

Results of Proficiency Test
Gasoil B10 (10% FAME)
April 2013

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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1 INTRODUCTION

Since 2005, the Institute for Interlaboratory Studies organizes a proficiency test for automotive diesel containing FAME, according to EN590 and ASTM D7467 every year. In this interlaboratory study on Gasoil B10, 66 laboratories from 29 countries have participated. See appendix 3 for the number of participating laboratories per country. In this report, the results of the 2013 Gasoil B10 proficiency test are presented and discussed.

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 EN590:09 and ASTM D7467:10. It was decided depending on the registration to send one 1 litre bottle and one 0.5 litre bottle of Gasoil B10 (both labelled #13060), and/or, one 1 litre bottle Gasoil (labelled #13061) 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 ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentiality of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires.

2.2 PROTOCOL

The protocol followed in the organisation was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of January 2010 (iis-protocol, version 3.2). This protocol can be downloaded via the FAQ page of the iis website <http://www.iisnl.com>.

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

The necessary bulk material (Gasoil with approx. 1.2% FAME) was purchased from a local Gasoil producer. To 200 litre of the bulk material approximately 18 litre of pure FAME (B100) was added to increase the FAME content up to 10%.

After homogenization, 80 subsamples were transferred to 1 litre brown glass bottles and labelled #13060. Another 80 bottles of 500 mL (also labelled #13060) were subsequently filled and another 50 bottles of one litre (labelled #13061), see also for total contamination, were filled with approx. 850 mL of material especially for Total Contamination.

The homogeneity of the subsamples #13060 (1x1L + 1x0.5) was checked by determination of density @15° on 7 stratified randomly selected samples in accordance with ASTM D4052:11.

	<i>Density @ 15 °C in kg/m³</i>
sample #13060-1	823.25
sample #13060-2	833.26
sample #13060-3	833.27
sample #13060-4	833.26
sample #13060-5	833.26
sample #13060-6	833.26
sample #13060-7	833.26

table 1: homogeneity test results of subsamples #13060

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:

	<i>Density @ 15 °C in kg/m³</i>
r (sample #13060)	0.02
reference test	ISO12185:96
0.3 x R(reference test)	0.15

table 2: repeatability of the subsamples #13060

The calculated repeatability was less than 0.3 times the respective reproducibility of the reference method. Therefore, homogeneity of the subsamples #13060 was assumed.

For Total Contamination, to each of 50 empty and clean 1 liter bottles and labelled #13061, 1 ml of a freshly prepared and ultrasonically homogenized, 14.07 g/kg particulate quartz material BCR-067 (Ø 2.4-32 µm) in oil suspension, was added by weighing and filled with 850 ml Gasoil.

Depending on the registration of the participant two bottles (1x1L + 1x0.5L, labelled #13060) and/or one bottle of 1L, labelled #13061 were sent to the participating laboratories on April 24, 2013.

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 EN590: Ash Content, Aromatics by FIA, Cetane Indices D976 and ISO4264, Cloud Point, Cold Filter Plugging Point, Conradson Carbon Residue on 10% Residue (ISO10370 and D524), Copper Corrosion, Density @ 15°C, Distillation, FAME, Flash Point PMcc, Kinematic Viscosity @40°C, Lubricity by HFRR @60°C, Oxidation Stability EN 15751 and ISO12205, Polycyclic Aromatic Hydrocarbons, Pour Point (manual and automated), Sulphur Content, TAN, 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 1 of this report. The laboratories are presented by their code numbers.

Directly after deadline, a reminder fax was sent to those laboratories that had not yet reported.

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

3.1 STATISTICS

Statistical calculations were performed as described in the report 'iis Interlaboratory Studies: Protocol for the Organization, Statistics and Evaluation' of January 2010 (iis-protocol, version 3.2).

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

First, the normality of the distribution of the various data sets per determination was checked by means of the Lilliefors-test. After removal of outliers, this check was repeated. Not all data sets proved to have a normal distribution, in which cases the conclusions of statistical evaluation should be used with due care.

In accordance with ISO 5725 (1986 and 1994) the original results per determination were subsequently submitted to Dixon and Grubbs outlier tests.

Outliers are marked by D(0.01) for the Dixon test, by G(0.01) or DG(0.01) for the Grubbs test. Stragglers are marked by D(0.05) for the Dixon test, by G(0.05) or DG(0.05) for the Grubbs test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

For each assigned value the uncertainty was determined in accordance with ISO13528. Subsequently the calculated uncertainty was evaluated against the respective requirement based on the target reproducibility in accordance with ISO13528. When the uncertainty passed the evaluation no remarks are made in the report. However, when the uncertainty failed the evaluation it is mentioned in the report and it will have consequences for the evaluation of the test results.

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

3.2 GRAPHICS

In order to visualize the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported analysis results are plotted. The corresponding laboratory numbers are under the X-axis.

The straight horizontal line presents the consensus value (a trimmed mean). The four striped lines, parallel to the consensus value line, are the +3s, +2s, -2s and -3s target reproducibility limits of the selected standard. Outliers and other data, which were excluded from the calculations, are represented as a "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).

3.3 Z-SCORES

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

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

The z-scores were calculated according to:

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

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

Absolute values for $z < 2$ are very common and absolute values for $z > 3$ are very rare.

Therefore, the usual interpretation of z-scores is as follows:

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

4 EVALUATION

During the execution of this proficiency test some reporting problems occurred. In total 9 participants reported test results after the final reporting date. All laboratories except 5 reported test results, but not all laboratories were able to perform all analyses requested. Finally, 61 participants reported in total 1257 numerical test results. Observed were 30 outlying results, which is 2.4%. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

Not all original data sets proved to have a normal distribution. Non-Gaussian distributions were found for Ash Content, Cloud Point, Cold Filter Plugging Point, Density and Pour Point (manual and automated). Therefore, the statistical evaluation for these determinations should be used with care.

4.1 EVALUATION PER TEST

In this section, the results are discussed per test.

Ash: This determination was not problematic. No statistical outliers were observed. And the calculated reproducibility is in agreement with the requirements of ISO6245:93 and ASTM D482:07.

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 D7467:10. When the calculated reproducibility is compared with the requirements of ASTM D1319:13 for diesel without FAME than the calculated reproducibility is not at all in agreement.

C.I. D976: This determination was not problematic. No statistical outliers were observed. And the calculated reproducibility is in good agreement with the requirements of ASTM D976:11. Four laboratories reported to have used ASTM D4737/IP380. These test results were excluded and evaluated under Cetane Index according to ISO4262 because ASTM D4737/IP380 is not technically equivalent to ASTM D976 that uses a different calculation formula.

C.I. ISO4264: Regretfully, no reproducibility limits are mentioned in ISO4264:07. 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. And the calculated reproducibility is in good agreement with the requirements of EN23015:94 and ASTM D2500:11.
- CFPP: This determination was very problematic. No statistical outliers were observed. The calculated reproducibility is not at all in agreement with the requirements of EN116:97 and IP309:99. Evaluation should be done with care; the range of the precision data is between -35 and 0°C. (EN116:fig.9). Rounding of the results may partly explain the observed spread.
- CR 10% res.: No significant conclusions were drawn as the carbon residue content was below the application range of the reference method. All participants agreed that Conradson Carbon Residue was less than 0.1 %M/M. One laboratory reported to have used ASTM D524. This test result was excluded because ASTM D524:10 is not equal to ISO10370:93.
- Ramsbottom.: Only six laboratories reported a test result of which two reported to have used the Conradson Carbon Residue test method. Therefore no significant conclusions were drawn.
- Copper Corr.: No problems were observed, almost all participants agreed on a test result of 1 or 1A. Three participants reported Copper Corrosion as 1B.
- Density @15°C: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO12185:96 and ASTM D4052:11.
- FAME: This determination was problematic. Seven statistical outliers were observed. The calculated reproducibility, after rejection of the statistical outliers, is not in agreement with the requirements of EN14078:09.
- Flash Point: This determination was not problematic. Only one statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier, is in agreement with the requirements of ISO2719:02 and ASTM D93A:12.
- Kin. Visc. 40°C: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of ISO3104:94+corr.1997 and D445:12/IP71:97.
- Lubricity: This determination was not problematic. Only one statistical outlier was observed. However, the calculated reproducibility, after rejection of the statistical outlier, is in good agreement with the requirements of ISO12156-1:06 and in agreement with the requirements of ASTM D6079:11.

Ox. Stab. EN15751: This determination was very problematic. Two statistical outliers were observed and one laboratory reported to have used ASTM D7545 which is not equivalent to EN15751. The calculated reproducibility, after rejection of the suspect test results, is not at all in agreement with the requirements of EN15751:09. One laboratory reported to have used ASTM D7545 which is not equivalent to EN15751.

Ox. Stab. ISO12205: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of ISO12205:95.

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

Pour Point (M): This determination was not problematic. No statistical outliers were observed. And the calculated reproducibility is in full agreement with the requirements of ISO3016:94 and in agreement with the requirements of ASTM D97:11/IP15.

Pour Point (A): This determination was not problematic. No statistical outliers were observed. And the calculated reproducibility is in agreement with the requirements of ASTM D5950:12. Remarkably five laboratories reported to have used ASTM D97/IP15 and two other laboratories used ISO3016 which are manual test methods. These seven test results were excluded from the statistical evaluation and were evaluated under the manual method.

Sulphur: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is agreement with the requirements of ISO20846:11 and ASTM D5453:09.

TAN: This determination was not problematic. No statistical outliers were observed. And the calculated reproducibility is in full agreement with the requirements of ASTM D664:11.
Eight laboratories used test method ASTM D974/IP139. These test results were excluded from the statistical evaluation because ASTM D974/IP139 is not technically equivalent to ASTM D664.

Water: This determination was not problematic. Only one statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in good agreement with the requirements of EN12937:00.

Distillation: As only six laboratories reported results from a manual distillation, these results are listed and evaluated together with the results of the automated

distillation. Only the 10% recovery point was somewhat problematic. In total seven statistical outliers were observed and the calculated reproducibilities of ibp, 50% rec., 90% rec., 95% rec., FBP, vol @250° and vol @350°, after rejection of the statistical outliers, are all in agreement with the requirements of ISO3405:11 (auto) and of ASTM D86:11 (auto).

Total Contamination: The samples were spiked with a freshly prepared and well shaken suspension of particulate quartz material (\varnothing 2.4-32 μ m) in oil. The theoretical Total contamination concentration of the gasoil after spiking is 14.8 mg/kg. Surprisingly, the average concentration found by the participants was 27.2 mg/kg.

Serious analytical problems have been observed. No statistical outliers were observed but the calculated reproducibility is not at all agreement with the requirements of EN12662:08.

The participants were asked to provide the version of the used method, see page 60. The variety in versions used does not explain the large spread in test results as no correlation can be found between the version used and the reported test results.

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.

<i>Parameters</i>	<i>unit</i>	<i>n</i>	<i>average</i>	<i>2.8 * sd</i>	<i>R (lit)</i>
Ash content	%M/M	22	0.0014	0.0033	0.0050
Aromatics by FIA	%V/V	15	19.53	8.67	n.a
Cetane Index D976		26	53.87	1.00	2.00
Cetane Index ISO4264		39	53.51	0.97	n.a
Cloud Point	°C	51	-8.7	2.1	4.0
Cold Filter Plugging Point	°C	49	-25.3	8.3	5.2
CCR on 10% residue	%M/M	30	0.024	0.031	(0.020)*
Ramsbottom CR on 10% residue	%M/M	4	0.068	n.a	n.a
Copper Corrosion 3hrs @ 50°C		46	1A	n.a	n.a
Density @ 15°C	kg/m ³	57	833.18	0.40	0.50
Fatty Acid Methyl Ester	%V/V	42	8.20	0.75	0.61
Flash Point PMcc	°C	55	57.16	3.89	4.06
Kinematic Viscosity @ 40°C	mm ² /s	50	2.6518	0.0303	0.0299
Lubricity	µm	37	178.8	54.4	102.0
Oxidation Stability EN15751	hrs	20	50.45	20.31	9.98
Oxidation Stability ISO12205	g/m ³	16	3.73	8.26	8.28
Polycyclic Aromatic Hydrocarbons	%M/M	32	1.40	0.60	0.72
Pour Point (manual)	°C	26	-33.4	6.7	6.6
Pour Point (automated)	°C	21	-32.4	3.7	4.5
Sulphur	mg/kg	49	6.87	1.84	2.75
Total Acid Number	mgKOH/g	23	0.029	0.044	0.043
Water	mg/kg	50	58.05	26.99	52.40
Initial Boiling Point	°C	53	165.29	9.36	9.09
10% recovery	°C	54	203.29	5.06	4.47
50% recovery	°C	51	271.99	2.74	2.97
90% recovery	°C	53	330.56	4.22	4.96
95% recovery	°C	54	342.17	6.33	8.55
Final Boiling Point	°C	54	350.68	6.11	7.10
Volume @250°C	%V/V	52	34.94	2.09	2.66
Volume @350°C	%V/V	43	97.00	2.18	2.66
Total Contamination (#13061)	mg/kg	31	27.24	19.12	8.21

Table 3: summary of test results samples #13060 and #13061

*) 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 APRIL 2013 WITH PREVIOUS PTS.

	<i>April 2013</i>	<i>April 2012</i>	<i>April 2011</i>	<i>April 2010</i>
Number of reporting labs	61	57	67	55
Number of results reported	1257	1197	1363	1023
Statistical outliers	29	33	50	39
Percentage outliers	2.4%	2.8%	3.7%	3.8%

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:

	<i>April 2013</i>	<i>April 2012</i>	<i>April 2011</i>	<i>April 2010</i>
Ash content	+	(++)	(++)	(++)
Aromatics by FIA	n.e	n.e	n.e.	n.e.
Cetane Index D976	++	++	++	++
Cetane Index ISO4264	n.e	n.e	n.e.	n.e.
Cloud Point	++	+	++	++
Cold Filter Plugging Point	--	+	+/-	--
Conradson CR on 10% res.	(-)	(--)	(--)	(--)
Ramsbottom CR on 10% res.	(--)	n.e	-	--
Density @ 15 °C	+	++	++	++
Fatty Acid Methyl Ester	-	-	--	--
Flash Point PMcc	+	+	++	++
Kinematic Viscosity @ 40 °C	+/-	-	++	-
Lubricity	++	++	++	++
Oxidation Stability EN15751	--	--	-	-
Oxidation Stability ISO12205	+/-	+	++	++
Polycyclic Aromatic Hydrocar.	+	-	--	--
Pour Point manual	+/-	+	++	+
Pour Point automated	+	+	++	+/-
Sulphur	++	+	--	++
TAN	+	+	(++)	++
Water content	++	+	++	++
Distillation	+	+	+/-	+/-
Total Contamination	--	-	--	--

table 5: comparison determinations against the standard

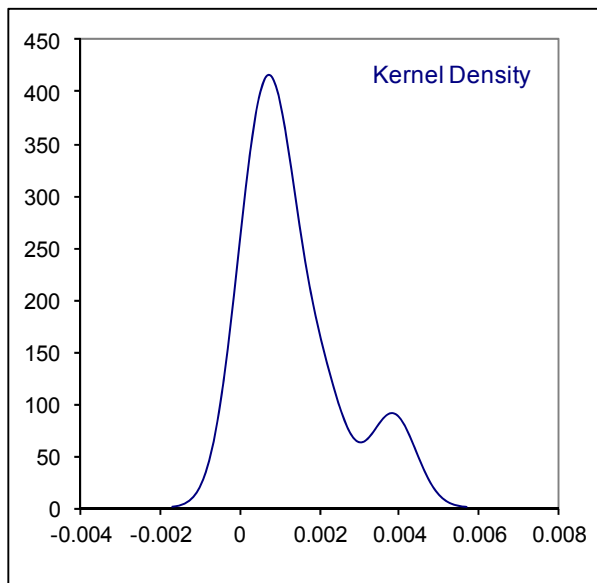
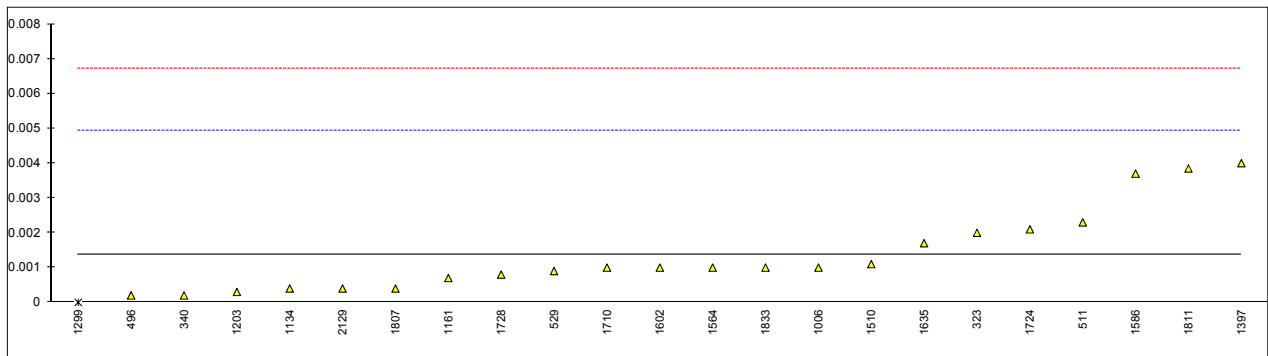
The performance of the determinations against the requirements of the respective standards is listed in the above table. The following performance categories were used:

- ++: 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 Ash Content on sample #13060; result in %M/M

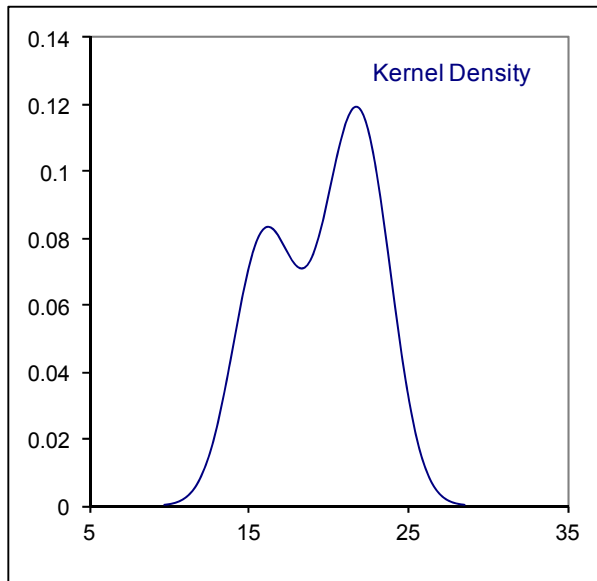
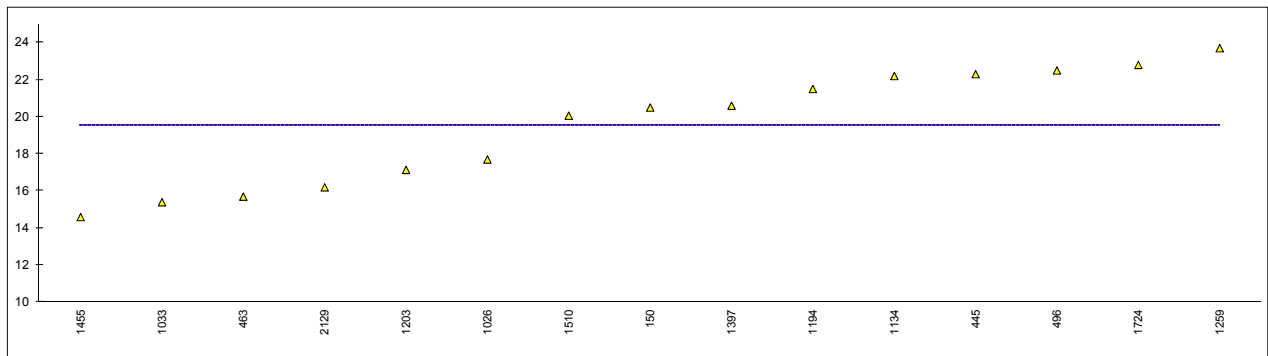
lab	method	value	mark	z(targ)	remarks
150	ISO6245	<0.001		----	
311		----		----	
312		----		----	
323	ISO6245	0.002		0.36	
334		----		----	
338		----		----	
340	ISO6245	0.0002		-0.65	
343	ISO6245	<0.01		----	
353	IP4	<0.001		----	
432		----		----	
445	IP4	<0.001		----	
463	ISO6245	<0.001		----	
495	ISO6245	<0.001		----	
496	ISO6245	0.0002		-0.65	
511	D482	0.0023		0.52	
529	D482	0.0009		-0.26	
540	D482	<0.001		----	
631	D482	<0.001		----	
1006	D482	0.001		-0.20	
1016		----		----	
1017		----		----	
1026	ISO6245	<0.001		----	
1033		----		----	
1065		----		----	
1081	D482	<0.0001		----	reported < 1 mg/kg
1108		----		----	
1126		----		----	
1134	ISO6245	0.0004		-0.54	
1140	IP4	<0.001		----	
1161	ISO6245	0.0007		-0.37	
1194		----		----	
1199		----		----	
1203	ISO6245	0.0003		-0.60	
1205		----		----	
1218		----		----	
1227		----		----	
1237		----		----	
1259		----		----	
1299	D482	0.000	ex	-0.76	result excluded, zero is not a real value
1346		----		----	
1389		----		----	
1397	ISO6245	0.004		1.48	
1404	ISO6245	<0.001		----	
1428	ISO6245	<0.001		----	
1455	ISO6245	<0.001		----	
1510	IP4	0.0011		-0.15	
1564	D482	0.001		-0.20	
1569		----		----	
1586	ISO6245	0.0037		1.31	
1602	ISO6245	0.0010		-0.20	
1631		----		----	
1634		----		----	
1635	ISO6245	0.0017		0.19	
1656	ISO6245	<0.01		----	
1667		----		----	
1676		----		----	
1706		----		----	
1710	ISO6245	0.001		-0.20	
1724	ISO6245	0.0021		0.41	
1728	D482	0.0008		-0.32	
1807	ISO6245	0.0004		-0.54	
1810		----		----	
1811	ISO6245	0.00385		1.39	first reported: 0.007
1833	D482	0.0010		-0.20	
1842		----		----	
2129	ISO6245	0.0004		-0.54	
	normality	not OK			
	n	22			
	outliers	0			
	mean (n)	0.00137			
	st.dev. (n)	0.001172			
	R(calc.)	0.00328			application range 0.001 - 0.180 %M/M
	R(ISO6245:93)	0.00500			compare R(D482:07) = 0.005



Determination of Aromatics by FIA on sample #13060; result in %V/V

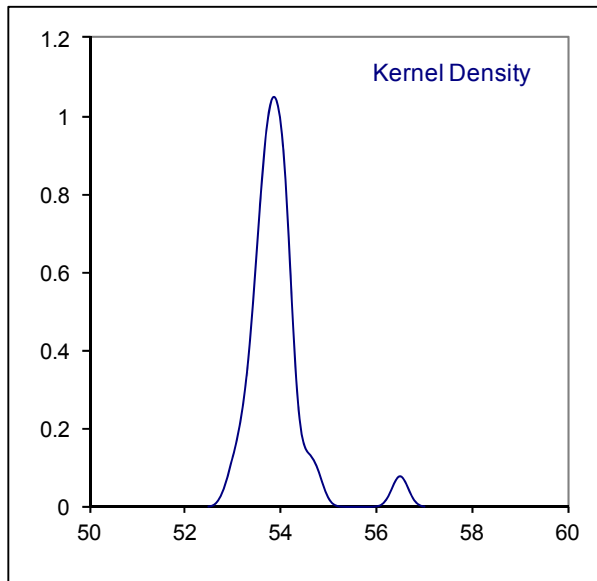
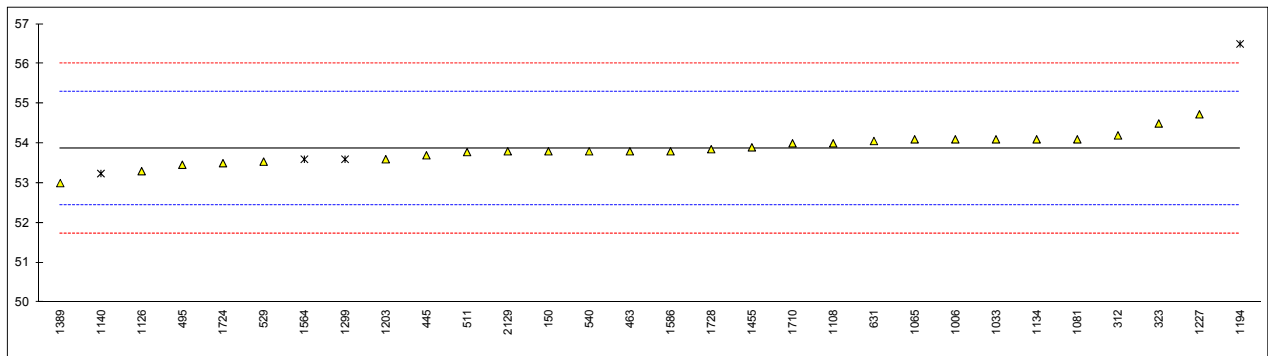
lab	method	value	mark	z(targ)	remarks
150	D1319	20.5		----	
311		----		----	
312		----		----	
323		----		----	
334		----		----	
338		----		----	
340		----		----	
343		----		----	
353		----		----	
432		----		----	
445	D1319	22.3		----	
463	D1319	15.7		----	
495		----		----	
496	D1319	22.50		----	
511		----		----	
529		----		----	
540		----		----	
631		----		----	
1006		----		----	
1016		----		----	
1017		----		----	
1026	EN12916	17.7		----	
1033	D1319	15.4		----	
1065		----		----	
1081		----		----	
1108		----		----	
1126		----		----	
1134	D1319	22.2		----	
1140		----		----	
1161		----		----	
1194	EN12916	21.5		----	
1199		----		----	
1203	D1319	17.14		----	
1205		----		----	
1218		----		----	
1227		----		----	
1237		----		----	
1259	D1319	23.7		----	
1299		----		----	
1346		----		----	
1389		----		----	
1397	D1319	20.6		----	
1404		----		----	
1428		----		----	
1455	D1319	14.6		----	
1510	D1319	20.06		----	
1564		----		----	
1569		----		----	
1586		----		----	
1602		----		----	
1631		----		----	
1634		----		----	
1635		----		----	
1656		----		----	
1667		----		----	
1676		----		----	
1706		----		----	
1710		----		----	
1724	D1319	22.8		----	
1728		----		----	
1807		----		----	
1810		----		----	
1811		----		----	
1833		----		----	
1842		----		----	
2129	D1319	16.2		----	
	normality	OK			
	n	15			
	outliers	0			
	mean (n)	19.527			
	st.dev. (n)	3.0953			
	R(calc.)	8.667			
	R(D1319:13)	n.a			

Compare R(D1319:13 for diesel without FAME) = 3.7



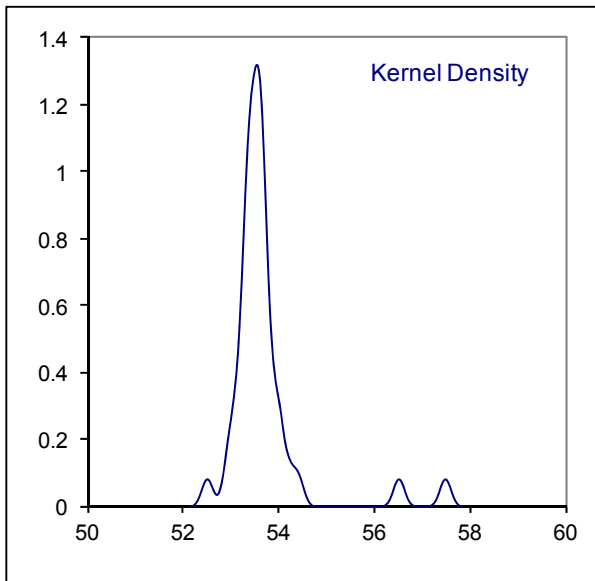
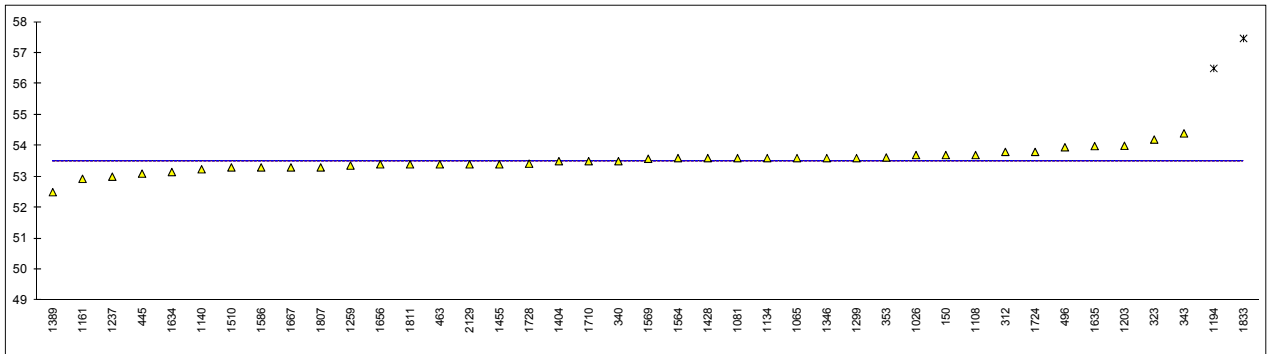
Determination of Cetane Index D976 on sample #13060

lab	method	value	mark	z(targ)	remarks
150	D976	53.8		-0.10	
311		----		----	
312	D976	54.2		0.46	
323	D976	54.5		0.88	
334		----		----	
338		----		----	
340		----		----	
343		----		----	
353		----		----	
432		----		----	
445	D976	53.7		-0.24	
463	D976	53.8		-0.10	
495	D976	53.46		-0.57	
496		----		----	
511	D976	53.78		-0.13	
529	D976	53.54		-0.46	
540	D976	53.8		-0.10	
631	D976	54.059		0.26	
1006	D976	54.1		0.32	
1016		----		----	
1017		----		----	
1026		----		----	
1033	D976	54.1		0.32	
1065	D976	54.1		0.32	
1081	D976	54.1		0.32	
1108	D976	54.0		0.18	
1126	D976	53.3		-0.80	
1134	D976	54.1		0.32	
1140	IP380	53.24	ex	-0.88	result excluded, see §4.1
1161		----		----	
1194	INH-4737	56.5	ex	3.68	result excluded, see §4.1
1199		----		----	
1203	D976	53.6		-0.38	
1205		----		----	
1218		----		----	
1227	D976	54.73		1.20	
1237		----		----	
1259		----		----	
1299	D4737	53.6	ex	-0.38	result excluded, see §4.1
1346		----		----	
1389	D976	53.0		-1.22	
1397		----		----	
1404		----		----	
1428		----		----	
1455	D976	53.9		0.04	
1510		----		----	
1564	D4737	53.6	ex	-0.38	result excluded, see §4.1
1569		----		----	
1586	D976	53.8		-0.10	
1602		----		----	
1631		----		----	
1634		----		----	
1635		----		----	
1656		----		----	
1667		----		----	
1676		----		----	
1706		----		----	
1710	D976	54.0		0.18	
1724	D976	53.5		-0.52	
1728	D976	53.853		-0.02	
1807		----		----	
1810		----		----	
1811		----		----	
1833		----		----	
1842		----		----	
2129	D976	53.8		-0.10	
	normality	OK			
	n	26			
	outliers	0			
	mean (n)	53.870			
	st.dev. (n)	0.3584			
	R(calc.)	1.003			
	R(D976:11)	2.000			



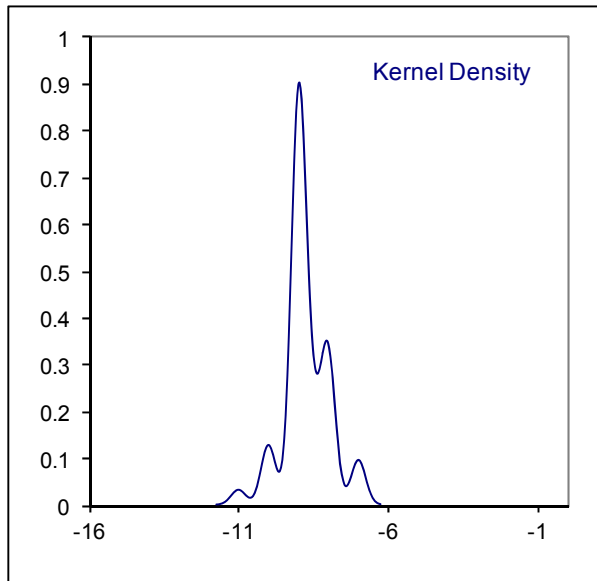
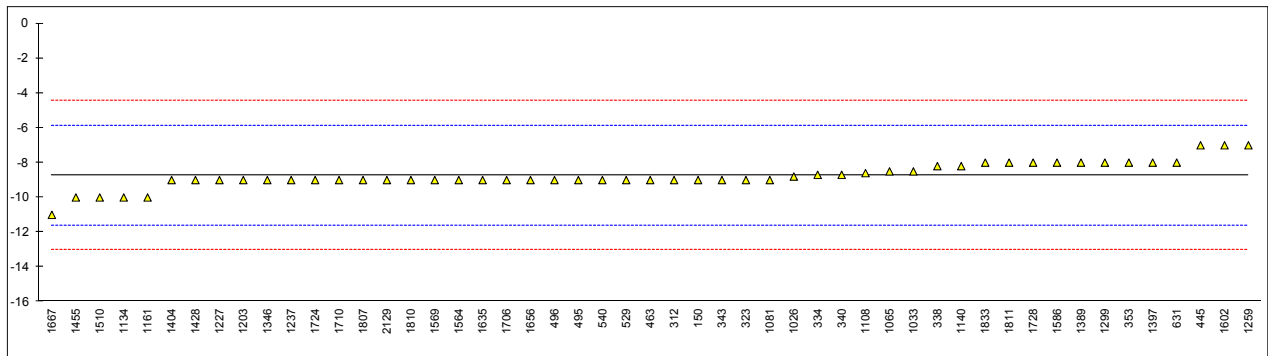
Determination of Cetane Index ISO4264 on sample #13060

lab	method	value	mark	z(targ)	remarks
150	ISO4264	53.7		----	
311		----		----	
312	ISO4264	53.8		----	
323	ISO4264	54.2		----	
334		----		----	
338		----		----	
340	ISO4264	53.5		----	
343	ISO4264	54.4		----	
353	IP380	53.62		----	
432		----		----	
445	IP380	53.1		----	
463	ISO4264	53.4		----	
495		----		----	
496	ISO4264	53.95		----	
511		----		----	
529		----		----	
540		----		----	
631		----		----	
1006		----		----	
1016		----		----	
1017		----		----	
1026	ISO4264	53.7		----	
1033		----		----	
1065	ISO4264	53.6		----	
1081	ISO4264	53.6		----	
1108	ISO4264	53.7		----	
1126		----		----	
1134	ISO4264	53.6		----	
1140	IP380	53.24		----	result was reported under CI D976
1161	ISO4264	52.93		----	
1194	INH-4737	56.5	G(0.01)	----	result was reported under CI D976
1199		----		----	
1203	ISO4264	54.0		----	
1205		----		----	
1218		----		----	
1227		----		----	
1237	ISO4264	53.0		----	
1259	ISO4264	53.36		----	
1299	D4737	53.6		----	result was reported under CI D976
1346	ISO4264	53.6		----	
1389	ISO4264	52.5		----	
1397		----		----	
1404	ISO4264	53.5		----	
1428	ISO4264	53.6		----	
1455	ISO4264	53.4		----	
1510	IP380	53.3		----	
1564	D4737	53.6		----	result was reported under CI D976
1569	ISO4264	53.58		----	
1586	ISO4264	53.3		----	
1602		----		----	
1631		----		----	
1634	ISO4264	53.15		----	
1635	ISO4264	53.99		----	
1656	ISO4264	53.4		----	
1667	ISO4264	53.3		----	
1676		----		----	
1706		----		----	
1710	ISO4264	53.5		----	
1724	ISO4264	53.8		----	
1728	ISO4264	53.4214		----	
1807	ISO4264	53.3		----	
1810		----		----	
1811	ISO4264	53.4		----	
1833	ISO4264	57.47	G(0.01)	----	
1842		----		----	
2129	ISO4264	53.4		----	
	normality	OK			
	n	39			
	outliers	2			
	mean (n)	53.514			
	st.dev. (n)	0.3455			
	R(calc.)	0.967			
	R(ISO4264:07)	n.a			



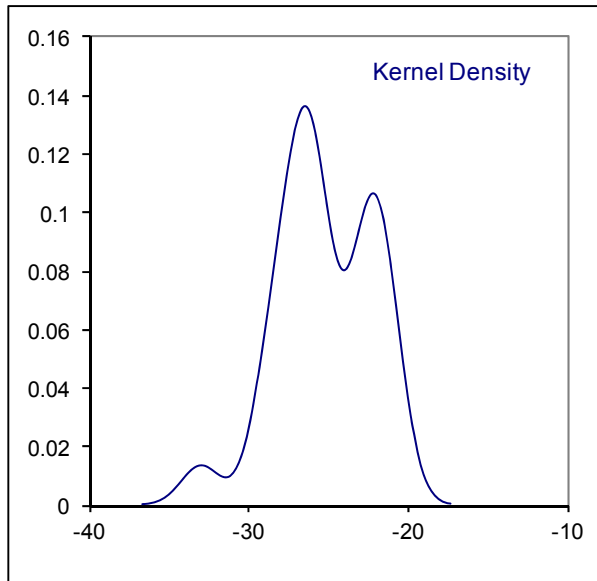
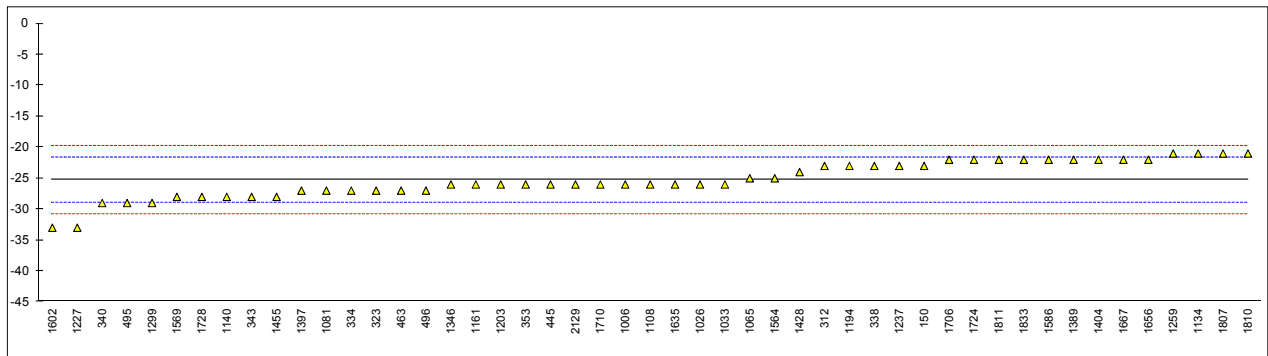
Determination of Cloud Point on sample #13060; result in °C

lab	method	value	mark	z(targ)	remarks
150	D5771	-9.0		-0.18	
311		----		----	
312	EN23015	-9		-0.18	
323	EN23015	-9		-0.18	
334	EN23015	-8.7		0.03	
338	EN23015	-8.2		0.38	
340	EN23015	-8.7		0.03	
343	EN23015	-9		-0.18	
353	IP219	-8		0.52	
432		----		----	
445	IP219	-7		1.22	
463	EN23015	-9		-0.18	
495	EN23015	-9		-0.18	
496	EN23015	-9.0		-0.18	
511		----		----	
529	D2500	-9.0		-0.18	
540	EN23015	-9		-0.18	
631	D2500	-8		0.52	
1006		----		----	
1016		----		----	
1017		----		----	
1026	D5773	-8.8		-0.04	
1033	IP219	-8.5		0.17	
1065	D5771	-8.5		0.17	
1081	D5772	-9		-0.18	
1108	D5771	-8.6		0.10	
1126		----		----	
1134	EN23015	-10		-0.88	
1140	IP446	-8.2		0.38	
1161	EN23015	-10		-0.88	
1194		----		----	
1199		----		----	
1203	EN23015	-9	C	-0.18	first reported: -6
1205		----		----	
1218		----		----	
1227	D2500	-9		-0.18	
1237	EN23015	-9		-0.18	
1259	EN23015	-7		1.22	
1299	D5572	-8.0		0.52	
1346	EN23015	-9		-0.18	
1389	D2500	-8		0.52	
1397	EN23015	-8		0.52	
1404	D5771	-9		-0.18	
1428	EN23015	-9		-0.18	
1455	EN23015	-10		-0.88	
1510	IP219	-10		-0.88	
1564	D5772	-9		-0.18	
1569	ISO12937	-9.0		-0.18	
1586	EN23015	-8.0		0.52	
1602	ISO3015	-7		1.22	
1631		----		----	
1634		----		----	
1635	EN23015	-9		-0.18	
1656	EN23015	-9		-0.18	
1667	EN23015	-11		-1.58	
1676		----		----	
1706	EN23015	-9.0		-0.18	
1710	EN23015	-9		-0.18	
1724	EN23015	-9		-0.18	
1728	D2500	-8		0.52	
1807	EN23015	-9		-0.18	
1810	EN23015	-9		-0.18	
1811	EN23015	-8		0.52	
1833	D2500	-8		0.52	
1842		----		----	
2129	EN23015	-9		-0.18	
	normality	not OK			
	n	51			
	outliers	0			
	mean (n)	-8.75			
	st.dev. (n)	0.748			
	R(calc.)	2.09			
	R(EN23015:94)	4.00			Compare R(D2500:11) = 4.00



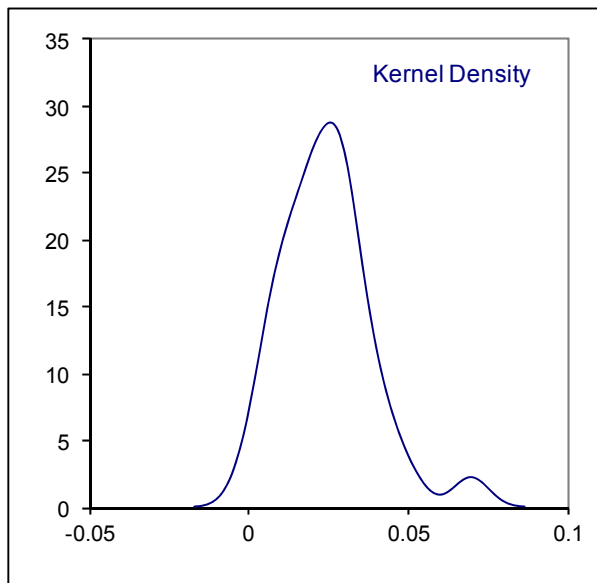
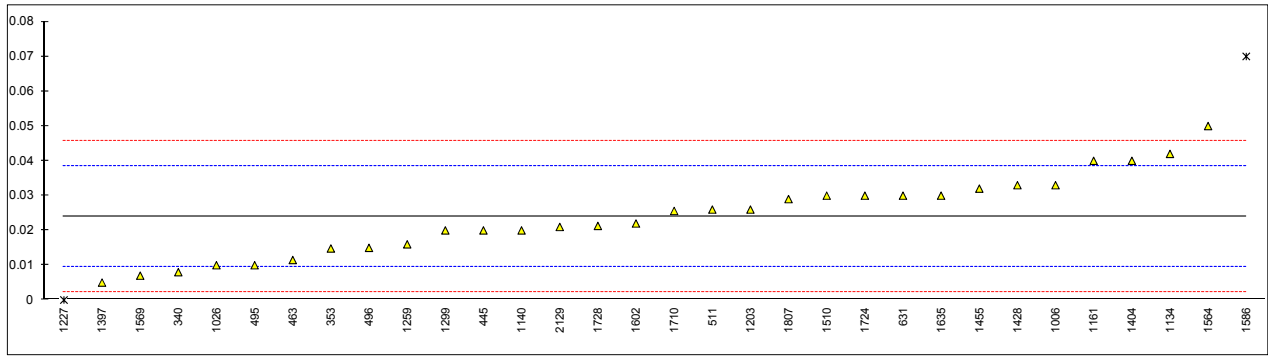
Determination of Cold Filter Plugging Point on sample #13060; result in °C

lab	method	value	mark	z(targ)	remarks
150	EN116	-23.0		1.23	
311		----		----	
312	EN116	-23		1.23	
323	EN116	-27		-0.94	
334	EN116	-27		-0.94	
338	EN116	-23		1.23	
340	EN116	-29		-2.02	
343	EN116	-28		-1.48	
353	IP309	-26		-0.40	
432		----		----	
445	IP309	-26		-0.40	
463	EN116	-27		-0.94	
495	EN116	-29		-2.02	
496	EN116	-27.0		-0.94	
511		----		----	
529		----		----	
540	EN116	<-20		----	
631		----		----	
1006	D6371	-26		-0.40	
1016		----		----	
1017		----		----	
1026	EN116	-26		-0.40	
1033	IP309	-26		-0.40	
1065	EN116	-25		0.14	
1081	EN116	-27		-0.94	
1108	EN116	-26		-0.40	
1126		----		----	
1134	EN116	-21		2.31	
1140	IP309	-28.0		-1.48	
1161	EN116	-26		-0.40	
1194	EN116	-23		1.23	
1199		----		----	
1203	EN116	-26		-0.40	
1205		----		----	
1218		----		----	
1227	EN116	-33		-4.18	
1237	EN116	-23		1.23	
1259	EN116	-21		2.31	
1299	IP309	-29		-2.02	
1346	EN116	-26		-0.40	
1389	IP309	-22		1.77	
1397	EN116	-27		-0.94	
1404	EN116	-22		1.77	
1428	EN116	-24		0.68	
1455	EN116	-28		-1.48	
1510		----		----	
1564	IP309	-25		0.14	
1569	EN116	-28.0		-1.48	
1586	EN116	-22		1.77	
1602	EN116	-33		-4.18	
1631		----		----	
1634		----		----	
1635	EN116	-26		-0.40	
1656	EN116	-22		1.77	
1667	EN116	-22		1.77	
1676		----		----	
1706	EN116	-22		1.77	
1710	EN116	-26		-0.40	
1724	EN116	-22		1.77	
1728	D6371	-28		-1.48	
1807	EN116	-21		2.31	
1810	EN116	-21		2.31	
1811	EN116	-22		1.77	
1833	D6371	-22		1.77	
1842		----		----	
2129	EN116	-26		-0.40	
	normality	not OK			
	n	49			
	outliers	0			
	mean (n)	-25.3			
	st.dev. (n)	2.96			
	R(calc.)	8.3			
	R(EN116:97/C1:99)	5.2			R(EN116:97)= R(IP309:99)



Determination of Conradson Carbon Residue on 10% dist. res. on sample #13060; result in %M/M

lab	method	value	mark	z(targ)	remarks
150		----		----	
311		----		----	
312		----		----	
323	ISO10307	<0.10		----	
334		----		----	
338		----		----	
340	ISO10307	0.008		----	
343	ISO10307	<0.1		----	
353	IP13	0.0148		----	
432		----		----	
445	ISO10307	0.02	C	----	first reported: 0.070
463	ISO10307	0.0115		----	
495	ISO10307	0.010		----	
496	ISO10307	0.015		----	
511	D189	0.026		----	
529		----		----	
540	D189	<0.01		----	
631	D4530	0.03		----	
1006	ISO10307	0.033		----	
1016		----		----	
1017		----		----	
1026	ISO10307	0.01		----	
1033		----		----	
1065		----		----	
1081	ISO10307	<0.1		----	
1108		----		----	
1126		----		----	
1134	IP13	0.042		----	
1140	IP398	0.020		----	reported under Ramsbottom Carbon Residue
1161	ISO10307	0.04		----	
1194		----		----	
1199		----		----	
1203	ISO10307	0.026		----	
1205		----		----	
1218		----		----	
1227	D4530	0	ex	----	result excluded, zero is not a real value
1237		----		----	
1259	D189	0.016		----	reported under Ramsbottom Carbon Residue
1299	D4530	0.02		----	
1346		----		----	
1389		----		----	
1397	ISO10307	0.005		----	
1404	ISO10307	0.04		----	
1428	ISO10307	0.033		----	
1455	ISO10307	0.032		----	
1510	ISO10307	0.03		----	
1564	D4530	0.05		----	
1569	ISO10307	0.007		----	
1586	ISO10307	0.07	G(0.05)	----	
1602	ISO10307	0.022		----	
1631		----		----	
1634		----		----	
1635	ISO10307	0.03		----	
1656		----		----	
1667		----		----	
1676		----		----	
1706		----		----	
1710	ISO10307	0.0256		----	
1724	ISO10307	0.03		----	
1728	ISO10307	0.0213		----	
1807	ISO10307	0.029		----	
1810		----		----	
1811		----		----	
1833	D524	<0.1	ex	----	result excluded: ASTM D524 is Ramsbottom Carbon Residue
1842		----		----	
2129	ISO10307	0.021		----	
	normality	OK			
	n	30			
	outliers	1			
	mean (n)	0.0239			
	st.dev. (n)	0.01125			
	R(calc.)	0.0315			
	R(ISO10370:93)	(0.0204)			application range: 0.1-30 %M/M



Determination of Ramsbottom Carbon Res. on 10% dist. res. on sample #13060; result in %M/M

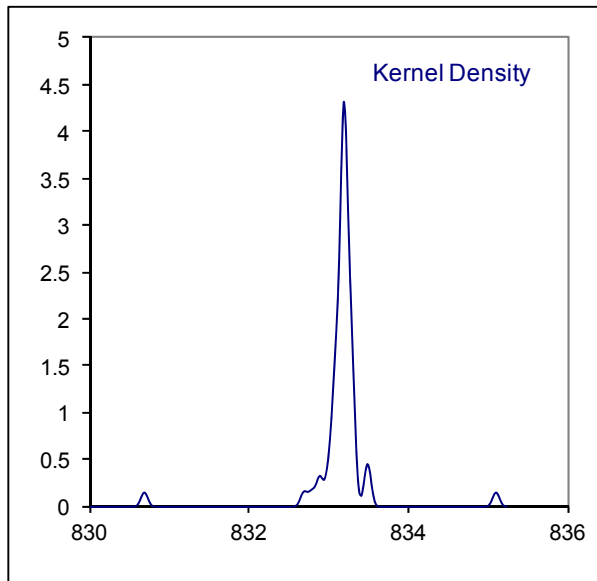
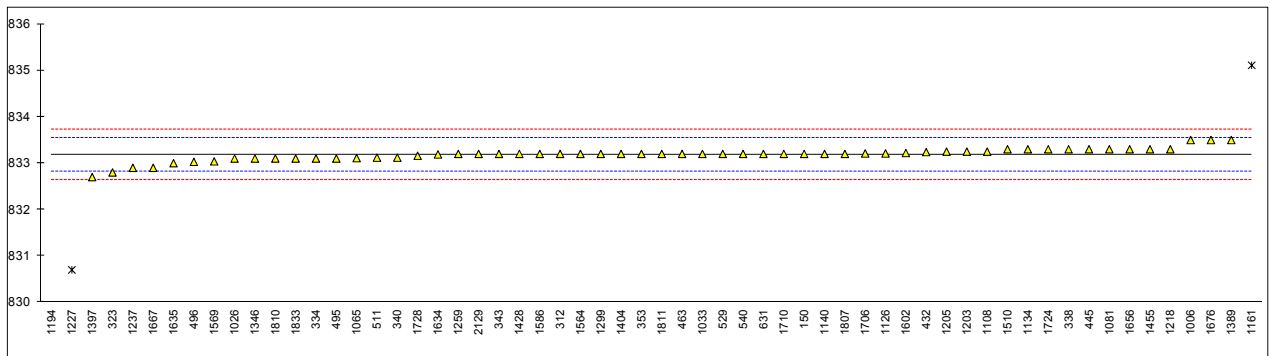
lab	method	value	mark	z(targ)	remarks
150	D524	0.03		----	
311		----		----	
312		----		----	
323		----		----	
334		----		----	
338		----		----	
340		----		----	
343		----		----	
353		----		----	
432		----		----	
445	D524	0.065		----	
463		----		----	
495		----		----	
496		----		----	
511	D524	0.075		----	
529		----		----	
540		----		----	
631		----		----	
1006		----		----	
1016		----		----	
1017		----		----	
1026		----		----	
1033		----		----	
1065		----		----	
1081		----		----	
1108		----		----	
1126		----		----	
1134		----		----	
1140	IP398	0.020	ex	----	result excluded , IP398 = Conradson Carbon Residue
1161		----		----	
1194		----		----	
1199		----		----	
1203		----		----	
1205		----		----	
1218		----		----	
1227		----		----	
1237		----		----	
1259	D189	0.016	ex	----	result excluded , D189 = Conradson Carbon Residue
1299		----		----	
1346		----		----	
1389		----		----	
1397		----		----	
1404		----		----	
1428		----		----	
1455		----		----	
1510		----		----	
1564		----		----	
1569		----		----	
1586		----		----	
1602		----		----	
1631		----		----	
1634		----		----	
1635		----		----	
1656		----		----	
1667		----		----	
1676		----		----	
1706		----		----	
1710		----		----	
1724		----		----	
1728		----		----	
1807		----		----	
1810		----		----	
1811		----		----	
1833	D524	0.1		----	
1842		----		----	
2129		----		----	
	normality	n.a			
	n	4			
	outliers	n.a			
	mean (n)	0.068			
	st.dev. (n)	n.a			
	R(calc.)	n.a			
	R(D524:10)	n.a			

Determination of Copper Corrosion 3hrs @ 50 °C on sample #13060

lab	method	value	mark	z(targ)	remarks
150	ISO2160	1A		----	
311		----		----	
312		----		----	
323	ISO2160	1A		----	
334		----		----	
338		----		----	
340	ISO2160	1A		----	
343	ISO2160	1A		----	
353	D130	1A		----	
432		----		----	
445	IP154	1A		----	
463	ISO2160	1A		----	
495	ISO2160	1A		----	
496	ISO2160	1A		----	
511	D130	1A		----	
529	D130	1A		----	
540	D130	1		----	
631	D130	1B		----	
1006	D130	1A		----	
1016		----		----	
1017		----		----	
1026	ISO2160	1B		----	
1033	IP154	1A		----	
1065		----		----	
1081	D130	1A		----	
1108	ISO2160	1		----	
1126		----		----	
1134	IP154	1A		----	
1140	IP154	1A		----	
1161	ISO2160	1A		----	
1194		----		----	
1199		----		----	
1203	ISO2160	1		----	
1205		----		----	
1218		----		----	
1227	D130	1A		----	
1237		----		----	
1259	ISO2160	1A		----	
1299	D130	1A		----	
1346	ISO2160	1A		----	
1389	D130	1A		----	
1397	ISO2160	1		----	
1404	ISO2160	1A		----	
1428	ISO2160	1A		----	
1455	ISO2160	1A		----	
1510	IP154	1A		----	
1564	D130	1A		----	
1569	ISO2160	1A		----	
1586	ISO2160	1B		----	
1602	ISO2160	1A		----	
1631		----		----	
1634	ISO2160	1A		----	
1635	ISO2160	1A		----	
1656	ISO2160	1		----	
1667		----		----	
1676		----		----	
1706		----		----	
1710	ISO2160	1A		----	
1724	ISO2160	1A		----	
1728	D130	1A		----	
1807	ISO2160	1A		----	
1810		----		----	
1811	ISO2160	1		----	
1833	D130	1A		----	
1842		----		----	
2129	ISO2160	1A		----	
	normality	n.a			
	n	46			
	outliers	n.a			
	mean (n)	1(A)			
	st.dev. (n)	n.a			
	R(calc.)	n.a			
	R(ISO2160:98)	n.a			

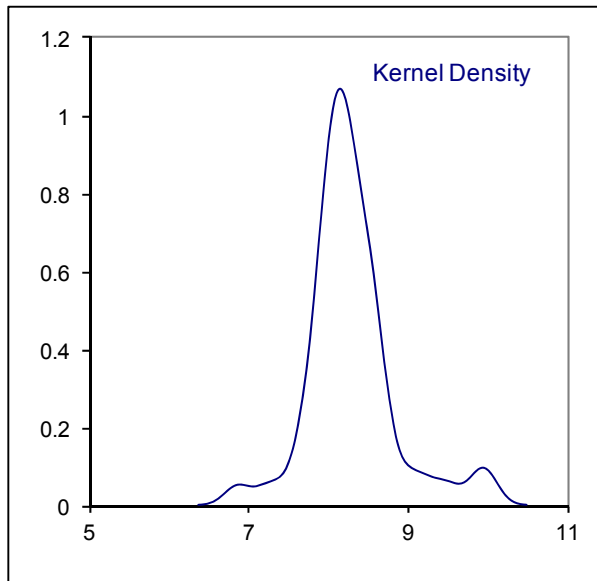
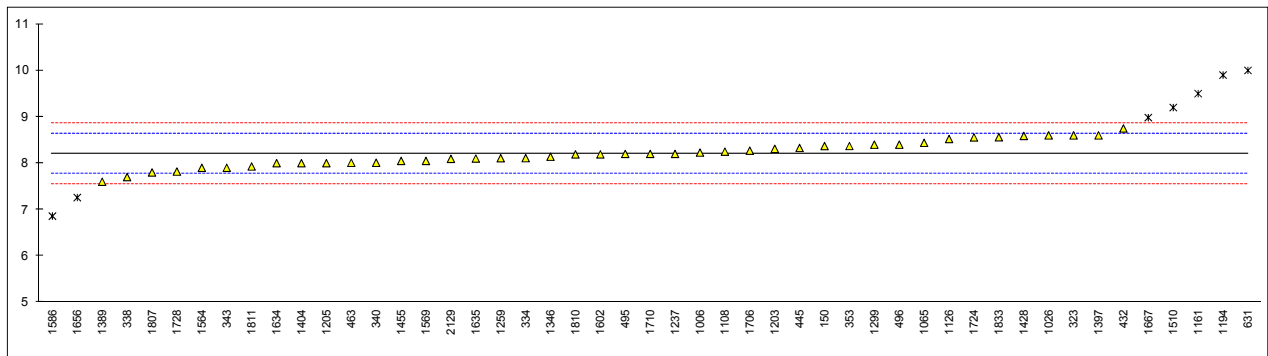
Determination of Density @15 °C on sample #13060; result in kg/m³

lab	method	value	mark	z(targ)	remarks
150	D4052	833.2		0.09	
311		-----		-----	
312	ISO12185	833.2		0.09	
323	ISO12185	832.8		-2.15	
334	ISO12185	833.1		-0.47	
338	ISO12185	833.3		0.65	
340	ISO12185	833.12		-0.36	
343	ISO12185	833.2		0.09	
353	IP365	833.2		0.09	
432	ISO12185	833.24		0.31	
445	IP365	833.3		0.65	
463	ISO12185	833.20		0.09	
495	ISO12185	833.1		-0.47	
496	ISO12185	833.03		-0.86	
511	D4052	833.12		-0.36	
529	D4052	833.2		0.09	
540	ISO12185	833.2		0.09	
631	D4052	833.2		0.09	
1006	D4052	833.5		1.77	
1016		-----		-----	
1017		-----		-----	
1026	D4052	833.10		-0.47	
1033	IP365	833.2		0.09	
1065	D4052	833.11		-0.41	
1081	ISO12185	833.3		0.65	
1108	ISO12185	833.25		0.37	
1126	ISO12185	833.21		0.15	
1134	IP365	833.3		0.65	
1140	IP365	833.2	U	0.09	probably unit error, reported 0.8332 kg/m ³
1161	ISO12185	835.11	C,G(0.01)	10.79	
1194	INH-12185	829.1	G(0.01)	-22.87	
1199		-----		-----	
1203	ISO12185	833.25		0.37	
1205	ISO12185	833.25		0.37	
1218	ISO12185	833.3		0.65	
1227	D4052	830.7	C,G(0.01)	-13.91	first reported: 0.8307
1237	ISO12185	832.9		-1.59	
1259	ISO12185	833.2		0.09	
1299	D4052	833.2		0.09	
1346	ISO12185	833.10		-0.47	
1389	D4052	833.5		1.77	
1397	ISO12185	832.7		-2.71	
1404	ISO12185	833.2		0.09	
1428	ISO12185	833.2		0.09	
1455	ISO12185	833.3		0.65	
1510	IP365	833.3	C	0.65	first reported; 0.8333
1564	D4052	833.2		0.09	
1569	ISO12185	833.04		-0.81	
1586	ISO12185	833.2		0.09	
1602	ISO12185	833.22		0.20	
1631		-----		-----	
1634	ISO12185	833.189		0.03	
1635	ISO12185	833.0		-1.03	
1656	ISO12185	833.3		0.65	
1667	ISO3675	832.9		-1.59	
1676	ISO12185	833.50		1.77	
1706	ISO12185	833.21		0.15	
1710	ISO12185	833.2		0.09	
1724	ISO12185	833.3		0.65	
1728	D4052	833.161		-0.13	
1807	ISO12185	833.2		0.09	
1810	ISO12185	833.1		-0.47	
1811	ISO12185	833.2		0.09	
1833	D4052	833.1		-0.47	
1842		-----		-----	
2129	D4052	833.2		0.09	
	normality	not OK			
	n	57			
	outliers	3			
	mean (n)	833.184			
	st.dev. (n)	0.1416			
	R(calc.)	0.396			
	R(ISO12185:96)	0.500			compare R(D4052:11) = 0.500



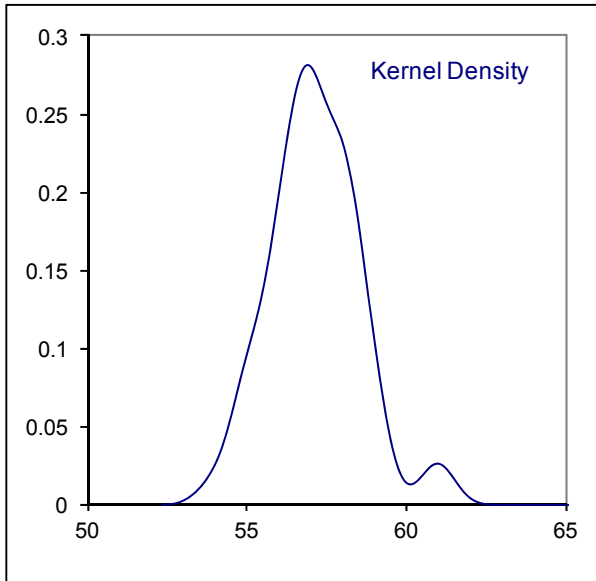
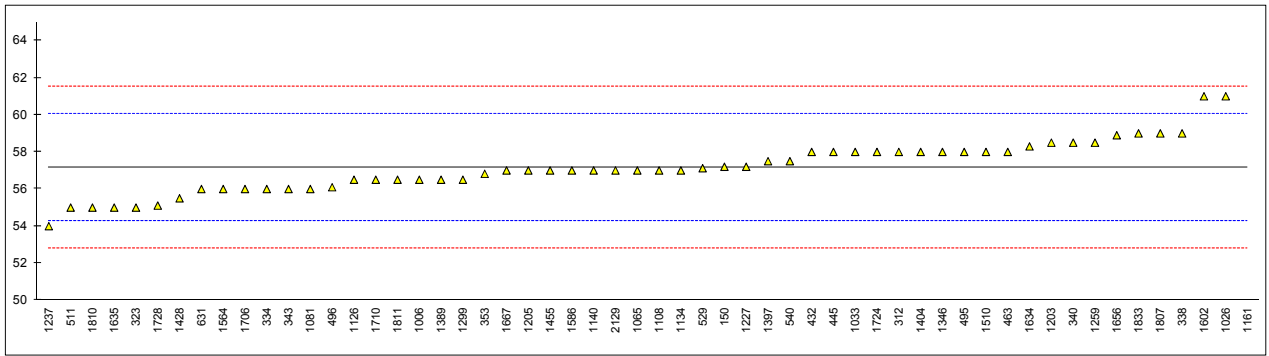
Determination of Fatty Acid Methyl Esters content on sample #13060; result in %V/V

lab	method	value	mark	z(targ)	remarks
150	EN14078	8.37		0.78	
311		----		----	
312		----		----	
323	EN14078	8.6		1.83	
334	EN14078	8.11		-0.42	
338	EN14078	7.7		-2.30	
340	EN14078	8.01		-0.88	
343	EN14078	7.9		-1.38	
353	EN14078	8.371		0.78	
432	EN14078	8.75		2.52	
445	EN14078	8.33		0.59	
463	EN14078	8.01		-0.88	
495	EN14078	8.20		-0.01	
496	EN14078	8.4		0.91	
511		----		----	
529		----		----	
540		----		----	
631	EN14078	10.0	C,DG(0.01)	8.27	first reported: 9.17
1006	EN14078	8.23		0.13	
1016		----		----	
1017		----		----	
1026	EN14078	8.6		1.83	
1033		----		----	
1065	EN14078	8.44		1.10	
1081		----		----	
1108	EN14078	8.25		0.22	
1126	EN14078	8.522		1.47	
1134		----		----	
1140		----		----	
1161	EN14078	9.50	C,G(0.05)	5.97	first reported: 5.65
1194	INH-14078	9.9	DG(0.01)	7.81	
1199		----		----	
1203	EN14078	8.31		0.50	
1205	EN14078	8.0		-0.92	
1218		----		----	
1227		----		----	
1237	EN14078	8.2		-0.01	
1259	EN14078	8.108		-0.43	
1299	EN14078	8.4		0.91	
1346	EN14078	8.14		-0.28	
1389	EN14078	7.6		-2.76	
1397	EN14078	8.6		1.83	
1404	EN14078	8.0		-0.92	
1428	EN14078	8.588		1.78	
1455	EN14078	8.05		-0.69	
1510	EN14078	9.2	C,DG(0.05)	4.59	first reported: 9.18
1564	EN14078	7.9		-1.38	
1569	EN14078	8.05		-0.69	
1586	EN14078	6.86	DG(0.05)	-6.17	
1602	EN14078	8.19		-0.05	
1631		----		----	
1634	EN14078	8.0		-0.92	
1635	EN14078	8.1		-0.47	
1656	EN14078	7.26	DG(0.05)	-4.33	
1667	EN14078	8.983	DG(0.05)	3.59	
1676		----		----	
1706	EN14078	8.27		0.32	
1710	EN14078	8.2		-0.01	
1724	EN14078	8.556		1.63	
1728	EN14078	7.82		-1.75	
1807	EN14078	7.8		-1.84	
1810	EN14078	8.19		-0.05	
1811	EN14078	7.93		-1.25	
1833	IP590	8.56		1.65	
1842		----		----	
2129	EN14078	8.094		-0.49	
	normality	OK			
	n	42			
	outliers	7			
	mean (n)	8.201			
	st.dev. (n)	0.2692			
	R(calc.)	0.754			
	R(EN14078:09)	0.609			



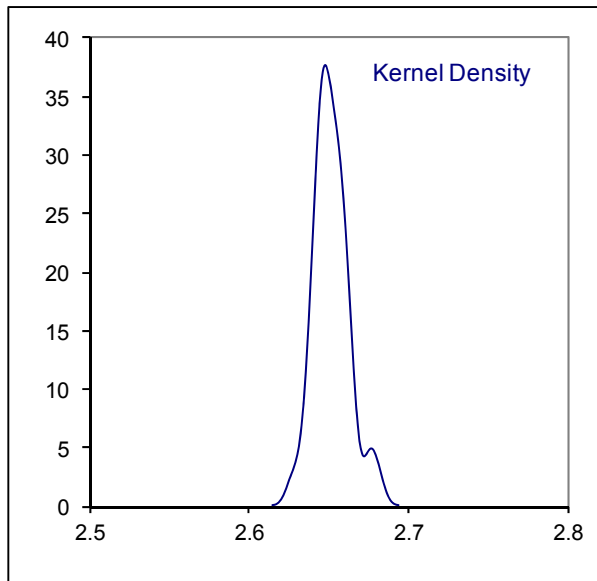
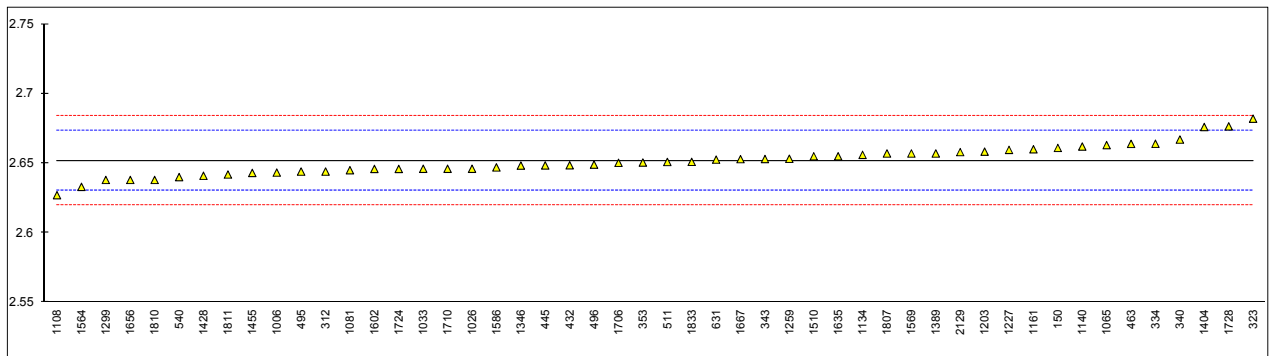
Determination of Flash Point PMcc on sample #13060; result in °C

lab	method	value	mark	z(targ)	remarks
150	ISO2719	57.2		0.03	
311		----		----	
312	D93	58.0		0.58	
323	ISO2719	55.0		-1.49	
334	ISO2719	56.0		-0.80	
338	ISO2719	59.0		1.27	
340	ISO2719	58.5		0.93	
343	ISO2719	56.0		-0.80	
353	IP34	56.825		-0.23	
432	ISO2719	58.0		0.58	
445	IP34	58.00		0.58	
463	ISO2719	58.0		0.58	
495	ISO2719	58.0		0.58	
496	ISO2719	56.1		-0.73	
511	D93	55.0		-1.49	
529	D93	57.125		-0.02	
540	ISO2719	57.5		0.24	
631	D93	56.0		-0.80	
1006	D93	56.5		-0.45	
1016		----		----	
1017		----		----	
1026	ISO2719	61.0		2.65	
1033	IP34	58.0		0.58	
1065	D93	57		-0.11	
1081	D93	56.0		-0.80	
1108	ISO2719	57.0		-0.11	
1126	ISO2719	56.5		-0.45	
1134	IP34	57.0		-0.11	
1140	IP34	57.0		-0.11	
1161	ISO2719	70.0	C,G(0.01)	8.86	first reported: 62.5
1194		----		----	
1199		----		----	
1203	ISO2719	58.5		0.93	
1205	D93	57.0		-0.11	
1218		----		----	
1227	D93	57.2		0.03	
1237	ISO2719	54.0		-2.18	
1259	ISO2719	58.5		0.93	
1299	D93	56.5		-0.45	
1346	ISO2719	58.0		0.58	
1389	D93	56.5		-0.45	
1397	ISO2719	57.5		0.24	
1404	ISO2719	58.0		0.58	
1428	ISO2719	55.5		-1.14	
1455	ISO2719	57.0		-0.11	
1510	IP34	58		0.58	
1564	D93	56.0		-0.80	
1569		----		----	
1586	ISO2719	57.0		-0.11	
1602	ISO2719	61.0		2.65	
1631		----		----	
1634	ISO2719	58.3		0.79	
1635	ISO2719	55		-1.49	
1656	ISO2719	58.9		1.20	
1667	ISO2719	57.0		-0.11	
1676		----		----	
1706	ISO2719	56.0		-0.80	
1710	ISO2719	56.5		-0.45	
1724	ISO2719	58.0		0.58	
1728	D93	55.11		-1.41	
1807	ISO2719	59.0		1.27	
1810	ISO2719	55.0		-1.49	
1811	ISO2719	56.5		-0.45	
1833	D93	59		1.27	
1842		----		----	
2129	ISO2719	57.0		-0.11	
	normality	OK			
	n	55			
	outliers	1			
	mean (n)	57.16			
	st.dev. (n)	1.391			
	R(calc.)	3.89			
	R(ISO2719:02)	4.06			R(ISO2719:02) = R(D93A:12)



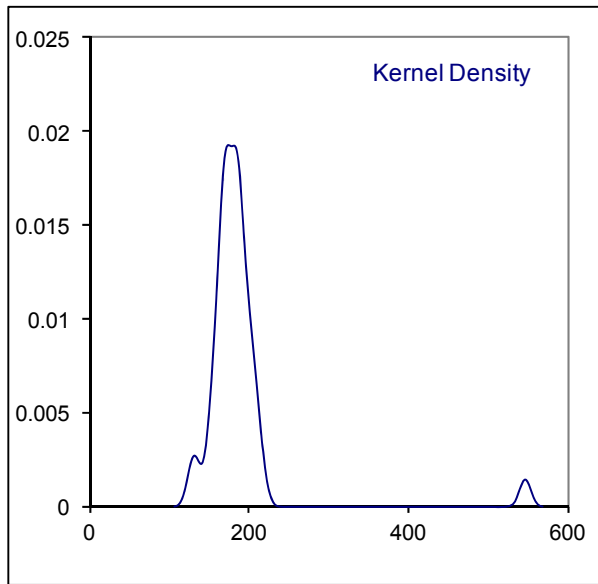
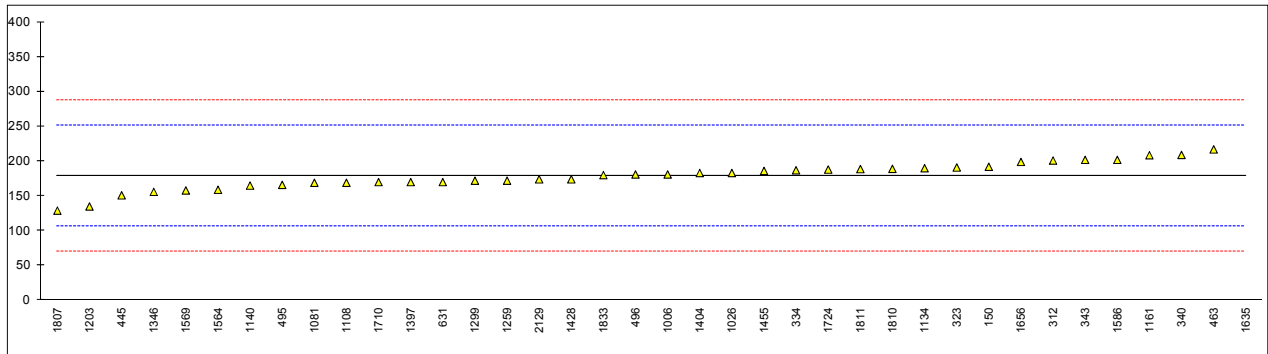
Determination of Kinematic Viscosity @ 40°C on sample #13060; result in mm²/s

lab	method	value	mark	z(targ)	remarks
150	D445	2.661		0.86	
311		----		----	
312	D445	2.644		-0.73	
323	ISO3104	2.682		2.82	
334	ISO3104	2.664		1.14	
338		----		----	
340	ISO3104	2.6670		1.42	
343	ISO3104	2.653		0.11	
353	IP71	2.65051		-0.12	
432	ISO3104	2.6485		-0.31	
445	IP71	2.6484		-0.32	
463	ISO3104	2.6639		1.13	
495	ISO3104	2.644		-0.73	
496	ISO3104	2.6490		-0.26	
511	D445	2.6509		-0.08	
529		----		----	
540	D445	2.640		-1.10	
631	D445	2.6526		0.07	
1006	D445	2.6433		-0.79	
1016		----		----	
1017		----		----	
1026	ISO3104	2.646		-0.54	
1033	IP71	2.646		-0.54	
1065	D445	2.663	C	1.05	first reported: 2.586
1081	D445	2.645		-0.64	
1108	ISO3104	2.627		-2.32	
1126		----		----	
1134	ISO3104	2.656		0.39	
1140	IP71	2.662		0.95	
1161	ISO3104	2.660		0.77	
1194		----		----	
1199		----		----	
1203	ISO3104	2.6583		0.61	
1205		----		----	
1218		----		----	
1227	D445	2.6596	C	0.73	first reported: 2.7039
1237		----		----	
1259	ISO3104	2.6532		0.13	
1299	D445	2.638		-1.29	
1346	ISO3104	2.6483		-0.33	
1389	D445	2.657		0.49	
1397		----		----	
1404	ISO3104	2.676		2.26	
1428	ISO3104	2.641		-1.01	
1455	ISO3104	2.643		-0.82	
1510	IP71	2.655		0.30	
1564	D445	2.633		-1.76	
1569	ISO3104	2.657		0.49	
1586	ISO3104	2.647		-0.45	
1602	ISO3104	2.6459		-0.55	
1631		----		----	
1634		----		----	
1635	ISO3104	2.655		0.30	
1656	ISO3104	2.638	C	-1.29	first reported: 2.588
1667	ISO3104	2.652947	C	0.11	first reported: 2.7110865
1676		----		----	
1706	ISO3104	2.6503		-0.14	
1710	ISO3104	2.646		-0.54	
1724	ISO3104	2.6459		-0.55	
1728	D445	2.6765	C	2.31	first reported: 2.7868
1807	ISO3104	2.657	C	0.49	first reported: 2.614
1810	ISO3104	2.638		-1.29	
1811	ISO3104	2.6419		-0.93	
1833	D445	2.651		-0.07	
1842		----		----	
2129	ISO3104	2.6580		0.58	
	normality	OK			
	n	50			
	outliers	0			
	mean (n)	2.65180			
	st.dev. (n)	0.010818			
	R(calc.)	0.03029			
	R(ISO3104:94)	0.02994			R(ISO3104:94)=R(D445:12)=IP71:97



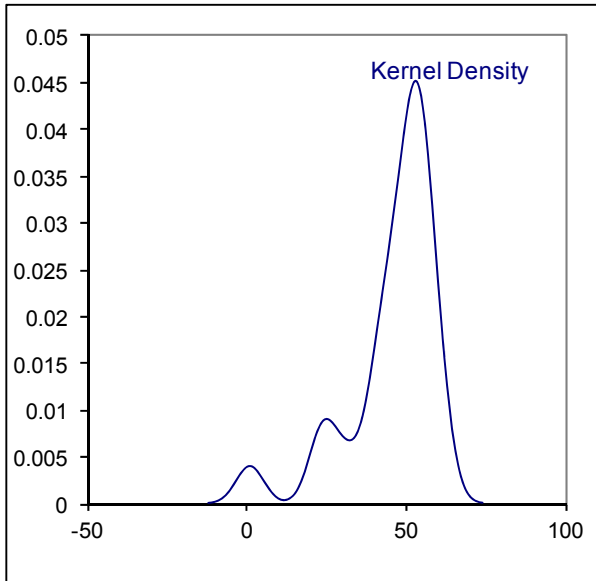
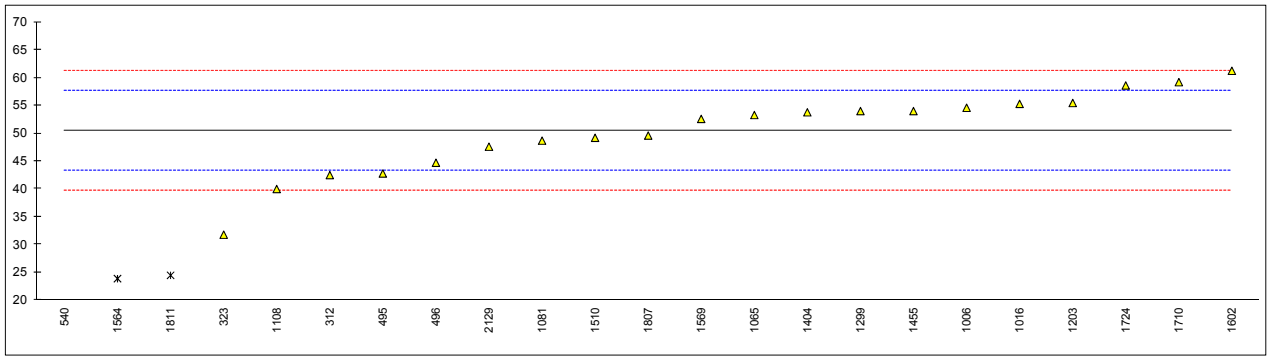
Determination of Lubricity by HFRR on sample #13060; result in μm

lab	method	value	mark	z(targ)	remarks
150	ISO12156	192		0.36	
311		----		----	
312	ISO12156	201		0.61	
323	ISO12156	191		0.33	
334	ISO12156	187		0.22	
338		----		----	
340	ISO12156	209		0.83	
343	ISO12156	202		0.64	
353		----		----	
432		----		----	
445	ISO12156	151		-0.76	
463	ISO12156	217.0		1.05	
495	ISO12156	166		-0.35	
496	ISO12156	181		0.06	
511		----		----	
529		----		----	
540		----		----	
631	D7688	170	C	-0.24	first reported: 343
1006	D6078	181		0.06	
1016		----		----	
1017		----		----	
1026	ISO12156	183		0.11	
1033		----		----	
1065		----		----	
1081	ISO12156	169		-0.27	
1108	ISO12156	169		-0.27	
1126		----		----	
1134	ISO12156	190		0.31	
1140	IP450	165		-0.38	
1161	ISO12156	208.61	C	0.82	first reported: 373.38
1194		----		----	
1199		----		----	
1203	ISO12156	135		-1.20	
1205		----		----	
1218		----		----	
1227		----		----	
1237		----		----	
1259	ISO12156	172		-0.19	
1299	ISO12156	172		-0.19	
1346	ISO12156	156		-0.63	
1389		----		----	
1397	ISO12156	170		-0.24	
1404	ISO12156	183		0.11	
1428	ISO12156	174		-0.13	
1455	ISO12156	186		0.20	
1510		----		----	
1564	ISO12156	159		-0.54	
1569	ISO12156	158		-0.57	
1586	ISO12156	202		0.64	
1602		----		----	
1631		----		----	
1634		----		----	
1635	ISO12156	547	G(0.01)	10.11	
1656	ISO12156	199		0.55	
1667		----		----	
1676		----		----	
1706		----		----	
1710	ISO12156	170		-0.24	
1724	ISO12156	188		0.25	
1728		----		----	
1807	ISO12156	129		-1.37	
1810	ISO12156	189		0.28	
1811	ISO12156	188.7		0.27	
1833	D6079	180		0.03	
1842		----		----	
2129	ISO12156	174		-0.13	
	normality	OK			
	n	37			
	outliers	1			
	mean (n)	178.85			
	st.dev. (n)	19.416			
	R(calc.)	54.36			
	R(ISO12156-1:06)	102.00			Compare R(D6079:11) = 80



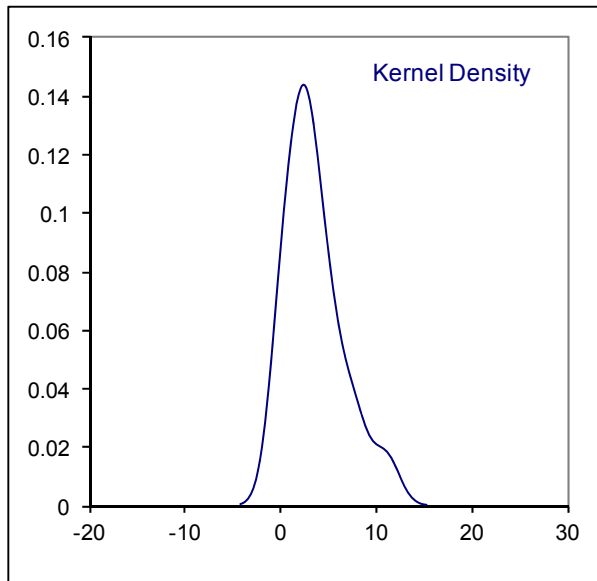
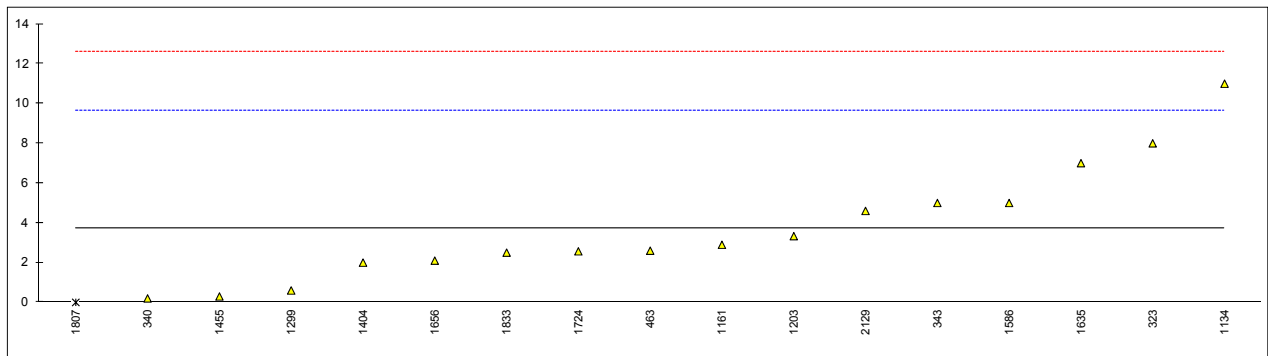
Determination of Oxidation Stability EN15751 on sample #13060; result in hours

lab	method	value	mark	z(targ)	remarks
150		----		----	
311		----		----	
312	EN15751	42.5		-2.23	
323	EN15751	31.8		-5.23	
334		----		----	
338		----		----	
340		----		----	
343	EN15751	>20		----	
353		----		----	
432		----		----	
445	EN15751	>16		----	
463		----		----	
495	EN15751	42.8		-2.15	
496	EN15751	44.72		-1.61	
511		----		----	
529		----		----	
540	D7545	1.25	ex	-13.81	result excluded, see §4.1
631		----		----	
1006	EN15751	54.6		1.16	
1016	EN15751	55.30		1.36	
1017		----		----	
1026		----		----	
1033		----		----	
1065	EN15751	53.3		0.80	
1081	EN15751	48.7		-0.49	
1108	EN15751	40		-2.93	
1126		----		----	
1134		----		----	
1140		----		----	
1161		----		----	
1194		----		----	
1199		----		----	
1203	EN15751	55.46	C	1.41	first reported: 3.33
1205		----		----	
1218		----		----	
1227		----		----	
1237		----		----	
1259	EN15751	>20		----	
1299	EN15751	54.0		1.00	
1346		----		----	
1389		----		----	
1397	EN15751	>20		----	
1404	EN15751	53.79		0.94	
1428		----		----	
1455	EN15751	54.0		1.00	
1510	EN15751	49.2		-0.35	
1564	EN15751	23.9	C,DG(0.05)	-7.45	first reported: 29.5
1569	EN15751	52.6		0.60	
1586		----		----	
1602	EN15751	61.24		3.03	
1631		----		----	
1634		----		----	
1635		----		----	
1656	EN15751	>20		----	
1667		----		----	
1676		----		----	
1706		----		----	
1710	EN15751	59.2		2.46	
1724	EN15751	58.60		2.29	
1728		----		----	
1807	EN15751	49.6		-0.24	
1810		----		----	
1811	EN15751	24.5	C,DG(0.05)	-7.28	first reported: 29.25
1833		----		----	
1842		----		----	
2129	EN15751	47.61		-0.80	
	normality	OK			
	n	20			
	outliers	2			
	mean (n)	50.451			
	st.dev. (n)	7.2524			
	R(calc.)	20.307			
	R(EN15751:09)	9.978			



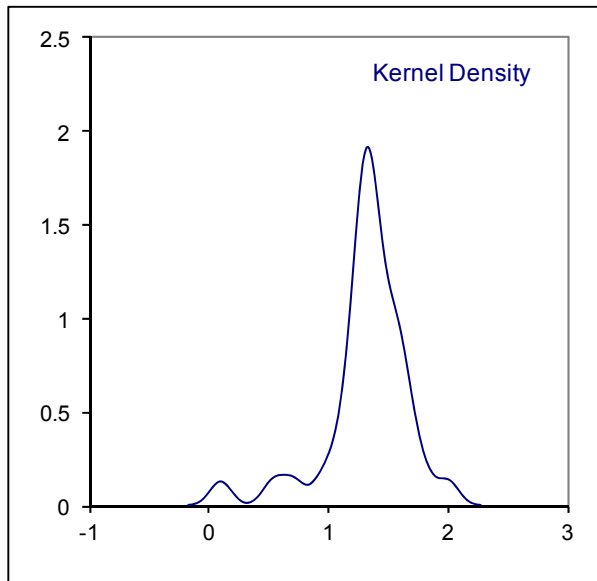
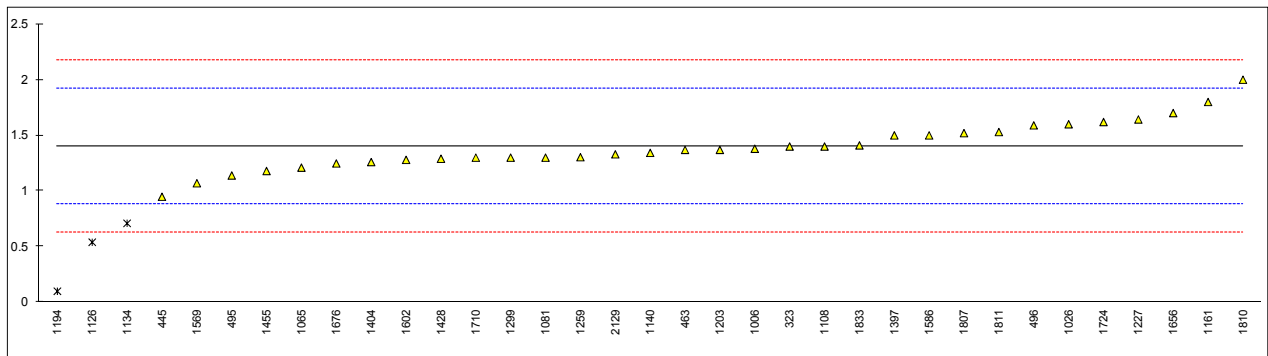
Determination of Oxidation Stability ISO12205 on sample #13060; result in g/m³

lab	method	value	mark	z(targ)	remarks
150		----		----	
311		----		----	
312		----		----	
323	ISO12205	8		1.44	
334		----		----	
338		----		----	
340	ISO12205	0.2		-1.19	
343	ISO12205	5		0.43	
353		----		----	
432		----		----	
445		----		----	
463	ISO12205	2.6		-0.38	
495		----		----	
496		----		----	
511		----		----	
529		----		----	
540		----		----	
631		----		----	
1006		----		----	
1016		----		----	
1017		----		----	
1026	ISO12205	<1		----	
1033		----		----	
1065		----		----	
1081		----		----	
1108		----		----	
1126		----		----	
1134	ISO12205	11		2.46	
1140		----		----	
1161	ISO12205	2.9		-0.28	
1194		----		----	
1199		----		----	
1203	ISO12205	3.33	C	-0.14	first reported: 55.46
1205		----		----	
1218		----		----	
1227		----		----	
1237		----		----	
1259		----		----	
1299	D2274	0.6		-1.06	
1346		----		----	
1389		----		----	
1397		----		----	
1404	ISO12205	2		-0.59	
1428		----		----	
1455	ISO12205	0.3		-1.16	
1510		----		----	
1564		----		----	
1569		----		----	
1586	ISO12205	5		0.43	
1602		----		----	
1631		----		----	
1634		----		----	
1635	ISO12205	7		1.10	
1656	ISO12205	2.1		-0.55	
1667		----		----	
1676		----		----	
1706		----		----	
1710		----		----	
1724	ISO12205	2.57		-0.39	
1728		----		----	
1807	ISO12205	0	ex	-1.26	result excluded, zero is not a real value
1810		----		----	
1811		----		----	
1833	ISO12205	2.5		-0.42	
1842		----		----	
2129	ISO12205	4.6		0.29	
	normality	OK			
	n	16			
	outliers	0			
	mean (n)	3.731			
	st.dev. (n)	2.9487			
	R(calc.)	8.256			
	R(ISO12205:95)	8.285			



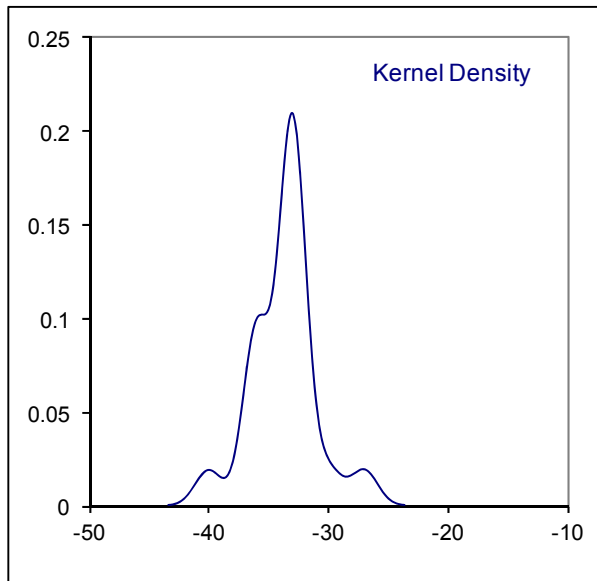
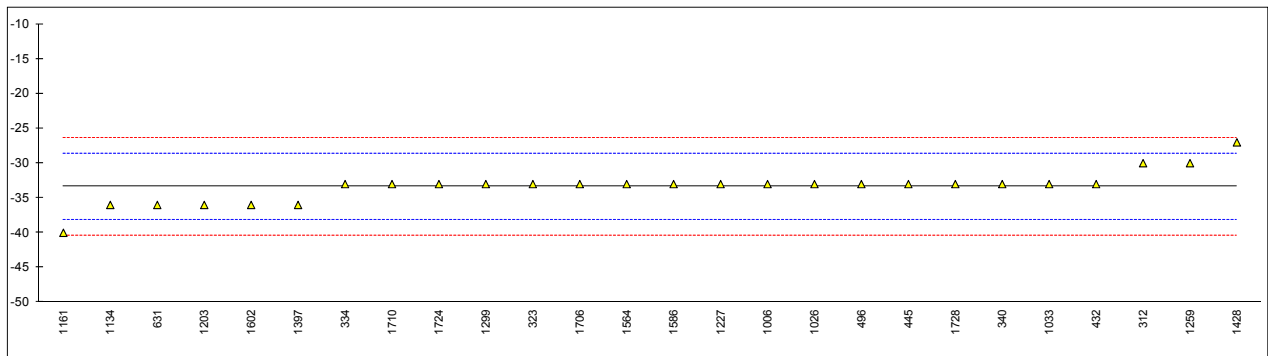
Determination of Poly Aromatic Hydrocarbons on sample #13060; result in %M/M

lab	method	value	mark	z(targ)	remarks
150		----		----	
311		----		----	
312		----		----	
323	EN12916	1.4		0.00	
334		----		----	
338		----		----	
340		----		----	
343	EN12916	<7		----	
353		----		----	
432		----		----	
445	IP391	0.949		-1.75	
463	EN12916	1.37		-0.12	
495	EN12916	1.14		-1.01	
496	EN12916	1.59		0.73	
511		----		----	
529		----		----	
540		----		----	
631		----		----	
1006	D6591	1.38		-0.08	
1016		----		----	
1017		----		----	
1026	EN12916	1.6		0.77	
1033		----		----	
1065	IP391	1.21		-0.74	
1081	EN12916	1.3		-0.39	
1108	EN12916	1.4		0.00	
1126	EN12916	0.54	DG(0.05)	-3.33	
1134	IP391	0.71	DG(0.05)	-2.67	
1140	IP391	1.343		-0.22	
1161	EN12916	1.8	C	1.54	first reported: 2.4
1194	INH-12916	0.1	G(0.01)	-5.03	
1199		----		----	
1203	EN12916	1.37		-0.12	
1205		----		----	
1218		----		----	
1227	EN12916	1.643		0.94	
1237		----		----	
1259	EN12916	1.304		-0.38	
1299	EN12916	1.30		-0.39	
1346		----		----	
1389		----		----	
1397	EN12916	1.5		0.38	
1404	EN12916	1.26		-0.55	
1428	EN12916	1.29		-0.43	
1455	EN12916	1.18		-0.86	
1510		----		----	
1564		----		----	
1569	EN12916	1.07		-1.28	
1586	EN12916	1.5		0.38	
1602	EN12916	1.28		-0.47	
1631		----		----	
1634		----		----	
1635		----		----	
1656	EN12916	1.7		1.16	
1667		----		----	
1676	EN12916	1.248		-0.59	
1706		----		----	
1710	EN12916	1.3		-0.39	
1724	EN12916	1.62		0.85	
1728		----		----	
1807	EN12916	1.52		0.46	
1810	EN12916	2.0		2.32	
1811	EN12916	1.53		0.50	
1833	IP391	1.41		0.03	
1842		----		----	
2129	EN12916	1.33		-0.28	
	normality	OK			
	n	32			
	outliers	3			
	mean (n)	1.401			
	st.dev. (n)	0.2146			
	R(calc.)	0.601			
	R(EN12916:06)	0.724			



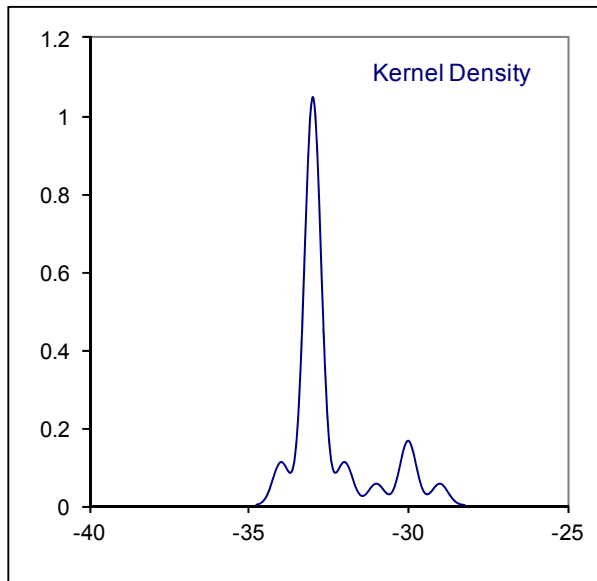
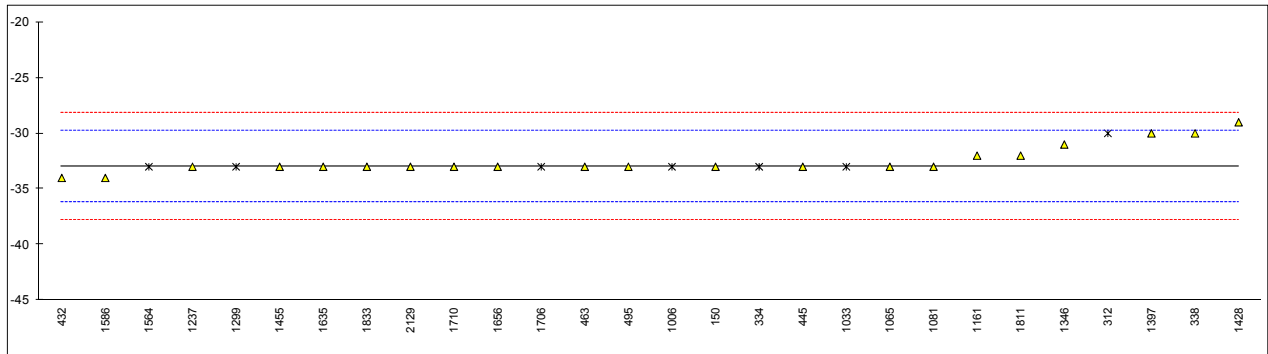
Determination of Pour Point (manual) on sample #13060; results in °C

lab	method	value	mark	z(targ)	remarks
150		----		----	
311		----		----	
312	ISO3016	-30		1.44	result was reported under pour point automated
323	ISO3016	-33		0.16	
334	D97	-33		0.16	result was reported under pour point automated
338		----		----	
340	ISO3016	-33		0.16	
343	ISO3016	<-30		----	
353		----		----	
432	ISO3016	-33		0.16	
445	IP15	-33		0.16	
463		----		----	
495		----		----	
496	ISO3016	-33.0		0.16	
511		----		----	
529	D97	>-24		>4.04	false positive?
540	D97	<-21		----	
631	D97	-36		-1.11	
1006	D97	-33		0.16	result was reported under pour point automated
1016		----		----	
1017		----		----	
1026	D97	-33		0.16	
1033	IP15	-33		0.16	result was reported under pour point automated
1065		----		----	
1081		----		----	
1108		----		----	
1126		----		----	
1134	ISO3016	-36		-1.11	
1140		----		----	
1161	ISO3016	-40		-2.81	
1194		----		----	
1199		----		----	
1203	ISO3016	-36		-1.11	
1205		----		----	
1218		----		----	
1227	D97	-33		0.16	
1237		----		----	
1259	ISO3016	-30		1.44	
1299	D97	-33		0.16	result was reported under pour point automated
1346		----		----	
1389	D97	<-21		----	
1397	ISO3016	-36		-1.11	
1404		----		----	
1428	ISO3016	-27		2.71	
1455		----		----	
1510		----		----	
1564	D97	-33		0.16	result was reported under pour point automated
1569		----		----	
1586	ISO3016	-33		0.16	
1602	ISO3016	-36		-1.11	
1631		----		----	
1634		----		----	
1635		----		----	
1656		----		----	
1667		----		----	
1676		----		----	
1706	ISO3016	-33.0		0.16	result reported under pour point automated
1710	ISO3016	-33		0.16	
1724	ISO3016	-33		0.16	
1728	D97	-33		0.16	
1807	ISO3016	<-24		----	
1810		----		----	
1811		----		----	
1833		----		----	
1842		----		----	
2129		----		----	
	normality	not OK			
	n	26			
	outliers	0			
	mean (n)	-33.38			
	st.dev. (n)	2.401			
	R(calc.)	6.72			
	R(ISO3016:94)	6.59			Compare R(D97:11) = R(IP15:95) = 9



Determination of Pour Point (automated) on sample #13060; results in °C

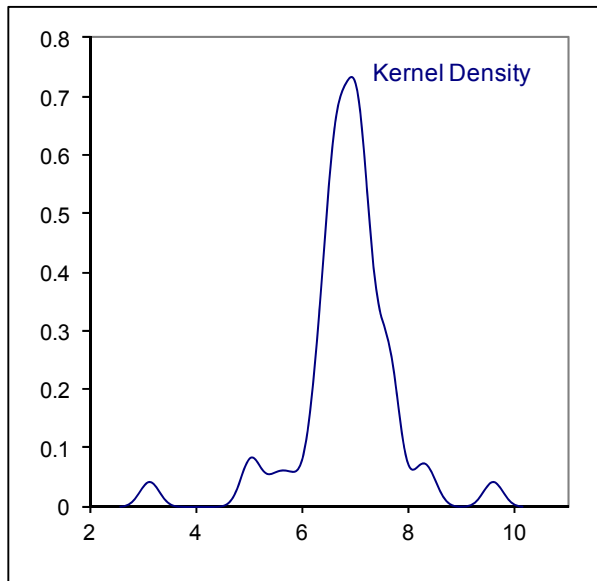
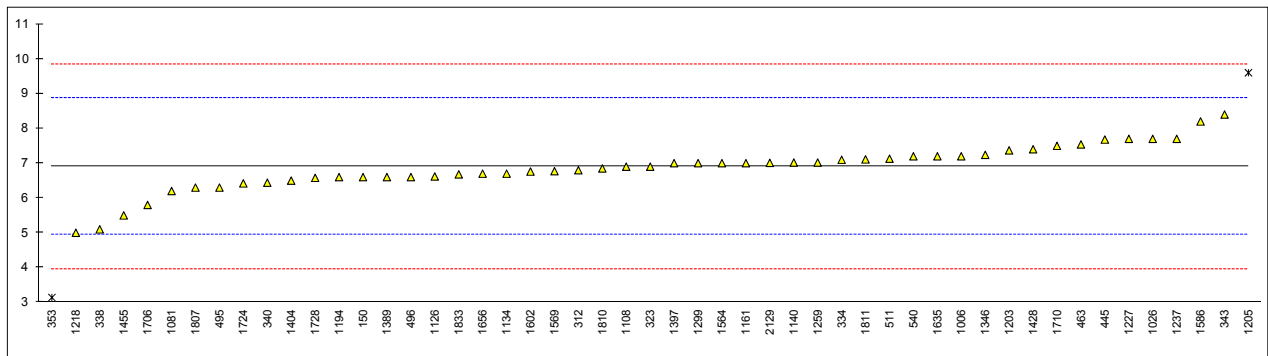
lab	method	value	mark	z(targ)	remarks
150	D5950	-33.0		-0.36	
311		----		----	
312	ISO3016	-30	ex	1.51	result excluded, see §4.1
323		----		----	
334	D97	-33	ex	-0.36	result excluded, see §4.1
338	D5950	-30		1.51	
340		----		----	
343		----		----	
353		----		----	
432	D5950	-34		-0.98	
445	D5950	-33		-0.36	
463	D6892	-33		-0.36	
495	D5950	-33		-0.36	
496		----		----	
511		----		----	
529		----		----	
540		----		----	
631		----		----	
1006	D97	-33	ex	-0.36	result excluded, see §4.1
1016		----		----	
1017		----		----	
1026		----		----	
1033	IP15	-33	ex	-0.36	result excluded, see §4.1
1065	D5950	-33		-0.36	
1081	D5950	-33		-0.36	
1108		----		----	
1126		----		----	
1134		----		----	
1140		----		----	
1161	D5950	-32		0.27	
1194		----		----	
1199		----		----	
1203		----		----	
1205		----		----	
1218		----		----	
1227		----		----	
1237	D5950	-33		-0.36	
1259		----		----	
1299	D97	-33	ex	-0.36	result excluded, see §4.1
1346	D5950	-31		0.89	
1389		----		----	
1397	D5950	-30		1.51	
1404	D5950	<-30		----	
1428	D6749	-29		2.13	
1455	D5950	-33		-0.36	
1510		----		----	
1564	D97	-33	ex	-0.36	result excluded, see §4.1
1569		----		----	
1586	D5950	-34		-0.98	
1602		----		----	
1631		----		----	
1634		----		----	
1635	D5950	-33		-0.36	
1656	D5950	-33		-0.36	
1667		----		----	
1676		----		----	
1706	ISO3016	-33.0	ex	-0.36	result excluded, see §4.1
1710	D5950	-33		-0.36	
1724		----		----	
1728		----		----	
1807		----		----	
1810		----		----	
1811	D5950	-32		0.27	
1833	D5950	-33		-0.36	
1842		----		----	
2129	D5950	-33		-0.36	
	normality	not OK			
	n	21			
	outliers	0			
	mean (n)	-32.43			
	st.dev. (n)	1.326			
	R(calc.)	3.71			
	R(D5950:12)	4.50			R(D5950:12) = 4.50 at 1 °C intervals, R(D5950:12) = 6.10 at 3 °C intervals



Determination of Sulphur Content on sample #13060; result in mg/kg

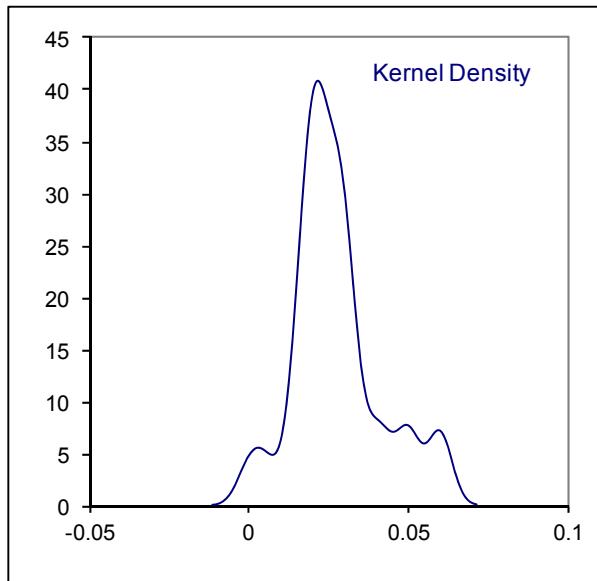
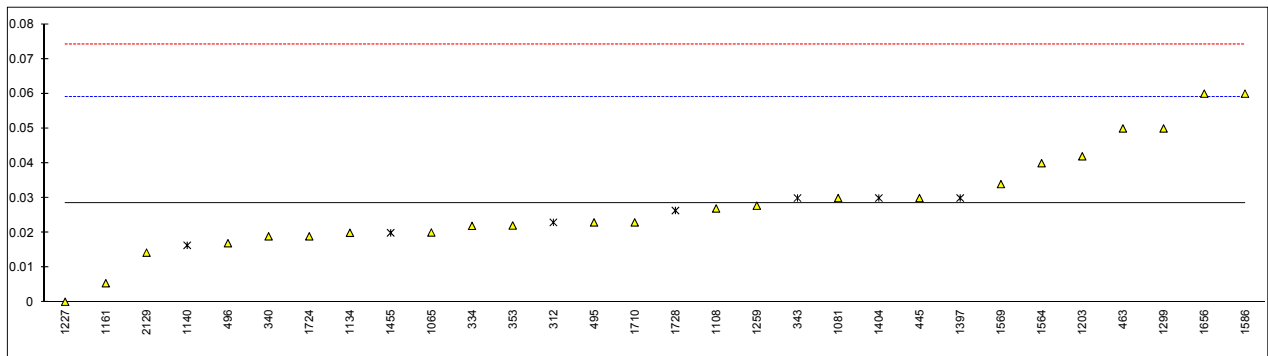
lab	method	value	mark	z(targ)	remarks
150	ISO20846	6.6		-0.28	
311		----		----	
312	D5453	6.8		-0.07	
323	ISO20846	6.9		0.03	
334	ISO20846	7.1		0.23	
338	ISO20846	5.1		-1.81	
340	ISO20846	6.44		-0.44	
343	ISO20846	8.4		1.56	
353	IP531	3.14	G(0.01)	-3.81	
432		----		----	
445	D5453	7.68		0.83	
463	D5453	7.54		0.68	
495	ISO20846	6.3		-0.58	
496	ISO20846	6.60		-0.28	
511	D5453	7.13		0.27	
529		----		----	
540	ISO20846	7.2		0.34	
631		----		----	
1006	D5453	7.2		0.34	
1016		----		----	
1017		----		----	
1026	ISO20846	7.7		0.85	
1033		----		----	
1065		----		----	
1081	ISO20846	6.2		-0.68	
1108	ISO20846	6.9		0.03	
1126	ISO20846	6.62		-0.26	
1134	ISO20846	6.7		-0.17	
1140	D5453	7.02		0.15	
1161	ISO20846	7.0		0.13	
1194	INH-7220	6.6		-0.28	
1199		----		----	
1203	ISO20846	7.37		0.51	
1205	ISO20884	9.6	G(0.01)	2.79	
1218	ISO20884	5.0		-1.91	
1227	D5453	7.7		0.85	
1237	ISO20846	7.7		0.85	
1259	ISO20846	7.02		0.15	
1299	ISO20846	7.0		0.13	
1346	ISO20846	7.24		0.38	
1389	ISO20846	6.6		-0.28	
1397	ISO20846	7.0		0.13	
1404	ISO20846	6.5		-0.38	
1428	ISO20846	7.4		0.54	
1455	ISO20884	5.5		-1.40	
1510		----		----	
1564	ISO20846	7		0.13	
1569	ISO20846	6.77		-0.10	
1586	ISO20846	8.2		1.36	
1602	ISO20846	6.76		-0.11	
1631		----		----	
1634		----		----	
1635	ISO20846	7.2		0.34	
1656	ISO20846	6.7		-0.17	
1667		----		----	
1676		----		----	
1706	ISO20884	5.8		-1.09	
1710	ISO20846	7.5		0.64	
1724	ISO20846	6.42		-0.46	
1728	D5453	6.58		-0.30	
1807	ISO20846	6.3		-0.58	
1810	ISO20846	6.85		-0.02	
1811	ISO20846	7.11		0.24	
1833	D5453	6.68		-0.19	
1842		----		----	
2129	ISO20846	7.01		0.14	
	normality	OK			
	n	49			
	outliers	2			
	mean (n)	6.870			
	st.dev. (n)	0.6586			
	R(calc.)	1.844			
	R(ISO20846:11)	2.742			

Compare R(5453:09) = 2.46, Application range 1-8000 mg/kg



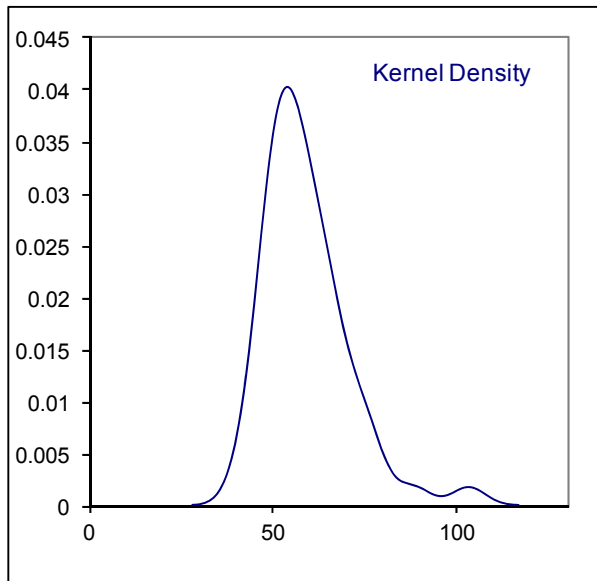
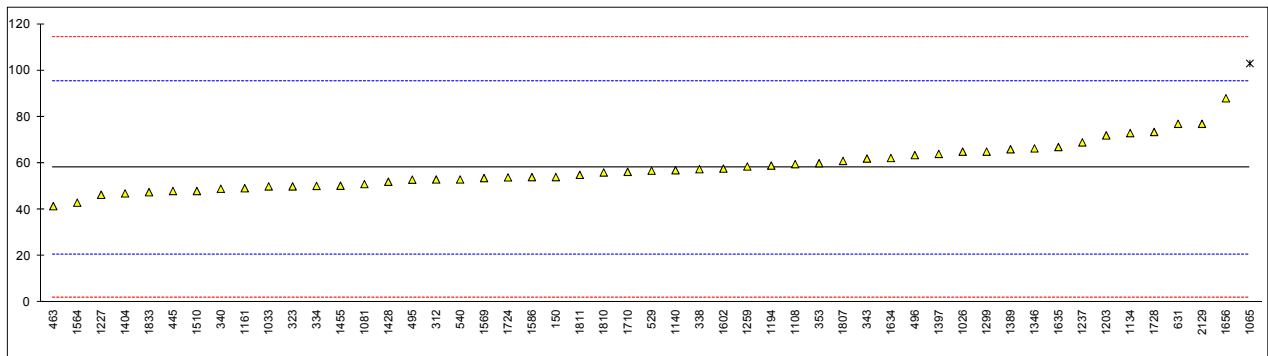
Determination of Total acid Number (TAN) on sample #13060; result in mgKOH/g

lab	method	value	mark	z(targ)	remarks
150		----		----	
311		----		----	
312	D974	0.023	ex	-0.36	result excluded, see §4.1
323	D664	<0.01		----	
334	D664	0.022		-0.43	
338		----		----	
340	D664	0.019		-0.62	
343	D974	0.03	ex	0.10	result excluded, see §4.1
353	IP177	0.0221		-0.42	
432		----		----	
445	D664	0.030		0.10	
463	D664	0.050		1.41	
495	D664	0.023		-0.36	
496	D664	0.017		-0.76	
511		----		----	
529		----		----	
540	D664	<0.1		----	
631		----		----	
1006		----		----	
1016		----		----	
1017		----		----	
1026	D974	<0.03	ex	----	result excluded, see §4.1
1033		----		----	
1065	D664	0.0201		-0.55	
1081	D664	0.03		0.10	
1108	D664	0.027		-0.10	
1126		----		----	
1134	D664	0.02		-0.56	
1140	IP139	0.0164	ex	-0.80	result excluded, see §4.1
1161	D664	0.0055		-1.51	
1194		----		----	
1199		----		----	
1203	D664	0.042		0.88	
1205		----		----	
1218		----		----	
1227	D664	0.0002		-1.86	
1237		----		----	
1259	D664	0.0278		-0.05	
1299	D664	0.050		1.41	
1346		----		----	
1389		----		----	
1397	D974	0.03	ex	0.10	result excluded, see §4.1
1404	D974	0.030	ex	0.10	result excluded, see §4.1
1428		----		----	
1455	D974	0.020	ex	-0.56	result excluded, see §4.1
1510		----		----	
1564	D664	0.04		0.75	
1569	D664	0.034		0.36	
1586	D664	0.06		2.07	
1602		----		----	
1631		----		----	
1634		----		----	
1635		----		----	
1656	D664	0.06	C	2.07	first reported: 0.11
1667		----		----	
1676		----		----	
1706		----		----	
1710	D664	0.023		-0.36	
1724	D664	0.019		-0.62	
1728	D974	0.0264	ex	-0.14	result excluded, see §4.1
1807		----		----	
1810		----		----	
1811		----		----	
1833	D664	<0.1		----	
1842		----		----	
2129	D664	0.0143		-0.93	
	normality	OK			
	n	23			
	outliers	0			
	mean (n)	0.0285			
	st.dev. (n)	0.01566			
	R(calc.)	0.0438			
	R(D664:11)	0.0427			



Determination of Water on sample #13060; result in mg/kg

lab	method	value	mark	z(targ)	remarks
150	E1064	54		-0.22	
311		----		----	
312	ISO12937	53		-0.27	
323	ISO12937	50		-0.43	
334	ISO12937	50.2		-0.42	
338	ISO12937	57.44		-0.03	
340	ISO12937	49		-0.48	
343	ISO12937	62		0.21	
353	IP439	60		0.10	
432		----		----	
445	IP438	48.0		-0.54	
463	ISO12937	41.5		-0.88	
495	ISO12937	52.9		-0.28	
496	ISO12937	63.5		0.29	
511		----		----	
529	E1064	56.80		-0.07	
540	D6304	53		-0.27	
631	D6304	77		1.01	
1006		----		----	
1016		----		----	
1017		----		----	
1026	D6304	65		0.37	
1033	IP438	50	U	-0.43	probably unit error, reported 0.005 mg/kg
1065	D6304	103	G(0.01)	2.40	
1081	D6304	51		-0.38	
1108	ISO12937	59.6		0.08	
1126		----		----	
1134	ISO12937	73		0.80	
1140	IP438	57.0		-0.06	
1161	ISO12937	49.223		-0.47	
1194	ISO12937	58.99		0.05	
1199		----		----	
1203	ISO12937	72		0.75	
1205		----		----	
1218		----		----	
1227	D6304	46.4		-0.62	
1237	ISO12937	69		0.59	
1259	ISO12937	58.6		0.03	
1299	ISO12937	65		0.37	
1346	ISO12937	66.4		0.45	
1389	ISO12937	66		0.42	
1397	ISO12937	64		0.32	
1404	ISO12937	47		-0.59	
1428	ISO12937	52		-0.32	
1455	ISO12937	50.3		-0.41	
1510	IP438	48		-0.54	
1564	ISO12937	43		-0.80	
1569	ISO12937	53.6		-0.24	
1586	ISO12937	54		-0.22	
1602	ISO12937	57.7		-0.02	
1631		----		----	
1634	ISO12937	62.25		0.22	
1635	ISO12937	67		0.48	
1656	ISO12937	88		1.60	
1667		----		----	
1676		----		----	
1706		----		----	
1710	ISO12937	56.3		-0.09	
1724	ISO12937	53.9		-0.22	
1728	E203	73.49		0.82	
1807	ISO12937	61		0.16	
1810	ISO12937	56		-0.11	
1811	ISO12937	55		-0.16	
1833	D6304	47.5		-0.56	
1842		----		----	
2129	IP439	77		1.01	
	normality	OK			
	n	50			
	outliers	1			
	mean (n)	58.052			
	st.dev. (n)	9.6381			
	R(calc.)	26.987			
	R(ISO12937:00)	52.397			

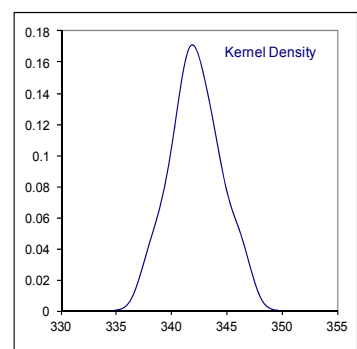
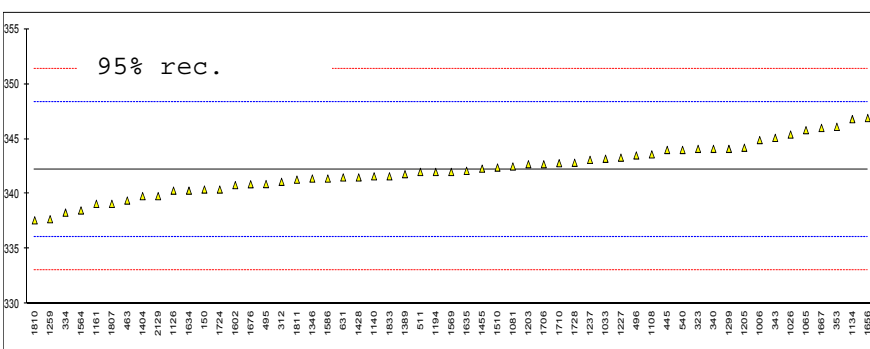
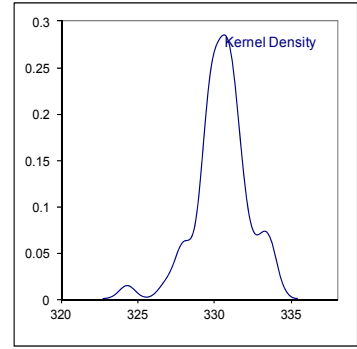
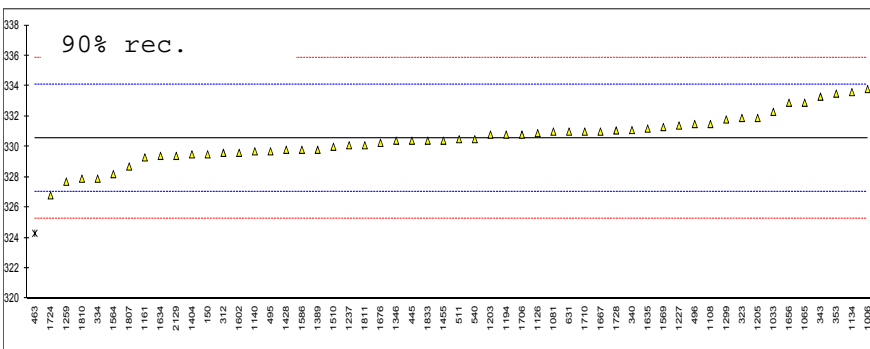
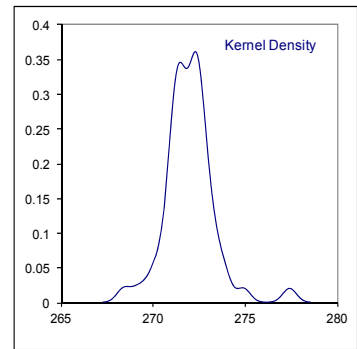
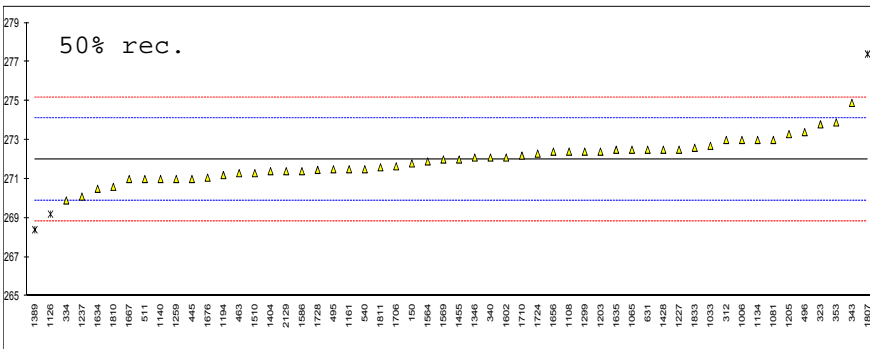
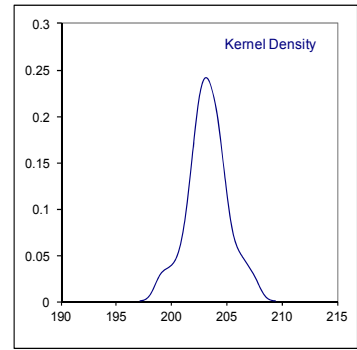
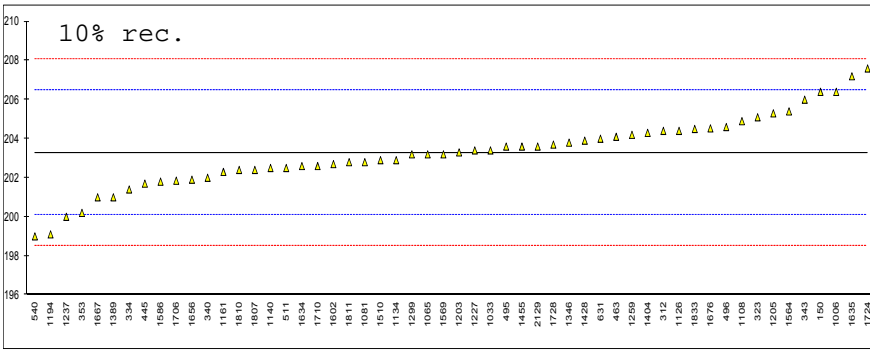
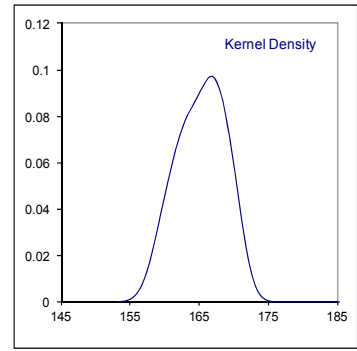
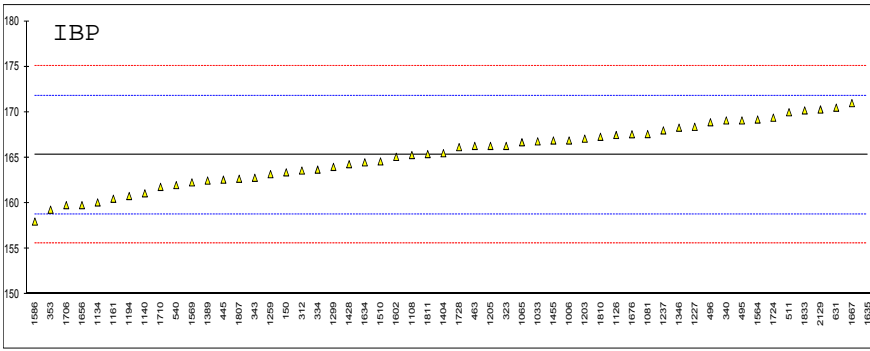


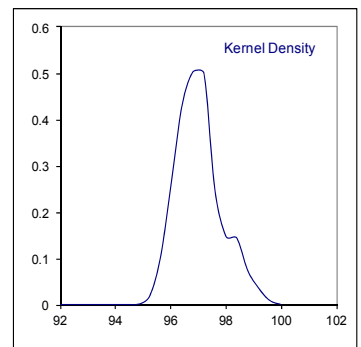
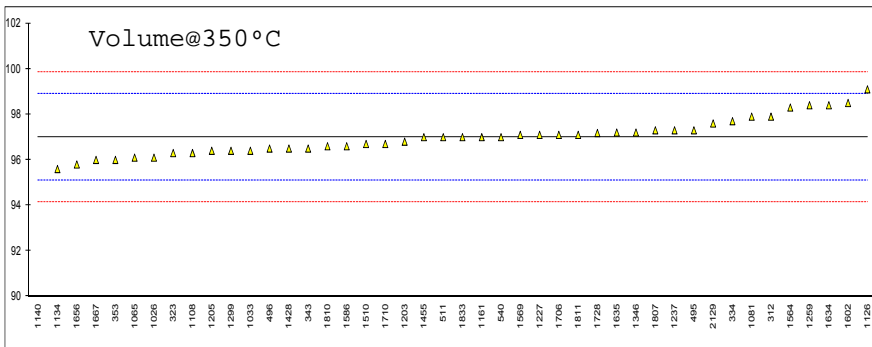
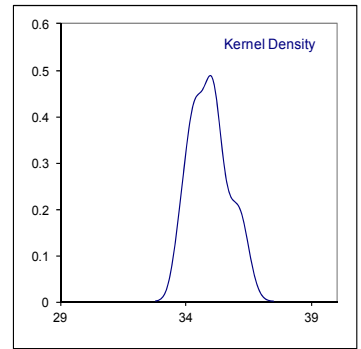
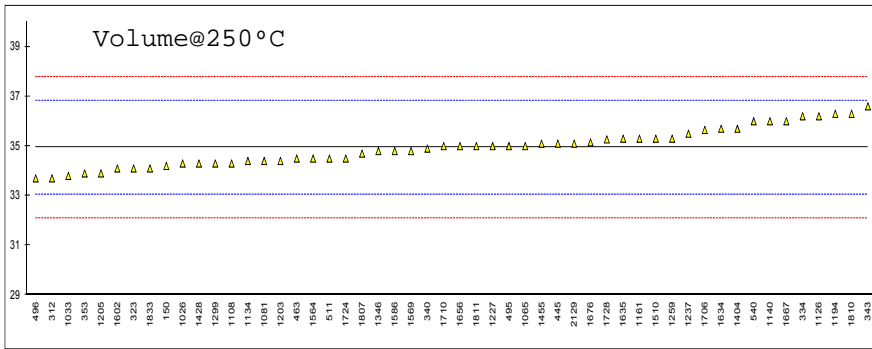
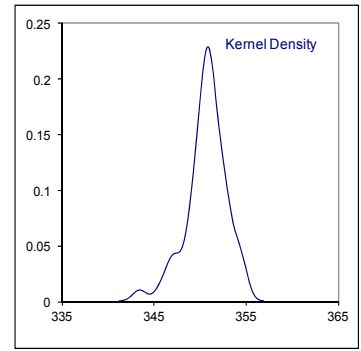
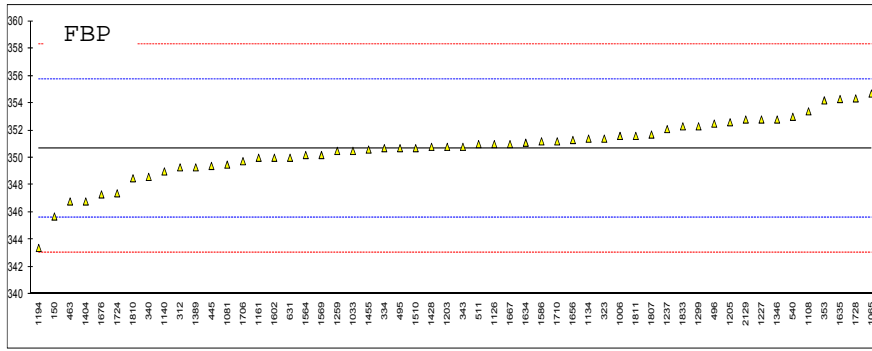
Determination of Distillation Automated on sample #13060; result in °C

Lab method	IBP	mark	10%rec	mark	50%rec	mark	90%rec	mark	95%rec	mark	FBP	mark
150 ISO3405-A	163.4		206.4		271.8		329.5		340.4		345.7	
311	----		----		----		----		----		----	
312 ISO3405-A	163.6		204.4		273.0		329.6		341.1		349.3	
323 ISO3405-A	166.3		205.1		273.8		331.9		344.1	C	351.4	
334 ISO3405	163.7		201.4		269.9		327.9		338.3		350.7	
338	----		----		----		----		----		----	
340 ISO3405-A	169.1		202.0		272.1		331.1		344.1		348.6	
343 ISO3405-A	162.8		206		274.9	C	333.3		345.1		350.8	
353 ISO3405-A	159.3		200.2		273.9		333.5		346.1		354.2	
432	----		----		----		----		----		----	
445 IP123-A	162.6		201.7		271.0		330.4		344.0		349.4	
463 D86-A	166.3		204.1		271.3		324.3	G(0.01)	339.4		346.8	
495 ISO3405-A	169.1		203.6		271.5		329.7		340.9		350.7	
496 ISO3405-A	168.9		204.6		273.4		331.5		343.5		352.5	
511 D86-M	170.0		202.5		271.0		330.5		342.0		351.0	
529	----		----		----		----		----		----	
540 ISO3405-M	162.0		199.0		271.5		330.5		344.0		353.0	
631 D86-M	170.5		204.0		272.5		331.0		341.5		350.0	
1006 D86-A	166.9		206.4		273.0		333.8		344.9		351.6	
1016	----		----		----		----		----		----	
1017	----		----		----		----		----		----	
1026	----		----		----		----		345.4		----	
1033 IP123-A	166.8		203.4		272.7		332.3		343.2		350.5	
1065 D86-A	166.7		203.2		272.5		332.9		345.8		354.7	
1081 D86-A	167.6		202.8		273.0		331.0		342.5		349.5	
1108 ISO3405-A	165.3		204.9		272.4		331.5		343.6		353.4	
1126 in house	167.5		204.4		269.2	DG(0.05)	330.9		340.3		351.0	
1134 ISO3405-A	160.1		202.9		273.0		333.6		346.8		351.4	
1140 IP123-A	161.1		202.5		271.0		329.7		341.6		349.0	
1161 ISO3405-A	160.5		202.3		271.5		329.3		339.1		350.0	
1194 INH-86-A	160.8		199.1		271.2		330.8		342.0		343.4	
1199	----		----		----		----		----		----	
1203 ISO3405-A	167.1		203.3		272.4		330.8		342.7		350.8	
1205 D86-A	166.3		205.3		273.3		331.9		344.2		352.6	
1218	----		----		----		----		----		----	
1227 D86-A	168.4		203.4		272.5		331.4		343.3		352.8	
1237 ISO3405-M	168.0		200.0		270.1		330.1		343.1		352.1	
1259 ISO3405-A	163.2		204.2		271.0		327.7		337.7		350.5	
1299 ISO3405-A	164.0		203.2		272.4		331.8		344.1		352.3	
1346 ISO3405-A	168.3		203.8		272.1		330.4		341.4		352.8	
1389 D86-M	162.5		201.0		268.4	DG(0.05)	329.8		341.8		349.3	
1397	----		----		----		----		----		----	
1404 ISO3405-A	165.5		204.3		271.4		329.5		339.8		346.8	
1428 ISO3405	164.3		203.9		272.5		329.8		341.5		350.8	
1455 ISO3405-A	166.9		203.6		272.0		330.4		342.3		350.6	
1510 IP123-A	164.6		202.9		271.3		330.0		342.4		350.7	
1564 D86-A	169.2		205.4		271.9		328.2		338.5		350.2	
1569 ISO3405-A	162.3		203.2		272.0		331.3		342.0		350.2	
1586 ISO3405-A	158.0		201.8		271.4		329.8		341.4		351.2	
1602 ISO3405-A	165.1		202.7		272.1		329.6		340.8		350.0	
1631	----		----		----		----		----		----	
1634 ISO3405-A	164.5		202.6		270.5		329.4		340.3		351.1	
1635 ISO3405-A	193.8	G(0.01)	207.2		272.5		331.2		342.1		354.3	
1656 ISO3405-A	159.8		201.9		272.4		332.9		346.9		351.3	
1667 ISO3405-M	171.0		201.0		271.0		331.0		346.0		351.0	
1676 ISO3405-A	167.58		204.53		271.07		330.26		340.88		347.32	
1706 ISO3405-A	159.8		201.85		271.65		330.8		342.7		349.75	
1710 ISO3405-A	161.8		202.6		272.2		331.0		342.8		351.2	
1724 ISO3405-A	169.4		207.6		272.3		326.8		340.4		347.4	
1728 ISO3405-M	166.167		203.700		271.465		331.075		342.835		354.347	
1807 ISO3405-A	162.7		202.4		277.4	G(0.01)	328.7		339.1		351.7	
1810 ISO3405-A	167.3		202.4		270.6		327.9		337.6		348.5	
1811 ISO3405-A	165.4		202.8		271.6		330.1		341.3		351.6	
1833 D86	170.2		204.5		272.6		330.4		341.6		352.3	
1842	----		----		----		----		----		----	
2129 ISO3405	170.3		203.6		271.4		329.4		339.8		352.8	
normality	OK		OK		OK		OK		OK		OK	
n	53		54		51		53		55		54	
outliers	1		0		3		1		0		0	
mean (n)	165.29		203.29		271.99		330.56		342.20		350.68	
st.dev. (n)	3.344		1.806		0.979		1.507		2.254		2.182	
R(calc.)	9.36		5.06		2.74		4.22		6.31		6.11	
R(ISO 3405:11/D86:12)	9.09		4.47		2.97		4.96		8.55		7.10	

Determination of Distillation Automated on sample #13060; result in %V/V, (continued)

Lab method	Volume at 250°C mark	z(targ)	Volume at 350°C mark	z(targ)	%residue	mark
150 ISO3405-A	34.2	-0.78	----	----	1.6	
311	----	----	----	----	----	
312 ISO3405-A	33.7	-1.31	97.9	0.95	2.1	
323 ISO3405-A	34.1	-0.89	96.3	-0.74	1.3	
334 ISO3405	36.2	1.32	97.7	0.74	0.7	
338	----	----	----	----	----	
340 ISO3405-A	34.9	-0.04	----	----	1.6	
343 ISO3405-A	36.6	1.75	96.5	-0.53	1.0	
353 ISO3405-A	33.9	-1.10	96.0	-1.05	1.0	
432	----	----	----	----	----	
445 IP123-A	35.1	0.17	----	----	1.5	
463 D86-A	34.5	-0.46	----	----	2.2	
495 ISO3405-A	35.0	0.06	97.3	0.32	1.4	
496 ISO3405-A	33.7	-1.31	96.5	-0.53	1.6	
511 D86-M	34.5	-0.46	97.0	0.00	1.0	
529	----	----	----	----	----	
540 ISO3405-M	36	1.11	97	0.00	1.0	
631	----	----	----	----	1.5	
1006	----	----	----	----	1.9	
1016	----	----	----	----	----	
1017	----	----	----	----	----	
1026 ISO3405	34.3	-0.68	96.1	-0.95	----	
1033 IP123-A	33.8	-1.20	96.4	-0.63	1.8	
1065 D86-A	35.0	0.06	96.1	-0.95	1.7	
1081 D86-A	34.4	-0.57	97.9	0.95	1.0	
1108 ISO3405-A	34.3	-0.68	96.3	-0.74	1.4	
1126 in house	36.2	1.32	99.1	2.21	----	
1134 ISO3405-A	34.4	-0.57	95.6	-1.47	1.0	
1140 IP123-A	36.0	1.11	0	G(0.01) -102.10	1.4	
1161 ISO3405-A	35.3	0.38	97.0	0.00	1	
1194 INH-86-A	36.3	1.43	----	----	1.7	
1199	----	----	----	----	----	
1203 ISO3405-A	34.4	-0.57	96.8	-0.21	1.4	
1205 D86-A	33.9	-1.10	96.4	-0.63	1.4	
1218	----	----	----	----	----	
1227 D86-A	35.0	0.06	97.1	0.11	1.0	
1237 ISO3405-M	35.5	0.59	97.3	0.32	1.6	
1259 ISO3405-A	35.3	0.38	98.4	1.47	1.4	
1299 ISO3405-A	34.3	-0.68	96.4	-0.63	1.5	
1346 ISO3405-A	34.8	-0.15	97.2	0.21	1.0	
1389	----	----	----	----	1.0	
1397	----	----	----	----	----	
1404 ISO3405-A	35.7	0.80	----	----	1.4	
1428 ISO3405	34.3	-0.68	96.5	-0.53	1.8	
1455 ISO3405-A	35.1	0.17	97.0	0.00	1.4	
1510 IP123-A	35.3	0.38	96.7	-0.32	1.4	
1564 D86-A	34.5	-0.46	98.3	1.37	0.5	
1569 ISO3405-A	34.8	-0.15	97.1	0.11	1.4	
1586 ISO3405-A	34.8	-0.15	96.6	-0.42	1.4	
1602 ISO3405-A	34.1	-0.89	98.5	1.58	1.3	
1631	----	----	----	----	----	
1634 ISO3405-A	35.7	0.80	98.4	1.47	1.2	
1635 ISO3405-A	35.3	0.38	97.2	0.21	1.5	
1656 ISO3405-A	35.0	0.06	95.8	-1.26	2.4	
1667 ISO3405-M	36.0	1.11	96.0	-1.05	1.2	
1676 ISO3405-A	35.15	0.22	----	----	1.4	
1706 ISO3405-A	35.65	0.75	97.1	0.11	1.85	
1710 ISO3405-A	35.0	0.06	96.7	-0.32	1.5	
1724 ISO3405-A	34.5	-0.46	----	----	1.8	
1728 ISO3405-M	35.27	0.35	97.18	0.19	1.3	
1807 ISO3405-A	34.7	-0.25	97.3	0.32	0.6	
1810 ISO3405-A	36.3	1.43	96.6	-0.42	0.5	
1811 ISO3405-A	35	0.06	97.1	0.11	1	
1833 D86	34.1	-0.89	97.0	0.00	1.5	
1842	----	----	----	----	----	
2129 ISO3405	35.1	0.17	97.6	0.63	0.4	
normality	OK		not OK			
n	52		43			
outliers	0		1			
mean (n)	34.94		97.00			
st.dev. (n)	0.746		0.780			
R(calc.)	2.09		2.18			
R(ISO3405:11/D86:12)	2.66		2.66			

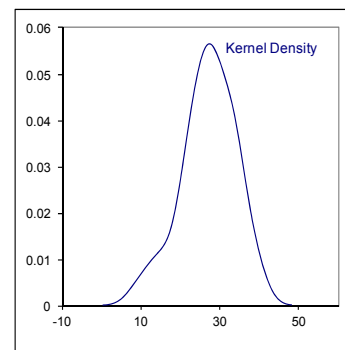
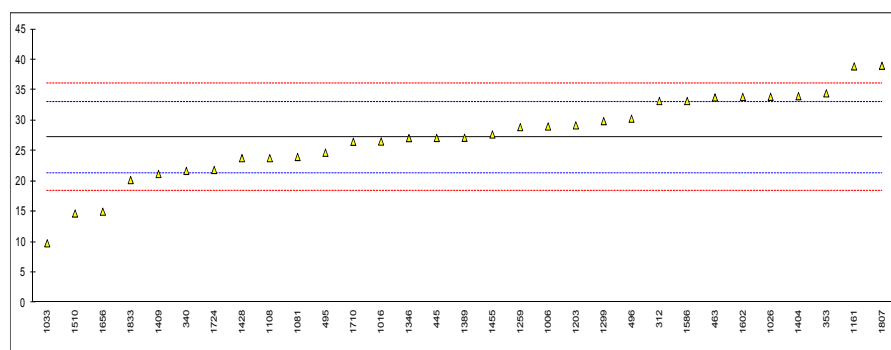




Lab 323 first reported: 323.4
 Lab 343 first reported: 275.9

Determination of Total Contamination on sample #13061; result in mg/kg

lab	method	value	mark	z(targ)	remarks
311		----		----	
312	EN12662:08	33.2		2.03	
323		----		----	
340	EN12662	21.71		-1.89	
343	EN12662:12	>30		----	
353	EN12662:08	34.468		2.46	
445	IP440:08	27.13		-0.04	
463	EN12662:08	33.79		2.23	
495	EN12662	24.7		-0.87	
496	EN12662:08	30.30		1.04	
540		----		----	
1006	EN12662:08	29.02		0.61	
1016	EN12662:08	26.54		-0.24	
1017		----		----	
1026	EN12662:08	33.9		2.27	
1033	IP440	9.8		-5.95	
1081	EN12662	24		-1.11	
1108	EN12662:08	23.8		-1.18	
1134		----		----	
1161	EN12662	38.9		3.98	
1203	EN12662:08	29.20		0.67	
1259	EN12662:99	28.9052		0.57	
1299	EN12662:08	29.9		0.91	
1346	EN12662:08	27.11		-0.05	
1389	EN12662:08	27.16		-0.03	
1404	EN12662:12	34.0		2.30	
1409	EN12662:08	21.2		-2.06	
1428	EN12662	23.8		-1.18	
1455	EN12662:08	27.7		0.16	
1510	EN12662:08	14.7		-4.28	
1586	EN12662:08	33.2		2.03	
1602	EN12662	33.88		2.26	
1631		----		----	
1656	EN12662:08	15.0		-4.18	
1710	EN12662:08	26.5		-0.25	
1724	EN12662	21.87		-1.83	
1807	EN12662:08	39.0		4.01	
1833	EN12662:12	20.2		-2.40	
normality		OK		<u>Spike</u>	
n		31			
outliers		0			
mean (n)		27.245		14.8	
st.dev. (n)		6.8298			
R(calc.)		19.123			
R(EN12662:08)		8.208			



APPENDIX 2

z-scores Distillation

lab	IBP	10%	50%	90%	95%	FBP
150	-0.58	1.95	-0.18	-0.60	-0.59	-1.97
311	----	----	----	----	----	----
312	-0.52	0.70	0.95	-0.54	-0.36	-0.55
323	0.31	1.13	1.70	0.76	0.62	0.28
334	-0.49	-1.18	-1.97	-1.50	-1.28	0.01
338	----	----	----	----	----	----
340	1.17	-0.81	0.10	0.31	0.62	-0.82
343	-0.77	1.70	2.74	1.55	0.95	0.05
353	-1.85	-1.93	1.80	1.66	1.28	1.39
432	----	----	----	----	----	----
445	-0.83	-0.99	-0.94	-0.09	0.59	-0.51
463	0.31	0.51	-0.65	-3.53	-0.92	-1.53
495	1.17	0.19	-0.46	-0.49	-0.43	0.01
496	1.11	0.82	1.33	0.53	0.43	0.72
511	1.45	-0.49	-0.94	-0.03	-0.07	0.12
529	----	----	----	----	----	----
540	-1.01	-2.68	-0.46	-0.03	0.59	0.91
631	1.60	0.45	0.48	0.25	-0.23	-0.27
1006	0.49	1.95	0.95	1.83	0.88	0.36
1016	----	----	----	----	----	----
1017	----	----	----	----	----	----
1026	----	----	----	----	1.05	----
1033	0.46	0.07	0.67	0.98	0.33	-0.07
1065	0.43	-0.06	0.48	1.32	1.18	1.58
1081	0.71	-0.31	0.95	0.25	0.10	-0.47
1108	0.00	1.01	0.38	0.53	0.46	1.07
1126	0.68	0.70	-2.63	0.19	-0.62	0.12
1134	-1.60	-0.24	0.95	1.72	1.51	0.28
1140	-1.29	-0.49	-0.94	-0.49	-0.20	-0.66
1161	-1.48	-0.62	-0.46	-0.71	-1.02	-0.27
1194	-1.38	-2.62	-0.75	0.14	-0.07	-2.87
1199	----	----	----	----	----	----
1203	0.56	0.01	0.38	0.14	0.16	0.05
1205	0.31	1.26	1.23	0.76	0.66	0.76
1218	----	----	----	----	----	----
1227	0.96	0.07	0.48	0.47	0.36	0.83
1237	0.83	-2.06	-1.78	-0.26	0.29	0.56
1259	-0.64	0.57	-0.94	-1.61	-1.47	-0.07
1299	-0.40	-0.06	0.38	0.70	0.62	0.64
1346	0.93	0.32	0.10	-0.09	-0.26	0.83
1389	-0.86	-1.43	-3.39	-0.43	-0.13	-0.55
1397	----	----	----	----	----	----
1404	0.06	0.63	-0.56	-0.60	-0.79	-1.53
1428	-0.31	0.38	0.48	-0.43	-0.23	0.05
1455	0.49	0.19	0.01	-0.09	0.03	-0.03
1510	-0.21	-0.24	-0.65	-0.32	0.07	0.01
1564	1.20	1.32	-0.09	-1.33	-1.21	-0.19
1569	-0.92	-0.06	0.01	0.42	-0.07	-0.19
1586	-2.25	-0.93	-0.56	-0.43	-0.26	0.20
1602	-0.06	-0.37	0.10	-0.54	-0.46	-0.27
1631	----	----	----	----	----	----
1634	-0.24	-0.43	-1.41	-0.65	-0.62	0.16
1635	8.78	2.45	0.48	0.36	-0.03	1.43
1656	-1.69	-0.87	0.38	1.32	1.54	0.24
1667	1.76	-1.43	-0.94	0.25	1.24	0.12
1676	0.70	0.78	-0.87	-0.17	-0.43	-1.33
1706	-1.69	-0.90	-0.32	0.14	0.16	-0.37
1710	-1.08	-0.43	0.20	0.25	0.20	0.20
1724	1.26	2.70	0.29	-2.12	-0.59	-1.29
1728	0.27	0.26	-0.50	0.29	0.21	1.44
1807	-0.80	-0.56	5.10	-1.05	-1.02	0.40
1810	0.62	-0.56	-1.31	-1.50	-1.51	-0.86
1811	0.03	-0.31	-0.37	-0.26	-0.29	0.36
1833	1.51	0.76	0.57	-0.09	-0.20	0.64
1842	----	----	----	----	----	----
2129	1.54	0.19	-0.56	-0.65	-0.79	0.83

APPENDIX 3**Number of participants per country**

1 lab in ARGENTINA
3 labs in AUSTRIA
4 labs in BELGIUM
1 lab in BULGARIA
3 labs in CROATIA
1 lab in CYPRUS
2 labs in CZECH REPUBLIC
4 labs in FRANCE
2 labs in GERMANY
2 labs in GREECE
1 lab in HONG KONG
3 labs in HUNGARY
2 labs in IRELAND
1 lab in ISRAEL
1 lab in MALTA
1 lab in MEXICO
1 lab in PERU
1 lab in PHILIPPINES
1 lab in POLAND
1 lab in PORTUGAL
1 lab in ROMANIA
1 lab in SLOVENIA
6 labs in SPAIN
1 lab in SWEDEN
1 lab in TAIWAN R.O.C.
7 labs in THE NETHERLANDS
5 labs in TURKEY
1 lab in U.S.A.
8 labs in UNITED KINGDOM

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
ex	= excluded from calculations
E	= error in calculations
n.a.	= not applicable
n.a.	= not evaluated
W	= result withdrawn
SDS	= Safety Data Sheet

Literature:

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