Results of Proficiency Test
Gasoil B10 (10% FAME)
May 2015

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

Authors: ing. L. Dijkstra
Correctors: ing. R.J. Starink, dr. R.G. Visser & ing. L. Sweere

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CONTENTS

1 INTRODUCTION

Since 2005, the Institute for Interlaboratory Studies organizes a proficiency test for automotive diesel containing 7-10% FAME, based on the EN590 (0-7% FAME) and ASTM D7467 (6-20% FAME) specifications every year.
In this interlaboratory study on Gasoil B10 iis15G03, 78 laboratories from 32 countries have participated. See appendix 3 for the number of participating laboratories per country. In this report, the results of the 2015 Gasoil B10 proficiency test are presented and discussed. This report is also electronically available through the iis internet site www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test. It was decided to evaluate the Gasoil B10 according the (different) test scopes of both EN590 and ASTM D7467. It was decided depending on the registration to send to each laboratory one 1 litre bottle and one 0.5 litre bottle of Gasoil B10 (both labelled #15070), and/or, one 1 litre bottle Gasoil (labelled #15071) especially for Total Contamination. Analyses for fit-for-use and homogeneity testing were subcontracted. Participants were requested to report rounded and unrounded results. The unrounded results were preferably used for the statistical evaluation.

2.1 ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in agreement with ISO/IEC 17043:2010 (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This PT falls under the accredited scope. This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentially of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires.

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2.2 PROTOCOL

The protocol followed in the organisation was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of April 2014 (iis-protocol, version 3.3). This protocol can be downloaded via the FAQ page of the iis internet site www.iisnl.com.

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

For the main round a batch of regular automotive diesel was used. To this batch pure FAME (B100) was added to increase the FAME content up to approx. 10%. After homogenization, from this mixture, 90 brown glass bottles of 1 litre and 90 brown glass bottles of 0.5 litre were filled. All bottles were labelled #15070.
The homogeneity of the subsamples #15070 (1 litre + 0.5 litre) was checked by determination of density at 15 ^{o}C on 8 stratified randomly selected samples (4 times a 1 litre bottle and 4 times a 0.5 litre bottle) in accordance with ASTM D4052.

	Density at 15 ^{o}C in kg/m^{3}
sample #15070-1	836.45
sample #15070-2	836.49
sample #15070-3	836.51
sample #15070-4	836.57
sample #15070-5	836.57
sample #15070-6	836.55
sample #15070-7	836.57
sample #15070-8	836.55

table 1: homogeneity test results of subsamples #15070

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

	Density at 15 ^{o}C in kg/m^{3}
r (sample #15070)	0.12
reference test	ISO12185:96
0.3 x R(reference test)	0.15

table 2: repeatability of the subsamples #15070

The calculated repeatability was less than 0.3 times the respective reproducibility of the reference method. Therefore, homogeneity of the subsamples #15070 was assumed.

For Total Contamination, to each bottle (labelled #15071) a particulate quartz material BCR-067 (∅ 2.4 – 32.0 µm) in oil suspension was added to give a total contamination of approx 15 mg/kg. To do this, a defined volume of the fresh prepared and well shaken quartz suspension was added to an empty bottle by means of a calibrated pipette. The addition was checked by weighing the bottle before and after addition.
In total 58 bottles were thus prepared and subsequently filled up to 850 mL with gasoil B10. After homogenization, a random sample was taken to verify the actual Total Contamination content.

Depending on the registration of the participant two bottles (1x1L + 1x0.5L), labelled #15070 and/or one bottle of 1L, labelled #15071 were sent to the participating laboratories on May 6, 2015.

2.5 STABILITY OF THE SAMPLES

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

2.6 ANALYSIS

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

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

3 RESULTS

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

Directly after the deadline, a reminder fax was sent to those laboratories that had not reported results at that moment.

Shortly after the deadline, the available results were screened for suspect data. A result was called suspect in case the Huber Elimination Rule (a robust outlier test) found it to be an outlier. The laboratories that produced these suspect data were asked to check the results. Additional or corrected results are used for data analysis and original results are placed under 'Remarks' in the result tables in appendix 1.

3.1 STATISTICS

Statistical calculations were performed as described in the report ‘iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation’ (iis-protocol, version 3.3) of April 2014.

For statistical evaluation the *unrounded* (when available) figures were used instead of the rounded results. Results reported as ‘<…’ or ‘>…’ were not used in the statistical evaluation.

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

According to ISO 5725 the original results per determination were submitted to Dixon’s and/or Grubbs' and/or Rosner’s outlier tests. 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 (ref. 15). 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. When the uncertainty passed the evaluation no remarks are made in the report. However, when the uncertainty failed the evaluation it is mentioned in the report and it will have consequences for the evaluation of the test results.

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

3.2 GRAPHICS

In order to visualize the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported analysis results are plotted. The corresponding laboratory numbers are under the X-axis. The straight horizontal line presents the consensus value (a trimmed mean). The four striped lines, parallel to the consensus value line, are the +3s, +2s, -2s and -3s target reproducibility limits of the selected standard. Outliers and other data, which were excluded from the calculations, are represented as a “x”. Accepted data are represented as a triangle. Furthermore, Kernel Density Graphs were made. This is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms (see appendix 4; nos.13 and 14). Also a normal Gauss curve was projected over the Kernel Density Graph.

3.3 Z-SCORES

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

When a laboratory did use a test method with a reproducibility that is significantly different fromthe 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:

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

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:

	$\lvert z\rvert < 1$	good
$1 <$	$\lvert z\rvert < 2$	satisfactory
$2 <$	$\lvert z\rvert < 3$	questionable
$3 <$	$\lvert z\rvert$	unsatisfactory

4 EVALUATION

During the execution of this proficiency test some reporting problems occurred. In total 3 participants reported test results after the final reporting date and five laboratories did not report any test results at all. Not all laboratories were able to perform all analyses requested. Finally, 73 participants reported in total 1371 numerical test results. Observed were 32 outlying results, which is 2.3%. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

4.1 EVALUATION PER TEST

In this section, the results are discussed per sample and per test. The specified test methods and requirements were taken into account for explaining the observed differences when possible and applicable. These methods are also in the tables together with the reported data. The abbreviations, used in these tables, are listed in appendix 3.
In the iis PT reports, ASTM methods are referred to with a number (e.g. D976) and an added designation for the year that the method was adopted or revised (e.g. D976:06). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D976:06 (2011)). In the results tables of Appendix 1 only the method number and year of adoption or revision will be used.

Not all original 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.

Acid number: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D664:11a. Six laboratories reported to have used test method ASTM D974. This method is not equivalent to ASTM D664/IP177. When the ASTM D664/IP177 data were evaluated separately, both average and precision do not differ significantly from the average and precision of full data set.

Aromatics (FIA): No significant conclusions were drawn as the precision and bias of ASTM D1319 with biodiesel blends is not known and is currently under investigation, see paragraph X1.11.1 of ASTM D7467:15.

Ash: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ISO6245:01.

C.I. D976: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in good agreement with the requirements of ASTM D976:06(2011). In paragraph X1.12.1 of ASTM D7467-2015 is mentioned that use of ASTM D976:80 required in the USA by 40 CFR Part 80. However, the precision and bias of Test Method D976:80 with biodiesel blends is not known.

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

Cloud Point: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN23015:94.

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

CCR 10% res.: The consensus value of the group was below the application range (0.1% - 30% M/M) of ISO10370:14. Therefore, no significant conclusions were drawn.

Ramsbottom: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D524:10.

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

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

Distillation: This determination was not problematic. In total eight statistical outliers were observed. For one participant outliers were observed for IBP, 10 % rec, FBP and volume at 350° and therefore all other test results were excluded. The calculated reproducibilities of IBP, 10 % rec, 50% rec., 90% rec., 95% rec., FBP, vol at 250°C and vol at 350°C, after rejection of the statistical outliers are all in agreement with the requirements of ISO3405:11 (auto) and of ASTM D86:12 (auto).

FAME: This determination was problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of EN14078:14. The fact that the results may depend on the FAME type used to construct the calibration line(s) (see the warning in paragraph 7.4.2 of EN14078:14), may explain (part of) the large spread.

Flash Point: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ISO2719:02.

Kin. Visc. 40°C: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers, is in agreement with the requirements of EN590:13, Annex A and with the requirements of ISO3104:94+corr.1997.

Lubricity: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ISO12156-1:06. Three laboratories used test method ASTM D6079, which is not equivalent to ISO12156 and therefore may give deviating test results.

Ox. Stab. ISO12205: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ISO12205:95.

Ox. Stab. EN15751: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of EN15751:14. Differences in test results from automated and manual evaluation of the conductivity curve may explain (part of) the large spread.

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

Pour Point (M): This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ISO3016:94.

Pour Point (A): This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D5950:14.

Sulphur: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO20846:11 and ASTM D5453:12.

Water: This determination was not problematic. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of EN12937:00.

Total Contamination: The samples were spiked with a freshly prepared and well shaken suspension of particulate quartz material (ø 2.4-32 µm) in oil. Therefore, the minimum Total Contamination to be found was known. The laboratories should be able to find at least 10.08 mg/kg [16.98 $mg/kg_{(added\ amount)}$ – 6.90 $mg/kg_{(R\ EN12662)}$]. None of the laboratories reported a test result below this minimum concentration of 10.08 mg/kg.
This determination was problematic for a number of laboratories. As a systematic deviation was observed between test results of the different versions, it was decided to use the 2014 version as reference. The test results of eleven (11) laboratories, that did not report to have used the 2014 version, were therefore excluded from the statistical calculations. Two statistical outliers were observed. The calculated reproducibility, after exclusion of the suspect test results, is almost in agreement with the requirements of EN12662:14.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

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

Parameters	*unit*	*n*	*average*	*2.8 * sd*	*R (lit)*
Acid Number	mgKOH/g	32	0.038	0.041	0.048
Aromatics by FIA	%V/V	15	21.19	10.07	n.a.
Ash content	%M/M	25	0.0013	0.0042	0.0050
Cetane Index D976		30	54.95	0.78	2.00
Cetane Index ISO4264		49	54.76	0.79	n.a.
Cloud Point	°C	57	-3.3	3.0	4.0
Cold Filter Plugging Point	°C	56	-15.5	2.5	4.2
CCR on 10% distillation residue	%M/M	28	0.018	0.035	(0.025)*
Ramsbottom CR on 10% residue	%M/M	5	0.07	0.03	0.03
Copper Corrosion 3hrs at 50˚C		46	1(1A)	n.a.	n.a.
Density @ 15°C	kg/m^3	65	836.44	0.31	0.50
Initial Boiling Point	°C	62	167.4	9.0	9.2
10% recovery	°C	61	210.9	5.1	4.6
50% recovery	°C	63	283.4	2.7	3.0
90% recovery	°C	63	338.6	3.9	5.1
95% recovery	°C	65	352.3	6.7	9.0
Final Boiling Point	°C	62	361.0	6.9	7.1
Volume at 250°C	%V/V	62	27.9	2.5	2.7
Volume at 350°C	%V/V	62	94.4	1.7	2.7
Fatty Acid Methyl Ester	%V/V	52	9.59	0.95	0.72
Flash Point PMcc	°C	60	63.29	4.01	4.49
Kinematic Viscosity at 40°C	mm^2/s	52	2.964	0.035	0.053
Lubricity	µm	38	221.5	132.0	102.0
Oxidation Stability ISO12205	g/m^3	13	2.47	4.97	7.48
Oxidation Stability EN15751	hrs	31	25.54	6.01	5.24
Polycyclic Aromatic Hydrocarbons	%M/M	26	1.73	0.59	0.78
Pour Point (manual)	°C	27	-16.9	5.8	6.6
Pour Point (automated)	°C	28	-16.4	5.6	4.5
Sulphur	mg/kg	54	6.99	1.61	1.90
Water	mg/kg	56	62.8	28.9	54.5
Total Contamination (#15071)	mg/kg	25	27.6	10.7	8.6

Table 3: summary of test results samples #15070 and #15071

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

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

4.3 COMPARISON OF THE INTERLABORATORY STUDY OF MAY 2015 WITH PREVIOUS PTS.

	May 2015	*May 2014*	*April 2013*	*April 2012*
Number of reporting labs	73	67	61	57
Number of results reported	1371	1317	1257	1197
Statistical outliers	32	33	29	33
Percentage outliers	2.3%	2.5%	2.4%	2.8%

table 4: comparison with previous proficiency tests.

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

The performance of the determinations of the proficiency tests was compared against the requirements of the respective standards. The conclusions are given the following table:

	May 2015	*May 2014*	*April 2013*	*April 2012*
Acid number	+	+	+	+
Aromatics by FIA	n.e.	n.e	n.e	n.e
Ash content	+	++	+	(++)
Cetane Index D976	++	++	++	++
Cetane Index ISO4264	n.e.	n.e	n.e	n.e
Cloud Point	+	++	++	+
Cold Filter Plugging Point	+	+	--	+
CR micro method on 10% res.	(-)	(-)	(-)	(--)
Ramsbottom CR on 10% res.	+/-	n.e	(--)	n.e
Density at 15 °C	+	+	+	++
Distillation	+	+	+	+
Fatty Acid Methyl Ester	-	-	-	-
Flash Point PMcc	+	+	+	+
Kinematic Viscosity at 40 °C	+/-	+	+/-	-
Lubricity	-	++	++	++
Oxidation Stability ISO12205	+	+	+/-	+
Oxidation Stability EN15751	-	+/-	--	--
Polycyclic Aromatic Hydrocar.	+	-	+	-
Pour Point manual	+	--	+/-	+
Pour Point automated	-	+	+	+
Sulphur	+	+/-	++	+
Water content	++	++	++	+
Total Contamination	--	--	--	-

table 5: comparison determinations against the standard

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

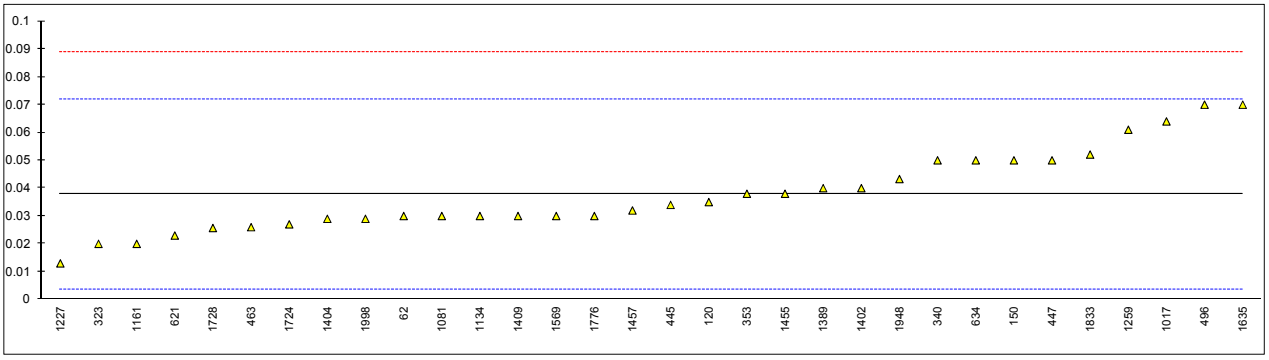
- ++: group performed much better than the standard
- + : group performed better than the standard
- +/-: group performance equals the standard
- - : group performed worse than the standard
- -- : group performed much worse than the standard
- n.e.: not evaluated

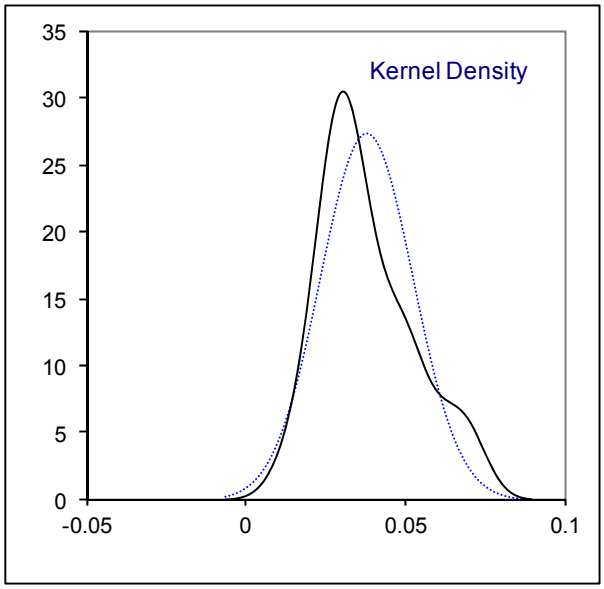
APPENDIX 1

Determination of Acid Number on sample #15070; result in mgKOH/g

lab	method	value	mark	z(targ)	remarks
62	D664	0.03		-0.46	
120	D664	0.035		-0.17	
150	D664	0.05		0.71	
171	D664	<0.01		-----	
311	D664	<0.10		-----	
312		-----		-----	
323	D664	0.02		-1.04	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340	D664	0.05		0.71	
343	D664	<0.05		-----	
351		-----		-----	
353	IP177	0.038		0.01	
381		-----		-----	
444		-----		-----	
445	D664	0.034		-0.22	
447	D664	0.05		0.71	
463	D664	0.026		-0.69	
496	D664	0.070		1.89	
511		-----		-----	
529		-----		-----	
541	D664	<0.1		-----	
556		-----		-----	
558		-----		-----	
621	D664	0.023		-0.87	
633		-----		-----	
634	D974	0.05		0.71	
1016		-----		-----	
1017	D974	0.064		1.54	
1033		-----		-----	
1064		-----		-----	
1065		-----		-----	
1080		-----		-----	
1081	D664	0.03		-0.46	
1126		-----		-----	
1134	D664	0.03		-0.46	
1141		-----		-----	
1143		-----		-----	
1161	D664	0.020		-1.04	
1194		-----		-----	
1227	D664	0.013		-1.45	
1237		-----		-----	
1259	D664	0.0610		1.36	
1299		-----		-----	
1389	D664	0.04		0.13	
1397		-----		-----	
1402	D664	0.04		0.13	
1404	D974	0.029		-0.52	
1409	D664	0.03		-0.46	
1419		-----		-----	
1455	D974	0.038		0.01	
1457	D974	0.032		-0.34	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1569	D664	0.03		-0.46	
1631		-----		-----	
1634		-----		-----	
1635	D664	0.07		1.89	
1656	D664	<0.1		-----	
1676		-----		-----	
1706		-----		-----	
1724	D664	0.027		-0.63	
1728	D974	0.0257		-0.71	
1776	D664	0.03		-0.46	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1833	D664	0.0521		0.84	
1948	D664	0.0433		0.32	
1984		-----		-----	
1987		-----		-----	
1998	D664	0.029		-0.52	
2129	D664	Lt 0.01		-----	

		Only D664 data
normality	OK	OK
n	32	26
outliers	0	0
mean (n)	0.0378	0.0374
st.dev. (n)	0.01457	0.01481
R(calc.)	0.0408	0.0415
R(D664:11a)	0.0478	0.0475



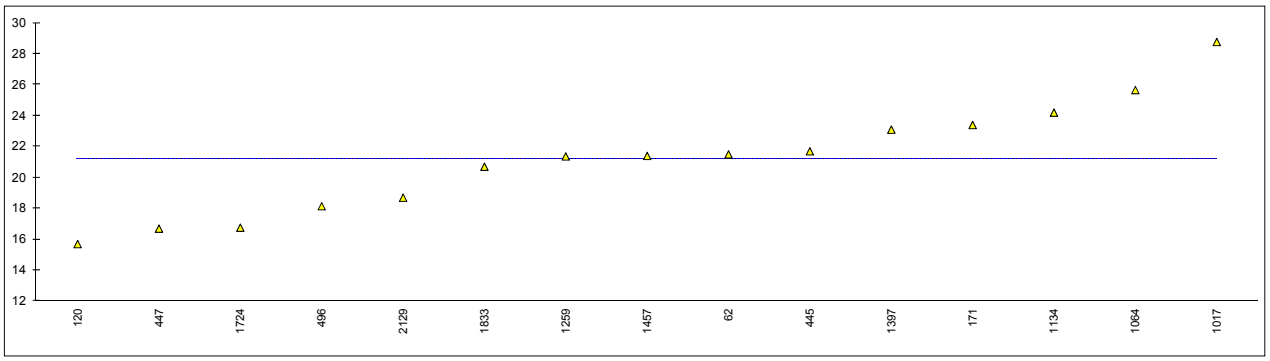


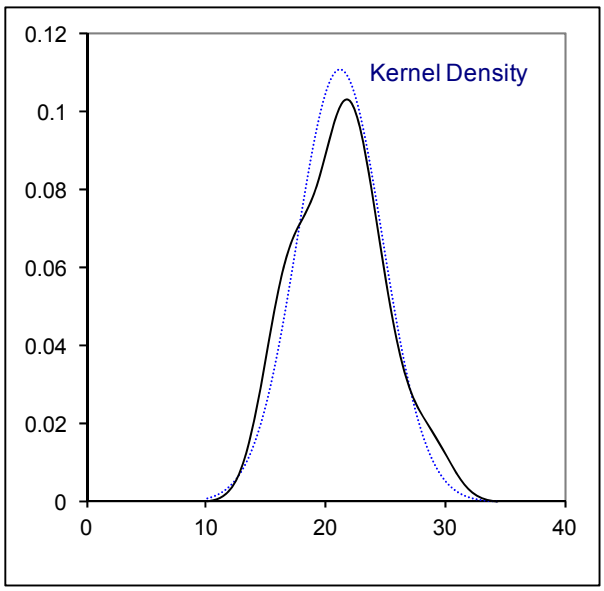
Determination of Aromatics by FIA on sample #15070; result in %V/V

lab	method	value	mark	z(targ)	remarks
62	D1319	21.5		-----	
120	D1319	15.7		-----	
150		-----		-----	
171	D1319	23.4		-----	
311		-----		-----	
312		-----		-----	
323		-----		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340		-----		-----	
343		-----		-----	
351		-----		-----	
353		-----		-----	
381		-----		-----	
444		-----		-----	
445	D1319	21.7		-----	
447	D1319	16.7		-----	
463		-----		-----	
496	D1319	18.15		-----	
511		-----		-----	
529		-----		-----	
541		-----		-----	
556		-----		-----	
558		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
1016		-----		-----	
1017	D1319	28.77		-----	
1033		-----		-----	
1064	D1319	25.66		-----	
1065		-----		-----	
1080		-----		-----	
1081		-----		-----	
1126		-----		-----	
1134	D1319	24.2		-----	
1141		-----		-----	
1143		-----		-----	
1161		-----		-----	
1194		-----		-----	
1227		-----		-----	
1237		-----		-----	
1259	EN15553	21.37		-----	
1299		-----		-----	
1389		-----		-----	
1397	D1319	23.1		-----	
1402		-----		-----	
1404		-----		-----	
1409		-----		-----	
1419		-----		-----	
1455		-----		-----	
1457	D1319	21.4		-----	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1569		-----		-----	
1631		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656		-----		-----	
1676		-----		-----	
1706		-----		-----	
1724	D1319	16.76		-----	
1728		-----		-----	
1776		-----		-----	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1833	D1319	20.7		-----	
1948		-----		-----	
1984		-----		-----	
1987		-----		-----	
1998		-----		-----	
2129	D1319	18.7		-----	

normality	OK
n	15
outliers	0
mean (n)	21.187
st.dev. (n)	3.5963
R(calc.)	10.070
R(D1319:14)	n.a.

Compare R(D1319:14 for diesel without FAME) = 3.7



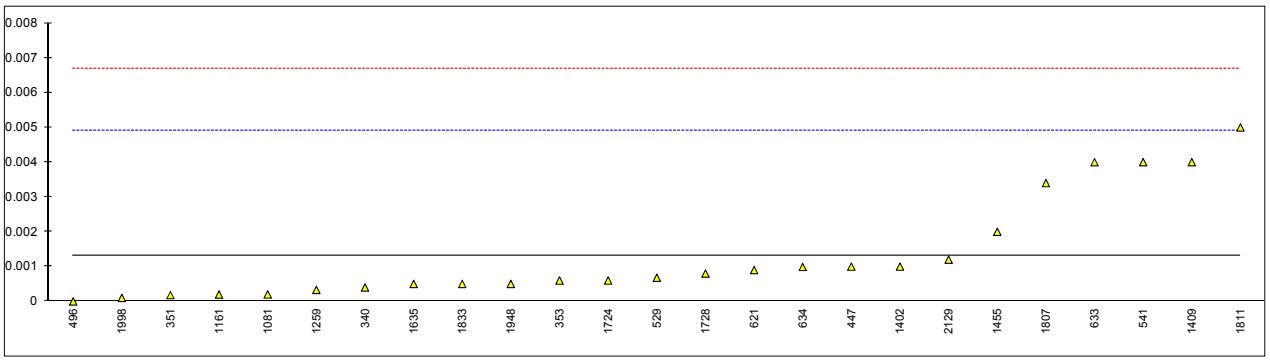


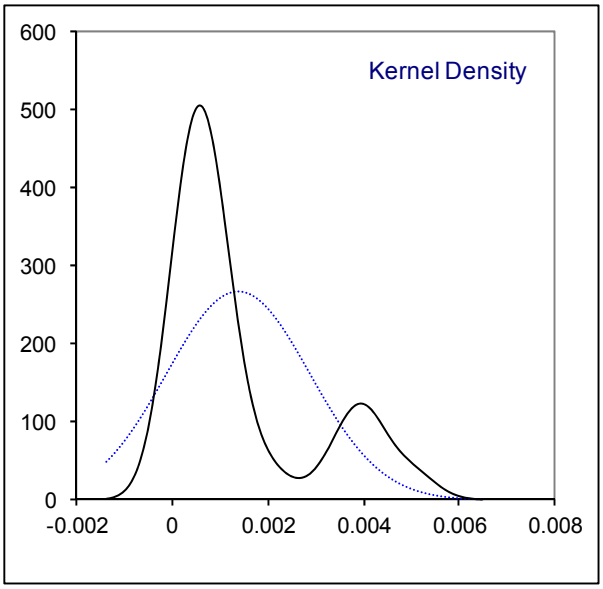
Determination of Ash Content on sample #15070; result in %M/M

lab	method	value	mark	z(targ)	remarks
62	D482	<0.001		-----	
120	D482	<0.001		-----	
150	ISO6245	<0.001		-----	
171	D482	<0.001		-----	
311	ISO6245	<0.001		-----	
312		-----		-----	
323	ISO6245	<0.001		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340	ISO6245	0.0004		-0.55	
343	ISO6245	<0.001		-----	
351	ISO6245	0.00018		-0.67	
353	IP4	0.0006		-0.44	
381		-----		-----	
444		-----		-----	
445	D482	<0.001		-----	
447	D482	0.001		-0.21	
463	ISO6245	<0.001		-----	
496	ISO6245	0.000		-----	
511		-----		-----	
529	D482	0.000679		-0.39	
541	D482	0.004		1.47	
556		-----		-----	
558		-----		-----	
621	D482	0.0009		-0.27	
633	D482	0.004		1.47	
634	D482	0.00099		-0.22	
1016		-----		-----	
1017	ISO6245	< 0.001		-----	
1033		-----		-----	
1064		-----		-----	
1065		-----		-----	
1080		-----		-----	
1081	D482	0.0002		-0.66	
1126		-----		-----	
1134	IP4	<0.01		-----	
1141		-----		-----	
1143		-----		-----	
1161	ISO6245	0.000197		-0.66	
1194		-----		-----	
1227		-----		-----	
1237		-----		-----	
1259	ISO6245	0.00033		-0.59	
1299	D482	<0.001		-----	
1389	D482	<0.001		-----	
1397		-----		-----	
1402	ISO6245	0.001		-0.21	
1404	ISO6245	<0.001		-----	
1409	ISO6245	0.004		1.47	
1419		-----		-----	
1455	ISO6245	0.002		0.35	
1457		-----		-----	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1569	ISO6245	<0.001		-----	
1631		-----		-----	
1634		-----		-----	
1635	ISO6245	0.0005		-0.49	
1656	D482	<0.01		-----	
1676		-----		-----	
1706		-----		-----	
1724	D482	0.0006		-0.44	
1728	D482	0.0008		-0.32	
1776		-----		-----	
1807	ISO6245	0.0034		1.13	
1810		-----		-----	
1811	ISO6245	0.0050		2.03	
1833	ISO6245	0.0005		-0.49	
1948	ISO6245	0.0005		-0.49	
1984		-----		-----	
1987		-----		-----	
1998	ISO6245	0.0001		-0.72	
2129	ISO6245	0.0012		-0.10	

normality	suspect
n	25
outliers	0
mean (n)	0.00132
st.dev. (n)	0.001486
R(calc.)	0.00416
R(ISO6245:01)	0.00500

R(D482) = 0.005
Application range ISO 6245:01 = 0.001% – 0.180 % M/M



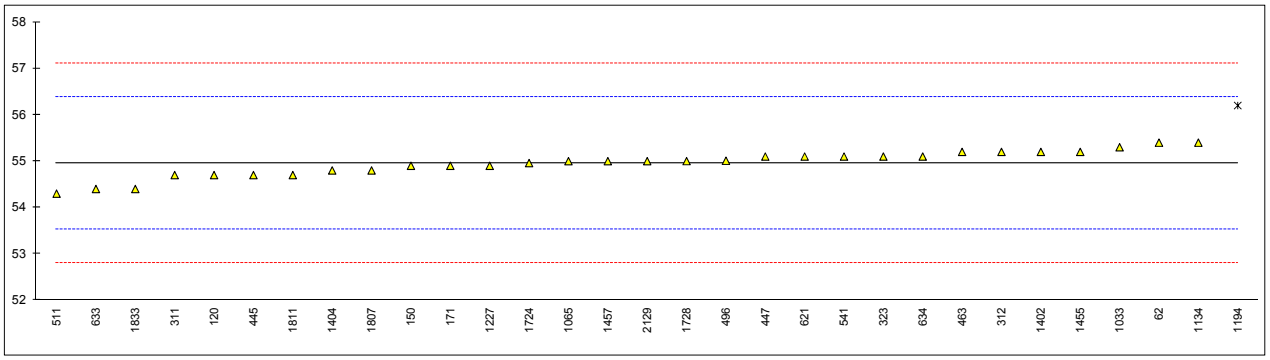


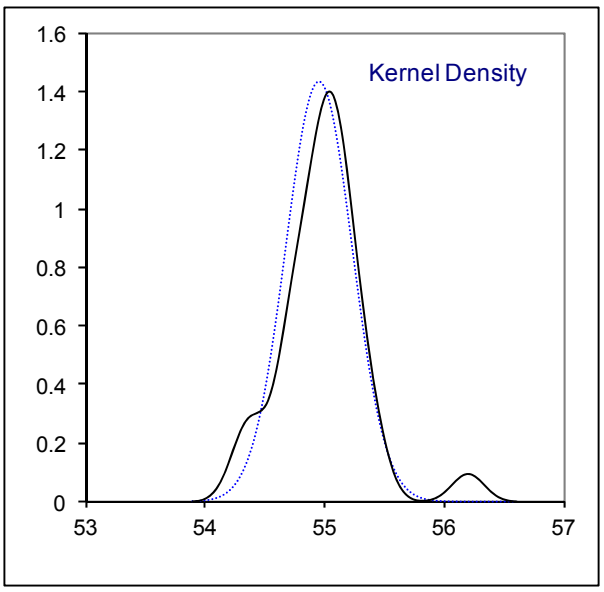
Determination of Cetane Index, two variables D976 on sample #15070

lab	method	value	mark	z(targ)	remarks
62	D976	55.4		0.63	
120	D976	54.7		-0.35	
150	D976	54.9		-0.07	
171	D976	54.9		-0.07	
311	D976	54.7		-0.35	
312	D976	55.2		0.35	
323	D976	55.1		0.21	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340		-----		-----	
343		-----		-----	
351		-----		-----	
353		-----		-----	
381		-----		-----	
444		-----		-----	
445	D976	54.7		-0.35	
447	D976	55.1		0.21	
463	D976	55.2		0.35	
496	D976	55.01		0.08	
511	D976	54.3	C	-0.91	first reported: 55.0
529		-----		-----	
541	D976	55.1		0.21	
556		-----		-----	
558		-----		-----	
621	D976	55.1		0.21	
633	D976	54.4		-0.77	
634	D976	55.1		0.21	
1016		-----		-----	
1017		-----		-----	
1033	D976	55.3		0.49	
1064		-----		-----	
1065	D976	55.0		0.07	
1080		-----		-----	
1081		-----		-----	
1126		-----		-----	
1134	D976	55.4		0.63	
1141		-----		-----	
1143		-----		-----	
1161		-----		-----	
1194	INH-4737	56.2	R(0.01)	1.75	
1227	D976	54.9		-0.07	
1237		-----		-----	
1259		-----		-----	
1299		-----		-----	
1389		-----		-----	
1397		-----		-----	
1402	D976	55.2		0.35	
1404	D976	54.8		-0.21	
1409		-----		-----	
1419		-----		-----	
1455	D976	55.2		0.35	
1457	D976	55.0		0.07	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1569		-----		-----	
1631		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656		-----		-----	
1676		-----		-----	
1706		-----		-----	
1724	D976	54.96		0.01	
1728	D976	55.002		0.07	
1776		-----		-----	
1807	D976	54.8		-0.21	
1810		-----		-----	
1811	D976	54.7		-0.35	
1833	D976	54.4		-0.77	
1948		-----		-----	
1984		-----		-----	
1987		-----		-----	
1998		-----		-----	
2129	D976	55.0		0.07	

normality	OK
n	30
outliers	1
mean (n)	54.952
st.dev. (n)	0.2775
R(calc.)	0.777
R(D976:06)	2.000

The precision and bias of Test Method D976-80 with biodiesel blends is not known.

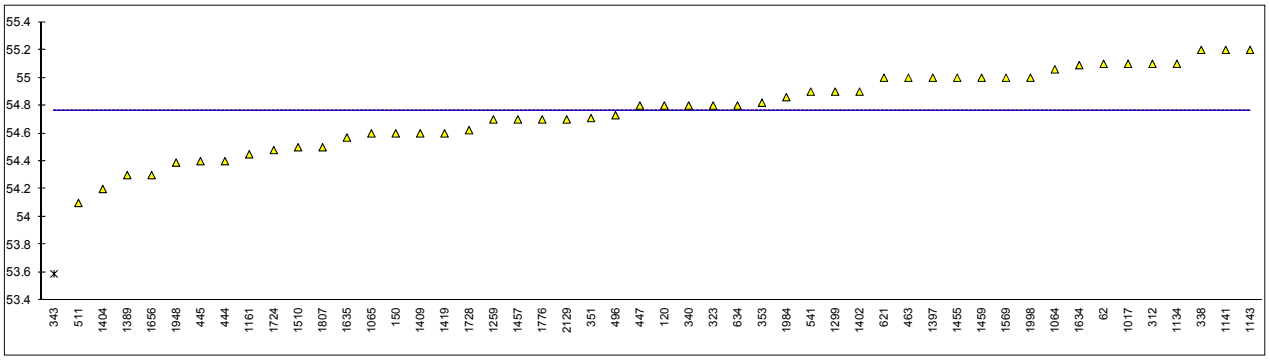


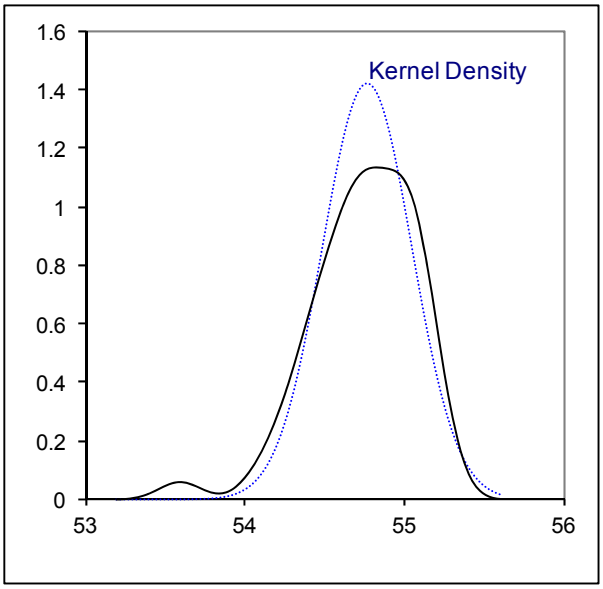


Determination of Cetane Index, four variables ISO4264 on sample #15070

lab	method	value	mark	z(targ)	remarks
62	D4737	55.1		-----	
120	D4737	54.8		-----	
150	ISO4264	54.6		-----	
171		-----		-----	
311		-----		-----	
312	ISO4264	55.1		-----	
323	ISO4264	54.8		-----	
334		-----		-----	
335		-----		-----	
338	ISO4262	55.2		-----	
340	ISO4264	54.8		-----	
343	D4737	53.59	R(0.01)	-----	
351	ISO4264	54.71		-----	
353	IP380	54.82		-----	
381		-----		-----	
444	ISO4264	54.4		-----	
445	ISO4264	54.4		-----	
447	D4737	54.8		-----	
463	ISO4264	55.0		-----	
496	ISO4264	54.73		-----	
511	D4737	54.1	C	-----	first reported: 55.0
529		-----		-----	
541	ISO4264	54.9		-----	
556		-----		-----	
558		-----		-----	
621	D4737	55.0		-----	
633		-----		-----	
634	D4737	54.8		-----	
1016		-----		-----	
1017	ISO4264	55.10		-----	
1033		-----		-----	
1064	ISO4264	55.06		-----	
1065	D4737	54.6		-----	
1080		-----		-----	
1081		-----		-----	
1126		-----		-----	
1134	ISO4264	55.1		-----	
1141	ISO4264	55.2		-----	
1143	ISO4264	55.2		-----	
1161	ISO4264	54.45		-----	
1194		-----		-----	
1227		-----		-----	
1237		-----		-----	
1259	ISO4264	54.70		-----	
1299	D4737	54.9		-----	
1389	D4737	54.3		-----	
1397	ISO4264	55.0		-----	
1402	ISO4264	54.9		-----	
1404	ISO4264	54.2		-----	
1409	ISO4264	54.6		-----	
1419	ISO4264	54.6		-----	
1455	ISO4264	55.0		-----	
1457	ISO4264	54.7		-----	
1459	D4737	55.0		-----	
1510	ISO4264	54.5		-----	
1549		-----		-----	
1550		-----		-----	
1569	ISO4264	55.0		-----	
1631		-----		-----	
1634	ISO4264	55.09		-----	
1635	ISO4264	54.57		-----	
1656	ISO4264	54.3		-----	
1676		-----		-----	
1706		-----		-----	
1724	ISO4264	54.48		-----	
1728	ISO4264	54.623		-----	
1776	ISO4264	54.7		-----	
1807	ISO4264	54.5		-----	
1810		-----		-----	
1811		-----		-----	
1833		-----		-----	
1948	ISO4264	54.39	C	-----	first reported: 57.83
1984	ISO4264	54.86		-----	
1987		-----		-----	
1998	ISO4264	55.0		-----	
2129	ISO4264	54.7		-----	

normality	OK
n	49
outliers	1
mean (n)	54.763
st.dev. (n)	0.2806
R(calc.)	0.786
R(ISO4264:07)	n.a.



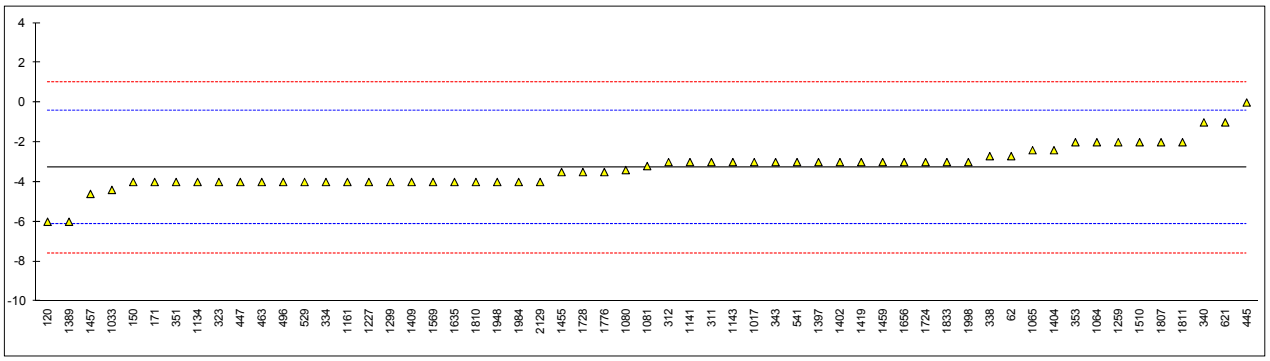


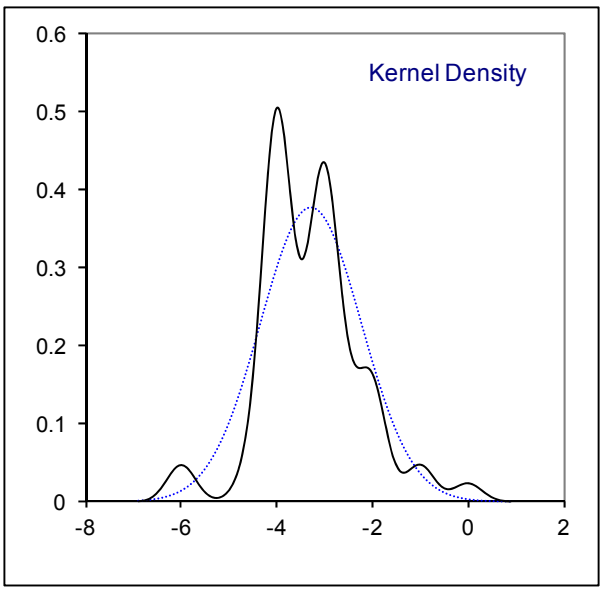
Determination of Cloud Point on sample #15070; result in °C

lab	method	value	mark	z(targ)	remarks
62	D5773	-2.7		0.41	
120	D2500	-6		-1.90	
150	D2500	-4		-0.50	
171	D2500	-4		-0.50	
311	ISO3015	-3		0.20	
312	EN23015	-3		0.20	
323	ISO3015	-4		-0.50	
334	EN23015	-4.0		-0.50	
335		-----		-----	
338	EN23015	-2.7		0.41	
340	EN23015	-1		1.60	
343	D2500	-3		0.20	
351	D7683	-4.0		-0.50	
353	IP219	-2.0		0.90	
381		-----		-----	
444		-----		-----	
445	IP219	0		2.30	
447	D2500	-4		-0.50	
463	EN23015	-4		-0.50	
496	EN23015	-4.0		-0.50	
511		-----		-----	
529	D2500	-4.0		-0.50	
541	D5771	-3		0.20	
556		-----		-----	
558		-----		-----	
621	D2500	-1.0		1.60	
633		-----		-----	
634		-----		-----	
1016		-----		-----	
1017	D5771	-3		0.20	
1033	D5772	-4.4		-0.78	
1064	EN23015	-2		0.90	
1065	D5771	-2.4		0.62	
1080	EN23015	-3.4		-0.08	
1081	D5771	-3.2		0.06	
1126		-----		-----	
1134	IP219	-4		-0.50	
1141	ISO3015	-3		0.20	
1143	ISO3015	-3		0.20	
1161	EN23015	-4		-0.50	
1194		-----		-----	
1227	D2500	-4		-0.50	
1237		-----		-----	
1259	EN23015	-2		0.90	
1299	D2500	-4		-0.50	
1389	D2500	-6		-1.90	
1397	D5771	-3		0.20	
1402	EN23015	-3		0.20	
1404	D5771	-2.4		0.62	
1409	EN23015	-4		-0.50	
1419	EN23015	-3		0.20	
1455	D2500	-3.5		-0.15	
1457	ISO3015	-4.6		-0.92	
1459	ISO3015	-3.0		0.20	
1510	EN23015	-2		0.90	
1549		-----		-----	
1550		-----		-----	
1569	EN23015	-4		-0.50	
1631		-----		-----	
1634		-----		-----	
1635	EN23015	-4		-0.50	
1656	D2500	-3		0.20	
1676		-----		-----	
1706		-----		-----	
1724	EN23015	-3		0.20	
1728	D2500	-3.5		-0.15	
1776	EN23015	-3.5		-0.15	
1807	EN23015	-2		0.90	
1810	D7689	-4		-0.50	
1811	EN23015	-2		0.90	
1833	D2500	-3		0.20	
1948	EN23015	-4		-0.50	
1984	EN23015	-4		-0.50	
1987		-----		-----	
1998	ISO3015	-3		0.20	
2129	EN23015	-4		-0.50	

normality	suspect
n	57
outliers	0
mean (n)	-3.29
st.dev. (n)	1.058
R(calc.)	2.96
R(EN23015:94)	4.00

Compare R(D2500:11) = 4.00



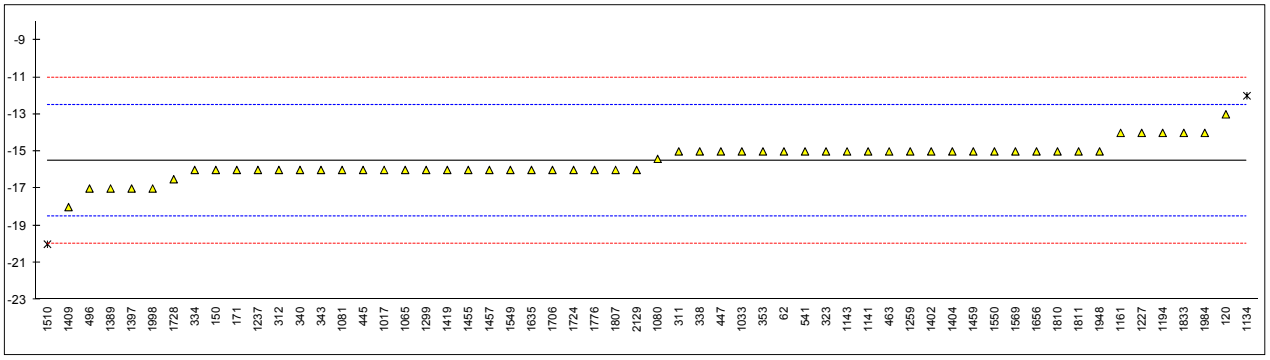


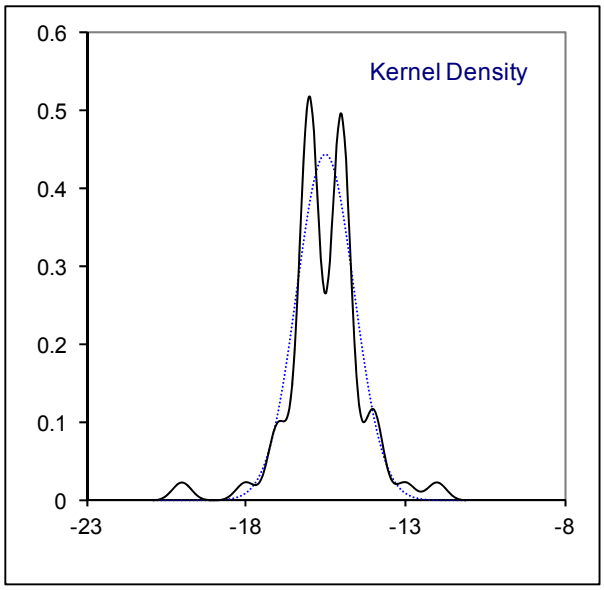
Determination of Cold Filter Plugging Point on sample #15070; result in °C

lab	method	value	mark	z(targ)	remarks
62	D6371	-15	C	0.33	first reported: -11
120	EN116	-13		1.68	
150	EN116	-16		-0.34	
171	D6371	-16		-0.34	
311	EN116	-15		0.33	
312	EN116	-16		-0.34	
323	EN116	-15		0.33	
334	EN116	-16		-0.34	
335		-----		-----	
338	EN116	-15		0.33	
340	EN116	-16		-0.34	
343	EN116	-16		-0.34	
351		-----		-----	
353	IP309	-15.0		0.33	
381		-----		-----	
444		-----		-----	
445	IP309	-16		-0.34	
447	IP309	-15		0.33	
463	EN116	-15		0.33	
496	EN116	-17.0		-1.01	
511		-----		-----	
529		-----		-----	
541	D6371	-15		0.33	
556		-----		-----	
558		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
1016		-----		-----	
1017	EN116	-16		-0.34	
1033	IP309	-15.0		0.33	
1064		-----		-----	
1065	IP309	-16		-0.34	
1080	EN116	-15.4		0.07	
1081	EN116	-16		-0.34	
1126		-----		-----	
1134	IP309	-12	R(0.05)	2.35	
1141	EN116	-15		0.33	
1143	EN116	-15		0.33	
1161	EN116	-14		1.01	
1194	EN116	-14		1.01	
1227	EN116	-14		1.01	
1237	EN116	-16		-0.34	
1259	EN116	-15		0.33	
1299	EN116	-16		-0.34	
1389	IP309	-17		-1.01	
1397	EN116	-17		-1.01	
1402	EN116	-15		0.33	
1404	EN116	-15		0.33	
1409	EN116	-18		-1.68	
1419	EN116	-16		-0.34	
1455	EN116	-16		-0.34	
1457	EN116	-16		-0.34	
1459	EN116	-15.0		0.33	
1510	EN116	-20	R(0.01)	-3.02	
1549	EN116	-16		-0.34	
1550	EN116	-15		0.33	
1569	EN116	-15		0.33	
1631		-----		-----	
1634		-----		-----	
1635	EN116	-16		-0.34	
1656	EN116	-15		0.33	
1676		-----		-----	
1706	EN116	-16.0		-0.34	
1724	EN116	-16		-0.34	
1728	D6371	-16.5		-0.67	
1776	EN116	-16		-0.34	
1807	EN116	-16		-0.34	
1810	EN116	-15		0.33	
1811	EN116	-15		0.33	
1833	D6371	-14		1.01	
1948	EN116	-15		0.33	
1984	EN116	-14		1.01	
1987		-----		-----	
1998	EN116	-17		-1.01	
2129	EN116	-16		-0.34	

normality	OK
n	56
outliers	2
mean (n)	-15.50
st.dev. (n)	0.900
R(calc.)	2.52
R(EN116:97)	4.17

R(EN116:97) = R(IP309:99)



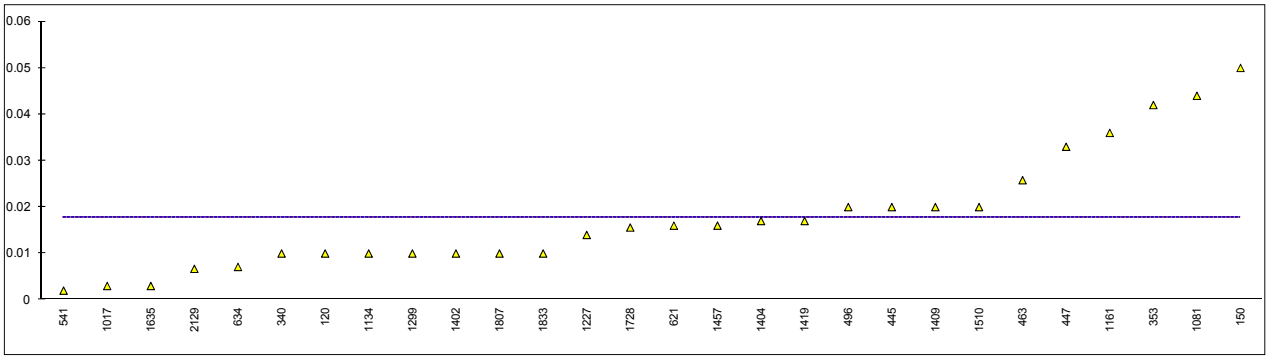


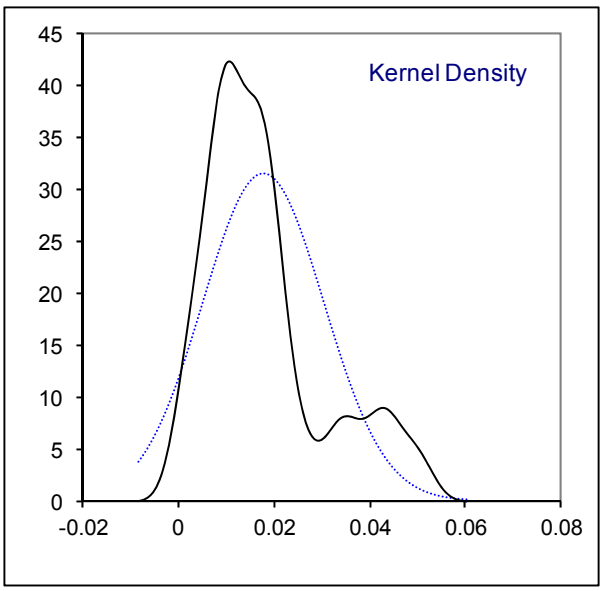
Determination of Carbon Residue, micro method on 10% dist. res. on sample #15070; result in %M/M

lab	method	value	mark	z(targ)	remarks
62	D4530	<0.1		-----	
120	D4530	0.01		-----	
150	ISO10370	0.05		-----	
171	D4530	<0.1		-----	
311	D4530	<0.10		-----	
312		-----		-----	
323	ISO10370	<0.10		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340	ISO10370	0.01		-----	
343	D4530	<0.1		-----	
351	ISO10370	<0.05		-----	
353	IP13	0.042		-----	
381		-----		-----	
444		-----		-----	
445	IP398	0.020		-----	
447	IP398	0.033		-----	
463	ISO10370	0.0258		-----	
496	ISO10370	0.02		-----	
511		-----		-----	
529		-----		-----	
541	D189	0.002		-----	
556		-----		-----	
558		-----		-----	
621	D189	0.016		-----	
633		-----		-----	
634	D189	0.0071		-----	
1016		-----		-----	
1017	ISO10370	0.003		-----	
1033		-----		-----	
1064		-----		-----	
1065		-----		-----	
1080		-----		-----	
1081	ISO10370	0.044		-----	
1126		-----		-----	
1134		0.01		-----	
1141		-----		-----	
1143		-----		-----	
1161	ISO10370	0.036		-----	
1194		-----		-----	
1227	D4530	0.014		-----	
1237		-----		-----	
1259		-----		-----	
1299	D4530	0.01		-----	
1389	D4530	<0.1		-----	
1397		-----		-----	
1402	ISO10370	0.01		-----	
1404	ISO10370	0.017		-----	
1409	ISO10370	0.02		-----	
1419	ISO10370	0.017		-----	
1455	ISO10370	<0.10		-----	
1457	ISO10370	0.016		-----	
1459		-----		-----	
1510	ISO10370	0.02		-----	
1549		-----		-----	
1550		-----		-----	
1569	ISO10370	<0.01		-----	
1631		-----		-----	
1634		-----		-----	
1635	ISO10370	0.003		-----	
1656	D4530	<0.1		-----	
1676		-----		-----	
1706		-----		-----	
1724	ISO10370	<0.1		-----	
1728	ISO10370	0.0156		-----	
1776		-----		-----	
1807	ISO10370	0.01		-----	
1810		-----		-----	
1811		-----		-----	
1833	D4530	0.01		-----	
1948		-----		-----	
1984		-----		-----	
1987		-----		-----	
1998		-----		-----	
2129	ISO10370	0.0067		-----	

normality	suspect
n	28
outliers	0
mean (n)	0.0178
st.dev. (n)	0.01267
R(calc.)	0.0355
R(ISO10370:14)	(0.0250)

Compare R(EN590:13, Annex A) = 0.0284
Application range: 0.1 – 30% M/M

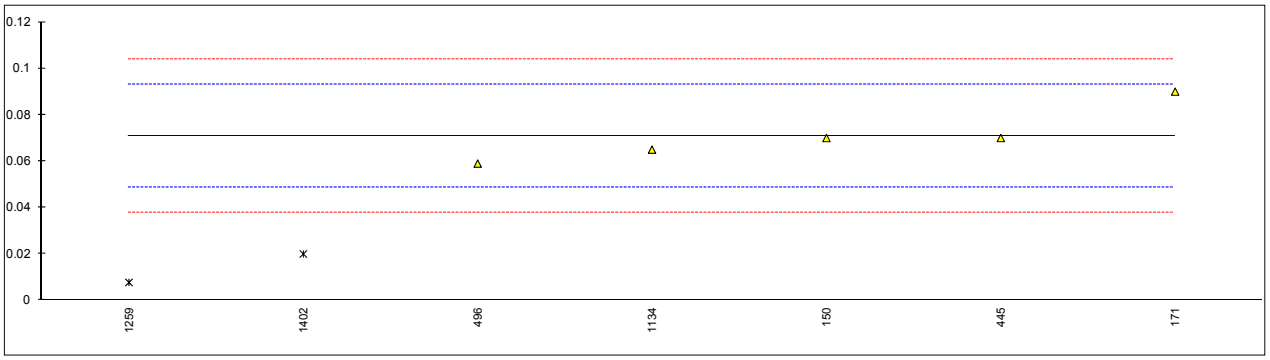




Determination of Ramsbottom Carbon Res. on 10% dist. res. on sample #15070; result in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
150	D524	0.07		-0.07	
171	D524	0.09		1.74	
311		-----		-----	
312		-----		-----	
323		-----		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340		-----		-----	
343		-----		-----	
351		-----		-----	
353		-----		-----	
381		-----		-----	
444		-----		-----	
445	IP14	0.070		-0.07	
447		-----		-----	
463		-----		-----	
496	D524	0.059		-1.07	
511		-----		-----	
529		-----		-----	
541		-----		-----	
556		-----		-----	
558		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
1016		-----		-----	
1017		-----		-----	
1033		-----		-----	
1064		-----		-----	
1065		-----		-----	
1080		-----		-----	
1081		-----		-----	
1126		-----		-----	
1134	D524	0.065		-0.52	
1141		-----		-----	
1143		-----		-----	
1161		-----		-----	
1194		-----		-----	
1227		-----		-----	
1237		-----		-----	
1259		0.007735		-5.70	
1299		-----		-----	
1389		-----		-----	
1397		-----		-----	
1402	D524	0.02		-4.60	
1404		-----		-----	
1409		-----		-----	
1419		-----		-----	
1455		-----		-----	
1457		-----		-----	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1569		-----		-----	
1631		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656		-----		-----	
1676		-----		-----	
1706		-----		-----	
1724		-----		-----	
1728		-----		-----	
1776		-----		-----	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1833		-----		-----	
1948		-----		-----	
1984		-----		-----	
1987		-----		-----	
1998		-----		-----	
2129		-----		-----	

normality	unknown
n	5
outliers	2
mean (n)	0.071
st.dev. (n)	0.0116
R(calc.)	0.033
R(D524:10)	0.031



Determination of Copper Corrosion 3hrs at 50 °C on sample #15070

lab	method	value	mark	z(targ)	remarks
62	D130	1A		-----	
120	D130	1A		-----	
150	ISO2160	1A		-----	
171	D130	1A		-----	
311	ISO2160	1A		-----	
312		-----		-----	
323	ISO2160	1A		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340	ISO2160	1		-----	
343	D130	1A		-----	
351	ISO2160	1A		-----	
353	D130	1A		-----	
381		-----		-----	
444		-----		-----	
445	IP154	1A		-----	
447	D130	1A		-----	
463	ISO2160	1A		-----	
496	ISO2160	1A		-----	
511	D130	1A		-----	
529	D130	1A		-----	
541	D130	1A		-----	
556		-----		-----	
558		-----		-----	
621	D130	1A		-----	
633	D130	1A		-----	
634	D130	1a		-----	
1016		-----		-----	
1017	ISO2160	1A		-----	
1033		-----		-----	
1064		-----		-----	
1065		-----		-----	
1080		-----		-----	
1081	D130	1A		-----	
1126		-----		-----	
1134	IP154	1A		-----	
1141	ISO2160	1A		-----	
1143		-----		-----	
1161	ISO2160	1A		-----	
1194		-----		-----	
1227	D130	1A		-----	
1237		-----		-----	
1259	ISO2160	1A		-----	
1299	D130	1A		-----	
1389	D130	1A		-----	
1397	ISO2160	1		-----	
1402	ISO2160	1A		-----	
1404	ISO2160	1A		-----	
1409	ISO2160	1A		-----	
1419		-----		-----	
1455	D130	1A		-----	
1457	ISO2160	1A		-----	
1459		-----		-----	
1510	ISO2160	1A		-----	
1549		-----		-----	
1550		-----		-----	
1569	ISO2160	1A		-----	
1631		-----		-----	
1634	ISO2160	1A		-----	
1635	ISO2160	1A		-----	
1656	D130	1A		-----	
1676		-----		-----	
1706		-----		-----	
1724	ISO2160	1A		-----	
1728	D130	1A		-----	
1776		-----		-----	
1807	D130	1A		-----	
1810		-----		-----	
1811		-----		-----	
1833	D130	1A		-----	
1948	ISO2160	1A		-----	
1984		-----		-----	
1987		-----		-----	
1998		-----		-----	
2129	ISO2160	1A		-----	

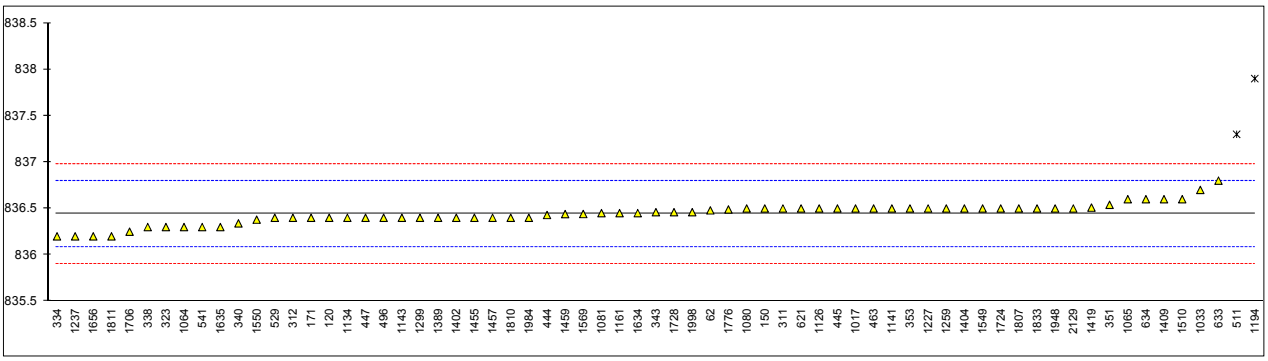
normality	n.a
n	46
outliers	n.a
mean (n)	1(1A)
st.dev. (n)	n.a.
R(calc.)	n.a.
R(ISO2160:98)	n.a.

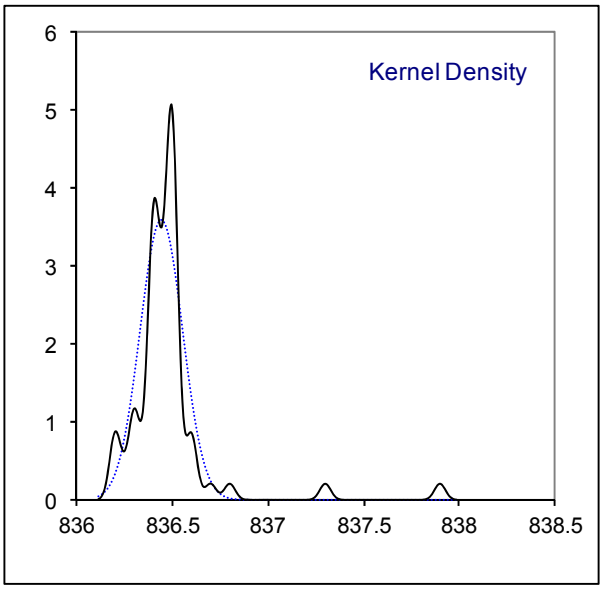
Determination of Density at 15 °C on sample #15070; result in kg/m^3

lab	method	value	mark	z(targ)	remarks
62	D4052	836.48		0.21	
120	D4052	836.4		-0.24	
150	ISO12185	836.5		0.32	
171	D4052	836.4		-0.24	
311	ISO12185	836.5		0.32	
312	ISO12185	836.4		-0.24	
323	ISO12185	836.3		-0.80	
334	ISO12185	836.2		-1.36	
335		-----		-----	
338	ISO12185	836.3		-0.80	
340	ISO12185	836.34		-0.57	
343	ISO12185	836.46		0.10	
351	ISO12185	836.54		0.55	
353	IP365	836.5		0.32	
381		-----		-----	
444	D4052	836.43		-0.07	
445	IP365	836.5		0.32	
447	D4052	836.4		-0.24	
463	ISO12185	836.50		0.32	
496	ISO12185	836.40		-0.24	
511	D4052	837.3	C,R(0.01)	4.80	first reported: 835.40
529	D4052	836.4		-0.24	
541	D4052	836.3		-0.80	
556		-----		-----	
558		-----		-----	
621	D4052	836.5		0.32	
633	D4052	836.8		2.00	
634	D4052	836.6		0.88	
1016		-----		-----	
1017	D4052	836.5		0.32	
1033	IP365	836.7		1.44	
1064	ISO12185	836.3		-0.80	
1065	D4052	836.6		0.88	
1080	ISO12185	836.5		0.32	
1081	D4052	836.45		0.04	
1126	ISO12185	836.5		0.32	
1134	IP365	836.4		-0.24	
1141	ISO12185	836.5		0.32	
1143	ISO12185	836.4		-0.24	
1161	ISO12185	836.45		0.04	
1194	ISO12185	837.9	C,R(0.01)	8.16	first reported:0.8379
1227	D4052	836.5		0.32	
1237	ISO12185	836.2		-1.36	
1259	ISO12185	836.5		0.32	
1299	D4052	836.4		-0.24	
1389	D4052	836.4		-0.24	
1397		-----		-----	
1402	ISO12185	836.4		-0.24	
1404	ISO12185	836.5		0.32	
1409	ISO12185	836.6		0.88	
1419	ISO12185	836.51		0.38	
1455	ISO12185	836.4		-0.24	
1457	ISO12185	836.4		-0.24	
1459	ISO12185	836.44		-0.01	
1510	ISO12185	836.6		0.88	
1549	ISO12185	836.5	C	0.32	first reported: 835.76
1550	ISO12185	836.38	C	-0.35	first reported: 835.7
1569	ISO12185	836.441		-0.01	
1631		-----		-----	
1634	ISO12185	836.450		0.04	
1635	ISO12185	836.3		-0.80	
1656	D4052	836.2		-1.36	
1676		-----		-----	
1706	ISO12185	836.25		-1.08	
1724	ISO12185	836.5		0.32	
1728	D4052	836.46		0.10	
1776	ISO12185	836.49		0.27	
1807	ISO12185	836.5		0.32	
1810	ISO12185	836.4		-0.24	
1811	ISO12185	836.2		-1.36	
1833	D4052	836.5		0.32	
1948	ISO12185	836.5		0.32	
1984	ISO12185	836.4		-0.24	
1987		-----		-----	
1998	ISO12185	836.46		0.10	
2129	D4052	836.5		0.32	

normality	suspect
n	65
outliers	2
mean (n)	836.44
st.dev. (n)	0.111
R(calc.)	0.31
R(ISO12185:96)	0.50

Compare R(D4052:11) = 0.50





Determination of Distillation on sample #15070; result in °C

Lab	method	mode	IBP	mark	10%rec	mark	50%rec	mark	90%rec	mark	95%rec	mark	FBP	mark
62	D86	Automated	167.1		210.7		285.4		341.1		356.8		364.2	
120	D86	Automated	169.5		211.4		282.9		340.6		358.1		359.5	
150	ISO3405		163.2		210.4		282.6		338.4		352.3		359.3	
171	D86	Automated	167.7		212.8		284.0		336.6		349.5		357.2	
311	ISO3405	Automated	162.6		208.9		281.9		337.4		350.7		359.3	
312	D86	Automated	166.2		212.2		284.4		338.5		353.4		359.4	
323	ISO3405	Automated	171.6		211.9		283.8		338.6		353.4		360.6	
334	ISO3405	Automated	169.2		207.0		283.1		338.6		351.7		365.3	
335			-----		-----		-----		-----		-----		-----	
338	ISO3405	Automated	165.7		212.6		284.7		340.7		357.1		363.3	
340	ISO3405	Automated	172.4		210.8		283.2		337.0		349.1		356.4	
343	ISO3405	Automated	156.0	R(0.05)	202.1	R(0.01)	280.8	ex	335.4	ex	346.1	ex	351.6	C,R(0.05)
351	ISO3405	Automated	168.45		210.65		283.30		340.55		352.40		354.20	
353	D86	Automated	163.7		209.5		284.4		342.0		359.3		364.2	
381			-----		-----		-----		-----		-----		-----	
444	D86	Automated	164.1		209.5		282		335		348.9		356.7	
445	ISO3405	Automated	167.4		209.8		281.9		337.0		351.2		358.9	
447	D86	Automated	165.8		211.1		283.5		338.6		351.9		361.7	
463	ISO3405	Automated	173.7		212.0		284.2		339.6		353.4		363.9	
496	ISO3405	Automated	165.5		210.5		283.2		337.6		351.3		361.3	
511	D86	Manual	171.2		211.3		281.5		337.5		351.5		361.5	
529			-----		-----		-----		-----		-----		-----	
541	D86	Automated	172.2		211.2		283.5		338.5		353.1		363.2	
556			-----		-----		-----		-----		-----		-----	
558			-----		-----		-----		-----		-----		-----	
621	D86	Manual	166.0		212.0		284.0		339.0		354.0		360.0	
633	D86	Manual	169.0		208.0		284	C	338.0		354.0		358.0	
634	D86	Manual	168.0		211.0		284.0		340.0		359.0		364.0	
1016			-----		-----		-----		-----		-----		-----	
1017	ISO3405	Automated	169.1		213.7		284.0		337.8		351.1		362.4	
1033	IP123	Automated	171.1		214.6		285.1		339.6		351.7		361.4	
1064	D86	Automated	167.5		211.9		284.1		339.8		353.9		362.0	
1065	D86	Automated	168.8		210.3		283.8		338.6		351.3		363.2	
1080			-----		-----		-----		-----		-----		-----	
1081	D86	Automated	165.7		214.4		284.6		339.5		353.2		363.0	
1126	in house	Automated	172.0		214.9		285.0		342.9		356.9		370.3	R(0.05)
1134	IP123	Automated	167.8		210.7		285.4		340.8		355.1		364.4	
1141	ISO3405	Automated	170.0		214.1		284.2		337.7		350.2		361.9	
1143	ISO3405	Automated	173.3		213.5		284.4		338.3		350.4		357.5	
1161	ISO3405	Automated	160.2		208.5		282.5		339.7		351.9		360.6	
1194	D86	Automated	141.7	R(0.01)	203.8	R(0.05)	281.8		339.6		352.5		358.5	
1227	D86	Automated	169.9		211.9		284.9		339.3		352.8		363.9	
1237	ISO3405		170.8		207.7		282.7		337.7		349.7		362.7	
1259	ISO3405	Automated	167.1		211.3		282.9		336.9		348.5		361.8	
1299	D86	Automated	170.0		211.5		283.4		339.0		353.4		362.6	
1389	D86	Automated	163.7		207.2		282.2		337.3		350.9		357.2	
1397	ISO3405		169.8		213.0		284.0		338.8		352.4		364.3	
1402	ISO3405	Automated	173.6		210.7		284.4		339.5		353.4		363.8	
1404	ISO3405	Automated	160.5		205.7	R(0.05)	282.4		338.5		351.0		353.9	
1409	ISO3405	Automated	166.0		210.1		282.9		338.4		352.4		361.2	
1419	ISO3405	Automated	167.9		210.7		282.4		336.9		349.7		359.4	
1455	ISO3405	Automated	170.0		211.7		283.8		339.7		354.3		362.3	
1457	ISO3405	Automated	166.6		211.1		282.8		337.3		351.4		361.9	
1459	ISO3405		167.6		211.6		284.3		338.5		352.8		361.5	
1510	ISO3405	Automated	165.4		209.9		282.8		337.8		351.2		361.4	
1549		Automated	-----		-----		-----		-----		354.725		-----	
1550		Automated	-----		-----		-----		-----		352.75		-----	
1569	ISO3405	Automated	163.4		212.0		283.8		338.7		351.1		360.8	
1631			-----		-----		-----		-----		-----		-----	
1634	ISO3405	Automated	167.4		211.9		284.8		339.6		353.5		362.8	
1635	ISO3405	Automated	168.0		208.1		283.2		337.1		348.8		363.02	
1656	D86	Automated	160.0		206.9	C	282.7		338.4		351.8		362.6	
1676			-----		-----		-----		-----		-----		-----	
1706	ISO3405	Automated	169.8		211.8		283.6		337.75		350.7		359.25	
1724	ISO3405	Automated	164.2		208.2		283.1		337.6		350.2		360.8	
1728	D86	Manual	168.14		209.36		283.25		339.27		352.53		359.56	
1776	ISO3405	Automated	168.8		211.9		282.7		337.2		350.0		359.3	
1807	ISO3405	Automated	165.1		210.4		282.3		337.3		350.5		361.5	
1810	ISO3405		166.2		210.9		283.9		338.3		350.7		361.9	
1811	ISO3405	Automated	168.0		210.8		282.3		337.3		349.9		360.4	
1833	D86	Automated	163.5		208.2		281.5		337.1		349.8		359.6	
1948	ISO3405	Automated	164.2		209.1		282.2		336.8		349.8		359.6	
1984	ISO3405	Automated	168.5		211.2		283.6		338.7		352.8		361.1	
1987			-----		-----		-----		-----		-----		-----	
1998	ISO3405	Automated	168.80		211.47		284.20		339.43		353.20		362.77	
2129	ISO3405	Automated	162.7		211.2		283.2		338.5		353.9		360.8	

normality	OK	OK	OK	OK	not OK	OK
n	62	61	63	63	65	62
outliers	2	3	0+1 excl.	0+1 excl.	0+1 excl.	2
mean (n)	167.44	210.88	283.43	338.57	352.32	360.98
st.dev. (n)	3.231	1.830	0.979	1.391	2.378	2.45
R(calc.)	9.05	5.12	2.74	3.90	6.66	6.86
R(ISO 3405:11/D86:12)	9.21	4.64	2.97	5.08	8.97	7.10

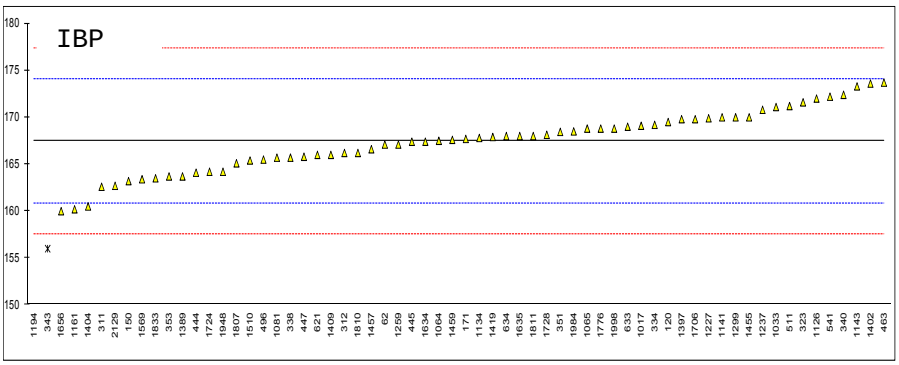
Lab 343 first reported FBP: 349.6, results for 50% rec, 90% rec, 95% rec excluded see §4.1
Lab 633 first reported 50% rec: 280.0
Lab 1656 first reported 10% rec: 205.3

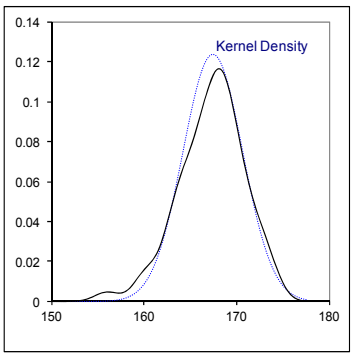
Determination of Distillation on sample #15070; result in %V/V, (continued)

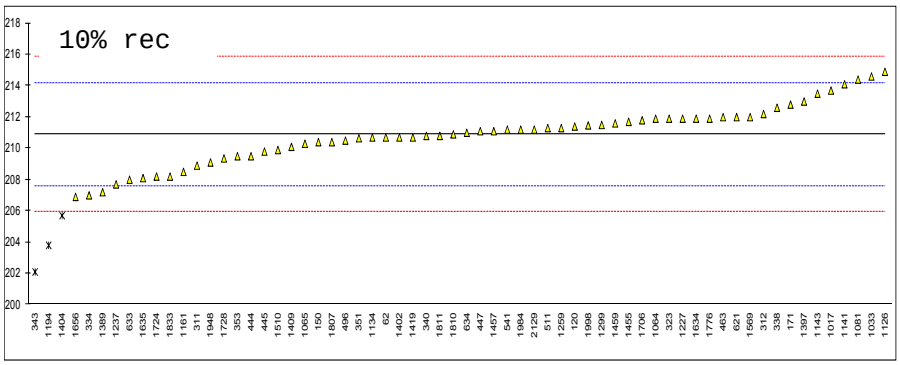
Lab	method	mode	Volume at 250°C	mark	z(targ)	Volume at 350°C	mark	z(targ)	%residue	mark
62	D86	Automated	27.9		-0.07	94.3		-0.09	1.0	
120	D86	Automated	27.5		-0.49	92.9		-1.54	1.4	
150	ISO3405		27.9		-0.07	94.4		0.01	1.5	
171	D86	Automated	27.3		-0.70	95.4		1.05	2.0	
311	ISO3405	Automated	29.0		1.07	94.8		0.43	1.4	
312	D86	Automated	27.0		-1.01	94.2		-0.20	2.0	
323	ISO3405	Automated	27.9		-0.07	94.2		-0.20	1.5	
334	ISO3405	Automated	27.5		-0.49	93.5		-0.92	0.8	
335			-----		-----	-----		-----	-----	
338	ISO3405	Automated	27.0		-1.01	93.4		-1.03	1.4	
340	ISO3405	Automated	28.3		0.34	95.2		0.84	1.7	
343	ISO3405	Automated	30.0	ex	2.10	96.7	C,R(0.05)	2.40	1.5	
351	ISO3405	Automated	27.75		-0.23	94.00		-0.40	1.5	
353	D86	Automated	27.8		-0.18	93.0		-1.44	0.9	
381			-----		-----	-----		-----	-----	
444	D86	Automated	30.6		2.73	95.1		0.74	2.3	
445	ISO3405	Automated	28.7		0.76	94.7		0.32	1.5	
447	D86	Automated	27.7		-0.28	94.4		0.01	1.4	
463	ISO3405	Automated	27.2		-0.80	94.0		-0.40	1.8	
496	ISO3405	Automated	27.6		-0.38	94.7		0.32	1.2	
511	D86	Manual	29.0		1.07	94.0		-0.40	1.0	
529			-----		-----	-----		-----	-----	
541		Automated	-----		-----	-----		-----	1.5	
556			-----		-----	-----		-----	-----	
558			-----		-----	-----		-----	-----	
621	D86	Manual	28.0		0.03	94.0		-0.40	-----	
633		Manual	-----		-----	-----		-----	1.1	
634	D86	Manual	28		0.03	94		-0.40	1.0	
1016			-----		-----	-----		-----	-----	
1017	ISO3405	Automated	27.0		-1.01	94.7		0.32	1.6	
1033	IP123	Automated	25.7		-2.36	93.7		-0.71	1.4	
1064	D86	Automated	27.1		-0.90	94.0		-0.40	1.4	
1065	D86	Automated	29.0		1.07	95.0		0.63	1.3	
1080			-----		-----	-----		-----	-----	
1081	D86	Automated	26.55		-1.47	94.14		-0.26	1.1	
1126	in house	Automated	26.8		-1.21	92.7		-1.75	-----	
1134	IP123	Automated	27.0		-1.01	93.7		-0.71	1.0	
1141	ISO3405	Automated	26.6		-1.42	94.9		0.53	1.0	
1143	ISO3405	Automated	26.8		-1.21	94.9		0.53	1.2	
1161	ISO3405	Automated	28.9		0.96	93.8		-0.61	0.9	
1194	D86	Automated	30.1		2.21	94.2		-0.20	1.8	
1227	D86	Automated	27.9		-0.07	95.0		0.63	1.0	
1237	ISO3405		28.7		0.76	93.9		-0.51	1.1	
1259	ISO3405	Automated	28.3		0.34	95.4		1.05	1.4	
1299		Automated	-----		-----	-----		-----	1.6	
1389	D86	Automated	28.8		0.86	94.8		0.43	1.4	
1397	ISO3405		27.2		-0.80	94.4		0.01	1.1	
1402	ISO3405	Automated	28.1		0.13	94.1		-0.30	1.0	
1404	ISO3405	Automated	28.9		0.96	94.6		0.22	1.5	
1409	ISO3405	Automated	27.9		-0.07	94.4		0.01	1.0	
1419	ISO3405	Automated	28.5		0.55	95.4		1.05	1.4	
1455	ISO3405	Automated	27.5		-0.49	93.9		-0.51	1.4	
1457	ISO3405	Automated	28.1		0.13	94.6		0.22	2.0	
1459	ISO3405		26.8		-1.21	94.3		-0.09	1.4	
1510	ISO3405	Automated	28.2		0.24	94.7		0.32	0.9	
1549	D7345	Automated	29.225		1.30	93.775		-0.64	-----	
1550	D7345	Automated	29.30		1.38	94.15		-0.25	-----	
1569	ISO3405	Automated	27.5		-0.49	94.7		0.32	1.4	
1631			-----		-----	-----		-----	-----	
1634	ISO3405	Automated	27.0		-1.01	93.7		-0.71	1.4	
1635	ISO3405	Automated	28.3		0.34	95.5		1.15	1.5	
1656	D86	Automated	29.2		1.27	94.6		0.22	1.4	
1676			-----		-----	-----		-----	-----	
1706	ISO3405	Automated	28.4		0.44	94.85		0.48	1.7	
1724	ISO3405	Automated	27.5		-0.49	95		0.63	1.1	
1728	D86	Manual	27.49		-0.50	94.28		-0.11	1.55	
1776	ISO3405	Automated	27.5	C	-0.49	95.0		0.63	1.4	
1807	ISO3405	Automated	29.0		1.07	94.8		0.43	1.4	
1810	ISO3405		27.4		-0.59	94.8		0.43	1.5	
1811	ISO3405	Automated	28.3		0.34	95.0		0.63	1.4	
1833	D86	Automated	28.7		0.76	95		0.63	1.6	
1948	ISO3405	Automated	27.8		-0.18	94.3		-0.09	1.7	
1984	ISO3405	Automated	28.5		0.55	94.8		0.43	1.4	
1987			-----		-----	-----		-----	-----	
1998	ISO3405	Automated	27.27		-0.73	94.25		-0.14	1.40	
2129	ISO3405	Automated	27.7		-0.28	94.2		-0.20	1.2	

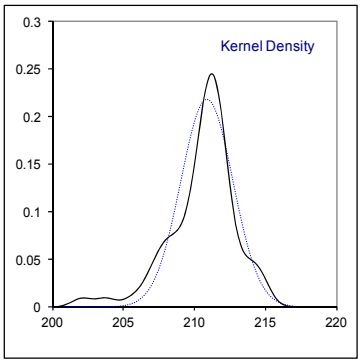
normality	OK	OK
n	62	62
outliers	0+1 excl.	1
mean (n)	27.94	94.39
st.dev. (n)	0.895	0.609
R(calc.)	2.50	1.70
R(ISO 3405:11/D86:12)	2.70	2.70

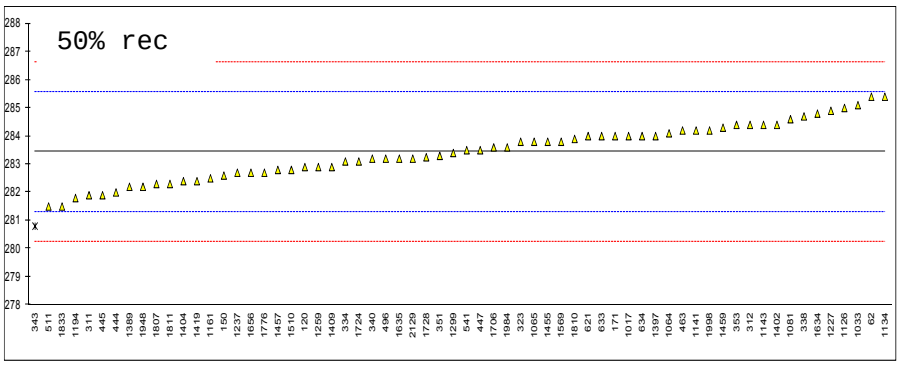
Lab 343 first reported volume at 350 °C:97.2, volume at 250 °C: excluded: see §4.1
Lab 1776 first reported volume at 250 °C:249.8

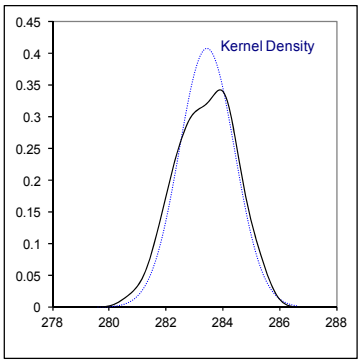

IBP

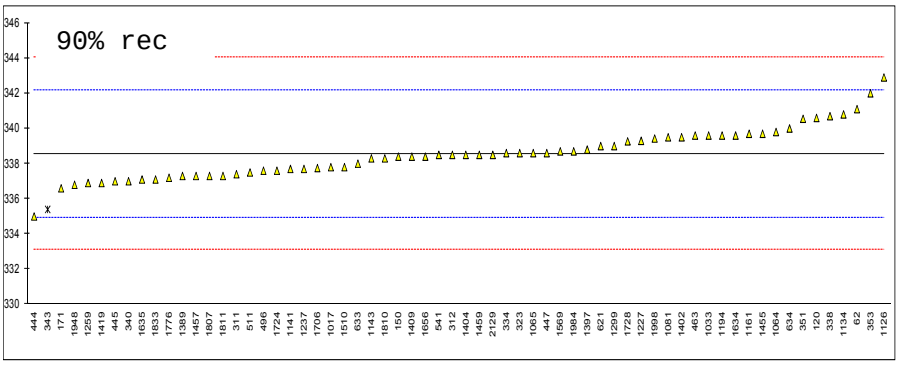

Kernel Density

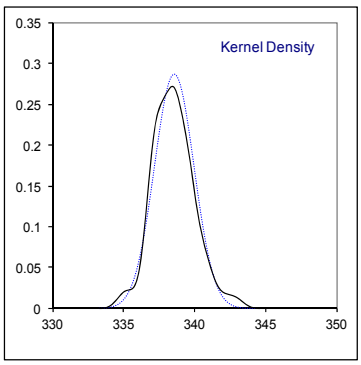

10% rec

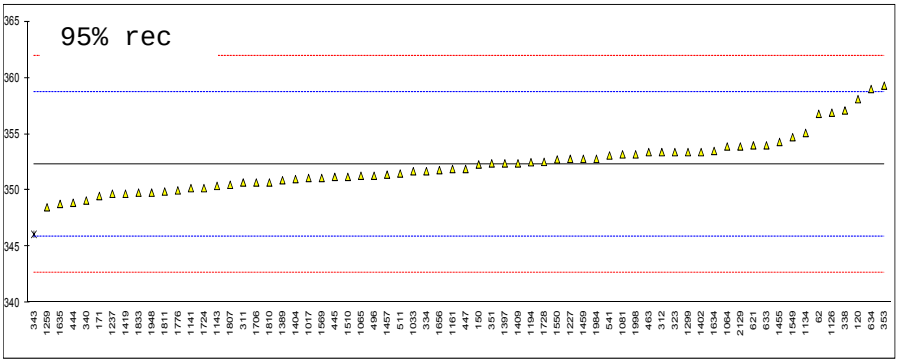

Kernel Density

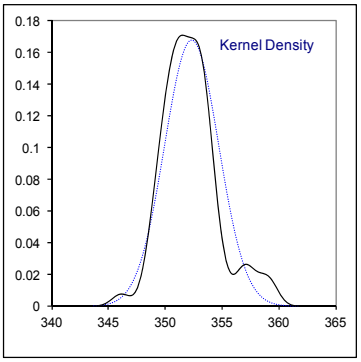

50% rec

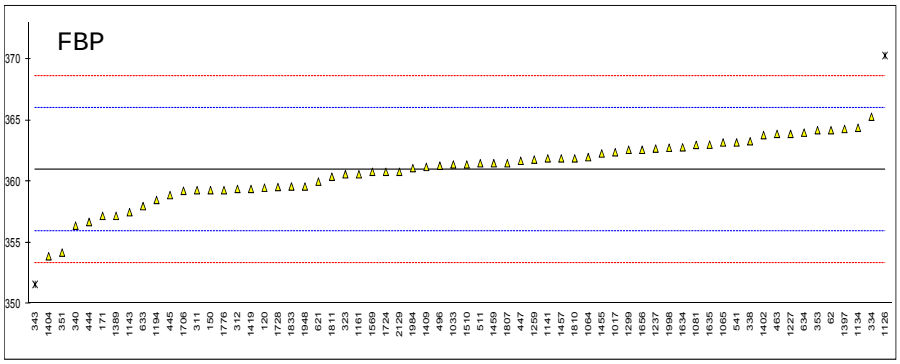

Kernel Density

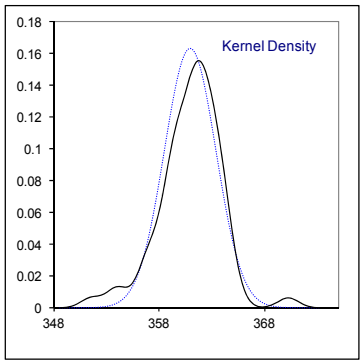

90% rec

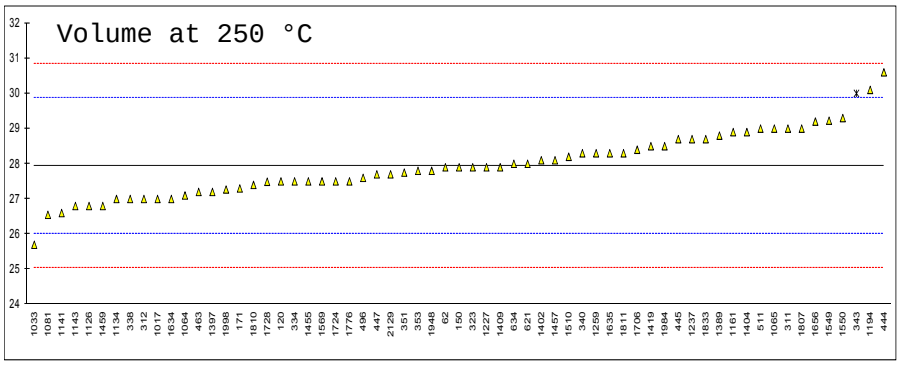

Kernel Density

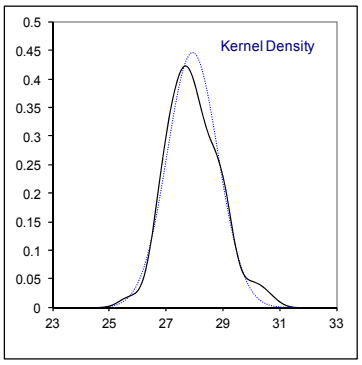

95% rec

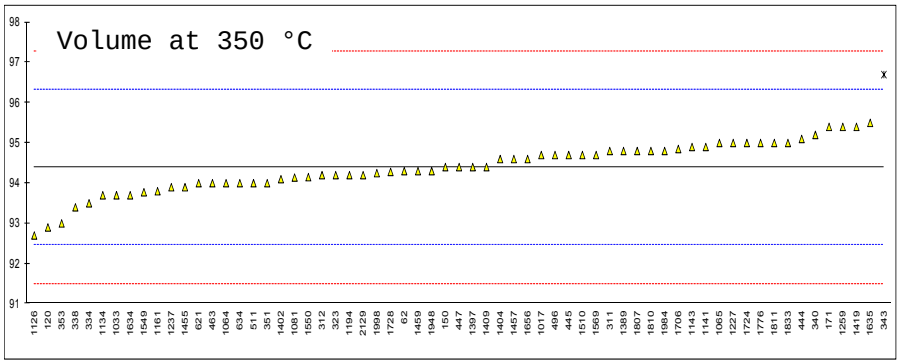

Kernel Density

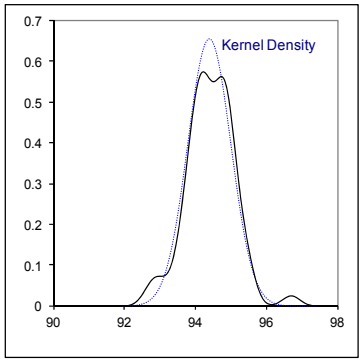

FBP


Kernel Density


Volume at 250 °C


Kernel Density

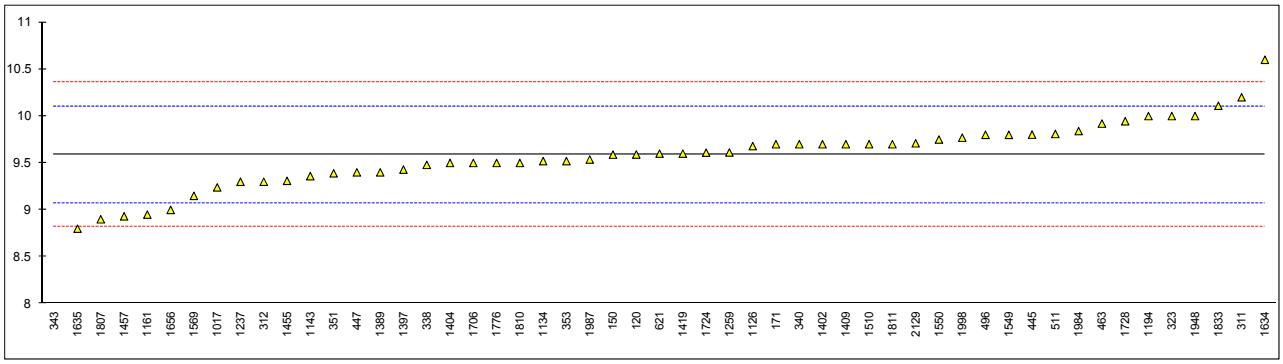

Volume at 350 °C

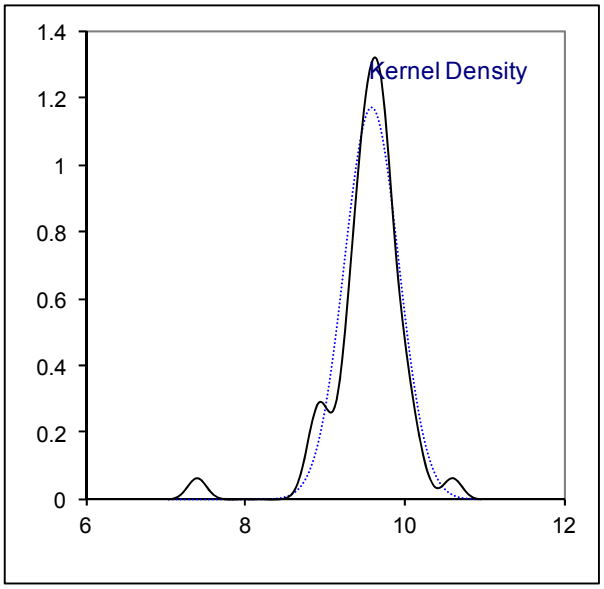

Kernel Density

Determination of Fatty Acid Methyl Esters (FAME) content on sample #15070; result in %V/V

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D7371	9.59		0.02	
150	EN14078	9.589		0.01	
171	EN14078	9.7	C	0.45	first reported: 8.6
311	EN14078	10.2		2.39	
312	EN14078	9.30		-1.11	
323	EN14078	10.0		1.61	
334		-----		-----	
335		-----		-----	
338	EN14078	9.48		-0.41	
340	EN14078	9.70		0.45	
343	EN14078	7.40	C,R(0.01)	-8.51	first reported: 0.79
351	EN14078	9.39		-0.76	
353	EN14078	9.52		-0.26	
381		-----		-----	
444		-----		-----	
445	EN14078	9.802		0.84	
447	EN14078	9.4		-0.72	
463	EN14078	9.92		1.30	
496	EN14078	9.8		0.83	
511	D7371	9.809		0.87	
529		-----		-----	
541		-----		-----	
556		-----		-----	
558		-----		-----	
621	EN14078	9.6		0.06	
633		-----		-----	
634		-----		-----	
1016		-----		-----	
1017	EN14078	9.24		-1.35	
1033		-----		-----	
1064		-----		-----	
1065		-----		-----	
1080		-----		-----	
1081		-----		-----	
1126	EN14078	9.68		0.37	
1134	EN14078	9.52		-0.26	
1141		-----		-----	
1143	D7371	9.36		-0.88	
1161	EN14078	8.95		-2.48	
1194	EN14078	10		1.61	
1227		-----		-----	
1237	EN14078	9.3		-1.11	
1259	EN14078	9.61195		0.10	
1299		-----		-----	
1389	EN14078	9.4	C	-0.72	first reported: 8.4
1397	EN14078	9.43		-0.61	
1402	EN14078	9.7		0.45	
1404	EN14078	9.5		-0.33	
1409	EN14078	9.7		0.45	
1419	EN14078	9.6		0.06	
1455	EN14078	9.31		-1.07	
1457	EN14078	8.932		-2.55	
1459		-----		-----	
1510	EN14078	9.7		0.45	
1549	EN14078	9.8		0.83	
1550	EN14078	9.75		0.64	
1569	EN14078	9.15		-1.70	
1631		-----		-----	
1634	EN14078	10.60		3.95	
1635	EN14078	8.8		-3.06	
1656	EN14078	9.0		-2.28	
1676		-----		-----	
1706	EN14078	9.5		-0.33	
1724	EN14078	9.61		0.09	
1728	EN14078	9.945		1.40	
1776	EN14078	9.5		-0.33	
1807	EN14078	8.9		-2.67	
1810	EN14078	9.5		-0.33	
1811	EN14078	9.70		0.45	
1833	EN14078	10.11		2.04	
1948	EN14078	10.00		1.61	
1984	EN14078	9.84		0.99	
1987	D7371	9.537		-0.19	
1998	EN14078	9.77		0.72	
2129	EN14078	9.71		0.48	

normality	suspect
n	52
outliers	1
mean (n)	9.586
st.dev. (n)	0.3401
R(calc.)	0.952
R(EN14078:14)	0.719



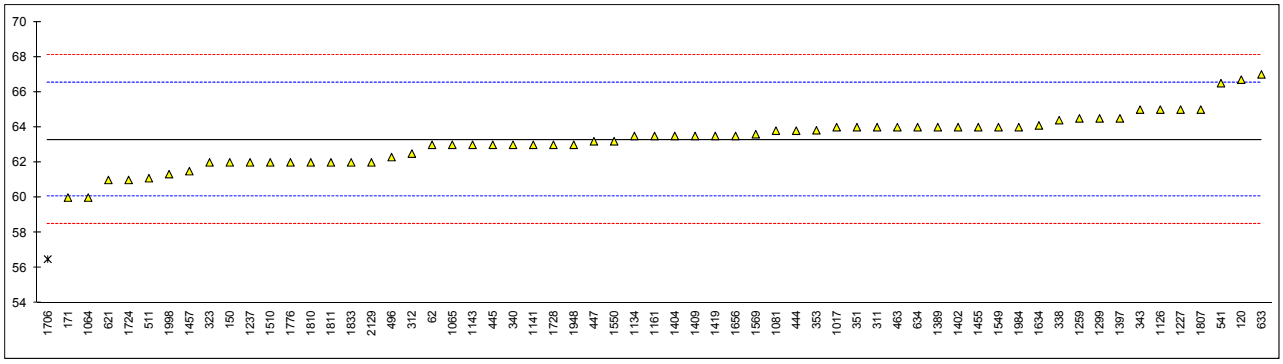


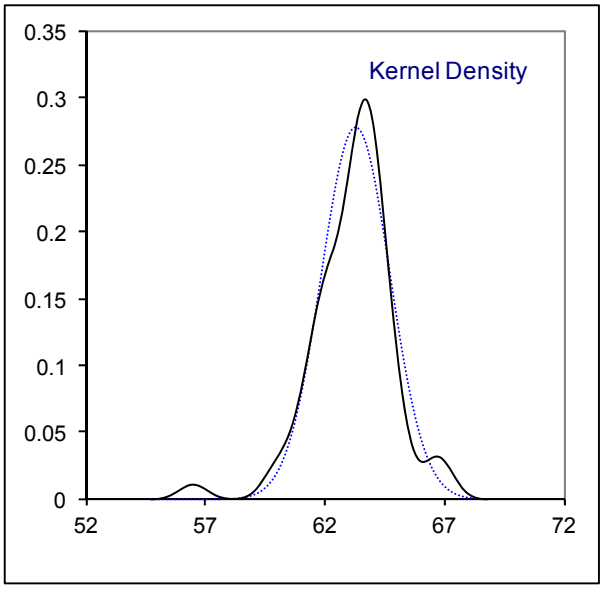
Determination of Flash Point PMcc on sample #15070; result in °C

lab	method	value	mark	z(targ)	remarks
62	D93	63.0		-0.18	
120	D93	66.7		2.13	
150	ISO2719	62.0		-0.80	
171	D93	60.0		-2.05	
311	ISO2719	64.0		0.44	
312	D93	62.5		-0.49	
323	ISO2719	62.0		-0.80	
334		-----		-----	
335		-----		-----	
338	ISO2719	64.4		0.69	
340	ISO2719	63.0		-0.18	
343	D93	65.0		1.07	
351	ISO2719	64.0		0.44	
353	IP34	63.825		0.33	
381		-----		-----	
444	D93	63.8		0.32	
445	IP34	63.0		-0.18	
447	D93	63.2		-0.06	
463	ISO2719	64.0		0.44	
496	ISO2719	62.3		-0.62	
511	D93	61.1		-1.36	
529		-----		-----	
541	ISO2719	66.5		2.00	
556		-----		-----	
558		-----		-----	
621	D93	61.0		-1.43	
633	D93	67.0		2.31	
634	D93	64.0		0.44	
1016		-----		-----	
1017	D93	64.0		0.44	
1033		-----		-----	
1064	ISO2719	60.0		-2.05	
1065	D93	63		-0.18	
1080		-----		-----	
1081	D93	63.8		0.32	
1126	ISO2719	65.0		1.07	
1134	IP34	63.5		0.13	
1141	ISO2719	63.0		-0.18	
1143	ISO2719	63.0		-0.18	
1161	ISO2719	63.5		0.13	
1194		-----		-----	
1227	D93	65.0		1.07	
1237	ISO2719	62.0		-0.80	
1259	ISO2719	64.5		0.75	
1299	D93	64.5		0.75	
1389	D93	64.0		0.44	
1397	ISO2719	64.5		0.75	
1402	ISO2719	64.0		0.44	
1404	ISO2719	63.5		0.13	
1409	ISO2719	63.5		0.13	
1419	ISO2719	63.5		0.13	
1455	ISO2719	64.0		0.44	
1457	ISO2719	61.5		-1.11	
1459		-----		-----	
1510	ISO2719	62.0		-0.80	
1549	ISO2719	64.0		0.44	
1550	ISO2719	63.20		-0.06	
1569	ISO2719	63.6		0.19	
1631		-----		-----	
1634	ISO2719	64.1		0.51	
1635		-----		-----	
1656	D93	63.5		0.13	
1676		-----		-----	
1706	ISO2719	56.5	R(0.01)	-4.23	
1724	ISO2719	61		-1.43	
1728	D93	63		-0.18	
1776	ISO2719	62.0		-0.80	
1807	ISO2719	65.0		1.07	
1810	ISO2719	62		-0.80	
1811	ISO2719	62.0		-0.80	
1833	D93	62		-0.80	
1948	ISO2719	63.0		-0.18	
1984	ISO2719	64.0		0.44	
1987		-----		-----	
1998	ISO2719	61.33		-1.22	
2129	ISO2719	62.0		-0.80	

normality	OK
n	60
outliers	1
mean (n)	63.289
st.dev. (n)	1.4328
R(calc.)	4.012
R(ISO2719:02)	4.494

Compare R(EN590:13, Annex A) = 3.5



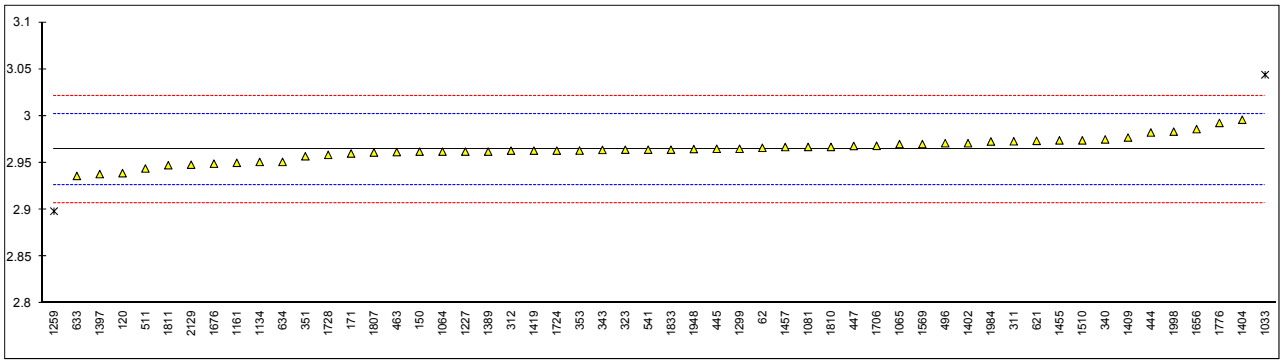


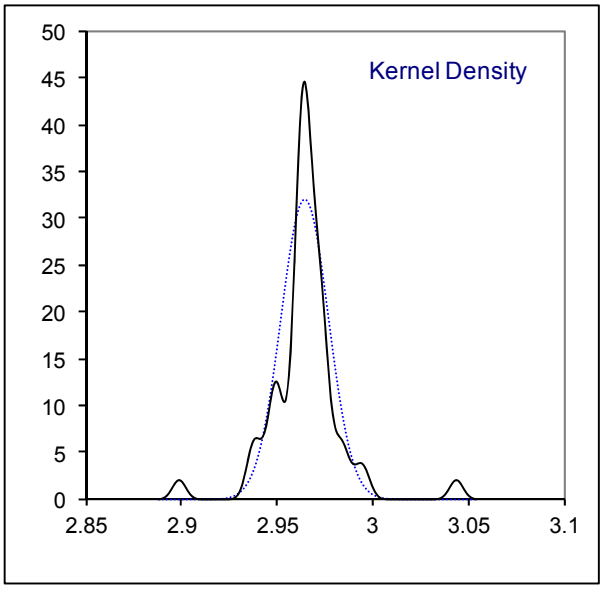
Determination of Kinematic Viscosity at 40°C on sample #15070; result in mm^2/s

lab	method	value	mark	z(targ)	remarks
62	D445	2.966		0.09	
120	D445	2.939		-1.33	
150	ISO3104	2.962		-0.12	
171	D445	2.96		-0.23	
311	ISO3104	2.973		0.45	
312	D445	2.963		-0.07	
323	ISO3104	2.964		-0.02	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340	ISO3104	2.975	C	0.56	first reported: 3.2353
343	D445	2.9638		-0.03	
351	ISO3104	2.957		-0.39	
353	ISO3104	2.9631		-0.07	
381		-----		-----	
444	D445	2.9824		0.95	
445	D445	2.965	C	0.03	first reported: 3.014
447	D445	2.968		0.19	
463	ISO3104	2.9615		-0.15	
496	ISO3104	2.9710		0.35	
511	D445	2.9440		-1.07	
529		-----		-----	
541	ISO3104	2.964		-0.02	
556		-----		-----	
558		-----		-----	
621	D445	2.9735	C	0.48	first reported: 2.8761
633	D7279	2.936		-1.49	
634	D445	2.951		-0.70	
1016		-----		-----	
1017		-----		-----	
1033	IP71	3.044	R(0.01)	4.18	
1064	ISO3104	2.962		-0.12	
1065	D445	2.970		0.30	
1080		-----		-----	
1081	D445	2.967		0.14	
1126		-----		-----	
1134	ISO3104	2.951		-0.70	
1141		-----		-----	
1143		-----		-----	
1161	ISO3104	2.950		-0.75	
1194		-----		-----	
1227	D445	2.962		-0.12	
1237		-----		-----	
1259	ISO3104	2.8984	R(0.01)	-3.46	
1299	D445	2.965		0.03	
1389	D445	2.962		-0.12	
1397	ISO3104	2.938		-1.38	
1402	ISO3104	2.971		0.35	
1404	ISO3104	2.996		1.66	
1409	ISO3104	2.977		0.66	
1419	ISO3104	2.963		-0.07	
1455	ISO3104	2.974		0.51	
1457	ISO3104	2.9669		0.13	
1459		-----		-----	
1510	ISO3104	2.974		0.51	
1549		-----		-----	
1550		-----		-----	
1569	ISO3104	2.970		0.30	
1631		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656	D445	2.986		1.14	
1676	ISO3104	2.9491		-0.80	
1706	ISO3104	2.9682		0.20	
1724	ISO3104	2.963		-0.07	
1728	D445	2.9585		-0.31	
1776	ISO3104	2.9926		1.48	
1807	ISO3104	2.961		-0.18	
1810	ISO3104	2.967		0.14	
1811	ISO3104	2.9475		-0.88	
1833	D445	2.964		-0.02	
1948	ISO3104	2.9647		0.02	
1984	ISO3104	2.9728		0.44	
1987		-----		-----	
1998	ISO3104	2.9833		0.99	
2129	ISO3104	2.948		-0.86	

normality	OK
n	52
outliers	2
mean (n)	2.9644
st.dev. (n)	0.01245
R(calc.)	0.0349
R(EN590:13, A)	0.0534

R (ISO3104:94) = R (D445:15) = R (IP71:97)
Compare R(ISO3104:94)=0.0325



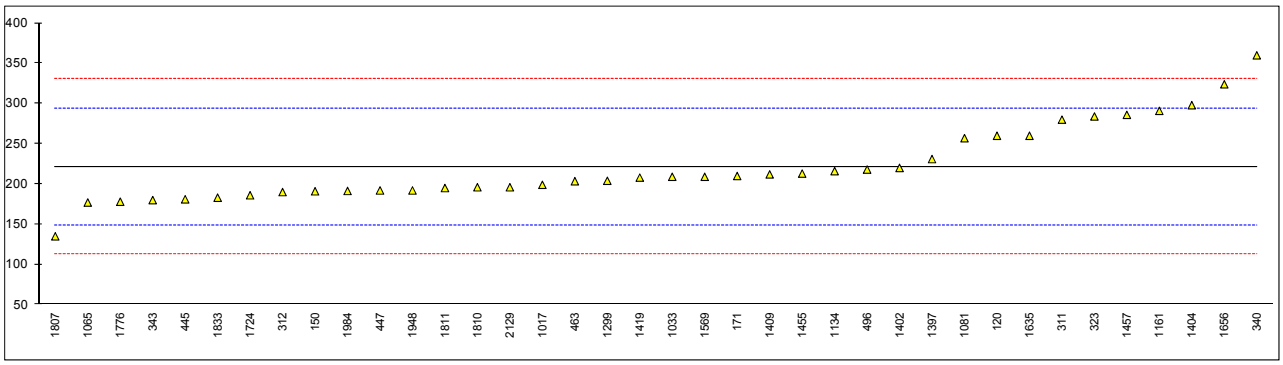


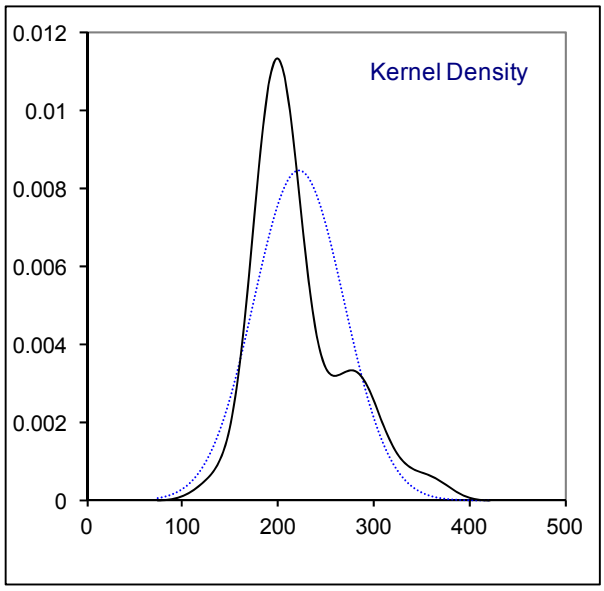
Determination of Lubricity by HFRR at 60°C on sample #15070; result in µm

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D6079	260		1.06	
150	ISO12156-1	191		-0.84	
171	D6079	210		-0.31	
311	ISO12156-1	280		1.61	
312	ISO12156-1	190		-0.86	
323	ISO12156-1	284		1.72	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340	ISO12156-1	360		3.80	
343	ISO12156-1	180		-1.14	
351		-----		-----	
353		-----		-----	
381		-----		-----	
444		-----		-----	
445	ISO12156-1	181		-1.11	
447	IP450	192		-0.81	
463	ISO12156-1	203.5		-0.49	
496	ISO12156-1	218		-0.10	
511		-----		-----	
529		-----		-----	
541		-----		-----	
556		-----		-----	
558		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
1016		-----		-----	
1017	ISO12156-1	199		-0.62	
1033	IP450	209		-0.34	
1064		-----		-----	
1065	ISO12156-1	177		-1.22	
1080		-----		-----	
1081	ISO12156-1	257		0.98	
1126		-----		-----	
1134	IP450	216		-0.15	
1141		-----		-----	
1143		-----		-----	
1161	ISO12156-1	290.96		1.91	
1194		-----		-----	
1227		-----		-----	
1237		-----		-----	
1259		-----		-----	
1299	ISO12156-1	204		-0.48	
1389		-----		-----	
1397	ISO12156-1	231		0.26	
1402	ISO12156-1	220		-0.04	
1404	ISO12156-1	298		2.10	
1409	ISO12156-1	212		-0.26	
1419	ISO12156-1	208		-0.37	
1455	ISO12156-1	213		-0.23	
1457	ISO12156-1	286		1.77	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1569	ISO12156-1	209		-0.34	
1631		-----		-----	
1634		-----		-----	
1635	ISO12156-1	260		1.06	
1656	ISO12156-1	324	C	2.81	first reported:452
1676		-----		-----	
1706		-----		-----	
1724	ISO12156-1	186		-0.97	
1728		-----		-----	
1776	ISO12156-1	178	C	-1.19	first reported:330
1807	ISO12156-1	135		-2.37	
1810	ISO12156-1	196		-0.70	
1811	ISO12156-1	195.0		-0.73	
1833	D6079	183	C	-1.06	first reported:343
1948	ISO12156-1	192		-0.81	
1984	ISO12156-1	191.4		-0.83	
1987		-----		-----	
1998		-----		-----	
2129	ISO12156-1	196		-0.70	

normality	not OK
n	38
outliers	0
mean (n)	221.47
st.dev. (n)	47.126
R(calc.)	131.95
R(ISO12156-1:06)	102.00

Compare R(D6079) = 80.00

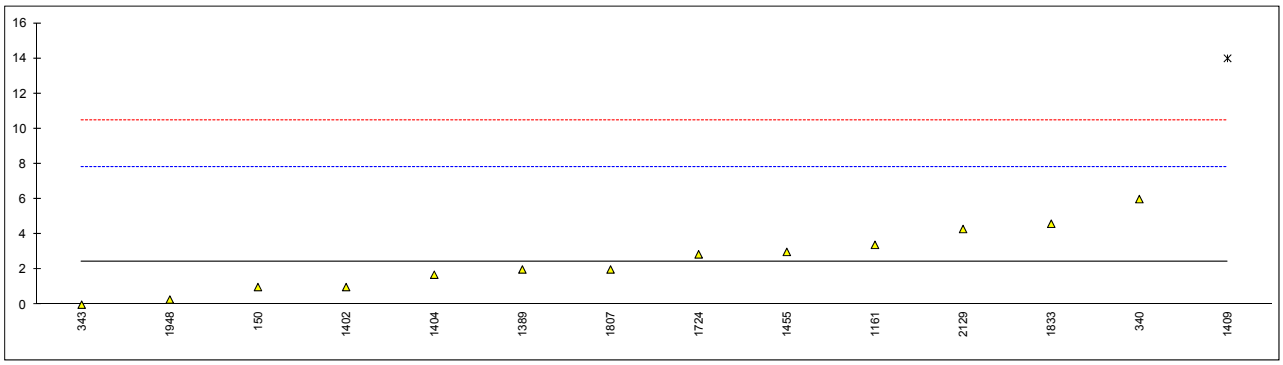


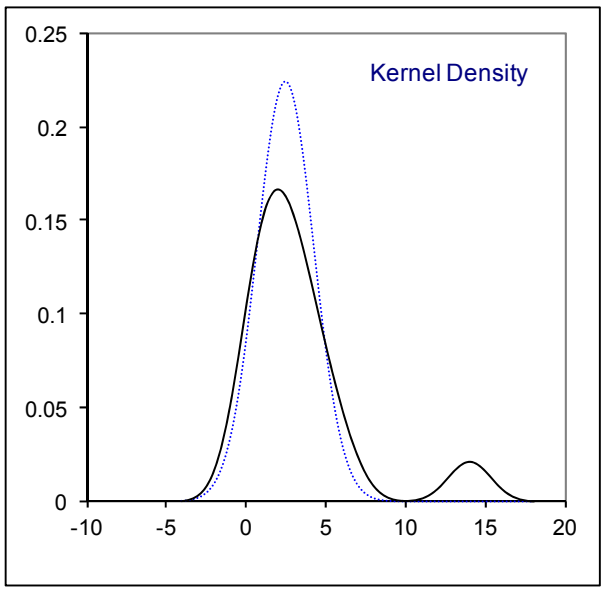


Determination of Oxidation Stability ISO12205 on sample #15070; result in g/m^3

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
150	ISO12205	1		-0.55	
171		-----		-----	
311		-----		-----	
312		-----		-----	
323		-----		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340	ISO12205	6.0		1.32	
343	ISO12205	0		-0.93	
351		-----		-----	
353		-----		-----	
381		-----		-----	
444		-----		-----	
445	ISO12205	<1		-----	
447		-----		-----	
463		-----		-----	
496		-----		-----	
511		-----		-----	
529		-----		-----	
541		-----		-----	
556		-----		-----	
558		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
1016		-----		-----	
1017		-----		-----	
1033		-----		-----	
1064		-----		-----	
1065		-----		-----	
1080		-----		-----	
1081		-----		-----	
1126		-----		-----	
1134		-----		-----	
1141		-----		-----	
1143		-----		-----	
1161	ISO12205	3.4		0.35	
1194		-----		-----	
1227		-----		-----	
1237		-----		-----	
1259		-----		-----	
1299		-----		-----	
1389	D2274	2		-0.18	
1397		-----		-----	
1402	ISO12205	1		-0.55	
1404	ISO12205	1.7		-0.29	
1409	ISO12205	14	G(0.01)	4.32	
1419		-----		-----	
1455	ISO12205	3		0.20	
1457		-----		-----	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1569		-----		-----	
1631		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656		-----		-----	
1676		-----		-----	
1706		-----		-----	
1724	ISO12205	2.86		0.14	
1728		-----		-----	
1776		-----		-----	
1807	ISO12205	2.0		-0.18	
1810		-----		-----	
1811		-----		-----	
1833	ISO12205	4.6		0.80	
1948	ISO12205	0.29		-0.82	
1984		-----		-----	
1987		-----		-----	
1998		-----		-----	
2129		4.3		0.68	

normality	OK
n	13
outliers	1
mean (n)	2.473
st.dev. (n)	1.7761
R(calc.)	4.973
R(ISO12205:95)	7.475

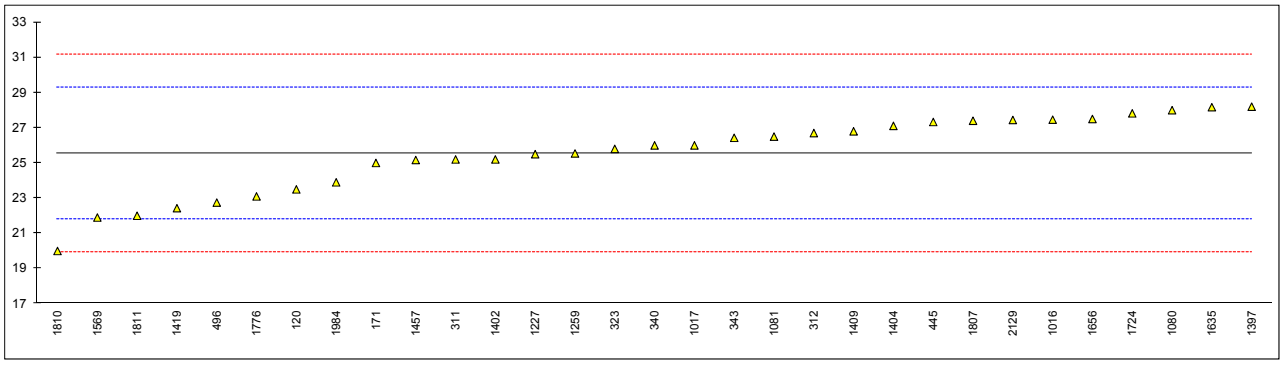


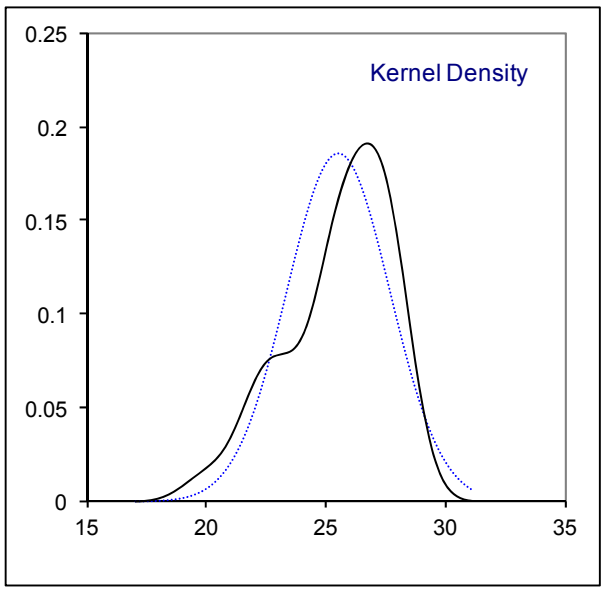


Determination of Oxidation Stability EN15751 on sample #15070; result in hours

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	EN15751	23.5		-1.09	
150		-----		-----	
171	EN15751	25.0		-0.29	
311	EN15751	25.2		-0.18	
312	EN15751	26.7		0.62	
323	EN15751	25.8		0.14	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340	EN15751	26.0		0.24	
343	EN15751	26.43		0.47	
351		-----		-----	
353		-----		-----	
381		-----		-----	
444		-----		-----	
445	EN15751	27.33		0.96	
447		-----		-----	
463		-----		-----	
496	EN15751	22.75		-1.49	
511		-----		-----	
529		-----		-----	
541		-----		-----	
556		-----		-----	
558		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
1016	EN15751	27.46		1.02	
1017	EN15751	26		0.24	
1033		-----		-----	
1064		-----		-----	
1065		-----		-----	
1080	EN15751	28.0		1.31	
1081	EN15751	26.5		0.51	
1126		-----		-----	
1134		-----		-----	
1141		-----		-----	
1143		-----		-----	
1161		-----		-----	
1194		-----		-----	
1227	EN15751	25.5		-0.02	
1237		-----		-----	
1259	EN15751	25.54		0.00	
1299		-----		-----	
1389		-----		-----	
1397	EN15751	28.2		1.42	
1402	EN15751	25.2		-0.18	
1404	EN15751	27.11		0.84	
1409	EN15751	26.8		0.67	
1419	EN15751	22.43		-1.67	
1455		-----		-----	
1457	EN15751	25.17		-0.20	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1569	EN15751	21.9		-1.95	
1631	EN15751	>20		-----	
1634		-----		-----	
1635	EN15751	28.17		1.40	
1656	EN15751	27.5		1.05	
1676		-----		-----	
1706		-----		-----	
1724	EN15751	27.82		1.22	
1728		-----		-----	
1776	EN15751	23.10		-1.31	
1807	EN15751	27.4		0.99	
1810	EN15751	20.0		-2.96	
1811	EN15751	22		-1.90	
1833		-----		-----	
1948		-----		-----	
1984	EN15751	23.90		-0.88	
1987		-----		-----	
1998		-----		-----	
2129	EN15751	27.445		1.02	

normality	OK
n	31
outliers	0
mean (n)	25.544
st.dev. (n)	2.1452
R(calc.)	6.007
R(EN15751:14)	5.236



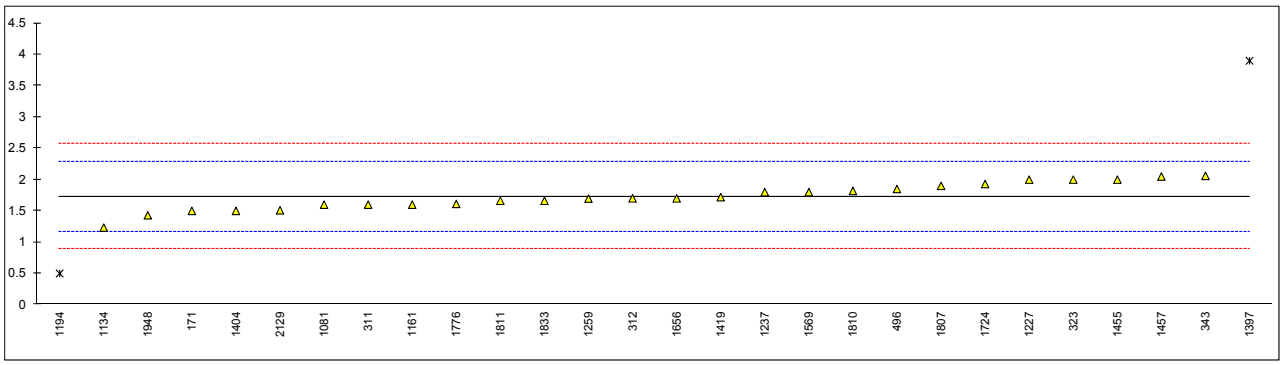


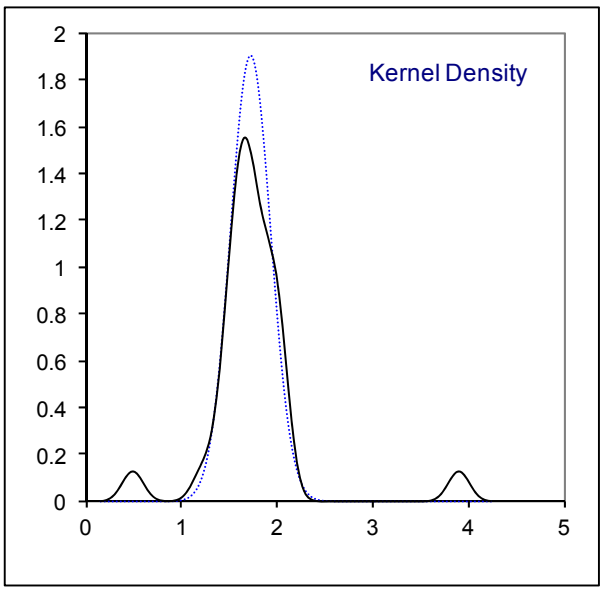
Determination of Poly Aromatic Hydrocarbons on sample #15070; result in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
150		-----		-----	
171	EN12916	1.5		-0.81	
311	EN12916	1.6		-0.46	
312	EN12916	1.7		-0.10	
323	EN12916	2.0		0.97	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340		-----		-----	
343	EN12916	2.06		1.18	
351		-----		-----	
353		-----		-----	
381		-----		-----	
444		-----		-----	
445		-----		-----	
447		-----		-----	
463		-----		-----	
496	EN12916	1.85		0.43	
511		-----		-----	
529		-----		-----	
541		-----		-----	
556		-----		-----	
558		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
1016		-----		-----	
1017		-----		-----	
1033		-----		-----	
1064		-----		-----	
1065		-----		-----	
1080		-----		-----	
1081	EN12916	1.6		-0.46	
1126		-----		-----	
1134	EN12916	1.233		-1.77	
1141		-----		-----	
1143		-----		-----	
1161	EN12916	1.6		-0.46	
1194	EN12916	0.5	R(0.01)	-4.38	
1227	EN12916	2.0		0.97	
1237	EN12916	1.8		0.26	
1259	EN12916	1.696		-0.12	
1299		-----		-----	
1389		-----		-----	
1397	EN12916	3.9	R(0.01)	7.75	
1402		-----		-----	
1404	EN12916	1.5		-0.81	
1409		-----		-----	
1419	EN12916	1.72		-0.03	
1455	EN12916	2.0		0.97	
1457	EN12916	2.05		1.15	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1569	EN12916	1.8	C	0.26	first reported: 19.4
1631		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656	IP391	1.7		-0.10	
1676		-----		-----	
1706		-----		-----	
1724	EN12916	1.93		0.72	
1728		-----		-----	
1776	EN12916	1.612		-0.41	
1807	EN12916	1.9		0.61	
1810	EN12916	1.82		0.33	
1811	IP391	1.662		-0.24	
1833	IP391	1.662		-0.24	
1948	EN12916	1.43	C	-1.06	first reported: 3.43
1984		-----		-----	
1987		-----		-----	
1998		-----		-----	
2129	EN12916	1.51	C	-0.78	first reported: 20.380

normality	OK
n	26
outliers	2
mean (n)	1.728
st.dev. (n)	0.2097
R(calc.)	0.587
R(EN12916:06)	0.785

R(IP391:07) = R(EN12916:06)



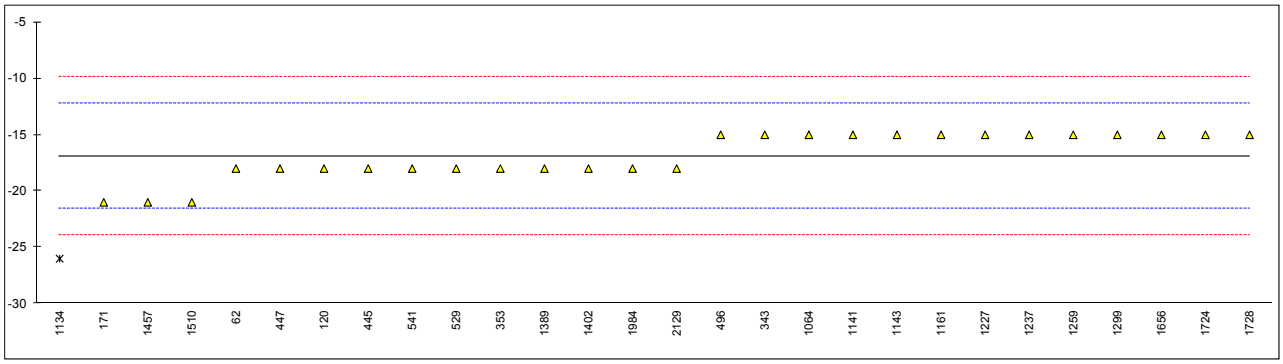


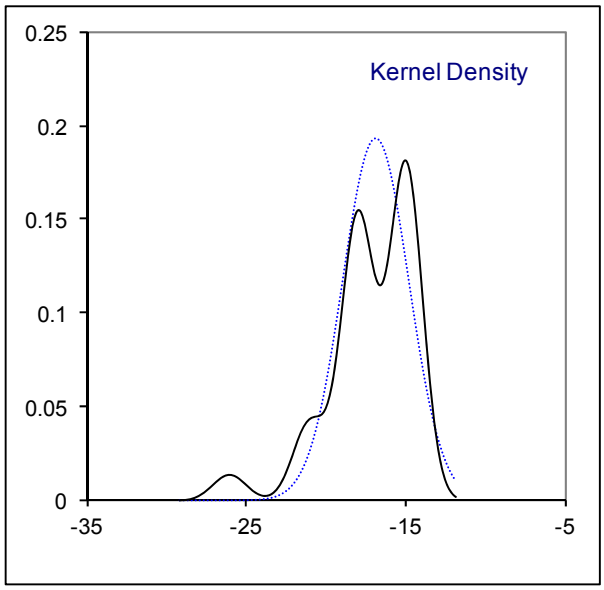
Determination of Pour Point, manual on sample #15070; results in °C

lab	method	value	mark	z(targ)	remarks
62	D97	-18		-0.47	
120	D97	-18		-0.47	
150		-----		-----	
171	D97	-21		-1.75	
311		-----		-----	
312		-----		-----	
323		-----		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
340		-----		-----	
343	D97	-15		0.80	
351		-----		-----	
353	IP15	-18.0		-0.47	
381		-----		-----	
444		-----		-----	
445	IP15	-18		-0.47	
447	D97	-18		-0.47	
463		-----		-----	
496	ISO3016	-15.0		0.80	
511		-----		-----	
529	D97	-18		-0.47	
541	ISO3016	-18		-0.47	
556		-----		-----	
558		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
1016		-----		-----	
1017		-----		-----	
1033		-----		-----	
1064	ISO3016	-15		0.80	
1065		-----		-----	
1080		-----		-----	
1081		-----		-----	
1126		-----		-----	
1134	IP15	-26	R(0.01)	-3.87	
1141	ISO3016	-15		0.80	
1143	ISO3016	-15		0.80	
1161	ISO3016	-15		0.80	
1194		-----		-----	
1227	D97	-15		0.80	
1237	ISO3016	-15		0.80	
1259	ISO3016	-15		0.80	
1299	D97	-15		0.80	
1389	D97	-18		-0.47	
1397		-----		-----	
1402	ISO3016	-18		-0.47	
1404		-----		-----	
1409		-----		-----	
1419		-----		-----	
1455		-----		-----	
1457	ISO3016	-21		-1.75	
1459		-----		-----	
1510	ISO3016	-21		-1.75	
1549		-----		-----	
1550		-----		-----	
1569		-----		-----	
1631		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656	ISO3016	-15		0.80	
1676		-----		-----	
1706		-----		-----	
1724	ISO3016	-15		0.80	
1728	D97	-15		0.80	
1776		-----		-----	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1833		-----		-----	
1948		-----		-----	
1984	INH-105	-18		-0.47	
1987		-----		-----	
1998		-----		-----	
2129	ISO3016	-18		-0.47	

normality	OK
n	27
outliers	1
mean (n)	-16.89
st.dev. (n)	2.063
R(calc.)	5.78
R(ISO3016:94)	6.59

R(ISO3016:94) = R(IP15:95) = R(D97:02)

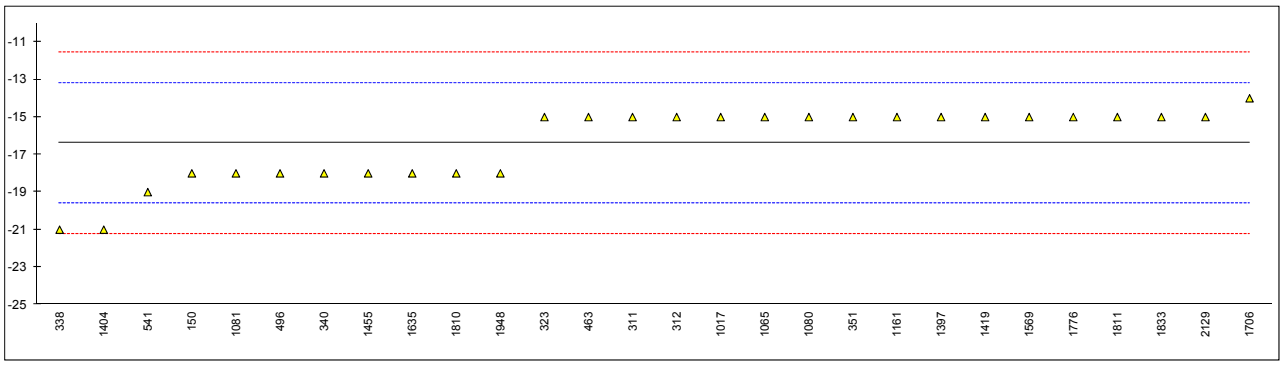


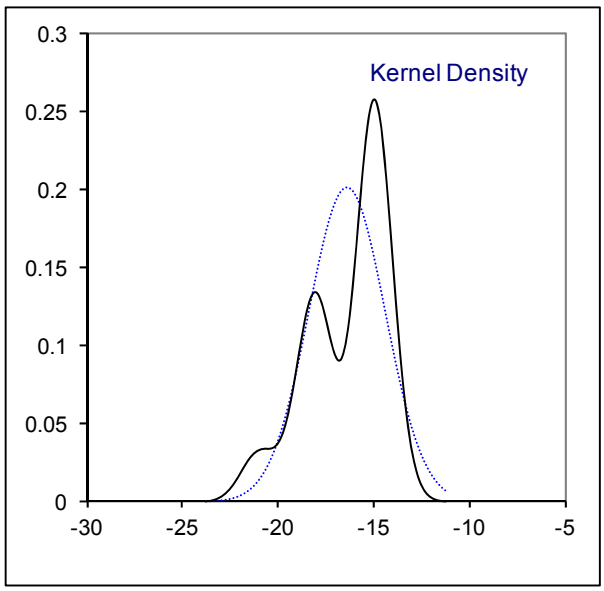


Determination of Pour Point, automated (3°C interval) on sample #15070; results in °C

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
150	D5950	-18		-1.00	
171		-----		-----	
311	D5950	-15		0.87	
312	D5950	-15		0.87	
323	D5950	-15		0.87	
334		-----		-----	
335		-----		-----	
338	INH-105	-21		-2.87	
340	D5950	-18		-1.00	
343		-----		-----	
351	D6749	-15		0.87	
353		-----		-----	
381		-----		-----	
444		-----		-----	
445		-----		-----	
447		-----		-----	
463	D6892	-15		0.87	
496	D7346	-18.0		-1.00	
511		-----		-----	
529		-----		-----	
541	D5950	-19		-1.62	
556		-----		-----	
558		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
1016		-----		-----	
1017	D5950	-15		0.87	
1033		-----		-----	
1064		-----		-----	
1065	D5950	-15		0.87	
1080	D6749	-15.0		0.87	
1081	D5950	-18		-1.00	
1126		-----		-----	
1134		-----		-----	
1141		-----		-----	
1143		-----		-----	
1161	D6749	-15		0.87	
1194		-----		-----	
1227		-----		-----	
1237		-----		-----	
1259		-----		-----	
1299		-----		-----	
1389		-----		-----	
1397	D5950	-15		0.87	
1402		-----		-----	
1404	D5950	-21		-2.87	
1409		-----		-----	
1419	D5950	-15		0.87	
1455	D5950	-18		-1.00	
1457		-----		-----	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1569	D5950	-15		0.87	
1631		-----		-----	
1634		-----		-----	
1635	D5950	-18		-1.00	
1656		-----		-----	
1676		-----		-----	
1706	D5950	-14		1.49	
1724		-----		-----	
1728		-----		-----	
1776	D5950	-15		0.87	
1807		-----		-----	
1810	D7689	-18		-1.00	
1811	D5950	-15		0.87	
1833	D5950	-15		0.87	
1948	D5950	-18		-1.00	
1984		-----		-----	
1987		-----		-----	
1998		-----		-----	
2129	D5950	-15		0.87	

normality	OK
n	28
outliers	0
mean (n)	-16.39
st.dev. (n)	1.988
R(calc.)	5.57
R(D5950:14)	4.50



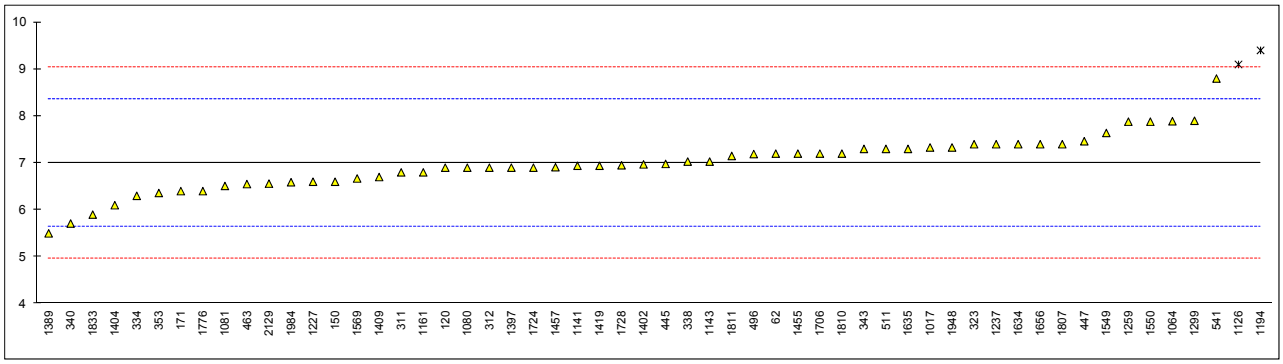


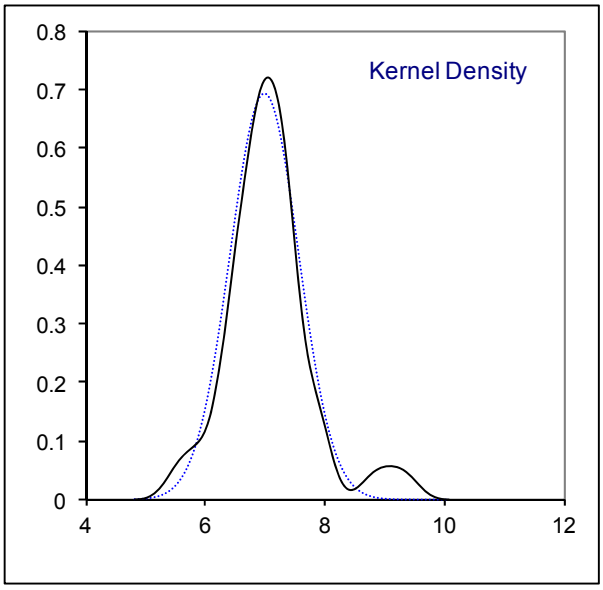
Determination of Sulphur Content on sample #15070; result in mg/kg

lab	method	value	mark	z(targ)	remarks
62	D5453	7.2		0.31	
120	D5453	6.9		-0.13	
150	ISO20846	6.6		-0.57	
171	D5453	6.4		-0.87	
311	ISO20846	6.8		-0.28	
312	D5453	6.9		-0.13	
323	ISO20846	7.4		0.60	
334	ISO20846	6.3		-1.02	
335		-----		-----	
338	ISO20846	7.03		0.06	
340	ISO20846	5.71		-1.88	
343	ISO20846	7.3		0.46	
351		-----		-----	
353	IP531	6.36		-0.93	
381		-----		-----	
444		-----		-----	
445	IP490	6.98		-0.01	
447	D5453	7.463		0.70	
463	D5453	6.55		-0.65	
496	ISO20846	7.19		0.29	
511	D5453	7.30		0.46	
529		-----		-----	
541	D5453	8.8		2.66	
556		-----		-----	
558		-----		-----	
621	D4294	<20		-----	
633	D4294	<17		-----	
634		-----		-----	
1016		-----		-----	
1017	ISO20846	7.33		0.50	
1033		-----		-----	
1064	ISO20846	7.89		1.32	
1065		-----		-----	
1080	ISO20846	6.9		-0.13	
1081	ISO20846	6.51		-0.71	
1126	ISO20846	9.1	R(0.05)	3.10	
1134		-----		-----	
1141	ISO20846	6.94		-0.07	
1143	ISO20846	7.03		0.06	
1161	ISO20846	6.8		-0.28	
1194	INH-7220	9.4	R(0.05)	3.55	
1227	D5453	6.6		-0.57	
1237	ISO20846	7.4		0.60	
1259	ISO20846	7.88		1.31	
1299	ISO20846	7.9		1.34	
1389	ISO20846	5.5		-2.19	
1397	ISO20846	6.9		-0.13	
1402	ISO20846	6.97		-0.03	
1404	ISO20846	6.1		-1.31	
1409	ISO20846	6.7		-0.43	
1419	ISO20846	6.94		-0.07	
1455	D2622	7.2		0.31	
1457	ISO20846	6.91		-0.12	
1459		-----		-----	
1510		-----		-----	
1549	D7212	7.64		0.96	
1550	D7212	7.88		1.31	
1569	ISO20846	6.67		-0.47	
1631		-----		-----	
1634	ISO20846	7.4		0.60	
1635	ISO20846	7.3		0.46	
1656	ISO20846	7.4		0.60	
1676		-----		-----	
1706	ISO20846	7.2		0.31	
1724	ISO20846	6.9		-0.13	
1728	D5453	6.95		-0.06	
1776	ISO20846	6.4		-0.87	
1807	ISO20846	7.4		0.60	
1810	ISO20846	7.2		0.31	
1811	ISO20846	7.15		0.24	
1833	D5453	5.9		-1.60	
1948	ISO20846	7.33		0.50	
1984	ISO20846	6.59		-0.59	
1987		-----		-----	
1998		-----		-----	
2129	D5453	6.56		-0.63	

normality	suspect
n	54
outliers	2
mean (n)	6.99
st.dev. (n)	0.575
R(calc.)	1.61
R(ISO20846:11)	1.90

R(D5453:12) = 2.49

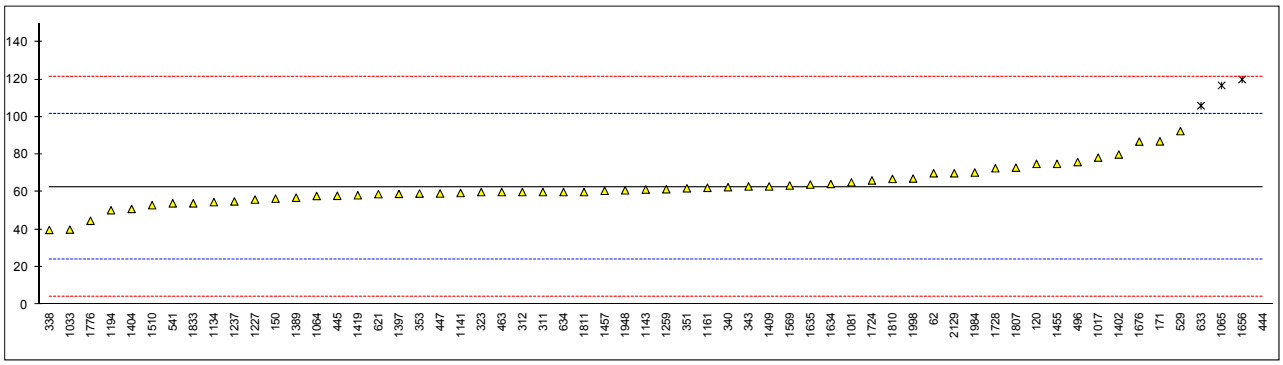


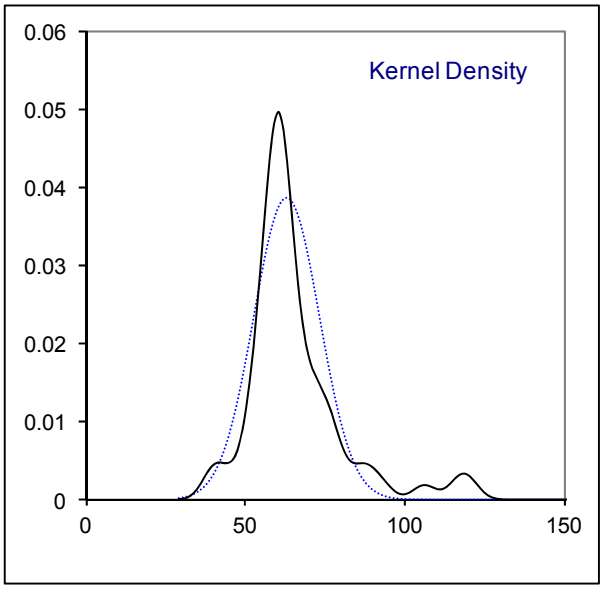


Determination of Water content, KF on sample #15070; result in mg/kg

lab	method	value	mark	z(targ)	remarks
	D6304	70		0.37	
120	E203	75		0.63	
150	ISO12937	56.5		-0.32	
171	D6304	87		1.24	
311	ISO12937	60		-0.14	
312	ISO12937	60		-0.14	
323	ISO12937	60		-0.14	
334		-----		-----	
335		-----		-----	
338	ISO12937	39.84		-1.18	
340	ISO12937	62.6		-0.01	
343	ISO12937	63		0.01	
351	ISO12937	62		-0.04	
353	IP439	59.2		-0.19	
381		-----		-----	
444	IP438	381	C,R(0.01)	16.35	first reported: 144
445	IP438	58		-0.25	
447	IP438	59.25		-0.18	
463	ISO12937	60		-0.14	
496	ISO12937	76		0.68	
511		-----		-----	
529	E1064	92.51		1.53	
541	D6304	54		-0.45	
556		-----		-----	
558		-----		-----	
621	D6304	58.89		-0.20	
633	D6304	106	R(0.01)	2.22	
634	D6304	60		-0.14	
1016		-----		-----	
1017	ISO12937	78.38		0.80	
1033	IP438	40		-1.17	
1064	ISO12937	57.9		-0.25	
1065	D6304	116.8	R(0.01)	2.77	
1080		-----		-----	
1081	ISO12937	65.16		0.12	
1126		-----		-----	
1134	ISO12937	54.64		-0.42	
1141	ISO12937	59.507		-0.17	
1143	ISO12937	61.335		-0.08	
1161	ISO12937	62.277		-0.03	
1194	ISO12937	50.3		-0.64	
1227	D6304	56		-0.35	
1237	ISO12937	55		-0.40	
1259	ISO12937	61.5		-0.07	
1299		-----		-----	
1389	ISO12937	57		-0.30	
1397	ISO12937	59		-0.20	
1402	ISO12937	80		0.88	
1404	ISO12937	51		-0.61	
1409	ISO12937	63		0.01	
1419	ISO12937	58.3		-0.23	
1455	ISO12937	75		0.63	
1457	IP439	60.7		-0.11	
1459		-----		-----	
1510	ISO12937	53		-0.50	
1549		-----		-----	
1550		-----		-----	
1569	in house	63.5		0.04	
1631		-----		-----	
1634	ISO12937	64.3		0.08	
1635	ISO12937	64		0.06	
1656	ISO12937	120	R(0.01)	2.94	
1676	ISO12937	86.9		1.24	
1706		-----		-----	
1724	ISO12937	66.2		0.17	
1728	ISO12937	72.7		0.51	
1776	ISO12937	44.7		-0.93	
1807	ISO12937	73		0.52	
1810	ISO12937	67		0.22	
1811	ISO12937	60.0		-0.14	
1833	D6304	54		-0.45	
1948	ISO12937	60.93		-0.10	
1984	ISO12937	70.4		0.39	
1987		-----		-----	
1998	ISO12937	67.2		0.23	
2129	IP439	70		0.37	

normality	suspect
n	56
outliers	4
mean (n)	62.81
st.dev. (n)	10.307
R(calc.)	28.86
R(ISO12937:00)	54.50

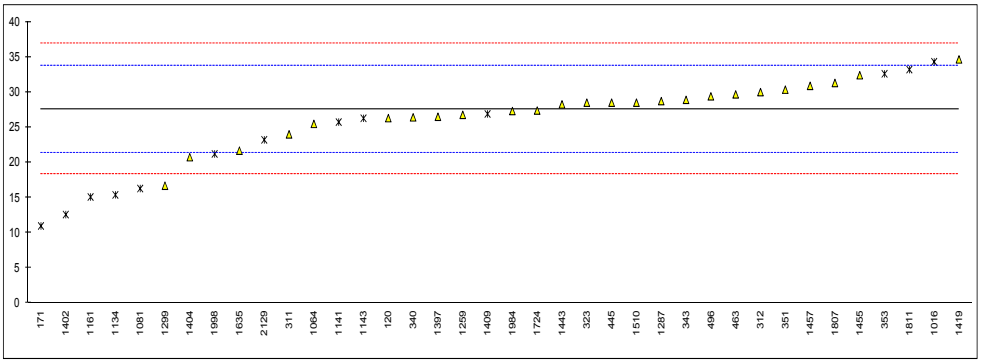


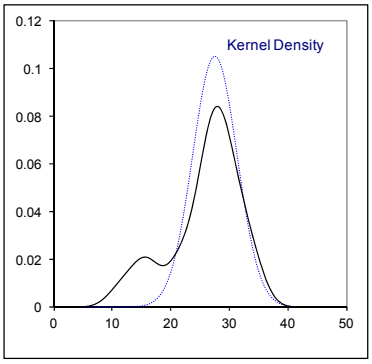


Determination of Total Contamination on sample #15071; result in mg/kg

lab	method	Value	mark	z(targ)	version	volume	remarks
120	EN12662	26.3		-0.03	2014	500	
171	EN12662	10.98		-5.00	2014	300	
311	EN12662	24.0		-0.78	2014	300	
312	EN12662	30		1.16	2014	300	
323	EN12662	28.5		0.68	2014	300	
334		-----		-----	-----	-----	
335		-----		-----	-----	-----	
340	EN12662	26.42		0.01	2014	300	
343	EN12662	28.9		0.81	2014	300	
351	EN12662	30.35		1.28	2014	335	
353	IP440	32.60	ex	2.01	2008	530	stopped at 500 ml
445	IP440	28.5		0.68	2014	297	
447		-----		-----	-----	-----	
463	EN12662	29.679		1.06	2014	300	
496	EN12662	29.40		0.97	2014	300	
1016	EN12662	34.3	ex	2.56	2008	645	filter blocked at 645 ml
1033		-----		-----	-----	-----	
1064	EN12662	25.48		-0.30	2014	312	
1081	EN12662	16.3	ex	-3.27	-----	300	
1134	EN12662	15.4	ex	-3.56	1998	800	
1141	EN12662	25.74	ex	-0.22	2012	800	
1143	EN12662	26.28	ex	-0.04	-----	800	
1161	EN12662	15.1	ex	-3.66	-----	300	
1259	EN12662	26.77		0.12	2014	300	
1287	EN12662	28.72		0.75	2014	300	
1299	EN12662	16.7		-3.14	2014	300	
1389		-----		-----	-----	-----	
1397	EN12662	26.5		0.03	2014	300	
1402	IP440	12.6		-4.47	2014	300	
1404	EN12662	20.75		-1.83	2014	300	
1409	EN12662	26.9	ex	0.16	-----	800	
1419	EN12662	34.65		2.67	2014	300	
1443	EN12662	28.26		0.60	2014	300	
1455	EN12662	32.4		1.94	2014	300	
1457	EN12662	30.89		1.45	2014	333	
1510	EN12662	28.5		0.68	2014	300	
1635	EN12662	21.68		-1.53	2014	533	
1724	EN12662	27.38		0.32	2014	300	
1807	EN12662	31.3		1.59	14	250 grams	
1811	EN12662	33.20	ex	2.20	-----	300	
1833		-----		-----	-----	-----	
1984	EN12662	27.31		0.29	2014	291	
1998	EN12662	21.22	ex	-1.68	-----	291	
2129	EN12662	23.22	ex	-1.03	2008	310	

				All test results:
	normality	OK	Spike	OK
	n	25		38
	outliers	2 (+ 11 excl.)		0
	mean (n)	27.574	16.98	25.873
	st.dev. (n)	3.8040		6.0063
	R(calc.)	10.651		16.818
	R(EN12662:14)	8.644		8.365





APPENDIX 2

z-scores Distillation

lab	IBP	10% rec	50% rec	90% rec	95% rec	FBP	Vol @ 250 °C	Vol @ 350 °C
62	-0.10	-0.11	1.85	1.40	1.40	1.27	-0.04	-0.09
120	0.63	0.31	-0.51	1.12	1.80	-0.58	-0.45	-1.54
150	-1.29	-0.29	-0.79	-0.09	-0.01	-0.66	-0.04	0.01
171	0.08	1.16	0.53	-1.09	-0.88	-1.49	-0.66	1.05
311	-1.47	-1.20	-1.45	-0.64	-0.51	-0.66	1.10	0.43
312	-0.38	0.80	0.91	-0.04	0.34	-0.62	-0.97	-0.20
323	1.26	0.62	0.34	0.02	0.34	-0.15	-0.04	-0.20
334	0.53	-2.34	-0.32	0.02	-0.19	1.70	-0.45	-0.92
335	-----	-----	-----	-----	-----	-----	-----	-----
338	-0.53	1.04	1.19	1.18	1.49	0.92	-0.97	-1.03
340	1.51	-0.05	-0.23	-0.86	-1.01	-1.81	0.37	0.84
343	**-3.48**	**-5.30**	***-2.49***	***-1.75***	***-1.94***	**-3.70**	***2.14***	**2.40**
351	0.31	-0.14	-0.13	1.09	0.02	-2.67	-0.20	-0.40
353	-1.14	-0.83	0.91	1.89	2.18	1.27	-0.14	-1.44
381	-----	-----	-----	-----	-----	-----	-----	-----
444	-1.02	-0.83	-1.36	-1.97	-1.07	-1.69	2.76	0.74
445	-0.01	-0.65	-1.45	-0.86	-0.35	-0.82	0.79	0.32
447	-0.50	0.13	0.06	0.02	-0.13	0.28	-0.25	0.01
463	1.90	0.68	0.72	0.57	0.34	1.15	-0.77	-0.40
496	-0.59	-0.23	-0.23	-0.53	-0.32	0.13	-0.35	0.32
511	1.14	0.25	-1.83	-0.59	-0.26	0.21	1.10	-0.40
529	-----	-----	-----	-----	-----	-----	-----	-----
541	1.45	0.19	0.06	-0.04	0.24	0.88	-----	-----
556	-----	-----	-----	-----	-----	-----	-----	-----
558	-----	-----	-----	-----	-----	-----	-----	-----
621	-0.44	0.68	0.53	0.24	0.52	-0.39	0.06	-0.40
633	0.47	-1.74	0.53	-0.31	0.52	-1.17	-----	-----
634	0.17	0.07	0.53	0.79	2.08	1.19	0.06	-0.40
1016	-----	-----	-----	-----	-----	-----	-----	-----
1017	0.50	1.70	0.53	-0.42	-0.38	0.56	-0.97	0.32
1033	1.11	2.25	1.57	0.57	-0.19	0.17	-2.32	-0.71
1064	0.02	0.62	0.62	0.68	0.49	0.40	-0.87	-0.40
1065	0.41	-0.35	0.34	0.02	-0.32	0.88	1.10	0.63
1080	-----	-----	-----	-----	-----	-----	-----	-----
1081	-0.53	2.12	1.09	0.51	0.27	0.80	-1.44	-0.26
1126	1.39	**2.43**	1.47	2.39	1.43	3.68	-1.18	-1.75
1134	0.11	-0.11	1.85	1.23	0.87	1.35	-0.97	-0.71
1141	0.78	1.94	0.72	-0.48	-0.66	0.36	-1.39	0.53
1143	1.78	1.58	0.91	-0.15	-0.60	-1.37	-1.18	0.53
1161	-2.20	-1.44	-0.89	0.62	-0.13	-0.15	1.00	-0.61
1194	**-7.83**	**-4.27**	-1.55	0.57	0.06	-0.98	2.24	-0.20
1227	0.75	0.62	1.38	0.40	0.15	1.15	-0.04	0.63
1237	1.02	-1.92	-0.70	-0.48	-0.82	0.68	0.79	-0.51
1259	-0.10	0.25	-0.51	-0.92	-1.19	0.32	0.37	1.05
1299	0.78	0.37	-0.04	0.24	0.34	0.64	-----	-----
1389	-1.14	-2.22	-1.17	-0.70	-0.44	-1.49	0.89	0.43
1397	0.72	1.28	0.53	0.13	0.02	1.31	-0.77	0.01
1402	1.87	-0.11	0.91	0.51	0.34	1.11	0.17	-0.30
1404	-2.11	**-3.13**	-0.98	-0.04	-0.41	-2.79	1.00	0.22
1409	-0.44	-0.47	-0.51	-0.09	0.02	0.09	-0.04	0.01
1419	0.14	-0.11	-0.98	-0.92	-0.82	-0.62	0.58	1.05
1455	0.78	0.49	0.34	0.62	0.62	0.52	-0.45	-0.51
1457	-0.26	0.13	-0.60	-0.70	-0.29	0.36	0.17	0.22
1459	0.05	0.43	0.81	-0.04	0.15	0.21	-1.18	-0.09
1510	-0.62	-0.59	-0.60	-0.42	-0.35	0.17	0.27	0.32
1549	-----	-----	-----	-----	0.75	-----	1.33	-0.64
1550	-----	-----	-----	-----	0.13	-----	1.41	-0.25
1569	-1.23	0.68	0.34	0.07	-0.38	-0.07	-0.45	0.32
1631	-----	-----	-----	-----	-----	-----	-----	-----
1634	-0.01	0.62	1.28	0.57	0.37	0.72	-0.97	-0.71
1635	0.17	-1.68	-0.23	-0.81	-1.10	0.80	0.37	1.15
1656	-2.26	-2.40	-0.70	-0.09	-0.16	0.64	1.31	0.22
1676	-----	-----	-----	-----	-----	-----	-----	-----
1706	0.72	0.56	0.15	-0.45	-0.51	-0.68	0.48	0.48
1724	-0.99	-1.62	-0.32	-0.53	-0.66	-0.07	-0.45	0.63
1728	0.21	-0.92	-0.18	0.39	0.06	-0.56	-0.47	-0.11
1776	0.41	0.62	-0.70	-0.75	-0.72	-0.66	-0.45	0.63
1807	-0.71	-0.29	-1.07	-0.70	-0.57	0.21	1.10	0.43
1810	-0.38	0.01	0.43	-0.15	-0.51	0.36	-0.56	0.43

Z-scores underlined and bold belong to the statistical outliers acc. to Grubbs/Dixon/Rosner outlier test.

Z-scores underlined, bold and italic belong to excluded results.

z-scores Distillation

lab	IBP	10% rec	50% rec	90% rec	95% rec	FBP	Vol @ 250 °C	Vol @ 350 °C
1811	0.17	-0.05	-1.07	-0.70	-0.76	-0.23	0.37	0.63
1833	-1.20	-1.62	-1.83	-0.81	-0.79	-0.54	0.79	0.63
1948	-0.99	-1.07	-1.17	-0.97	-0.79	-0.54	-0.14	-0.09
1984	0.32	0.19	0.15	0.07	0.15	0.05	0.58	0.43
1987	-----	-----	-----	-----	-----	-----	-----	-----
1998	0.41	0.36	0.72	0.48	0.27	0.71	-0.69	-0.14
2129	-1.44	0.19	-0.23	-0.04	0.49	-0.07	-0.25	-0.20

APPENDIX 3

Number of participants per country

1 lab in	ARGENTINA
2 labs in	AUSTRIA
3 labs in	BELGIUM
2 labs in	BRAZIL
3 labs in	BULGARIA
1 lab in	CANADA
3 labs in	CROATIA
1 lab in	CYPRUS
2 labs in	CZECH REPUBLIC
7 labs in	FRANCE
2 labs in	GERMANY
1 lab in	GREECE
1 lab in	HUNGARY
1 lab in	INDONESIA
1 lab in	IRELAND
1 lab in	ISRAEL
1 lab in	ITALY
1 lab in	MEXICO
7 labs in	NETHERLANDS
2 labs in	PERU
2 labs in	PHILIPPINES
1 lab in	POLAND
2 labs in	PORTUGAL
1 lab in	ROMANIA
3 labs in	SERBIA
1 lab in	SLOVAKIA
1 lab in	SLOVENIA
5 labs in	SPAIN
2 labs in	SWEDEN
5 labs in	TURKEY
9 labs in	UNITED KINGDOM
3 labs in	UNITED STATES OF AMERICA

APPENDIX 4

Abbreviations:

C	= final result after checking of first reported suspect result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01)	= outlier in Grubbs' outlier test
G(0.05)	= straggler in Grubbs' outlier test
DG(0.01)	= outlier in Double Grubbs' outlier test
DG(0.05)	= straggler in Double Grubbs' outlier test
R(0.01)	= outlier in Rosner's GESD outlier test
R(0.05)	= straggler in Rosner' GESD outlier test
ex	= excluded from calculations
E	= error in calculations
n.a.	= not applicable
n.e.	= not evaluated
W	= result withdrawn
SDS	= Safety Data Sheet

Literature:

1 iis Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, April 2014

2 ASTM E178-08

3 ASTM E1301-03

4 ISO 5725-86

5 ISO 5725, parts 1-6, 1994, Technical Corrigendum 1998, 2001, 2002

6 ISO13528-05

7 M. Thompson and R. Wood, J. AOAC Int, 76, 926, (1993)

8 W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)

9 ISO4259:06

10 DIN 38402 T41/42

11 P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)

12 J.N. Miller, Analyst, 118, 455, (1993)

13 Analytical Methods Committee Technical Brief, No4 January 2001

14 The Royal Society of Chemistry 2002, Analyst 2002, 127 page1359-1364, P.J. Lowthian and M. Thompson. (see http://www.rsc.org/suppdata/an/b2/b205600n/)

15 Bernard Rosner, Percentage Points for a Generalized ESD Many-Outlier Procedure, *Technometrics*, 25(2), pp. 165-172, (1983)