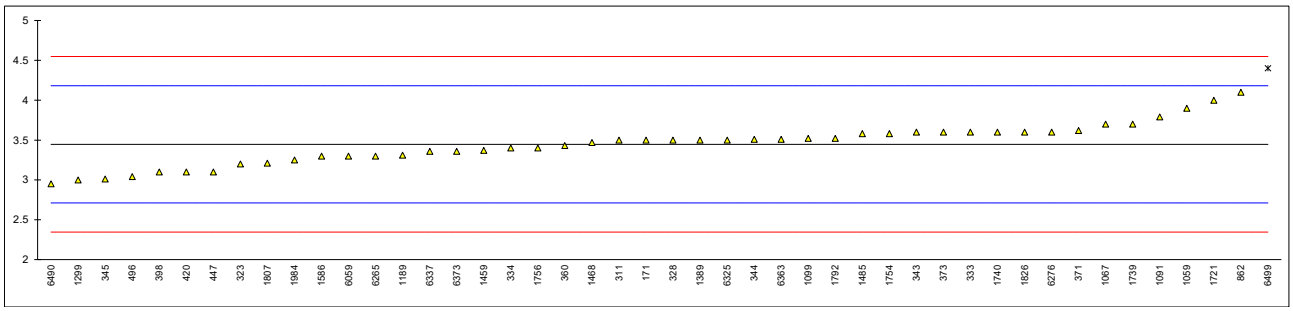

4.56
4.54
4.52
4.5
4.48
4.46
4.44
4.42
4.4
6406 6373 6276 1586 1756 343 1826 120 862 371 496 1739 1740 1744 1485 1468 663 1099 1754 1067 323 6337 824 1189 171 360 1059 328 1299 1792 370 335 1557 373 334 1807 1656 6259 6265 1091 1429 1389 6059 1721 6325 311 447 1459 420 398

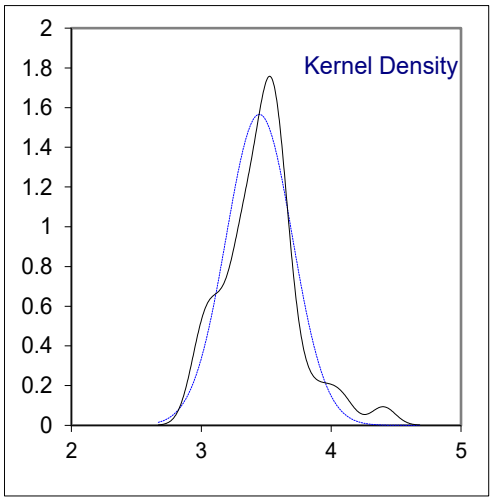

Kernel Density
40
35
30
25
20
15
10
5
0
4.4
4.45
4.5
4.55
4.6

Determination of Oxidation Stability Induction period on sample #23205; results in hours

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	EN15751	3.5		0.15	
311	EN15751	3.5		0.15	
312		-----		-----	
323	EN15751	3.2		-0.67	
328	EN15751	3.5		0.15	
333	EN14112	3.6		0.42	
334	EN15751	3.4		-0.13	
335		-----		-----	
338		-----		-----	
343	EN15751	3.6		0.42	
344	EN14112	3.51		0.17	
345	EN15751	3.01		-1.19	
360	EN14112	3.43		-0.04	
370		-----		-----	
371	EN14112	3.62		0.47	
373	EN14112	3.60		0.42	
398	EN14112	3.1		-0.94	
420	EN15751	3.1		-0.94	
447	EN15751	3.1		-0.94	
496	EN15751	3.04		-1.11	
663		-----		-----	
824		-----		-----	
862	EN14112	4.1		1.78	
1059	EN15751	3.9		1.23	
1067	EN14112	3.7		0.69	
1091	EN14112	3.79		0.94	
1099	EN15751	3.52		0.20	
1189	EN15751	3.31		-0.37	
1199		-----		-----	
1299	EN15751	3.0		-1.22	
1389	EN15751	3.5		0.15	
1429		-----		-----	
1459	EN15751	3.37		-0.21	
1468	EN14112	3.47		0.06	
1485	EN14112	3.58		0.36	
1557		-----		-----	
1586	EN14112	3.3		-0.40	
1656		-----		-----	
1721	EN14112	4.0		1.51	
1739	EN14112	3.70		0.69	
1740	EN15751	3.6		0.42	
1744		-----		-----	
1754	EN14112	3.58		0.36	
1756	EN14112	3.4		-0.13	
1792	EN15751	3.52		0.20	
1807	EN15751	3.21		-0.64	
1826	EN15751	3.6		0.42	
1984	EN15751	3.25		-0.53	
6001		-----		-----	
6059	EN15751	3.3		-0.40	
6259		-----		-----	
6265	EN15751	3.30		-0.40	
6276	EN15751	3.6		0.42	
6325	EN15751	3.5		0.15	
6337	EN15751	3.36		-0.24	
6363	EN15751	3.51		0.17	
6373	EN15751	3.36		-0.24	
6406		-----		-----	
6447		-----		-----	
6490	EN14112	2.95		-1.35	
6499	EN15751	4.40	R(0.05)	2.60	
6505		-----		-----	
6531		-----		-----	

	normality	OK
	n	45
	outliers	1
	mean (n)	3.446
	st.dev. (n)	0.2546
	R(calc.)	0.713
	st.dev.(EN15751:14)	0.3674
	R(EN15751:14)	1.029
compare		
	R(EN14112:20)	1.126

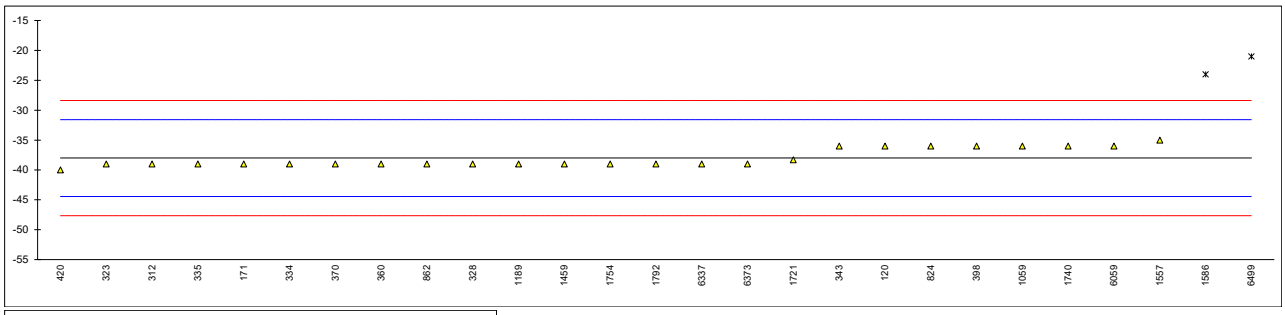

5
4.5
4
3.5
3
2.5
2
6490 1299 345 496 398 420 447 323 1807 1984 1586 6059 6265 1189 6337 6373 1459 334 1756 360 1468 311 171 328 1389 6325 344 6363 1099 1792 1485 1754 343 373 333 1740 1826 6276 371 1067 1739 1091 1059 1721 862 6499

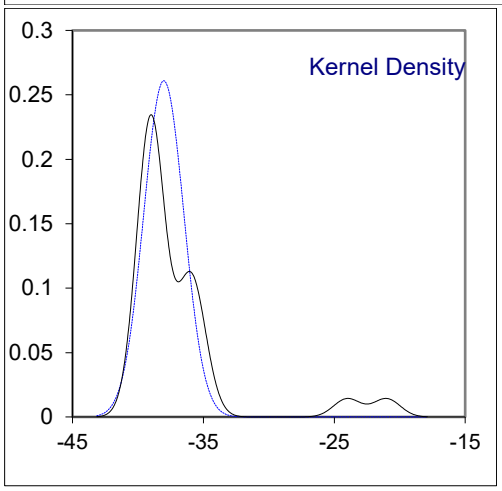

Kernel Density
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2
3
4
5

Determination of Pour Point on sample #23205; results in °C

lab	method	value	mark	z(targ)	remarks
120	D97	-36		0.63	
171	D5950	-39		-0.31	
311		-----		-----	
312	ISO3016	-39		-0.31	
323	ISO3016	-39		-0.31	
328	ISO3016	-39		-0.31	
333		-----		-----	
334	ISO3016	-39		-0.31	
335	ISO3016	-39		-0.31	
338		-----		-----	
343	ISO3016	-36		0.63	
344		-----		-----	
345		-----		-----	
360	ISO3016	-39		-0.31	
370	ISO3016	-39		-0.31	
371		-----		-----	
373		-----		-----	
398	ISO3016	-36		0.63	
420	ISO3016	-40		-0.62	
447		-----		-----	
496		-----		-----	
663	D97	<-36		-----	
824	ISO3016	-36		0.63	
862	ISO3016	-39		-0.31	
1059	ISO3016	-36		0.63	
1067		-----		-----	
1091		-----		-----	
1099		-----		-----	
1189	ISO3016	-39		-0.31	
1199		-----		-----	
1299		-----		-----	
1389	D97	<-21	C	-----	First reported -21
1429	D97	<-30		-----	
1459	In house	-39.0		-0.31	
1468		-----		-----	
1485		-----		-----	
1557	ISO3016	-35	C	0.94	First reported -21
1586	D97	-24	R(0.01)	4.36	
1656		-----		-----	
1721	D5950	-38.3		-0.09	
1739		-----		-----	
1740	ISO3016	-36		0.63	
1744		-----		-----	
1754	ISO3016	-39		-0.31	
1756		-----		-----	
1792	ISO3016	-39		-0.31	
1807		-----		-----	
1826		-----		-----	
1984		-----		-----	
6001		-----		-----	
6059	ISO3016	-36	C	0.63	First reported -18
6259		-----		-----	
6265		-----		-----	
6276		-----		-----	
6325	D97	<-24		-----	
6337	ISO3016	-39		-0.31	
6363		-----		-----	
6373	D97	-39		-0.31	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499	D6749	-21	R(0.01)	5.29	
6505		-----		-----	
6531		-----		-----	

normality	OK
n	25
outliers	2
mean (n)	-38.0
st.dev. (n)	1.53
R(calc.)	4.3
st.dev.(ISO3016:19)	3.21
R(ISO3016:19)	9


-15
-20
-25
-30
-35
-40
-45
-50
-55
420
323
312
335
171
334
370
360
862
328
1189
1459
1754
1792
6337
6373
1721
343
120
824
398
1059
1740
6059
1557
1586
6499


Kernel Density
0.3
0.25
0.2
0.15
0.1
0.05
0
-45
-35
-25
-15

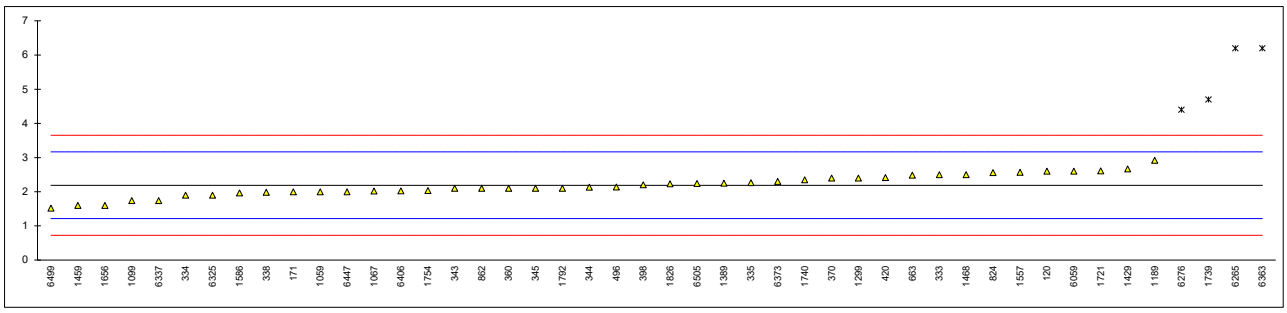
Determination of Sulfated Ash on sample #23205; results in %M/M

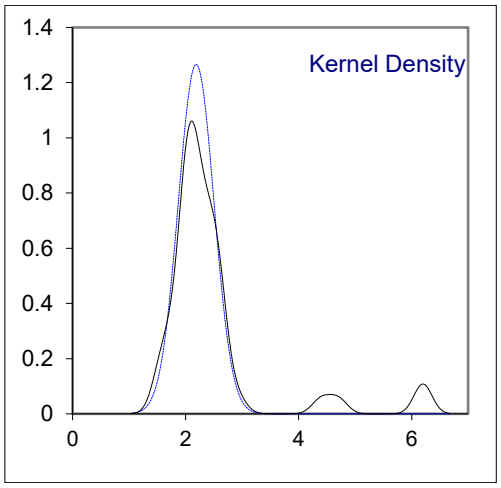
lab	method	value	mark	z(targ)	remarks
120	D874	<0.005		-----	
171	D874	<0.005		-----	
311		-----		-----	
312		-----		-----	
323	D874	<0.005		-----	
328		-----		-----	
333		-----		-----	
334	D874	<0.001		-----	
335		-----		-----	
338		-----		-----	
343	ISO3987	<0.005		-----	
344	D874	<0.01		-----	
345	ISO3987	<0.005		-----	
360	ISO3987	0.0004		-----	
370	ISO3987	<0.001		-----	
371	ISO3987	<0.005		-----	
373		-----		-----	
398	D874	<0.005		-----	
420	ISO3987	<0.005		-----	
447		-----		-----	
496	ISO3987	0		-----	
663		-----		-----	
824	D874	<0.005		-----	
862	D874	<0.005		-----	
1059	ISO3987	<0.005		-----	
1067	ISO3987	0		-----	
1091		-----		-----	
1099		-----		-----	
1189	ISO3987	<0.005		-----	
1199		-----		-----	
1299	ISO3987	<0.005		-----	
1389	D874	<0.005		-----	
1429		-----		-----	
1459	ISO3987	<0.005		-----	
1468	ISO3987	<0.001		-----	
1485		-----		-----	
1557	ISO3987	0.001		-----	
1586	D874	0.0012		-----	
1656	D874	<0.01		-----	
1721	ISO3987	<0.005		-----	
1739	ISO3987	0.0000		-----	
1740		-----		-----	
1744		-----		-----	
1754	ISO3987	< 0.005		-----	
1756	ISO3987	0.001		-----	
1792	ISO3987	0.001		-----	
1807	ISO3987	0.0014		-----	
1826		-----		-----	
1984		-----		-----	
6001		-----		-----	
6059	D874	0.002		-----	
6259		-----		-----	
6265		-----		-----	
6276		-----		-----	
6325	ISO3987	0.001		-----	
6337	ISO3987	<0.005		-----	
6363		-----		-----	
6373		-----		-----	
6406	ISO3987	0.0008		-----	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505		-----		-----	
6531		-----		-----	
	n	33			
	mean (n)	<0.005			Application limit ASTM D874:23 >0.005%M/M

Determination of Sulfur on sample #23205; results in mg/kg

lab	method	value	mark	z(targ)	remarks
120	D5453	2.6		0.85	
171	D5453	2.0		-0.38	
311	ISO20846	<3		-----	
312		-----		-----	
323	ISO20846	<3.0		-----	
328	ISO20846	<3		-----	
333	ISO20846	2.5		0.64	
334	ISO20846	1.9		-0.59	
335	ISO20846	2.262		0.15	
338	ISO20846	1.984		-0.42	
343	ISO20846	2.1		-0.18	
344	D5453	2.133		-0.11	
345	ISO20846	2.1		-0.18	
360	D5453	2.10		-0.18	
370	ISO20846	2.4		0.44	
371		-----		-----	
373		-----		-----	
398	ISO20846	2.2		0.03	
420	ISO20846	2.41		0.46	
447	IP490	<3.0		-----	
496	ISO20884	2.14		-0.10	
663	D5453	2.485		0.61	
824	ISO20846	2.56		0.76	
862	ISO20846	2.1		-0.18	
1059	ISO20846	2.0		-0.38	
1067	ISO20846	2.02		-0.34	
1091		-----		-----	
1099	ISO20846	1.74		-0.92	
1189	D5453	2.92		1.50	
1199		-----		-----	
1299	ISO20884	2.4		0.44	
1389	ISO20846	2.25		0.13	
1429	IP490	2.67		0.99	
1459	ISO20884	1.6		-1.20	
1468	ISO20846	2.5		0.64	
1485		-----		-----	
1557	ISO20846	2.57		0.79	
1586	D5453	1.967		-0.45	
1656	ISO20846	1.6		-1.20	
1721	ISO20846	2.61		0.87	
1739	ISO13032	4.70	C,R(0.01)	5.15	First reported 3.50
1740	ISO20846	2.35		0.33	
1744		-----		-----	
1754	ISO20846	2.038		-0.31	
1756		-----		-----	
1792	ISO20846	2.1		-0.18	
1807		-----		-----	
1826	ISO20846	2.23		0.09	
1984	ISO20846	<3		-----	
6001		-----		-----	
6059	ISO20846	2.6		0.85	
6259		-----		-----	
6265	ISO13032	6.2	R(0.01)	8.23	
6276	ISO13032	4.4	R(0.01)	4.54	
6325	ISO20846	1.9		-0.59	
6337	ISO20846	1.74		-0.92	
6363	ISO13032	6.2	R(0.01)	8.23	
6373	ISO20846	2.3		0.23	
6406	ISO20846	2.025		-0.33	
6447	D5453	2		-0.38	
6490		-----		-----	
6499	D7220	1.52		-1.37	
6505	ISO20846	2.24		0.11	
6531		-----		-----	

	normality	OK
	n	42
	outliers	4
	mean (n)	2.187
	st.dev. (n)	0.3150
	R(calc.)	0.882
	st.dev.(ISO20846:19)	0.4875
	R(ISO20846:19)	1.365
compare		
	R(D5453:19a)	1.043

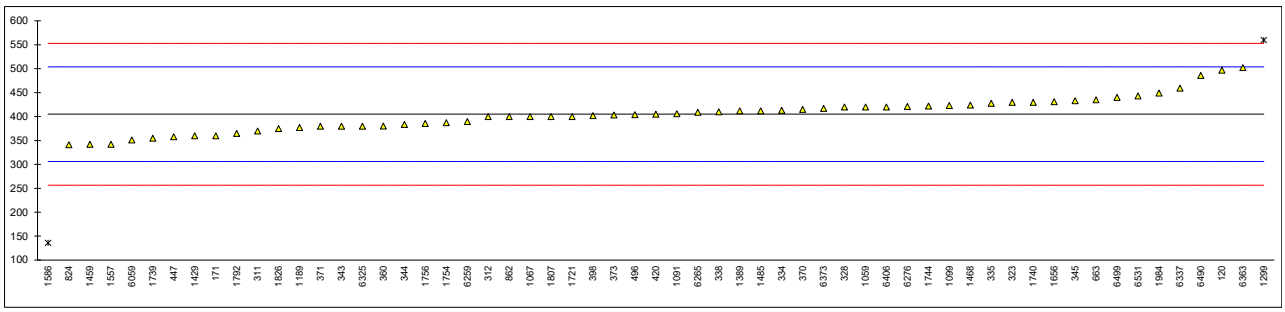

7
6
5
4
3
2
1
0
6499
1459
1656
1099
6337
334
6325
1586
338
171
1059
6447
1067
6406
1754
343
862
360
345
1792
344
496
398
1826
6505
1389
335
6373
1740
370
1299
420
663
333
1468
824
1557
120
6059
1721
1429
1189
6276
1739
6265
6363

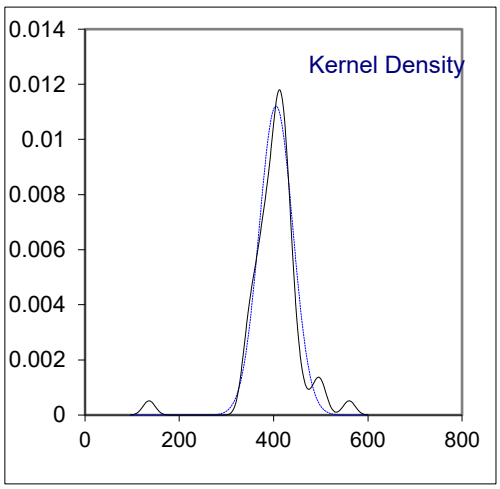

Kernel Density
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
2
4
6

Determination of Water on sample #23205; results in mg/kg

lab	method	value	mark	z(targ)	remarks
120	ISO12937	497		1.86	
171	D6304-A:20	360		-0.91	
311	ISO12937	370		-0.71	
312	ISO12937	400		-0.10	
323	ISO12937	430		0.51	
328	ISO12937	420		0.30	
333		-----		-----	
334	ISO12937	413		0.16	
335	ISO12937	427.9		0.46	
338	ISO12937	410		0.10	
343	ISO12937	380		-0.51	
344	ISO12937	383.5		-0.43	
345	ISO12937	433		0.57	
360	ISO12937	380.3		-0.50	
370	ISO12937	415		0.20	
371	ISO12937	380		-0.51	
373	ISO12937	403.4		-0.03	
398	ISO12937	402		-0.06	
420	ISO12937	405		0.00	
447	IP438	358		-0.95	
496	ISO12937	404		-0.02	
663	ISO12937	435.2		0.61	
824	ISO12937	341		-1.29	
862	ISO12937	400		-0.10	
1059	ISO12937	420		0.30	
1067	ISO12937	400		-0.10	
1091	ISO12937	406		0.02	
1099	ISO12937	423		0.36	
1189	ISO12937	377		-0.57	
1199		-----		-----	
1299	ISO12937	560	R(0.01)	3.14	
1389	ISO12937	412		0.14	
1429	IP438	359.52		-0.92	
1459	ISO12937	342		-1.27	
1468	ISO12937	424		0.38	
1485	ISO12937	412.2		0.15	
1557	ISO12937	342		-1.27	
1586	ISO12937	136	R(0.01)	-5.44	
1656	ISO12937	431		0.53	
1721	ISO12937	400.2		-0.10	
1739	ISO12937	354.62		-1.02	
1740	D6304-A:20	430		0.51	
1744	E203	422		0.34	
1754	ISO12937	387.24		-0.36	
1756	ISO12937	385.6		-0.39	
1792	ISO12937	364.8		-0.81	
1807	ISO12937	400		-0.10	
1826	ISO12937	375		-0.61	
1984	ISO12937	449	C	0.89	First reported 649
6001		-----		-----	
6059	IP439	351		-1.09	
6259	ISO12937	389.422		-0.31	
6265	ISO12937	408.99		0.08	
6276	ISO12937	421		0.32	
6325	ISO12937	380		-0.51	
6337	ISO12937	459.8		1.11	
6363	ISO12937	502.4		1.97	
6373	ISO12937	417		0.24	
6406	ISO12937	420		0.30	
6447		-----		-----	
6490	ISO12937	486.0	C	1.64	First reported 574.5
6499	D6304-A:20	440.08		0.71	
6505		-----		-----	
6531	ISO12937	443		0.77	

	normality	OK
	n	57
	outliers	2
	mean (n)	404.99
	st.dev. (n)	35.597
	R(calc.)	99.67
	st.dev.(ISO12937:00)	49.427
	R(ISO12937:00)	138.39
compare		
	R(D6304-A:20)	161.46


600
550
500
450
400
350
300
250
200
150
100
1586 824 1459 1557 6059 1739 447 1429 171 1792 311 1826 1189 371 343 6325 360 344 1756 1754 6259 312 862 1067 1807 1721 398 373 496 420 1091 6265 338 1389 1485 334 370 6373 328 1059 6406 6276 1744 1099 1468 335 323 1740 1656 345 663 6499 6531 1984 6337 6490 120 6363 1299


Kernel Density
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
0
200
400
600
800

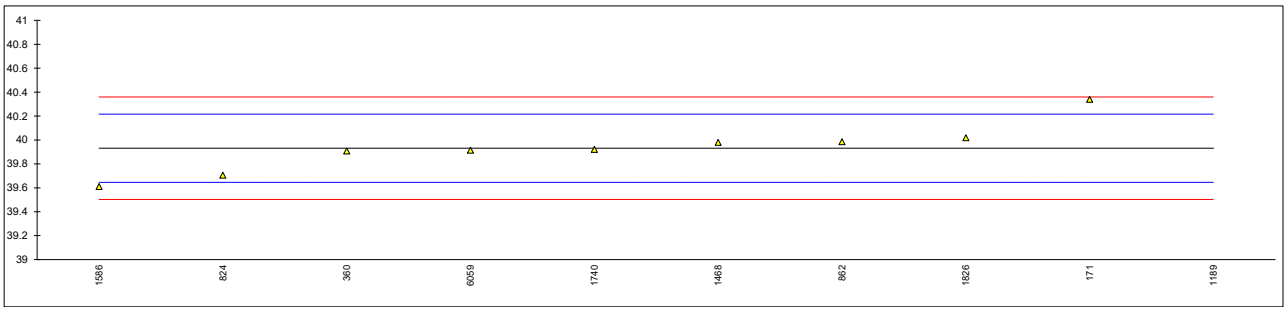
Determination of Water and Sediment on sample #23205; results in %V/V

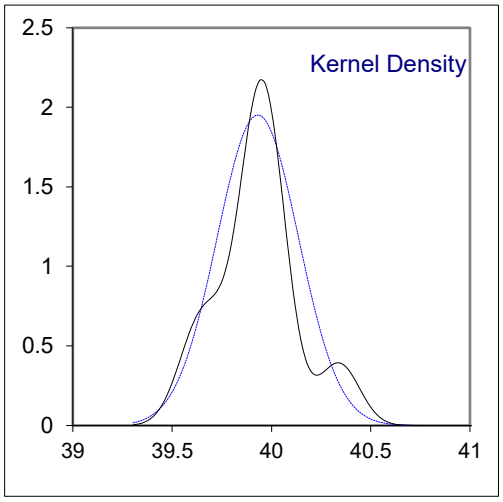
lab	method	value	mark	z(targ)	remarks
120	D2709	<0.01		-----	
171	D2709	<0.01		-----	
311		-----		-----	
312		-----		-----	
323	D2709	<0.01		-----	
328		-----		-----	
333		-----		-----	
334	D2709	<0.01		-----	
335		-----		-----	
338		-----		-----	
343		-----		-----	
344		-----		-----	
345		-----		-----	
360		-----		-----	
370		-----		-----	
371		-----		-----	
373		-----		-----	
398	D2709	0.005		-----	
420		-----		-----	
447		-----		-----	
496		-----		-----	
663	D2709	<0.01		-----	
824	D2709	<0.01		-----	
862	D2709	<0.05		-----	
1059	D2709	<0.05		-----	
1067		-----		-----	
1091		-----		-----	
1099		-----		-----	
1189	D2709	<0.05		-----	
1199		-----		-----	
1299		-----		-----	
1389	D2709	<0.025		-----	
1429		-----		-----	
1459		-----		-----	
1468		-----		-----	
1485		-----		-----	
1557	ISO3734	0.0		-----	
1586	D2709	<0.05		-----	
1656		-----		-----	
1721		-----		-----	
1739		-----		-----	
1740	D2709	<0.01		-----	
1744		-----		-----	
1754		-----		-----	
1756		-----		-----	
1792		-----		-----	
1807		-----		-----	
1826		-----		-----	
1984		-----		-----	
6001		-----		-----	
6059	D2709	<0.005		-----	
6259		-----		-----	
6265		-----		-----	
6276		-----		-----	
6325		-----		-----	
6337		-----		-----	
6363		-----		-----	
6373		-----		-----	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505		-----		-----	
6531		-----		-----	
	n	10			
	mean (n)	<0.01			Application limit ASTM D2709:22 >0.01%V/V

Determination of Calorific Value Gross at constant volume ($H_{o,v}$) on sample #23205; results in MJ/kg

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	D240	40.34		2.86	
311		-----		-----	
312		-----		-----	
323		-----		-----	
328		-----		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
343		-----		-----	
344		-----		-----	
345		-----		-----	
360	D240	39.907		-0.17	
370		-----		-----	
371		-----		-----	
373		-----		-----	
398		-----		-----	
420		-----		-----	
447		-----		-----	
496		-----		-----	
663		-----		-----	
824	KSM2057	39.706	C	-1.58	First reported 9485.2 kJ/kg
862	D240	39.985		0.38	
1059		-----		-----	
1067		-----		-----	
1091		-----		-----	
1099		-----		-----	
1189	D4868	45.030	G(0.01)	35.69	
1199		-----		-----	
1299		-----		-----	
1389		-----		-----	
1429		-----		-----	
1459		-----		-----	
1468	DIN51900-3	39.979		0.34	
1485		-----		-----	
1557		-----		-----	
1586	D240	39.61		-2.25	
1656		-----		-----	
1721		-----		-----	
1739		-----		-----	
1740	D240	39.920		-0.08	
1744		-----		-----	
1754		-----		-----	
1756		-----		-----	
1792		-----		-----	
1807		-----		-----	
1826	D240	40.018		0.61	
1984		-----		-----	
6001		-----		-----	
6059	D240	39.915		-0.11	
6259		-----		-----	
6265		-----		-----	
6276		-----		-----	
6325		-----		-----	
6337		-----		-----	
6363		-----		-----	
6373		-----		-----	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505		-----		-----	
6531		-----		-----	

normality	suspect
n	9
outliers	1
mean (n)	39.9311
st.dev. (n)	0.20454
R(calc.)	0.5727
st.dev.(D240:19)	0.14286
R(D240:19)	0.40


41
40.8
40.6
40.4
40.2
40
39.8
39.6
39.4
39.2
39
1586
824
360
6059
1740
1468
862
1826
171
1189


Kernel Density
2.5
2
1.5
1
0.5
0
39
39.5
40
40.5
41

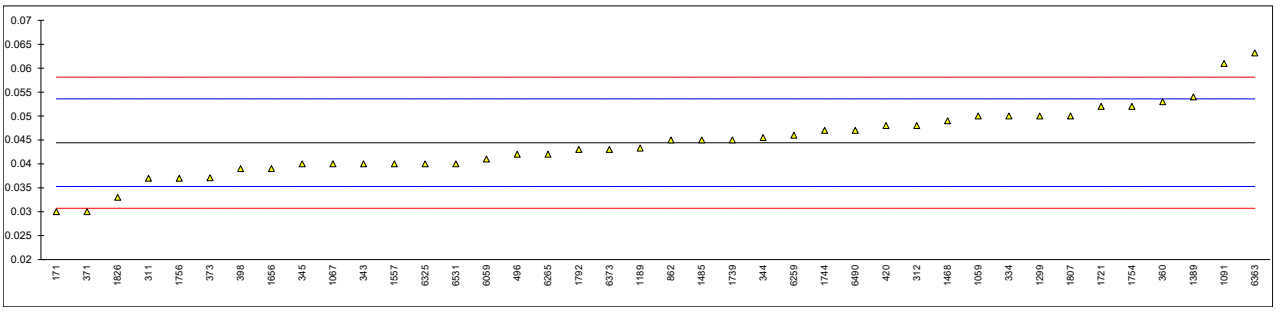
Determination of Distillation at 10 mmHg, % recovered as AET on sample #23205; results in °C

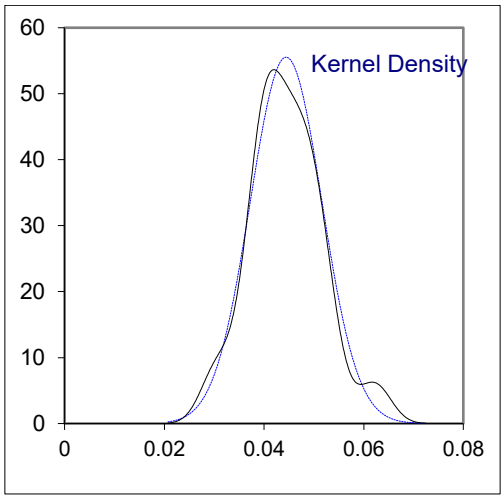
lab	method	80%rec.	mark	z(targ)	90%rec.	mark	z(targ)	95%rec.	mark	z(targ)
120		-----		-----	-----		-----	-----		-----
171	D1160	353		-----	357		-----	367		-----
311		-----		-----	-----		-----	-----		-----
312		-----		-----	-----		-----	-----		-----
323		-----		-----	-----		-----	-----		-----
328		-----		-----	-----		-----	-----		-----
333		-----		-----	-----		-----	-----		-----
334		352.9		-----	-----		-----	-----		-----
335		-----		-----	-----		-----	-----		-----
338		-----		-----	-----		-----	-----		-----
343		-----		-----	-----		-----	-----		-----
344		-----		-----	-----		-----	-----		-----
345		-----		-----	-----		-----	-----		-----
360		-----		-----	-----		-----	-----		-----
370		-----		-----	-----		-----	-----		-----
371		-----		-----	-----		-----	-----		-----
373		-----		-----	-----		-----	-----		-----
398		-----		-----	-----		-----	-----		-----
420		-----		-----	-----		-----	-----		-----
447		-----		-----	-----		-----	-----		-----
496		-----		-----	-----		-----	-----		-----
663		-----		-----	-----		-----	-----		-----
824		-----		-----	-----		-----	-----		-----
862		-----		-----	-----		-----	-----		-----
1059		-----		-----	-----		-----	-----		-----
1067		-----		-----	-----		-----	-----		-----
1091		-----		-----	-----		-----	-----		-----
1099		-----		-----	-----		-----	-----		-----
1189	D1160	361.3	G(0.01)	-----	364.8		-----	407.4		-----
1199		-----		-----	-----		-----	-----		-----
1299		-----		-----	-----		-----	-----		-----
1389		-----		-----	-----		-----	-----		-----
1429		-----		-----	-----		-----	-----		-----
1459		-----		-----	-----		-----	-----		-----
1468		-----		-----	-----		-----	-----		-----
1485		-----		-----	-----		-----	-----		-----
1557		-----		-----	-----		-----	-----		-----
1586	D1160	352.9		-----	355.1		-----	364.4		-----
1656		-----		-----	-----		-----	-----		-----
1721		-----		-----	-----		-----	-----		-----
1739		-----		-----	-----		-----	-----		-----
1740		-----		-----	-----		-----	-----		-----
1744		-----		-----	-----		-----	-----		-----
1754		-----		-----	-----		-----	-----		-----
1756		-----		-----	-----		-----	-----		-----
1792		-----		-----	-----		-----	-----		-----
1807		-----		-----	-----		-----	-----		-----
1826		-----		-----	-----		-----	-----		-----
1984		-----		-----	-----		-----	-----		-----
6001		-----		-----	-----		-----	-----		-----
6059		-----		-----	-----		-----	-----		-----
6259		-----		-----	-----		-----	-----		-----
6265		-----		-----	-----		-----	-----		-----
6276		-----		-----	-----		-----	-----		-----
6325		-----		-----	-----		-----	-----		-----
6337		-----		-----	-----		-----	-----		-----
6363		-----		-----	-----		-----	-----		-----
6373		-----		-----	-----		-----	-----		-----
6406		-----		-----	-----		-----	-----		-----
6447		-----		-----	-----		-----	-----		-----
6490		-----		-----	-----		-----	-----		-----
6499		-----		-----	-----		-----	-----		-----
6505		-----		-----	-----		-----	-----		-----
6531		-----		-----	-----		-----	-----		-----
	normality	unknown			unknown			unknown		
	n	3			3			3		
	outliers	1			0			0		
	mean (n)	352.93			358.97			379.60		
	st.dev. (n)	0.058			5.140			24.111		
	R(calc.)	0.16			14.39			67.51		
	st.dev.(D1160:18)	(1.657)			(1.657)			(1.657)		
	R(D1160:18)	(4.64)			(4.64)			(4.64)		

Determination of Methanol on sample #23205; results in %M/M

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	EN14110	0.03		-3.15	
311	EN14110	0.037		-1.62	
312	EN14110	0.048		0.78	
323		-----		-----	
328		-----		-----	
333		-----		-----	
334	EN14110	0.05		1.22	
335		-----		-----	
338		-----		-----	
343	EN14110	0.04		-0.97	
344	EN14110	0.0455		0.23	
345	EN14110	0.04		-0.97	
360	EN14110	0.053		1.87	
370		-----		-----	
371	EN14110	0.03		-3.15	
373	EN14110	0.0371		-1.60	
398	EN14110	0.039		-1.19	
420	EN14110	0.048		0.78	
447		-----		-----	
496	EN14110	0.042		-0.53	
663		-----		-----	
824		-----		-----	
862	EN14110	0.045		0.13	
1059	EN14110	0.05		1.22	
1067	EN14110	0.04	C	-0.97	First reported 0.07
1091	EN14110	0.061		3.62	
1099		-----		-----	
1189	EN14110	0.0433		-0.25	
1199		-----		-----	
1299	EN14110	0.05		1.22	
1389	EN14110	0.054		2.09	
1429		-----		-----	
1459		-----		-----	
1468	EN14110	0.049		1.00	
1485	EN14110	0.045		0.13	
1557	EN14110	0.04		-0.97	
1586		-----		-----	
1656	EN14110	0.039		-1.19	
1721	EN14110	0.052		1.65	
1739	EN14110	0.045		0.13	
1740		-----		-----	
1744	EN14110	0.047		0.56	
1754	EN14110	0.052		1.65	
1756	EN14110	0.037		-1.62	
1792	EN14110	0.043		-0.31	
1807	EN14110	0.05		1.22	
1826	EN14110	0.033		-2.50	
1984		-----		-----	
6001		-----		-----	
6059	EN14110	0.041		-0.75	
6259	EN14110	0.046		0.34	
6265	EN14110	0.042		-0.53	
6276		-----		-----	
6325	EN14110	0.04		-0.97	
6337		-----		-----	
6363	EN14110	0.0632		4.10	
6373	EN14110	0.043		-0.31	
6406		-----		-----	
6447		-----		-----	
6490	EN14110	0.047		0.56	
6499		-----		-----	
6505		-----		-----	
6531	EN14110	0.04		-0.97	

normality	OK
n	40
outliers	0
mean (n)	0.04443
st.dev. (n)	0.007182
R(calc.)	0.02011
st.dev.(EN14110:19)	0.004578
R(EN14110:19)	0.01282

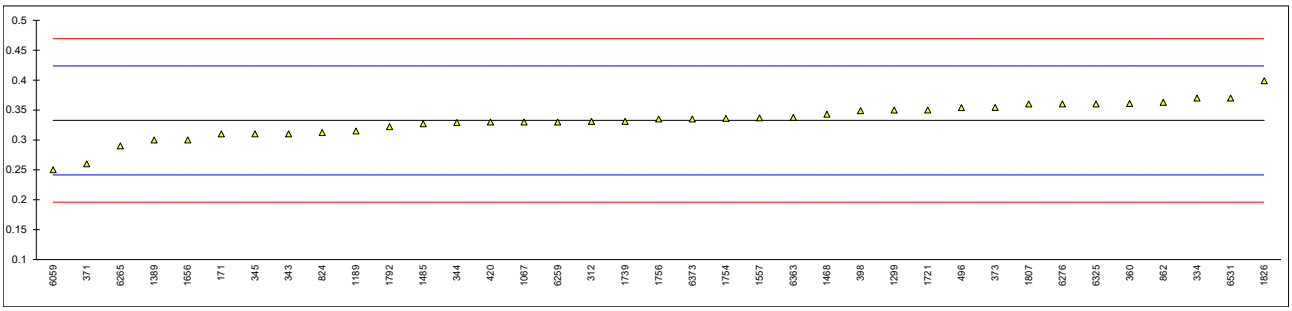

0.07
0.065
0.06
0.055
0.05
0.045
0.04
0.035
0.03
0.025
0.02
171 371 1826 311 1756 373 398 1656 345 1067 343 1557 6325 6531 6059 496 6265 1792 6373 1189 862 1485 1739 344 6259 1744 6490 420 312 1468 1059 334 1299 1807 1721 1754 360 1389 1091 6363

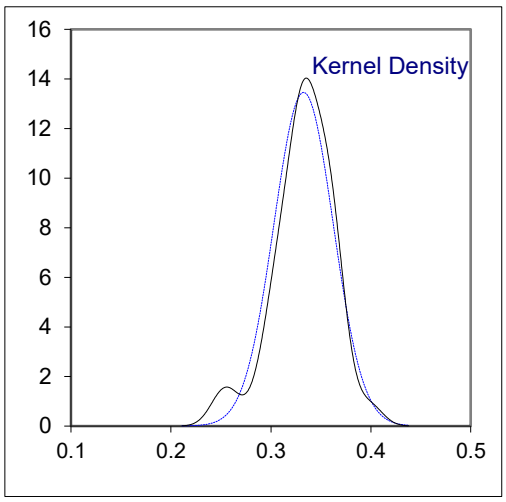

Kernel Density
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08

Determination of Monoglycerides on sample #23205; results in %M/M

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	EN14105	0.31		-0.50	
311		-----		-----	
312	EN14105	0.331		-0.04	
323		-----		-----	
328		-----		-----	
333		-----		-----	
334	EN14105	0.37		0.82	
335		-----		-----	
338		-----		-----	
343	EN14105	0.31		-0.50	
344	EN14105	0.3292		-0.08	
345	EN14105	0.31		-0.50	
360	EN14105	0.361		0.62	
370		-----		-----	
371	EN14105	0.26		-1.60	
373	EN14105	0.3543		0.47	
398	EN14105	0.349		0.36	
420	EN14105	0.33	C	-0.06	First reported 0.45
447		-----		-----	
496	EN14105	0.354		0.47	
663		-----		-----	
824	D6584	0.3125	C	-0.44	First reported 0.3114
862	EN14105	0.363		0.66	
1059		-----		-----	
1067	EN14105	0.33		-0.06	
1091		-----		-----	
1099		-----		-----	
1189	EN14105	0.315		-0.39	
1199		-----		-----	
1299	EN14105	0.35		0.38	
1389	EN14105	0.30		-0.72	
1429		-----		-----	
1459		-----		-----	
1468	EN14105	0.343		0.23	
1485	EN14105	0.327		-0.13	
1557	EN14105	0.337		0.09	
1586		-----		-----	
1656	EN14105	0.30		-0.72	
1721	EN14105	0.35		0.38	
1739	EN14105	0.331		-0.04	
1740		-----		-----	
1744		-----		-----	
1754	EN14105	0.336		0.07	
1756	EN14105	0.335		0.05	
1792	EN14105	0.322		-0.24	
1807	EN14105	0.36		0.60	
1826	EN14105	0.399		1.45	
1984		-----		-----	
6001		-----		-----	
6059	EN14105	0.250		-1.82	
6259	D6584	0.330		-0.06	
6265	EN14105	0.29		-0.94	
6276	EN14105	0.36		0.60	
6325	EN14105	0.36		0.60	
6337		-----		-----	
6363	EN14105	0.3376		0.11	
6373	EN14105	0.335		0.05	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505		-----		-----	
6531	EN14105	0.37		0.82	

normality	suspect
n	37
outliers	0
mean (n)	0.33275
st.dev. (n)	0.029641
R(calc.)	0.08299
st.dev.(EN14105:20)	0.045544
R(EN14105:20)	0.12752

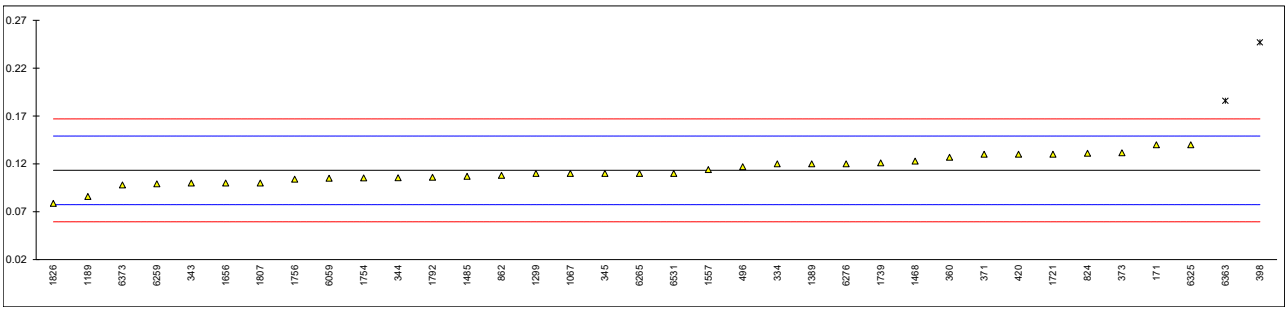

0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
6059
371
6265
1389
1656
171
345
343
824
1189
1792
1485
344
420
1067
6259
312
1739
1756
6373
1754
1557
6363
1468
398
1299
1721
496
373
1807
6276
6325
360
862
334
6531
1826

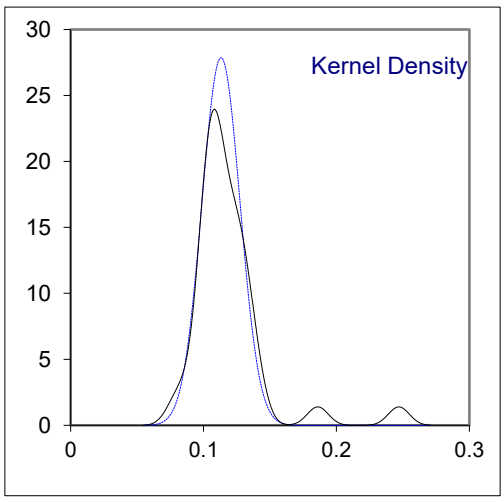

Kernel Density
16
14
12
10
8
6
4
2
0
0.1
0.2
0.3
0.4
0.5

Determination of Diglycerides on sample #23205; results in %M/M

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	EN14105	0.14		1.50	
311		-----		-----	
312	EN14105	<0.10		-----	
323		-----		-----	
328		-----		-----	
333		-----		-----	
334	EN14105	0.12		0.38	
335		-----		-----	
338		-----		-----	
343	EN14105	0.1		-0.73	
344	EN14105	0.1056		-0.42	
345	EN14105	0.11		-0.18	
360	EN14105	0.127		0.77	
370		-----		-----	
371	EN14105	0.13		0.94	
373	EN14105	0.1316		1.03	
398	EN14105	0.247	R(0.01)	7.46	
420	EN14105	0.13		0.94	
447		-----		-----	
496	EN14105	0.117		0.21	
663		-----		-----	
824	D6584	0.1311	C	1.00	First reported 0.0511
862	EN14105	0.108		-0.29	
1059		-----		-----	
1067	EN14105	0.11		-0.18	
1091		-----		-----	
1099		-----		-----	
1189	EN14105	0.086		-1.51	
1199		-----		-----	
1299	EN14105	0.11		-0.18	
1389	EN14105	0.12		0.38	
1429		-----		-----	
1459		-----		-----	
1468	EN14105	0.123		0.55	
1485	EN14105	0.107		-0.34	
1557	EN14105	0.114		0.05	
1586		-----		-----	
1656	EN14105	0.10		-0.73	
1721	EN14105	0.13		0.94	
1739	EN14105	0.121		0.44	
1740		-----		-----	
1744		-----		-----	
1754	EN14105	0.1054		-0.43	
1756	EN14105	0.104		-0.51	
1792	EN14105	0.106		-0.40	
1807	EN14105	0.10		-0.73	
1826	EN14105	0.0787		-1.92	
1984		-----		-----	
6001		-----		-----	
6059	EN14105	0.105		-0.45	
6259	D6584	0.099		-0.79	
6265	EN14105	0.11		-0.18	
6276	EN14105	0.12		0.38	
6325	EN14105	0.14		1.50	
6337		-----		-----	
6363	EN14105	0.186	R(0.01)	4.06	
6373	EN14105	0.098		-0.85	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505		-----		-----	
6531	EN14105	0.11		-0.18	

normality	OK
n	34
outliers	2
mean (n)	0.11316
st.dev. (n)	0.014321
R(calc.)	0.04010
st.dev.(EN14105:20)	0.017939
R(EN14105:20)	0.05023

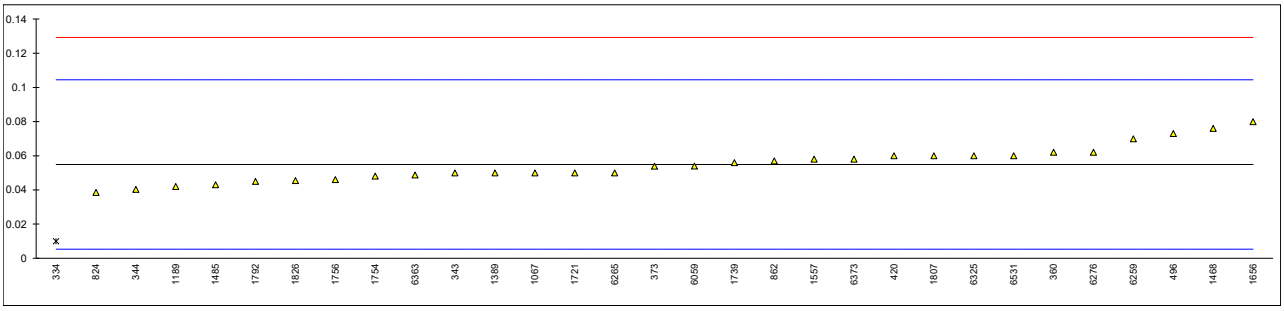

0.27
0.22
0.17
0.12
0.07
0.02
1826
1189
6373
6259
343
1656
1807
1756
6059
1754
344
1792
1485
862
1299
1067
345
6265
6531
1557
496
334
1389
6276
1739
1468
360
371
420
1721
824
373
171
6325
6363
398

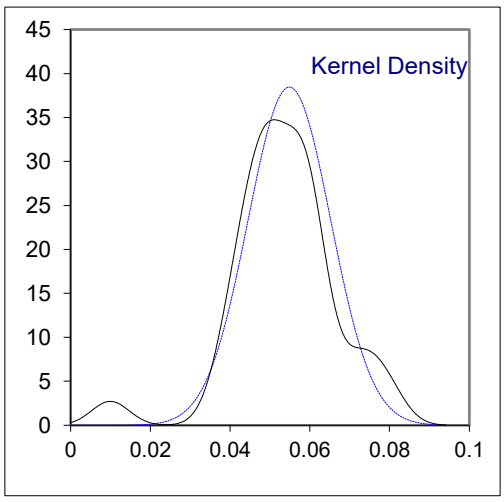

Kernel Density
30
25
20
15
10
5
0
0
0.1
0.2
0.3

Determination of Triglycerides on sample #23205; results in %M/M

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	EN14105	<0.10		-----	
311		-----		-----	
312	EN14105	<0.10		-----	
323		-----		-----	
328		-----		-----	
333		-----		-----	
334	EN14105	0.01	R(0.01)	-1.81	
335		-----		-----	
338		-----		-----	
343	EN14105	0.05		-0.20	
344	EN14105	0.0403		-0.59	
345	EN14105	<0.10		-----	
360	EN14105	0.062		0.29	
370		-----		-----	
371	EN14105	<0.10		-----	
373	EN14105	0.0539		-0.04	
398	EN14105	<0.01		-----	
420	EN14105	0.06		0.21	
447		-----		-----	
496	EN14105	0.073		0.73	
663		-----		-----	
824	D6584	0.0386	C	-0.66	First reported 0.0434
862	EN14105	0.057		0.08	
1059		-----		-----	
1067	EN14105	0.05		-0.20	
1091		-----		-----	
1099		-----		-----	
1189	EN14105	0.042		-0.52	
1199		-----		-----	
1299	EN14105	<0.10		-----	
1389	EN14105	0.05		-0.20	
1429		-----		-----	
1459		-----		-----	
1468	EN14105	0.076		0.85	
1485	EN14105	0.043		-0.48	
1557	EN14105	0.058		0.12	
1586		-----		-----	
1656	EN14105	0.08		1.01	
1721	EN14105	0.05		-0.20	
1739	EN14105	0.056		0.04	
1740		-----		-----	
1744		-----		-----	
1754	EN14105	0.0481		-0.27	
1756	EN14105	0.046		-0.36	
1792	EN14105	0.045		-0.40	
1807	EN14105	0.06		0.21	
1826	EN14105	0.0455		-0.38	
1984		-----		-----	
6001		-----		-----	
6059	EN14105	0.054		-0.04	
6259	D6584	0.070		0.61	
6265	EN14105	0.05		-0.20	
6276	EN14105	0.062		0.29	
6325	EN14105	0.06		0.21	
6337		-----		-----	
6363	EN14105	0.0487		-0.25	
6373	EN14105	0.058		0.12	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505		-----		-----	
6531	EN14105	0.06		0.21	

normality	OK
n	30
outliers	1
mean (n)	0.05490
st.dev. (n)	0.010372
R(calc.)	0.02904
st.dev.(EN14105:20)	0.024807
R(EN14105:20)	0.06946

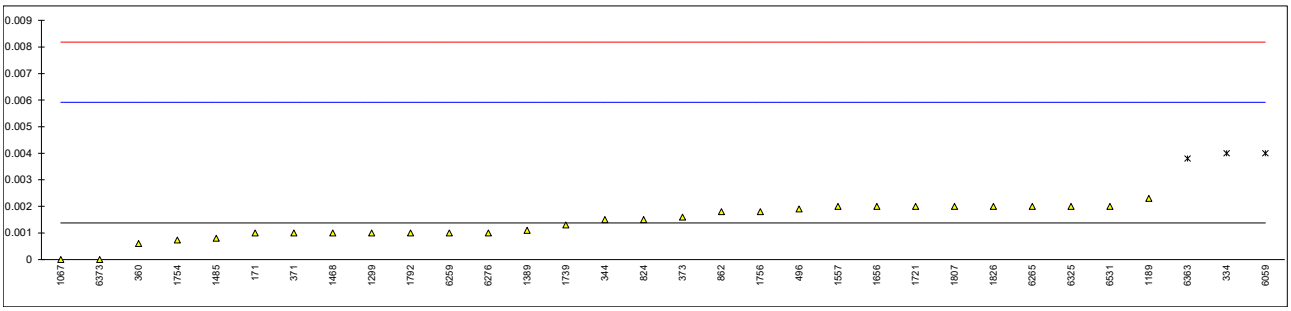

0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
334
824
344
1189
1485
1792
1826
1756
1754
6363
343
1389
1067
1721
6265
373
6059
1739
862
1557
6373
420
1807
6325
6531
360
6276
6259
496
1468
1656

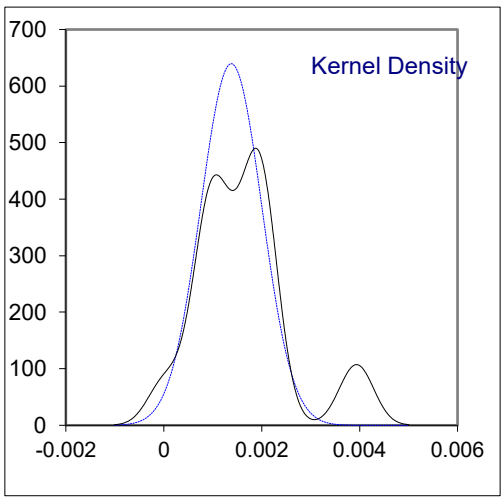

Kernel Density
45
40
35
30
25
20
15
10
5
0
0
0.02
0.04
0.06
0.08
0.1

Determination of Free Glycerol on sample #23205; results in %M/M

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	EN14105	0.001		-0.17	
311		-----		-----	
312	EN14105	<0.001		-----	
323		-----		-----	
328		-----		-----	
333		-----		-----	
334	EN14105	0.004	R(0.05)	1.16	
335		-----		-----	
338		-----		-----	
343	EN14105	<0.005		-----	
344	EN14105	0.0015		0.05	
345	EN14105	<0.001		-----	
360	EN14105	0.0006		-0.34	
370		-----		-----	
371	EN14105	0.001		-0.17	
373	EN14105	0.0016		0.10	
398	EN14105	<0.01		-----	
420	EN14105	<0,005		-----	
447		-----		-----	
496	EN14105	0.0019		0.23	
663		-----		-----	
824	D6584	0.0015		0.05	
862	EN14105	0.0018		0.19	
1059		-----		-----	
1067	EN14105	0		-0.61	
1091		-----		-----	
1099		-----		-----	
1189	EN14105	0.0023		0.41	
1199		-----		-----	
1299	EN14105	0.001		-0.17	
1389	EN14105	0.0011		-0.12	
1429		-----		-----	
1459		-----		-----	
1468	EN14105	0.0010		-0.17	
1485	EN14105	0.0008		-0.25	
1557	EN14105	0.002		0.27	
1586		-----		-----	
1656	EN14105	0.002		0.27	
1721	EN14105	0.002		0.27	
1739	EN14105	0.0013		-0.03	
1740		-----		-----	
1744		-----		-----	
1754	EN14105	0.00073		-0.29	
1756	EN14105	0.0018		0.19	
1792	EN14105	0.001		-0.17	
1807	EN14105	0.002		0.27	
1826	EN14105	0.002		0.27	
1984		-----		-----	
6001		-----		-----	
6059	EN14105	0.004	R(0.05)	1.16	
6259	D6584	0.001		-0.17	
6265	EN14105	0.002		0.27	
6276	EN14105	0.001		-0.17	
6325	EN14105	0.002		0.27	
6337		-----		-----	
6363	EN14105	0.0038	R(0.05)	1.07	
6373	EN14105	0.000		-0.61	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505		-----		-----	
6531	EN14105	0.002		0.27	

normality	OK
n	29
outliers	3
mean (n)	0.00138
st.dev. (n)	0.000624
R(calc.)	0.00175
st.dev.(EN14105:20)	0.002269
R(EN14105:20)	0.00635

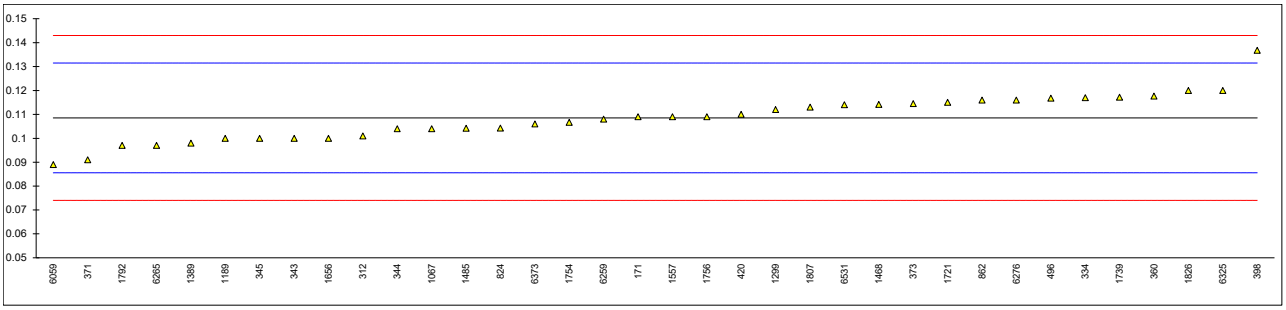

0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
1067
6373
360
1754
1485
171
371
1468
1299
1792
6259
6276
1389
1739
344
824
373
862
1756
496
1557
1656
1721
1807
1826
6265
6325
6531
1189
6363
334
6059

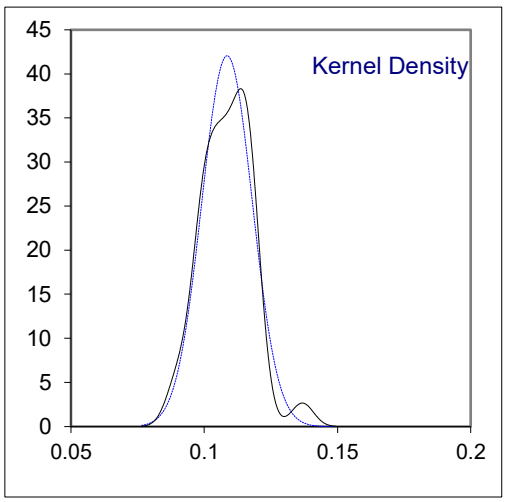

Kernel Density
700
600
500
400
300
200
100
0
-0.002
0
0.002
0.004
0.006

Determination of Total Glycerol on sample #23205; results in %M/M

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	EN14105	0.109		0.04	
311		-----		-----	
312	EN14105	0.101		-0.66	
323		-----		-----	
328		-----		-----	
333		-----		-----	
334	EN14105	0.117		0.74	
335		-----		-----	
338		-----		-----	
343	EN14105	0.1		-0.74	
344	EN14105	0.1040		-0.40	
345	EN14105	0.10		-0.74	
360	EN14105	0.1177		0.80	
370		-----		-----	
371	EN14105	0.091		-1.53	
373	EN14105	0.1145		0.52	
398	EN14105	0.1368		2.46	
420	EN14105	0.110	C	0.13	First reported 0.140
447		-----		-----	
496	EN14105	0.1168		0.72	
663		-----		-----	
824	D6584	0.1043	C	-0.37	First reported 0.0928
862	EN14105	0.1160		0.65	
1059		-----		-----	
1067	EN14105	0.104		-0.40	
1091		-----		-----	
1099		-----		-----	
1189	EN14105	0.100		-0.74	
1199		-----		-----	
1299	EN14105	0.112		0.30	
1389	EN14105	0.098		-0.92	
1429		-----		-----	
1459		-----		-----	
1468	EN14105	0.1142		0.49	
1485	EN14105	0.1042		-0.38	
1557	EN14105	0.109		0.04	
1586		-----		-----	
1656	EN14105	0.10		-0.74	
1721	EN14105	0.115		0.56	
1739	EN14105	0.1172		0.75	
1740		-----		-----	
1744		-----		-----	
1754	EN14105	0.1067		-0.16	
1756	EN14105	0.1090		0.04	
1792	EN14105	0.097		-1.01	
1807	EN14105	0.113		0.39	
1826	EN14105	0.120		1.00	
1984		-----		-----	
6001		-----		-----	
6059	EN14105	0.089		-1.70	
6259	D6584	0.108		-0.05	
6265	EN14105	0.097		-1.01	
6276	EN14105	0.116		0.65	
6325	EN14105	0.120		1.00	
6337		-----		-----	
6363		-----		-----	
6373	EN14105	0.106		-0.22	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505		-----		-----	
6531	EN14105	0.114		0.48	

normality	suspect
n	36
outliers	0
mean (n)	0.10854
st.dev. (n)	0.009485
R(calc.)	0.02656
st.dev.(EN14105:20)	0.011480
R(EN14105:20)	0.03214

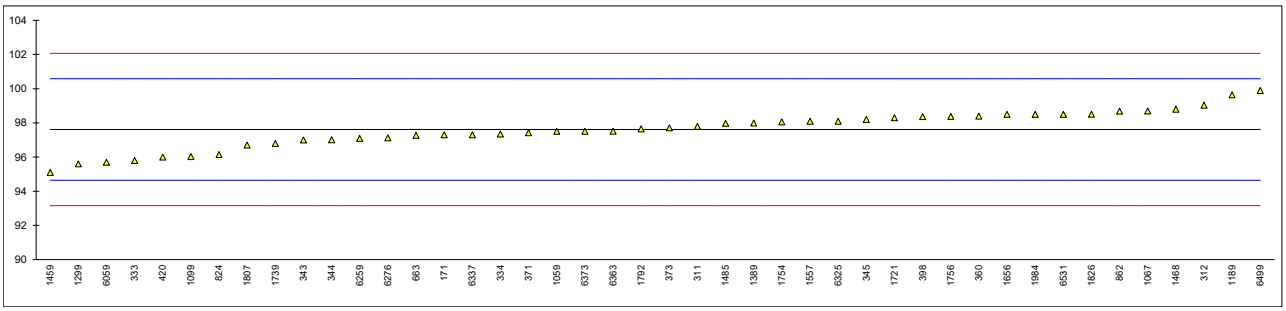

0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
6059 371 1792 6265 1389 1189 345 343 1656 312 344 1067 1485 824 6373 1754 6259 171 1557 1756 420 1299 1807 6531 1468 373 1721 862 6276 496 334 1739 360 1826 6325 398

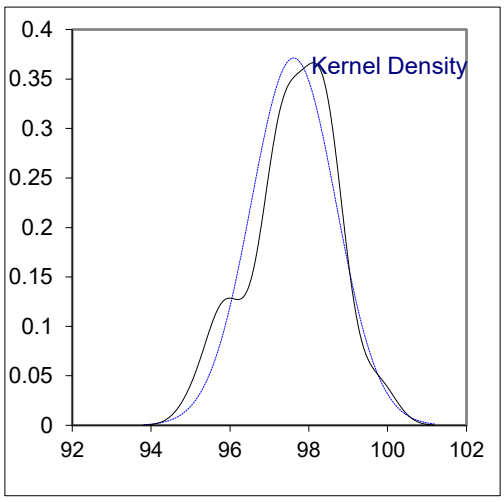

Kernel Density
45
40
35
30
25
20
15
10
5
0
0.05
0.1
0.15
0.2

Determination of Total Ester content (FAME) on sample #23205; results in %M/M

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	EN14103:2020	97.3		-0.21	
311	EN14103:2020	97.8		0.12	
312	EN14103:2011	99.04		0.96	
323		-----		-----	
328		-----		-----	
333	EN14103:2020	95.8		-1.22	
334	EN14103:2020	97.34		-0.18	
335		-----		-----	
338		-----		-----	
343	EN14103:2020	97.0		-0.41	
344	EN14103:2020	97.01		-0.41	
345	EN14103:2020	98.2		0.39	
360	EN14103:2020	98.39		0.52	
370		-----		-----	
371	EN14103:2020	97.42		-0.13	
373	EN14103:2020	97.71		0.06	
398	EN14103:2020	98.37		0.51	
420	EN14103:2020	96.0		-1.09	
447		-----		-----	
496		-----		-----	
663	EN14103:2020	97.27		-0.23	
824	EN14103:2020	96.15		-0.99	
862	EN14103:2020	98.68		0.72	
1059	EN14103:2020	97.5		-0.08	
1067	EN14103:2011	98.7		0.73	
1091		-----		-----	
1099	EN14103:2011	96.02		-1.07	
1189	EN14103:2011	99.64		1.36	
1199		-----		-----	
1299	EN14103:2020	95.6		-1.36	
1389	EN14103:2011	98.0		0.26	
1429		-----		-----	
1459	EN14103:2020	95.1		-1.69	
1468	EN14103:2011	98.8		0.80	
1485	EN14103:2011	97.97		0.24	
1557	EN14103:2020	98.1		0.33	
1586		-----		-----	
1656	EN14103:2011	98.5		0.60	
1721	EN14103:2020	98.3		0.46	
1739	EN14103:2011	96.79		-0.55	
1740		-----		-----	
1744		-----		-----	
1754	EN14103:2020	98.057		0.30	
1756	EN14103:2020	98.38		0.52	
1792	EN14103:2011	97.65		0.02	
1807	EN14103:2020	96.7		-0.62	
1826	EN14103:2020	98.51		0.60	
1984	EN14103:2020	98.5		0.60	
6001		-----		-----	
6059	EN14103:2020	95.7		-1.29	
6259	EN14103:2020	97.10		-0.35	
6265		-----		-----	
6276	EN14103:2011	97.12		-0.33	
6325	EN14103:2011	98.1		0.33	
6337	EN14103:2020	97.3		-0.21	
6363	EN14103:2020	97.52		-0.06	
6373	EN14103:2011	97.5		-0.08	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499	D7806	99.9		1.54	
6505		-----		-----	
6531	EN14103:2011	98.5		0.60	

normality	OK
n	44
outliers	0
mean (n)	97.6145
st.dev. (n)	1.07460
R(calc.)	3.0089
st.dev.(EN14103:20)	1.48571
R(EN14103:20)	4.16

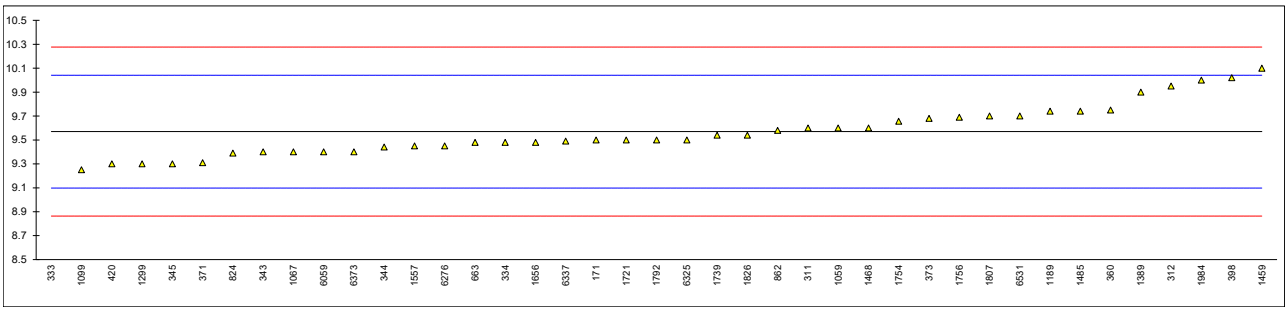

104
102
100
98
96
94
92
90
1459
1299
6059
333
420
1099
824
1807
1739
343
344
6259
6276
663
171
6337
334
371
1059
6373
6383
1792
373
311
1485
1389
1754
1557
6325
345
1721
398
1756
360
1656
1984
6531
1826
862
1067
1468
312
1189
6499

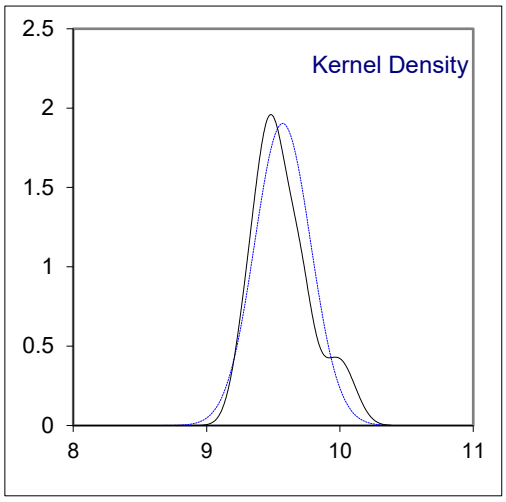

Kernel Density
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
92
94
96
98
100
102

Determination of Linolenic Acid Methyl Ester on sample #23205; results in %M/M

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	EN14103:2020	9.5		-0.30	
311	EN14103:2011	9.6		0.13	
312	EN14103:2011	9.95		1.61	
323		-----		-----	
328		-----		-----	
333	EN14103:2020	6.7	R(0.01)	-12.18	
334	EN14103:2020	9.48		-0.38	
335		-----		-----	
338		-----		-----	
343	EN14103:2020	9.4		-0.72	
344	EN14103:2020	9.44		-0.55	
345	EN14103:2020	9.3		-1.15	
360	EN14103:2020	9.75		0.76	
370		-----		-----	
371	EN14103:2020	9.31		-1.10	
373	EN14103:2020	9.68		0.47	
398	EN14103:2020	10.02		1.91	
420	EN14103:2020	9.3		-1.15	
447		-----		-----	
496		-----		-----	
663	EN14103:2020	9.48		-0.38	
824	EN14103:2020	9.39		-0.76	
862	EN14103:2020	9.58		0.04	
1059	EN14103:2020	9.6		0.13	
1067	EN14103:2011	9.4		-0.72	
1091		-----		-----	
1099	EN14103:2011	9.25		-1.36	
1189	EN14103:2011	9.74		0.72	
1199		-----		-----	
1299		9.3		-1.15	
1389	EN14103:2011	9.9		1.40	
1429		-----		-----	
1459	EN14103:2020	10.1		2.25	
1468	EN14103:2011	9.6		0.13	
1485	EN14103:2011	9.74		0.72	
1557	EN14103:2020	9.45		-0.51	
1586		-----		-----	
1656	EN14103:2011	9.48		-0.38	
1721	EN14103:2020	9.5		-0.30	
1739	EN14103:2011	9.54		-0.13	
1740		-----		-----	
1744		-----		-----	
1754	EN14103:2020	9.656		0.36	
1756	EN14103:2020	9.69		0.51	
1792	EN14103:2020	9.50		-0.30	
1807	EN14103:2020	9.7		0.55	
1826	EN14103:2020	9.54		-0.13	
1984	EN14103:2020	10.0		1.82	
6001		-----		-----	
6059	EN14103:2020	9.4		-0.72	
6259		-----		-----	
6265		-----		-----	
6276	EN14103:2011	9.45		-0.51	
6325	EN14103:2011	9.5		-0.30	
6337	EN14103:2020	9.49		-0.34	
6363		-----		-----	
6373	EN14103:2011	9.4		-0.72	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505		-----		-----	
6531	EN14103:2011	9.7		0.55	

normality	OK
n	40
outliers	1
mean (n)	9.5702
st.dev. (n)	0.20981
R(calc.)	0.5875
st.dev.(EN14103:20)	0.23570
R(EN14103:20)	0.6599

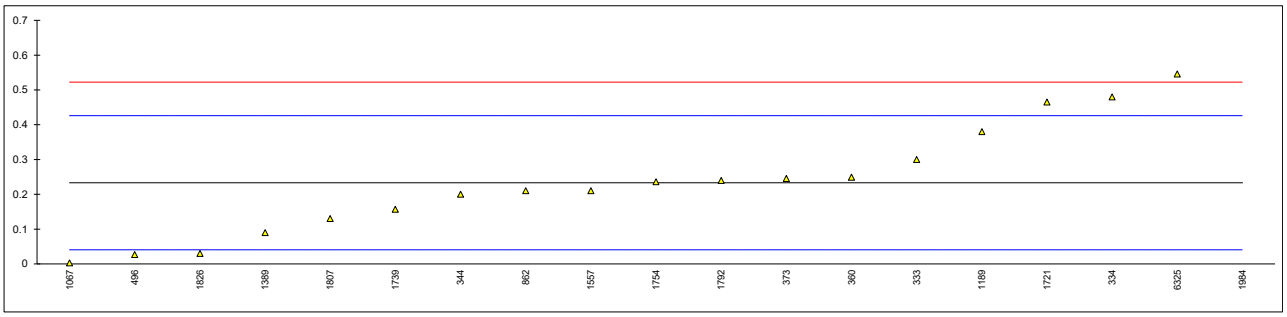

10.5
10.3
10.1
9.9
9.7
9.5
9.3
9.1
8.9
8.7
8.5
333 1099 420 1299 345 371 824 343 1067 6059 6373 344 1557 6276 663 334 1656 6337 171 1721 1792 6325 1739 1826 862 311 1059 1468 1754 373 1756 1807 6531 1189 1485 360 1389 312 1984 398 1459

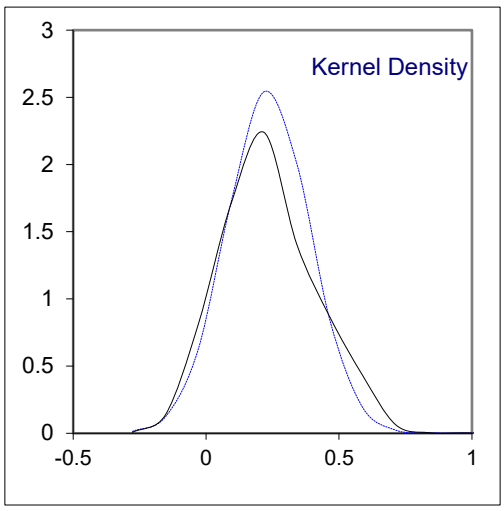

Kernel Density
2.5
2
1.5
1
0.5
0
8
9
10
11

Determination of Polyunsaturated (multiple double bonds) Methyl Esters on sample #23205; results in %M/M

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
171	EN15779	<0.30		-----	
311	EN15779	<0.63		-----	
312	EN15779	<0.6		-----	
323		-----		-----	
328		-----		-----	
333	EN15779	0.3		0.69	
334	EN15779	0.48		2.56	
335		-----		-----	
338		-----		-----	
343	EN15779	<0.3		-----	
344	EN15779	0.20		-0.34	
345	EN15779	<0.30		-----	
360	EN15779	0.249		0.16	
370		-----		-----	
371		-----		-----	
373	EN15779	0.2454		0.13	
398	EN15779	<0.1		-----	
420	EN15779	<0.10		-----	
447		-----		-----	
496	EN15779	0.027		-2.14	
663		-----		-----	
824		-----		-----	
862	EN15779	0.21		-0.24	
1059		-----		-----	
1067	EN15779	0.003		-2.39	
1091		-----		-----	
1099		-----		-----	
1189	EN14103	0.38		1.52	
1199		-----		-----	
1299	EN15779	<0.60		-----	
1389	EN15779	0.09		-1.49	
1429		-----		-----	
1459		-----		-----	
1468	EN15779	<0.3		-----	
1485		-----		-----	
1557	EN15779	0.21		-0.24	
1586		-----		-----	
1656		-----		-----	
1721	EN15779	0.465		2.40	
1739	EN15779	0.157		-0.79	
1740		-----		-----	
1744		-----		-----	
1754	EN15779	0.236		0.03	
1756		-----		-----	
1792	EN15779	0.24		0.07	
1807	EN15779	0.13		-1.07	
1826	EN15779	0.03		-2.11	
1984	EN14103	31.0	G(0.01)	319.06	
6001		-----		-----	
6059	EN15779	<0.5		-----	
6259		-----		-----	
6265		-----		-----	
6276		-----		-----	
6325	EN15779	0.546		3.24	
6337		-----		-----	
6363		-----		-----	
6373		-----		-----	
6406		-----		-----	
6447		-----		-----	
6490		-----		-----	
6499		-----		-----	
6505		-----		-----	
6531		-----		-----	

normality	OK
n	18
outliers	1
mean (n)	0.2332
st.dev. (n)	0.15622
R(calc.)	0.4374
st.dev.(EN15779:09+A1:13)	0.09643
R(EN15779:09+A1:13)	0.27

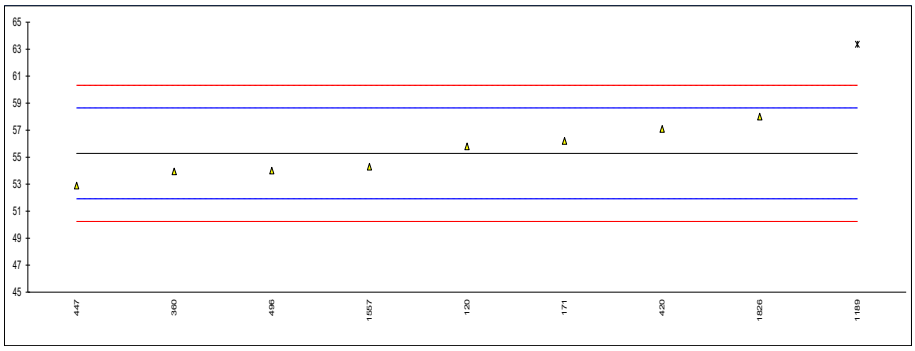

0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1067
496
1826
1389
1807
1739
344
862
1557
1754
1792
373
360
333
1189
1721
334
6325
1984

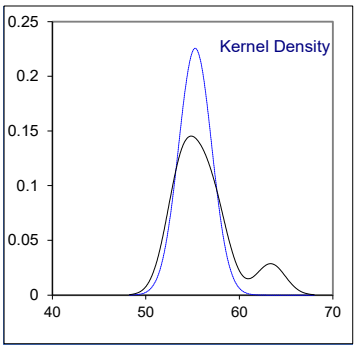

Kernel Density
3
2.5
2
1.5
1
0.5
0
-0.5
0
0.5
1

Determination of Cetane Number of sample #23206

lab	method	value	mark	z(targ)	remarks
120	D613	55.8		0.31	
171	D613	56.2		0.55	
323		-----		-----	
328		-----		-----	
333		-----		-----	
343		-----		-----	
360	ISO5165	53.94		-0.80	
420	ISO5165	57.1		1.08	
447	IP41	52.9		-1.41	
496	D613	54.0		-0.76	
1067		-----		-----	
1189	EN15195	63.36	G(0.05)	4.80	
1299		-----		-----	
1557	TM1200	54.3		-0.58	
1754		-----		-----	
1792		-----		-----	
1807		-----		-----	
1826	D613	58.0		1.62	
6373		-----		-----	
6406		-----		-----	

	normality	OK
	n	8
	outliers	1
	mean (n)	55.280
	st.dev. (n)	1.7682
	R(calc.)	4.951
	st.dev.(D613:18ae1)	1.6821
	R(D613:18ae1)	4.710
compare		
	R(EN14214:12+A2:19)	5.0
	R(ISO5165:20)	4.8

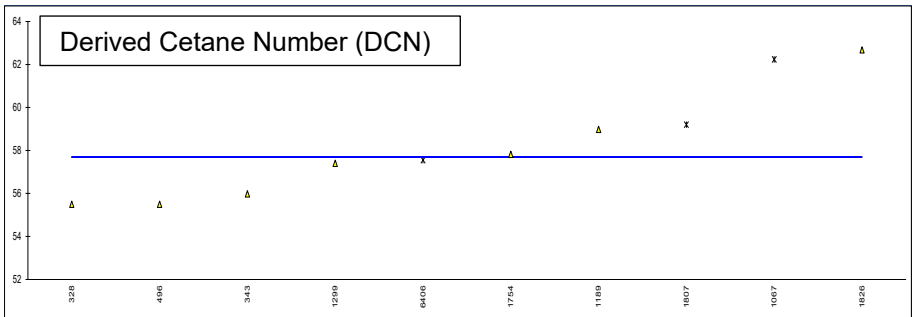


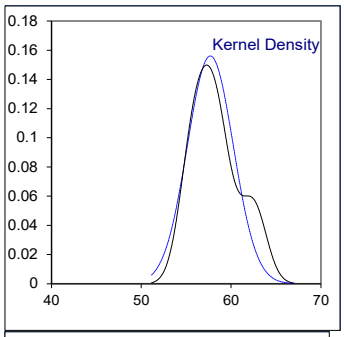


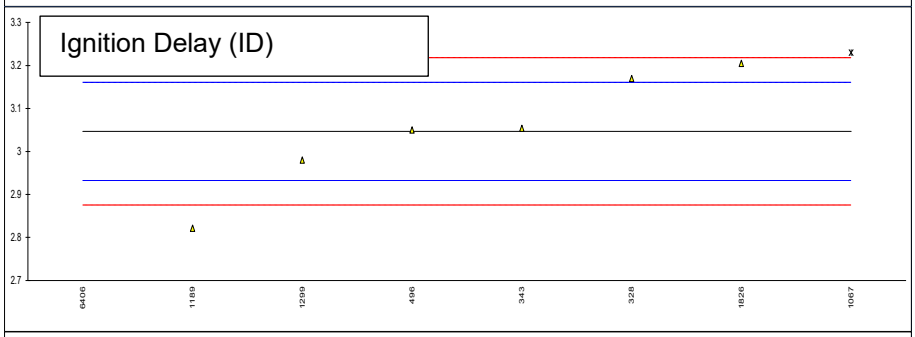
Determination of Derived Cetane Number (DCN) of sample #23206

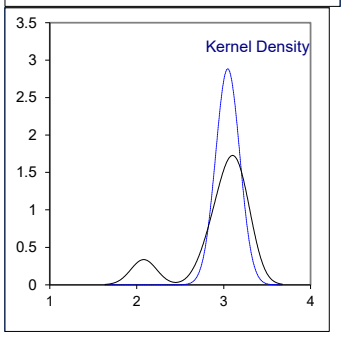
lab	Method	DCN	mark	z(targ)	ID	mark	z(targ)	CD	mark	z(targ)	W.T.
120		-----		-----	-----		-----	-----		-----	-----
171		-----		-----	-----		-----	-----		-----	-----
323		-----		-----	-----		-----	-----		-----	-----
328	D7668	55.5		-----	3.17		2.16	4.39		-----	591
333		-----		-----	-----		-----	-----		-----	-----
343	D7668	55.98		-----	3.054		0.13	4.265		-----	596.26
360		-----		-----	-----		-----	-----		-----	-----
420		-----		-----	-----		-----	-----		-----	-----
447		-----		-----	-----		-----	-----		-----	-----
496	EN16715	55.5		-----	3.05		0.06	4.30		-----	-----
1067	D6890	62.23	ex	-----	3.230	ex	3.21	-----		-----	-----
1189	D7668	58.98		-----	2.8213		-3.95	4.0718		-----	606.81
1299	D7668	57.4		-----	2.98		-1.17	4.17		-----	589
1557		-----		-----	-----		-----	-----		-----	-----
1754	D7668	57.82		-----	-----		-----	-----		-----	-----
1792		-----		-----	-----		-----	-----		-----	-----
1807	EN17155	59.2	ex	-----	-----		-----	-----		-----	-----
1826	D7668	62.68		-----	3.205		2.77	5.2	G(0.05)	-----	559.8
6373		-----		-----	-----		-----	-----		-----	-----
6406	EN17155	57.55	ex	-----	2.08	ex	-16.94	-----		-----	634.7
	normality	not OK			unknown			unknown			
	n	7			6			5			
	outliers	0+3ex			0+2ex			1			
	mean (n)	57.694			3.047			4.239			
	st.dev. (n)	2.5554			0.1383			0.1224			
	R(calc.)	7.155			0.387			0.343			
	st.dev.(D7668:17)	(0.6068)			0.0571			(0.0413)			
	R(D7668:17)	(1.699)			0.160			(0.116)			
compare											
	R(D7668:23)	(1.441)			0.160			(0.116)			

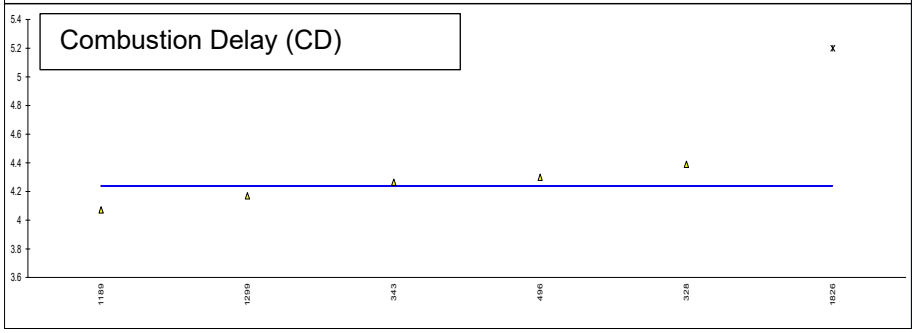
W.T. = Chamber Wall Temperature
Ex = test method is not compatible with D7668 / EN16175, therefore test results ware excluded from statical analysis.







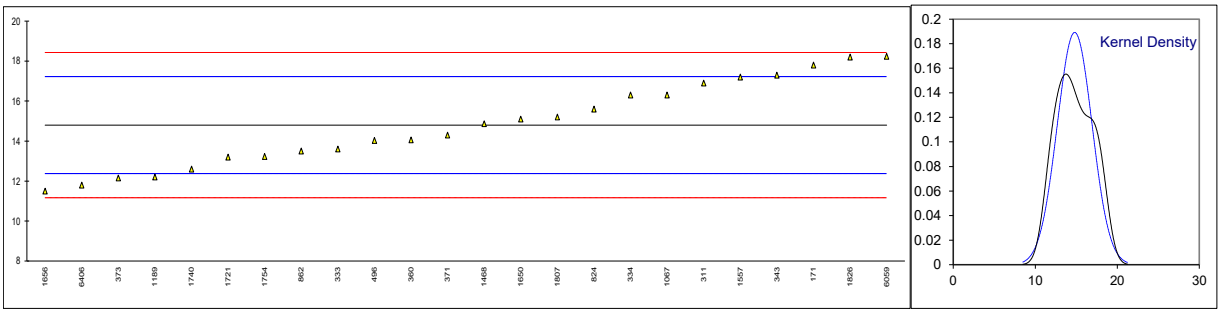




Determination of sum of Calcium and Magnesium (as Ca + Mg) on sample #23207; results in mg/kg

lab	method	value	mark	z(targ)	remarks
171	EN14538	17.8		2.48	
311	EN14538	16.9		1.73	
312		-----		-----	
323		-----		-----	
333	EN14538	13.6		-0.99	
334	EN14538	16.3		1.24	
343	EN14538	17.3		2.07	
345		-----		-----	
360	EN14538	14.06		-0.61	
371	EN14538	14.3		-0.41	
373	EN14538	12.1508		-2.19	
398		-----		-----	
496	EN14538	14.03		-0.63	
663		-----		-----	
824	EN14538	15.6		0.66	
862	EN14538	13.5		-1.07	
1067	EN14538	16.3		1.24	
1189	D5185	12.2		-2.15	
1299		-----		-----	
1468	EN14538	14.87		0.06	
1557	TM1200	17.2	C	1.98	First reported 38.37
1650	EN14538	15.1		0.25	
1656	EN14538	11.5		-2.72	
1721	EN14538	13.2		-1.32	
1740	EN14538	12.6		-1.82	
1754	EN14538	13.23		-1.30	
1792		-----		-----	
1807	EN14538	15.2		0.33	
1826	EN14538	18.2		2.81	
6059	EN14538	18.235		2.84	
6265		-----		-----	
6276		-----		-----	
6373		-----		-----	
6406	EN14538	11.8		-2.48	

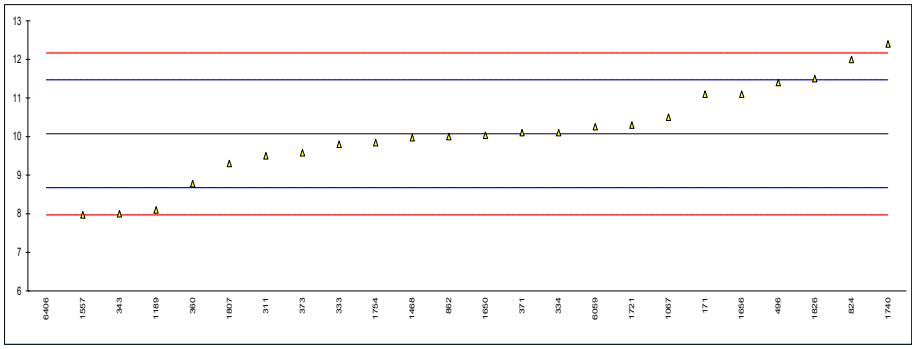
normality	OK
n	24
outliers	0
mean (n)	14.799
st.dev. (n)	2.1082
R(calc.)	5.903
st.dev.(EN14538:06)	1.2111
R(EN14538:06)	3.391

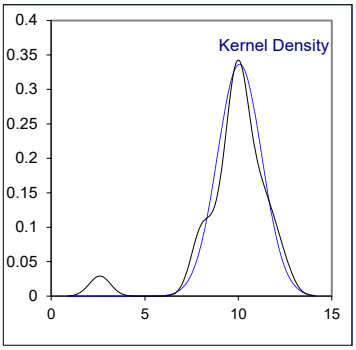


Determination of Phosphorus as P on sample #23207; results in mg/kg

lab	method	value	mark	z(targ)	remarks
171	D5185	11.1	C	1.47	First reported 0.00111 mg/kg
311	EN14107	9.5		-0.82	
312		-----		-----	
323		-----		-----	
333	EN14107	9.8		-0.39	
334	EN14107	10.1		0.04	
343	EN14107	8		-2.96	
345		-----		-----	
360	EN14107	8.78		-1.85	
371	EN14107	10.1		0.04	
373	EN14107	9.58		-0.70	
398		-----		-----	
496	EN14107	11.40		1.90	
663		-----		-----	
824	EN14107	12.0		2.76	
862	EN14107	10.0		-0.10	
1067	EN14107	10.5		0.61	
1189	D5185	8.1		-2.82	
1299		-----		-----	
1468	EN14107	9.97		-0.14	
1557	TM1200	7.97		-3.00	
1650	EN14107	10.03		-0.06	
1656	EN14107	11.1		1.47	
1721	EN14107	10.3	C	0.33	First reported 14.2
1740	EN14107	12.4		3.33	
1754	EN14107	9.84		-0.33	
1792		-----		-----	
1807	EN16294	9.3		-1.10	
1826	EN14107	11.5		2.04	
6059	EN14107	10.255		0.26	
6265		-----		-----	
6276		-----		-----	
6373		-----		-----	
6406	EN14107	2.6	R(0.01)	-10.68	

normality	OK
n	23
outliers	1
mean (n)	10.071
st.dev. (n)	1.1852
R(calc.)	3.319
st.dev.(EN14107:03)	0.6995
R(EN14107:03)	1.959

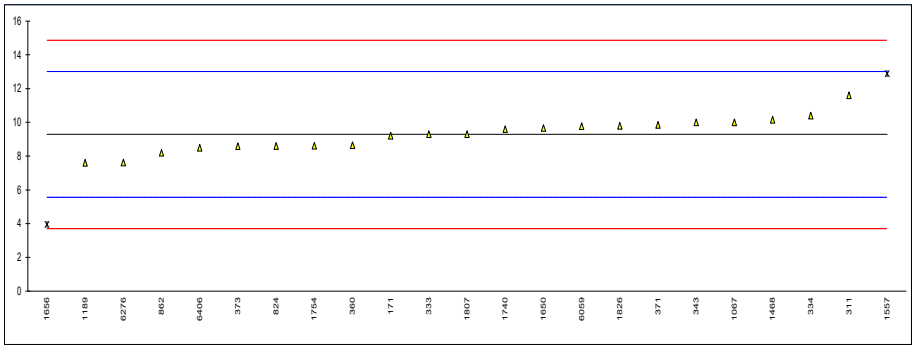


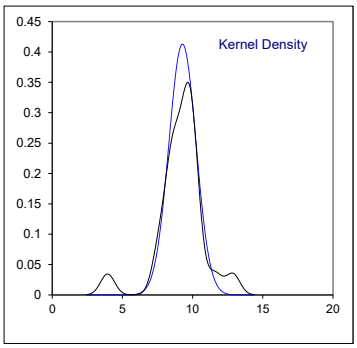


Determination of Potassium as K on sample #23207; results in mg/kg

lab	method	value	mark	z(targ)	remarks
171	EN14109	9.2		-0.05	
311	EN14538	11.6		1.24	
312		-----		-----	
323		-----		-----	
333	EN14538	9.3		0.01	
334	EN14538	10.4		0.60	
343	EN14538	10		0.38	
345		-----		-----	
360	EN14538	8.65		-0.34	
371	EN14538	9.85		0.30	
373	EN14538	8.59		-0.37	
398		-----		-----	
496		-----		-----	
663		-----		-----	
824	EN14538	8.6		-0.37	
862	EN14109	8.2		-0.58	
1067	EN14538	10.0		0.38	
1189	D5185	7.6		-0.91	
1299		-----		-----	
1468	EN14538	10.15		0.46	
1557	TM1200	12.88	R(0.05)	1.93	
1650	EN14109	9.67		0.21	
1656	EN14109	3.95	R(0.01)	-2.87	
1721		-----		-----	
1740	EN14538	9.6		0.17	
1754	EN14538	8.62		-0.36	
1792		-----		-----	
1807	EN14538	9.3		0.01	
1826	EN14109	9.8		0.28	
6059	EN14538	9.774		0.26	
6265		-----		-----	
6276	In house	7.62		-0.90	
6373		-----		-----	
6406	EN14538	8.5		-0.42	

normality	OK
n	21
outliers	2
mean (n)	9.287
st.dev. (n)	0.9658
R(calc.)	2.704
st.dev.(EN14109:03)	1.8614
R(EN14109:03)	5.212

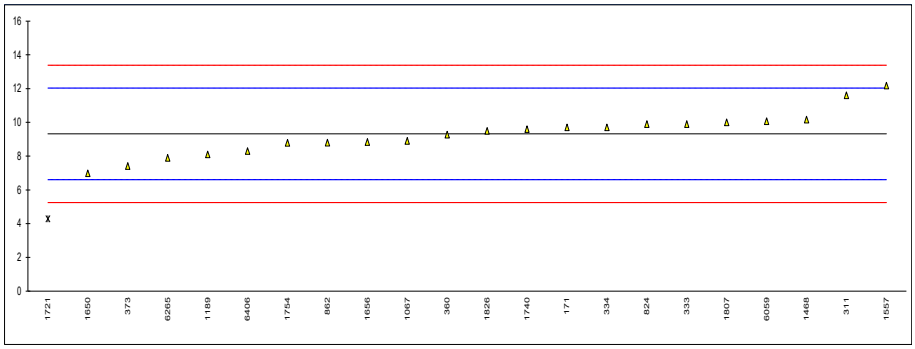


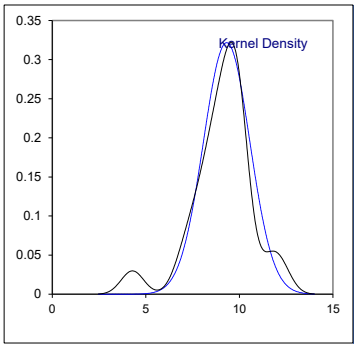


Determination of Sodium as Na on sample #23207; results in mg/kg

lab	method	value	mark	z(targ)	remarks
171	EN14108	9.7		0.28	
311	EN14538	11.6		1.68	
312		-----		-----	
323		-----		-----	
333	EN14538	9.9		0.43	
334	EN14538	9.7		0.28	
343	EN14538	>10		-----	
345		-----		-----	
360	EN14538	9.27		-0.03	
371	EN14538	>10.0		-----	
373	EN14538	7.42		-1.39	
398		-----		-----	
496		-----		-----	
663		-----		-----	
824	EN14538	9.9		0.43	
862	EN14108	8.8		-0.38	
1067	EN14538	8.9		-0.31	
1189	D5185	8.1		-0.89	
1299		-----		-----	
1468	EN14538	10.16		0.62	
1557	TM1200	12.18		2.11	
1650	EN14108	6.98		-1.72	
1656	EN14108	8.84		-0.35	
1721	EN14108	4.28	C,R(0.05)	-3.71	First reported 4.76
1740	EN14538	9.6		0.21	
1754	EN14538	8.79		-0.39	
1792		-----		-----	
1807	EN14538	10.0		0.50	
1826	EN14108	9.5		0.14	
6059	EN14538	10.070		0.56	
6265	In house	7.9		-1.04	
6276		-----		-----	
6373		-----		-----	
6406	EN14538	8.3		-0.75	

normality	OK
n	21
outliers	1
mean (n)	9.315
st.dev. (n)	1.2404
R(calc.)	3.473
st.dev.(EN14108:03)	1.3589
R(EN14108:03)	3.805

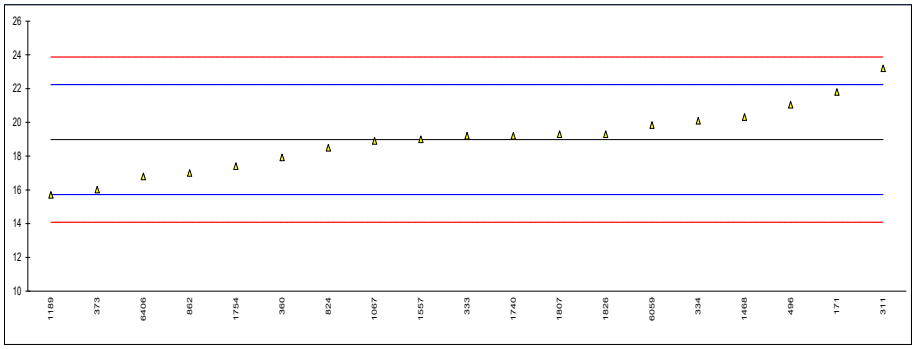


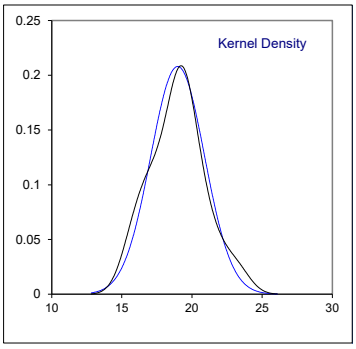


Determination of Sum of Potassium and Sodium (as K + Na) on sample #23207; results in mg/kg

lab	method	value	mark	z(targ)	remarks
171	EN14538	21.8	E	1.73	Calculation difference, iis calculated 18.9
311	EN14538	23.2		2.59	
312		-----		-----	
323		-----		-----	
333	EN14538	19.2		0.14	
334	EN14538	20.1		0.69	
343	EN14538	>20		-----	
345		-----		-----	
360	EN14538	17.92		-0.65	
371	EN14538	>20.0		-----	
373	EN14538	16.01		-1.82	
398		-----		-----	
496	EN14538	21.05		1.27	
663		-----		-----	
824	EN14538	18.5		-0.29	
862	EN14538	17.0		-1.21	
1067	EN14538	18.9		-0.05	
1189	D5185	15.7		-2.01	
1299		-----		-----	
1468	EN14538	20.31		0.82	
1557	TM1200	19.0	C	0.01	First reported 25.06
1650		-----		-----	
1656		-----		-----	
1721		-----		-----	
1740	EN14538	19.2		0.14	
1754	EN14538	17.41		-0.96	
1792		-----		-----	
1807	EN14538	19.3		0.20	
1826	EN14538	19.3		0.20	
6059	EN14538	19.844		0.53	
6265		-----		-----	
6276		-----		-----	
6373		-----		-----	
6406	EN14538	16.8		-1.33	

normality	OK
n	19
outliers	0
mean (n)	18.976
st.dev. (n)	1.9177
R(calc.)	5.369
st.dev.(EN14538:06)	1.6305
R(EN14538:06)	4.565



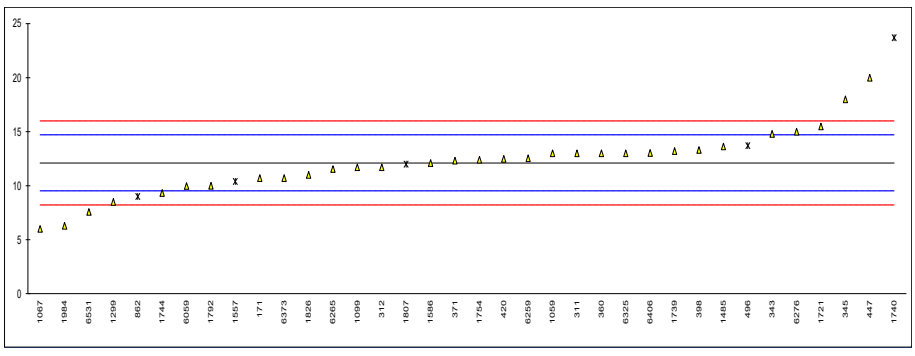


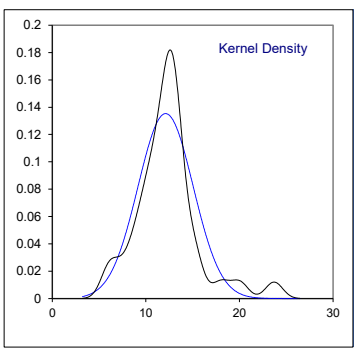
Determination of Total Contamination (EN12662) on sample #23208; results in mg/kg

lab	method	value	mark	z(targ)	complete	vol.filtered (mL)	stopped (min)	remarks
171	EN12662:2008	10.7		-1.09	Yes	300	-----	
311	EN12662:2008	13.0		0.69	Yes	800	-----	
312	EN12662:2008	11.7		-0.31	Yes	300	-----	
323		-----		-----		-----	-----	
334	EN12662:2014	<12		-----	Yes	300	-----	
343	EN12662:1998	14.8		2.08	Yes	-----	-----	
345	EN12662:2008	18.0		4.54		-----	-----	
360	EN12662:1998	13.0		0.69	Yes	300	-----	
371	EN12662:2008	12.32		0.16	Yes	800	6	
398	EN12662:2008	13.31		0.93	Yes	800	-----	
420	EN12662:1998	12.48		0.29		-----	-----	
447	EN12662:1998	20		6.08	Yes	-----	-----	
496	EN12662:2014	13.7	ex	1.23	Yes	-----	-----	
663		-----		-----		-----	-----	
862	EN12662:2014	9.0	ex	-2.40	Yes	-----	-----	
1059	EN12662:1998	13.0		0.69	Yes	-----	-----	
1067	EN12662:1998	6.0		-4.71		338	0.4	
1099	EN12662:1998	11.7		-0.31	Yes	-----	-----	
1299	EN12662:1998	8.5		-2.78	Yes	300	-----	
1429		-----		-----		-----	-----	
1485	EN12662:1998	13.63		1.17	Yes	-----	-----	
1557	EN12662:2014	10.4	ex	-1.32	Yes	300	2.2	
1586	EN12662:1998	12.1		-0.01	Yes	300	-----	
1721	EN12662:2008	15.49		2.61		800	11.3	
1739	EN12662:1998	13.2	C	0.84	Yes	-----	-----	fr. 22.9
1740	EN12662:2008	23.7	C,R(0.05)	8.94	Yes	300	-----	fr. 19.6 EN12662:2014
1744	EN12662:2008	9.32		-2.15	No	800	-----	
1754	EN12662:1998	12.41		0.23		300	-----	
1792	EN12662:1998	10.0		-1.62	Yes	300	-----	
1807	EN12662:2014	12.0	ex	-0.08	Yes	-----	-----	
1826	EN12662:2008	11.0		-0.85	Yes	300	-----	
1984	EN12662:2008	6.3		-4.48	Yes	300	-----	
6059	EN12662:2008	9.9734		-1.65	Yes	800	30	
6259	EN12662:2008	12.55		0.34	Yes	800	-----	
6265	EN12662:1998	11.54		-0.44	Yes	463	10	
6276	EN12662:1998	15		2.23		-----	-----	
6325	EN12662:1998	13		0.69	Yes	-----	-----	
6373	EN12662:1998	10.71		-1.08	Yes	-----	-----	
6406	EN12662:1998	13.03		0.71	Yes	280	-----	
6531	EN12662:2008	7.58		-3.49	Yes	-----	-----	

normality	suspect
n	31
outliers	1+4ex
mean (n)	12.108
st.dev. (n)	2.9476
R(calc.)	8.253
st.dev.(EN12662:08)	1.2973
R(EN12662:08)	3.632

ex = excluded from statistical analysis. Test result has been excluded because EN12662:2014 is not applicable to FAME (B100) according to CEN/TC 19 Committee, instead either method EN12662:1998 or EN12662:2008 should be used. See also iis memo 1903.





APPENDIX 2

Number of participants per country

1 lab in ARGENTINA
1 lab in AUSTRIA
3 labs in BELGIUM
3 labs in BULGARIA
1 lab in CHINA, People's Republic
2 labs in COLOMBIA
1 lab in CZECH REPUBLIC
1 lab in FINLAND
7 labs in FRANCE
1 lab in GERMANY
1 lab in GREECE
1 lab in HONG KONG
1 lab in ITALY
1 lab in KOREA, Republic of
2 labs in LATVIA
2 labs in LITHUANIA
2 labs in MALAYSIA
1 lab in MALTA
9 labs in NETHERLANDS
1 lab in NORTH MACEDONIA, Republic of
2 labs in POLAND
2 labs in PORTUGAL
1 lab in ROMANIA
1 lab in SERBIA
1 lab in SLOVENIA
8 labs in SPAIN
1 lab in THAILAND
5 labs in UNITED KINGDOM
2 labs in UNITED STATES OF AMERICA

APPENDIX 3

Abbreviations

C	= final test result after checking of first reported suspect test result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01)	= outlier in Grubbs' outlier test
G(0.05)	= straggler in Grubbs' outlier test
DG(0.01)	= outlier in Double Grubbs' outlier test
DG(0.05)	= straggler in Double Grubbs' outlier test
R(0.01)	= outlier in Rosner's outlier test
R(0.05)	= straggler in Rosner's outlier test
E	= calculation difference between reported test result and result calculated by iis
W	= test result withdrawn on request of participant
ex	= test result excluded from statistical evaluation
n.a.	= not applicable
n.e.	= not evaluated
n.d.	= not detected
fr.	= first reported
f+?	= possibly a false positive test result?
f-?	= possibly a false negative test result?
SDS	= Safety Data Sheet

Literature

1 iis Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, June 2018
2 ISO5725:86
3 ISO5725 parts 1-6:94
4 ISO13528:05
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6 W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)
7 P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)
8 J.N. Miller, Analyst, 118, 455, (1993)
9 Analytical Methods Committee, Technical Brief, No 4, January 2001
10 P.J. Lowthian and M. Thompson, The Royal Society of Chemistry, Analyst, 127, 1359-1364, (2002)
11 W. Horwitz and R. Albert, J. AOAC Int, 79.3, 589-621, (1996)
12 Bernard Rosner, Percentage Points for a Generalized ESD Many-Outlier Procedure, Technometrics, 25(2), 165-172, (1983)
13 Letter of CEN: CEN/TC 19 explanation on total contamination test result and applicability for FAME, dated 16-9-2015 and issued by Ortwin Costenoble on behalf of Liesbeth Jansen (CEN/TC 19 Chairman) and Nigel Elliot (CEN/TC 19/WG 24 Convenor).
14 iis memo 1903, Biodiesel B100 (100% FAME) for Total Contamination EN12662