

Results of Proficiency Test
Gasoil B10 (10% FAME)
April 2011

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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1 INTRODUCTION

Since 2005, the Institute for Interlaboratory Studies organizes every year a proficiency test for automotive diesel containing 5-10% FAME, according to EN590 and ASTM D7467.

In this interlaboratory study on gasoil B10, 68 laboratories from 26 countries have participated.

See appendix 3 for the number of participating laboratories per country.

In this report, the results of the 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 ASTM D7467 and EN590.

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 guide 43 and ILAC-G13:2007, (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This ensures 100% confidentiality of participant's data. Also customer's satisfaction is measured on a regular basis by sending questionnaires.

2.2 PROTOCOL

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organization, Statistics and Evaluation' of January 2010 (iis-protocol, version 3.2), which can be downloaded from www.iisnl.com. The participants were asked to report the analytical results using the indicated units on the report form.

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

The necessary bulk material (Gasoil with less than 0.5% FAME) was purchased from a local Gasoil producer. To 150 litre of the bulk material 15 litre of pure FAME (B100) was added to increase the FAME content upto 10%.

After homogenization, 128 subsamples were transferred to 1 litre brown glass bottles and labelled #11039. Another 80 bottles of 500 mL (also labelled #11039) were subsequently filled and another 85 bottles of one litre (labelled #11040) were filled with approx. 850 mL of material each.

The homogeneity of the subsamples #11039 was checked by determination of Density in accordance with ASTM D4052:09 and FAME content in accordance with EN14078:09 on 8 stratified randomly selected samples.

	<i>Density @ 15 °C in kg/m³</i>	<i>FAME in %V/V</i>
sample #11039-1	839.81	10.16
sample #11039-2	839.81	10.15
sample #11039-3	839.80	10.15
sample #11039-4	839.81	10.15
sample #11039-5	839.80	10.16
sample #11039-6	839.80	10.14
sample #11039-7	839.81	10.13
sample #11039-8	839.81	10.15

table 1: homogeneity test results of subsamples #1039

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

	<i>Density @ 15 °C in kg/m³</i>	<i>FAME in %V/V</i>
r (sample #11039)	0.00001	0.03
reference test	ISO12185:96	EN14078:09
0.3 x R(reference test)	0.00015	0.23

table 2: repeatabilities of the subsamples #11039

The calculated repeatabilities were both equal or less than 0.3 times the respective reproducibility of the reference method. Therefore, homogeneity of the subsamples #11039 was assumed.

For Total Contamination, each bottle labelled #11040 was spiked with 1 ml of a freshly prepared and well shaken suspension. This suspension was prepared from 0.82 g BCR-070 (ϕ 2.4 - 32 μ m) and 88.50 g oil.

The addition was checked by weighing the bottles before and after addition.

Two bottles (1x1L + 1x0.5L, labelled #11039) and/or one bottle of 1L, labelled #11040 were sent to the participating laboratories on April 13, 2011.

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, Cloudpoint, Cold Filter Plugging Point, Conradson Carbon Residue on 10% Residue, Ramsbottom Carbon Residue on 10% Residue, Copper Corrosion, Density @ 15°C, Distillation, FAME, Flash Point PMcc, Kinematic Viscosity @40°C, Lubricity, Oxidation Stability EN 15751 and ISO12205, Polycyclic Aromatic Hydrocarbons, Pour Point, 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, was sent together with each set of samples. Also, a letter of instructions and a SDS were added to the package.

3 RESULTS

During four weeks after sample despatch, the results of the individual laboratories were gathered. The original data are tabulated per determination in the appendix 1 of this report. The laboratories are presented by their code numbers.

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

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

3.1 STATISTICS

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

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

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

In accordance with ISO 5725 (1986 and 1994) the original results per determination were 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.

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 3; nr.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. 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

In this interlaboratory study, no large problems with sample despatch were encountered during the execution. In total 14 participants reported test results after the final reporting date. Only one participant decided not to report any test results. Finally, 67 participants reported in total 1363 numerical test results. Observed were 50 outlying results, which is 3.7%. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

Not all original data sets proved to have a normal distribution. For Calculated Cetane Index ISO4264, Cloud Point, Cold Filter Plugging Point, Density, Flash Point, Oxidation Stability in g/m^3 , and Pour Point (manual and automated) non-Gaussian distributions were found. 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: No significant conclusions were drawn as the consensus value is below the application range of the reference method. All participants agreed that ash was equal or less than 0.001 %M/M.

Aromatics (FIA): This determination was very problematic. No statistical outliers were detected, but the results vary over a large range (15.4 – 29.03 %V/V). The calculated reproducibility is not at all in agreement with ASTM D1319:10, but the precision and bias of D1319 with biodiesel blends is not known and is currently under investigation, see paragraph X1.11.1 of ASTM D7467:09a.

C.I. D976: This determination was not problematic. No statistical outliers were observed and the observed reproducibility is in good agreement with the requirements of ASTM D976:06.

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. Only one statistical outlier was detected. The calculated reproducibility, after rejection of the statistical outlier, is in good agreement with the requirements of EN23015:94 and/or ASTM D2500:09.

- CFPP: This determination was not problematic. No statistical outliers were detected and the calculated reproducibility is in full agreement with the requirements of EN116:98 and/or IP309:99.
- CCR 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.
- Ramsbottom.: The test results vary over a small range (0.076 – 0.11 %M/M). Still, no conclusions were drawn as only four laboratories reported a test result.
- Copper Corr.: No problems were observed, all participants agreed on a result of 1 or 1a.
- Density @15°C: This determination was not problematic. Only one statistical outlier was detected. The calculated reproducibility, after rejection of the statistical outlier, is in good agreement with the requirements of ISO12185:96 and/or ASTM D4052:09.
- FAME: This determination was problematic. Three statistical outliers were detected and the calculated reproducibility, after rejection of the statistical outliers, is not at all in agreement with the requirements of EN14078:09.
- Flash Point: This determination was not problematic. No statistical outliers were detected and the calculated reproducibility is in good agreement with the requirements of ISO2719:02 and ASTM D93:08.
- Kin. Visc. 40°C: This determination was problematic for a number of laboratories. Seven (!) statistical outliers were detected. However, the calculated reproducibility, after rejection of the statistical outliers, is in good agreement with the requirements of ISO3104:94 and/or ASTM D445:09.
- Lubricity: This determination was not problematic. Five statistical outliers were detected. However, the calculated reproducibility, after rejection of the statistical outlier, is in good agreement with the requirements of ISO12156-1:06.
- Ox. Stab. EN15751: This determination was problematic. Two statistical outliers were detected and the calculated reproducibility, after rejection of the statistical outliers, is not in agreement with the requirements of EN15751:09
- Ox. Stab. ISO12205: This determination was not problematic. Two statistical outliers were detected. However, the calculated reproducibility, after rejection of the statistical outliers, is in good agreement with the requirements of ISO12205:96.
- PAH: This determination was problematic. Two statistical outliers were detected and the calculated reproducibility, after rejection of the statistical outliers, is not in agreement with the requirements of EN12916:06.

- Pour Point (M): This determination was not problematic. Two statistical outliers were detected. However, the calculated reproducibility after rejection of the statistical outliers, is in good agreement with the requirements of ISO3016:94 and/or ASTM D97:09.
- Pour Point (A): This determination was not problematic. Only one statistical outlier was detected and the calculated reproducibility after rejection of the statistical outlier, is in good agreement with the requirements of ASTM D5950:07. Remarkably three laboratories reported to have used either ASTM D97 or IP 15, which are both manual test methods. These results were excluded from the statistical evaluation and these results were evaluated under the manual method.
- Sulphur: This determination was very problematic. Three statistical outliers were detected and the calculated reproducibility, after rejection of the statistical outliers, is not at all in agreement with the requirements of ISO20846:04 and of ASTM D5453:09.
- TAN: All participants agreed on a very low TAN, probably near or below the detection limit and therefore no significant conclusions were drawn.
- Water: No analytical problems have been observed. Three statistical outliers were detected. However, the calculated reproducibility after rejection of the statistical outliers, is in good agreement with the requirements of EN12937:00.
- Distillation: As only three 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 only five statistical outliers were detected and the calculated reproducibilities of ibp, 50% rec., 90% rec., 95% rec, vol @250° and vol @350°, after rejection of the statistical outliers, are all in good agreement with the requirements of ISO/DIS3405:11 (auto) and/or ASTM D86:09e1 (auto).
- Total Contamination: Serious analytical problems have been observed. The samples were spiked with a freshly prepared and well shaken suspension of particulate quartz material (\varnothing 2.4-32 μ m) in oil. And therefore the minimum Total Contamination content to be found was known (added 12 mg/kg). The laboratories should be able to find at least 8.4 mg/kg [12 mg/kg (added) – 3.6 mg/kg (R EN12662)]. However, two laboratories reported TC results lower than 8.4 mg/kg. These low results were rejected prior to data analysis. The reason for the low TC results found may be insufficient homogenisation of the sample by the respective laboratory prior to sub sampling for analysis. After exclusion of the suspicious data and the single statistical outlier, the calculated reproducibility of the remaining 28 test results is not in agreement with the requirements of EN12662:08.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the 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	20	0.0009	0.0017	(0.0050) *
Aromatics by FIA	%V/V	13	22.11	13.81	unknown
Cetane Index D976		26	54.66	1.33	2.00
Cetane Index ISO4264		39	55.63	1.30	unknown
Cloud Point	°C	50	-3.58	3.52	4.00
Cold Filter Plugging Point	°C	53	-11.5	3.79	3.76
CCR on 10% residue	%M/M	34	0.048	0.067	(0.032) *
Ramsbottom CR on 10% residue	%M/M	4	0.093	0.039	0.034
Density @ 15°C	kg/m ³	63	839.76	0.29	0.50
Fatty Acid Methyl Ester	%V/V	52	9.97	1.06	0.75
Flash Point PMcc	°C	61	73.02	3.97	5.18
Kinematic Viscosity @ 40°C	mm ² /s	48	3.1823	0.0317	0.0343
Lubricity	µm	38	193.0	51.5	102.0
Oxidation Stability EN15751	hrs	25	28.96	6.70	5.89
Oxidation Stability ISO12205	g/m ³	17	2.60	3.85	7.57
Polycyclic Aromatic Hydrocarbons	%M/M	33	2.86	1.32	0.99
Pour Point (manual)	°C	27	-13.04	4.29	6.60
Pour Point (automated)	°C	29	-12.31	4.10	4.50
Sulphur	mg/kg	50	117.5	27.3	14.7
Total Acid Number	mgKOH/g	26	0.030	0.023	(0.040)
Total Contamination	mg/kg	28	18.08	11.96	5.43
Water	mg/kg	50	86.59	39.13	63.99
Initial Boiling Point	°C	56	184.29	9.65	10.14
10% recovery	°C	55	229.56	6.28	5.05
50% recovery	°C	55	287.20	2.96	2.97
90% recovery	°C	56	337.06	4.05	5.06
95% recovery	°C	55	349.22	6.37	8.84
Final Boiling Point	°C	53	357.49	7.19	7.10
Volume @250°C	%V/V	52	20.88	2.27	2.66
Volume @350°C	%V/V	53	95.34	1.77	2.66

Table 4: summary of test results samples #11039

*) 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 2011 WITH PREVIOUS PTS.

	<i>April 2011</i>	<i>April 2010</i>	<i>April 2009</i>	<i>April 2008</i>	<i>April 2007</i>
Number of reporting labs	67	55	69	75	69
Number of results reported	1363	1023	1059	1136	1122
Statistical outliers	50	39	54	38	34
Percentage outliers	3.7%	3.8%	5.1%	3.3%	3.0%

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 2011</i>	<i>April 2010</i>	<i>April 2009*</i>	<i>April 2008*</i>	<i>April 2007*</i>
Ash content	(++)	(++)	(++)	(++)	(++)
Aromatics by FIA	n.e.	n.e.	n.e.	n.e.	n.e.
Cetane Index D976	++	++	n.e.	n.e.	n.e.
Cetane Index ISO4264	n.e.	n.e.	n.e.	n.e.	n.e.
Conradson CR on 10% res.	(--)	(--)	(--)	(--)	(--)
Ramsbottom CR on 10% res.	-	--	n.e.	n.e.	n.e.
Cloud Point	++	++	++	++	++
Cold Filter Plugging Point	+/-	--	++	++	++
Density @ 15 °C	++	++	++	+	++
Fatty Acid Methyl Ester	--	--	-	++	++
Flash Point PMcc	++	++	+	++	++
Kinematic Viscosity @ 40 °C	++	-	+	++	--
Lubricity	++	++	++	++	++
Oxidation Stability EN15751	-	-	++	+	+
Oxidation Stability ISO12205	++	++	n.e.	n.e.	n.e.
Polycyclic Aromatic	--	--	-	-	n.e.
Pour Point manual	++	+	n.e.	n.e.	n.e.
Pour Point automated	++	+/-	n.e.	n.e.	n.e.
Sulphur	--	++	++	+/-	+
Total Contamination	--	--	--	--	--
TAN	(++)	++	n.e.	n.e.	n.e.
Water content	++	++	++	++	++
Distillation	+/-	+/-	++	+/-	++

table 5: comparison determinations against the standard

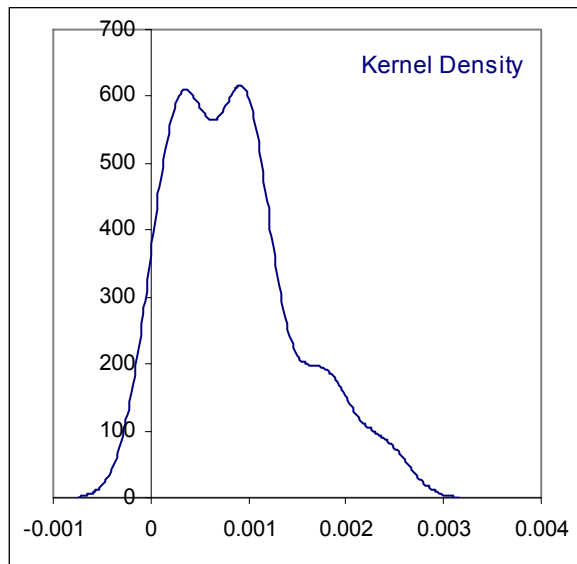
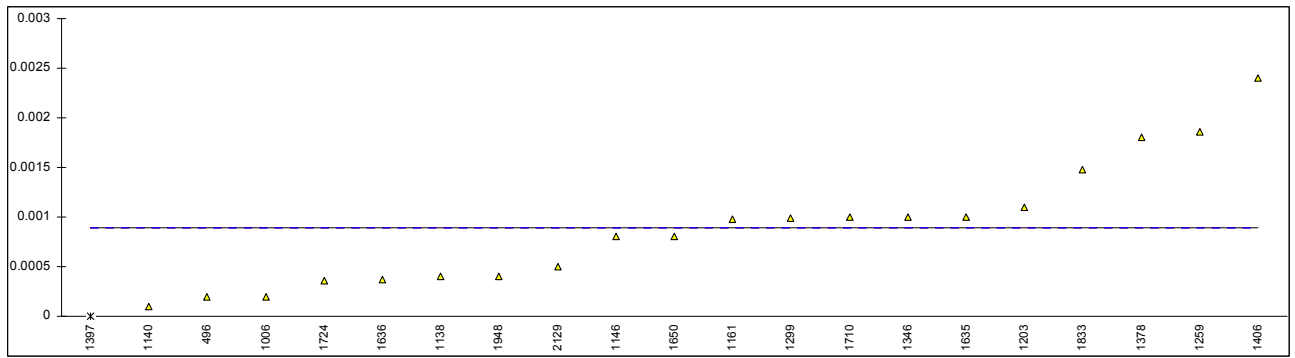
* NB.: in 2007-2009 B5 was evaluated, not B10

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

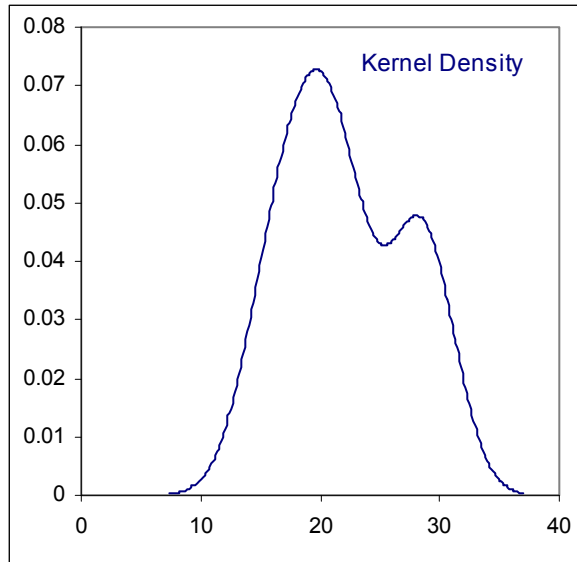
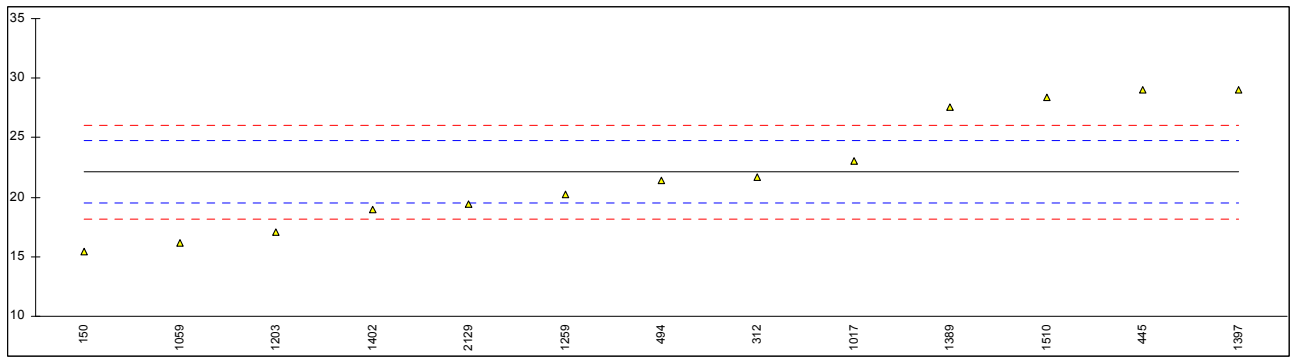
APPENDIX 1 Determination of Ash Content on sample #11039; result in %M/M

lab	method	value	mark	z(targ)	remarks
150	D482	<0.001		----	
311	ISO6245	<0.001		----	
312		----		----	
323		----		----	
338		----		----	
343	ISO6245	<0.001		----	
353	ISO6245	<0.001		----	
402		----		----	
431		----		----	
432		----		----	
433		----		----	
444		----		----	
445	IP4	<0.001		----	
463	ISO6245	<0.001		----	
494	ISO6245	<0.001		----	
495	ISO6245	<0.001		----	
496	ISO6245	0.0002		----	
540		----		----	
631		----		----	
1006	D482	0.0002		----	
1017	ISO6245	<0.001		----	
1033		----		----	
1047	ISO6245	<0.001		----	
1059	ISO6245	<0.001		----	
1080		----		----	
1081	D482	<10		----	Probably reported in deviating unit 10 mg/kg
1108		----		----	
1126		----		----	
1131		----		----	
1138	IP4	0.0004		----	
1140	IP4	0.00010		----	
1146	ISO6245	0.0008		----	
1161	ISO6245	0.00098		----	
1194		----		----	
1195		----		----	
1203	ISO6245	0.0011	C	----	First reported 0.0037
1205		----		----	
1218		----		----	
1227		----		----	
1237		----		----	
1259	ISO6245	0.001859		----	
1299	D482	0.00099		----	
1346	ISO6245	0.001	C	----	First reported 0.0032
1378	D482	0.0018		----	
1389		----		----	
1397	ISO6245	0.0	ex	----	Result excluded, zero is not a real value
1402		----		----	
1404	ISO6245	<0.001		----	
1406	ISO6245	0.0024		----	
1407		----		----	
1427	ISO6245	<0.001		----	
1428	ISO6245	<0.001		----	
1510	ISO6245	<0.001		----	
1634		----		----	
1635	ISO6245	0.001		----	
1636	D482	0.00037		----	
1650	D482	0.0008		----	
1706		----		----	
1710	ISO6245	0.001		----	
1715		----		----	
1724	ISO6245	0.00036		----	
1807	ISO6245	<0.001		----	
1810		----		----	
1811		----		----	
1833	ISO6245	0.00148		----	
1948	ISO6245	0.0004		----	
2129	ISO6245	0.0005		----	
2146		----		----	
	normality	OK			
	n	20			
	outliers	1			
	mean (n)	0.00089			
	st.dev. (n)	0.000619			
	R(calc.)	0.00173			
	R(ISO6245:93)	(0.00500)			Application range 0.001 - 0.180 %M/M



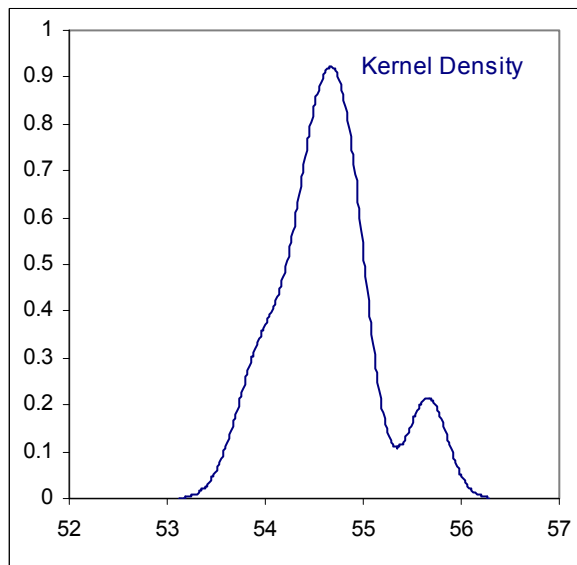
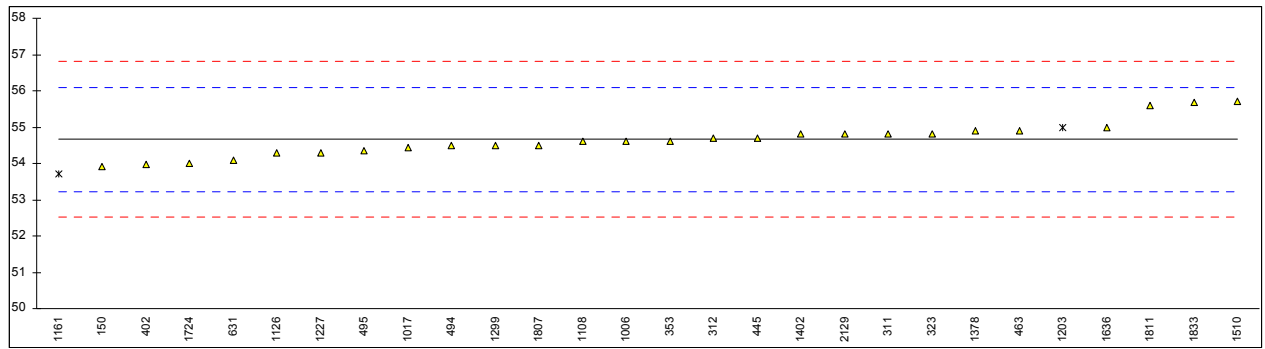
Determination of Aromatics by FIA on sample #11039; result in %V/V

lab	method	value	mark	z(targ)	remarks
150	D1319	15.4		----	
311				----	
312	D1319	21.7		----	
323				----	
338				----	
343				----	
353				----	
402				----	
431				----	
432				----	
433				----	
444				----	
445	D1319	29.0		----	
463				----	
494	D1319	21.40		----	
495				----	
496				----	
540				----	
631				----	
1006				----	
1017	D1319	23.013		----	
1033				----	
1047				----	
1059	D1319	16.2		----	
1080				----	
1081				----	
1108				----	
1126				----	
1131				----	
1138				----	
1140				----	
1146				----	
1161				----	
1194				----	
1195				----	
1203	D1319	17.1		----	
1205				----	
1218				----	
1227				----	
1237				----	
1259	D1319	20.24		----	
1299				----	
1346				----	
1378				----	
1389	D1319	27.58		----	
1397	D1319	29.03		----	
1402	D1319	19.0		----	
1404				----	
1406				----	
1407				----	
1427				----	
1428				----	
1510	D1319	28.4		----	
1634				----	
1635				----	
1636				----	
1650				----	
1706				----	
1710				----	
1715				----	
1724				----	
1807				----	
1810				----	
1811				----	
1833				----	
1948				----	
2129	D1319	19.4		----	
2146				----	
	normality	OK			
	n	13			
	outliers	0			
	mean (n)	22.112			
	st.dev. (n)	4.9320			
	R(calc.)	13.810			
	R(D1319:10)	unknown			Compare R(D1319 for diesel without FAME) = 3.7



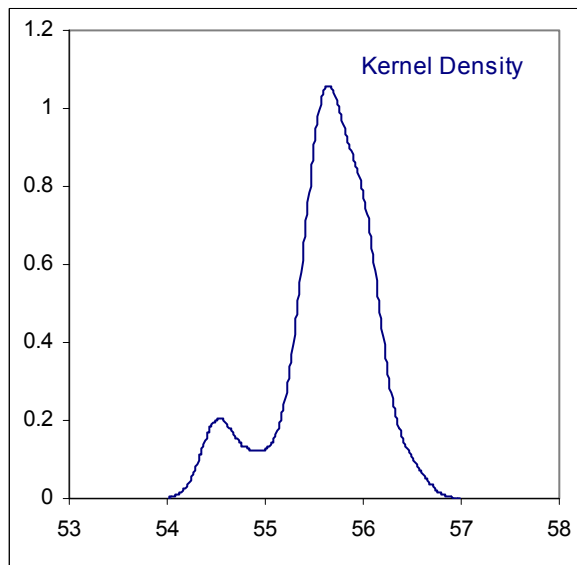
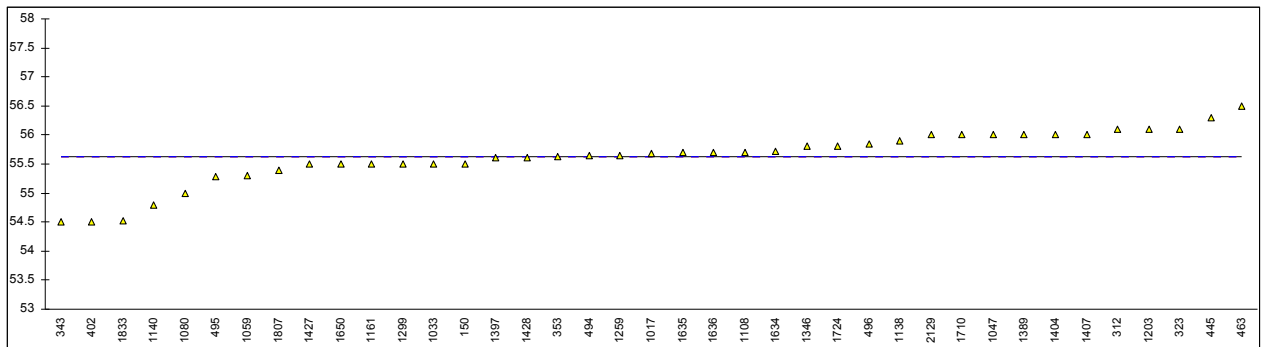
Determination of Cetane Index D976 on sample #11039

lab	method	value	mark	z(targ)	remarks
150	D976	53.9		-1.06	
311	D976	54.8		0.20	
312	D976	54.7		0.06	
323	D976	54.8		0.20	
338		----		----	
343		----		----	
353	D976	54.613		-0.06	
402	D976	53.96		-0.97	
431		----		----	
432		----		----	
433		----		----	
444		----		----	
445	D976	54.70		0.06	
463	D976	54.9		0.34	
494	D976	54.49		-0.23	
495	D976	54.35		-0.43	
496		----		----	
540		----		----	
631	D976	54.1		-0.78	
1006	D976	54.6		-0.08	
1017	D976	54.4359		-0.31	
1033		----	C	----	Reported according to IP 380, is equivalent with ISO 4264
1047		----		----	
1059		----		----	
1080		----		----	
1081		----		----	
1108	D976	54.6		-0.08	
1126	D976	54.3		-0.50	
1131		----		----	
1138		----	C	----	Reported according to D4737, is equivalent with ISO 4264
1140		----	C	----	Reported according to IP 380, is equivalent with ISO 4264
1146		----		----	
1161	D4737	53.7	ex	-1.34	D4737, equivalent with ISO 4264, is not equivalent with D976
1194		----		----	
1195		----		----	
1203	D4737	55.0	ex	0.48	D4737, equivalent with ISO 4264, is not equivalent with D976
1205		----		----	
1218		----		----	
1227	D976	54.3		-0.50	
1237	D976	----		----	
1259		----		----	
1299	D976	54.5		-0.22	
1346		----		----	
1378	D976	54.9		0.34	
1389		----		----	
1397		----		----	
1402	D976	54.8		0.20	
1404		----		----	
1406		----		----	
1407		----		----	
1427		----		----	
1428		----		----	
1510	D976	55.7		1.46	
1634		----		----	
1635		----		----	
1636	D976	55.0		0.48	
1650		----		----	
1706		----		----	
1710		----		----	
1715		----		----	
1724	D976	54.0		-0.92	
1807	D976	54.5		-0.22	
1810		----		----	
1811	D976	55.6		1.32	
1833	D976	55.68		1.44	
1948		----		----	
2129	D976	54.8		0.20	
2146		----		----	
	normality	OK			
	n	26			
	outliers	0			
	mean (n)	54.655			
	st.dev. (n)	0.4745			
	R(calc.)	1.329			
	R(D976:06)	2.000			



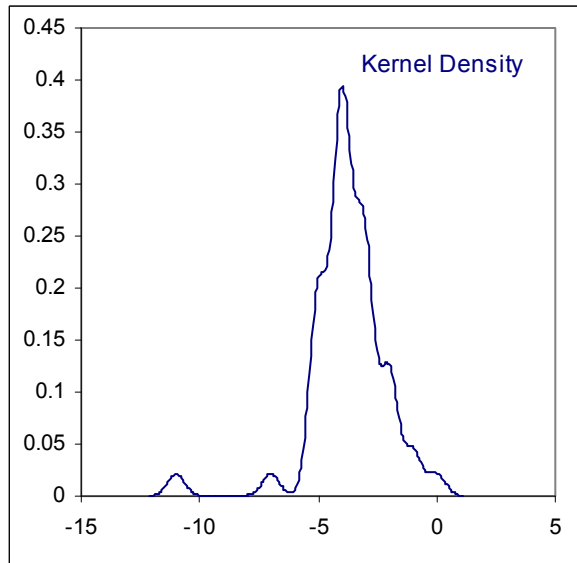
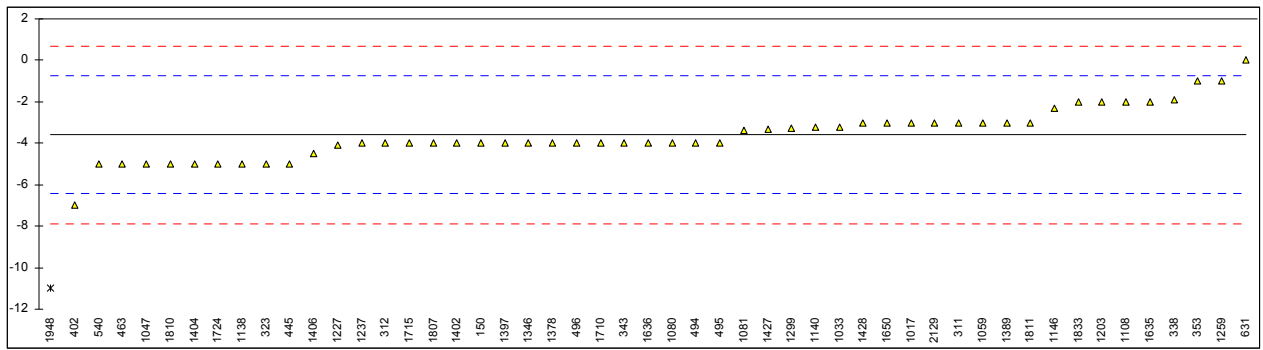
Determination of Cetane Index ISO4264 on sample #11039

lab	method	value	mark	z(targ)	remarks
150	ISO4264	55.5		----	
311				----	
312	ISO4264	56.1		----	
323	ISO4264	56.1		----	
338				----	
343	ISO4264	54.5		----	
353	ISO4264	55.633		----	
402	ISO4264	54.50		----	
431				----	
432				----	
433				----	
444				----	
445	IP380	56.30		----	
463	ISO4264	56.5		----	
494	ISO4264	55.64		----	
495	ISO4264	55.28		----	
496	ISO4264	55.85		----	
540				----	
631				----	
1006				----	
1017	ISO4264	55.6864		----	
1033	IP380	55.5	C	----	Reported under D976
1047	ISO4264	56.0		----	
1059	ISO4264	55.3		----	
1080	ISO4264	55		----	
1081				----	
1108	ISO4264	55.70		----	
1126				----	
1131				----	
1138	D4737	55.90	C	----	Reported under D976
1140	IP380	54.8	C	----	Reported under D976
1146				----	
1161	ISO4264	55.5		----	
1194				----	
1195				----	
1203	ISO4264	56.1		----	
1205				----	
1218				----	
1227				----	
1237				----	
1259	ISO4264	55.64		----	
1299	D4737(A)	55.5		----	
1346	ISO4264	55.8		----	
1378				----	
1389	ISO4264	56.00		----	
1397	ISO4264	55.6		----	
1402				----	
1404	ISO4264	56		----	
1406				----	
1407	ISO4264	56.0		----	
1427	ISO4264	55.5		----	
1428	ISO4264	55.6		----	
1510				----	
1634	ISO4264	55.72		----	
1635	ISO4264	55.7		----	
1636	D4737	55.7		----	
1650	D4737	55.5		----	
1706				----	
1710	ISO4264	56.0		----	
1715				----	
1724	ISO4264	55.8		----	
1807	ISO4264	55.4		----	
1810				----	
1811				----	
1833	ISO4264	54.52		----	
1948				----	
2129	ISO4264	56.0		----	
2146				----	
	normality	not OK			
	n	39			
	outliers	0			
	mean (n)	55.625			
	st.dev. (n)	0.4632			
	R(calc.)	1.297			
	R(ISO4264:07)	n.a			



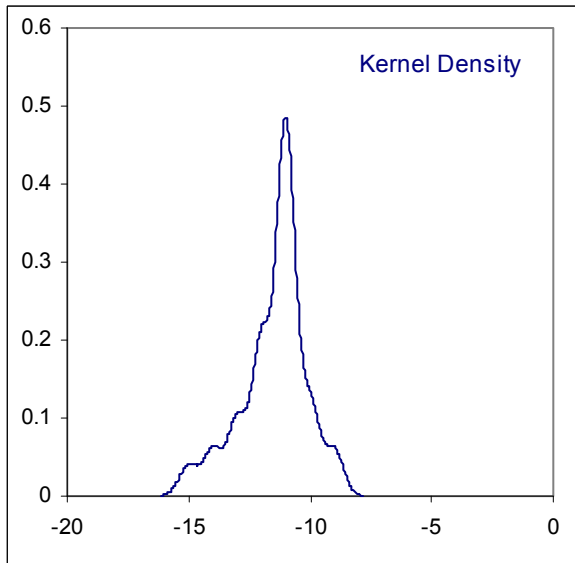
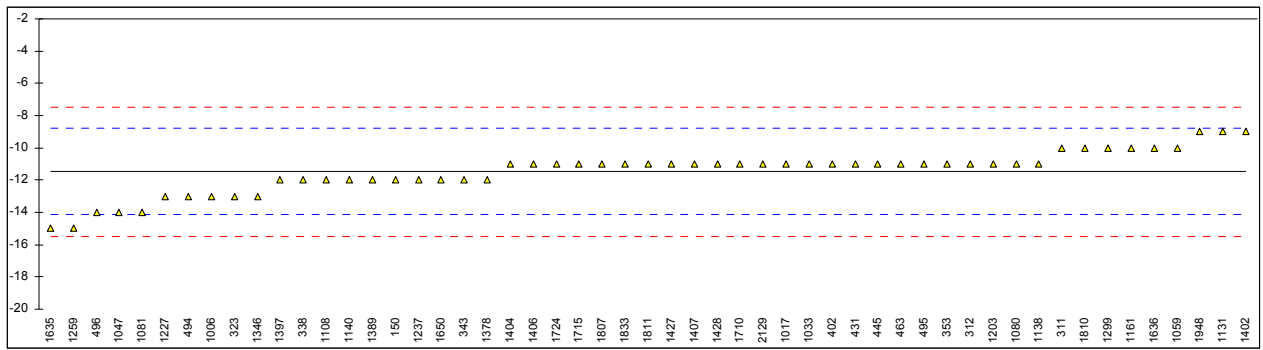
Determination of Cloud Point on sample #11039; result in °C

lab	method	value	mark	z(targ)	remarks
150	D2500	-4		-0.29	
311	EN23015	-3		0.41	
312	EN23015	-4		-0.29	
323	EN23015	-5		-0.99	
338	EN23015	-1.9		1.18	
343	EN23015	-4		-0.29	
353	IP219	-1		1.81	
402	EN23015	-7		-2.39	
431		----		----	
432		----		----	
433		----		----	
444		----		----	
445	IP219	-5		-0.99	
463	EN23015	-5		-0.99	
494	EN23015	-4		-0.29	
495	EN23015	-4		-0.29	
496	EN23015	-4.0		-0.29	
540	EN23015	-5		-0.99	
631	D2500	0.0		2.51	
1006		----		----	
1017	EN23015	-3		0.41	
1033	D5772	-3.2		0.27	
1047	ISO3015	-5		-0.99	
1059	EN23015	-3		0.41	
1080	EN23015	-4		-0.29	
1081	D5772	-3.4		0.13	
1108	EN23015	-2		1.11	
1126		----		----	
1131		----		----	
1138	D2500	-5		-0.99	
1140	IP446	-3.2		0.27	
1146	D2500	-2.3		0.90	
1161		----		----	
1194		----		----	
1195		----		----	
1203	EN23015	-2		1.11	
1205		----		----	
1218		----		----	
1227	D2500	-4.1		-0.36	
1237	EN23015	-4		-0.29	
1259	EN23015	-1		1.81	
1299	D5772	-3.3		0.20	
1346	EN23015	-4		-0.29	
1378	D2500	-4.0	C	-0.29	First reported 2.4
1389	D2500	-3		0.41	
1397	EN23015	-4		-0.29	
1402	EN23015	-4		-0.29	
1404	EN23015	-5		-0.99	
1406	EN23015	-4.5		-0.64	
1407		----		----	
1427	EN23015	-3.35		0.16	
1428	EN23015	-3		0.41	
1510		----		----	
1634		----		----	
1635	EN23015	-2		1.11	
1636	D2500	-4		-0.29	
1650	D5771	-3		0.41	
1706		----		----	
1710	EN23015	-4		-0.29	
1715	D2500	-4		-0.29	
1724	EN23015	-5		-0.99	
1807	D2500	-4		-0.29	
1810	EN23015	-5		-0.99	
1811	EN23015	-3		0.41	
1833	EN23015	-2		1.11	
1948	EN23015	-11	G(0.01)	-5.19	
2129	EN23015	-3		0.41	
2146		----		----	
	normality	not OK			
	n	50			
	outliers	1			
	mean (n)	-3.58			
	st.dev. (n)	1.258			
	R(calc.)	3.52			
	R(EN23015:94)	4.00			



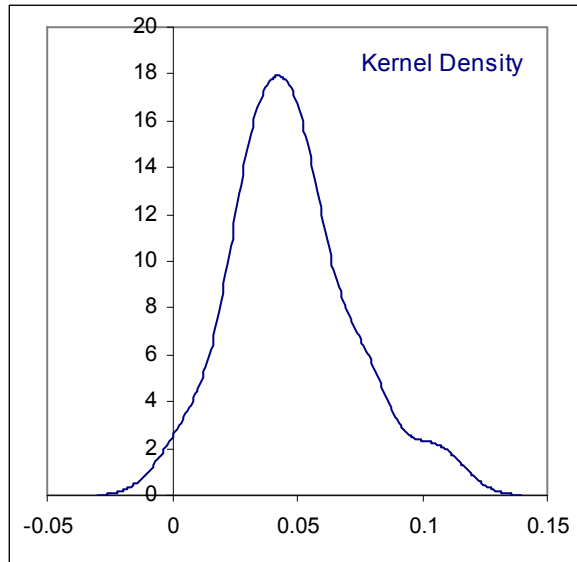
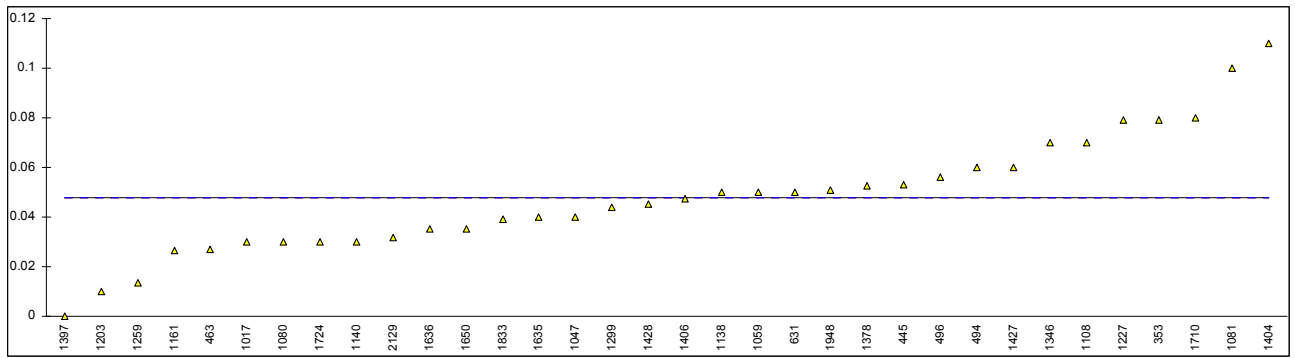
Determination of Cold Filter Plugging Point on sample #11039; result in °C

lab	method	value	mark	z(targ)	remarks
150	EN116	-12		-0.39	
311	EN116	-10		1.10	
312	EN116	-11		0.35	
323	EN116	-13		-1.14	
338	EN116	-12.0		-0.39	
343	EN116	-12		-0.39	
353	EN116	-11		0.35	
402	EN116	-11		0.35	
431	EN116	-11.0		0.35	
432		----		----	
433		----		----	
444		----		----	
445	IP309	-11		0.35	
463	EN116	-11		0.35	
494	EN116	-13		-1.14	
495	EN116	-11		0.35	
496	EN116	-14.0		-1.88	
540		----		----	
631		----		----	
1006	D6371	-13		-1.14	
1017	EN116	-11		0.35	
1033	IP309	-11		0.35	
1047	EN116	-14		-1.88	
1059	EN116	-10		1.10	
1080	EN116	-11		0.35	
1081	EN116	-14		-1.88	
1108	EN116	-12		-0.39	
1126		----		----	
1131	EN116	-9		1.84	
1138	IP309	-11		0.35	
1140	IP309	-12		-0.39	
1146		----		----	
1161	EN116	-10		1.10	
1194		----		----	
1195		----		----	
1203	EN116	-11		0.35	
1205		----		----	
1218		----		----	
1227	IP309	-13		-1.14	
1237	EN116	-12		-0.39	
1259	EN116	-15	C	-2.63	First reported -18
1299	EN116	-10		1.10	
1346	EN116	-13		-1.14	
1378	IP309	-12		-0.39	
1389	IP309	-12		-0.39	
1397	EN116	-12		-0.39	
1402	EN116	-9		1.84	
1404	EN116	-11		0.35	
1406	EN116	-11		0.35	
1407	EN116	-11		0.35	
1427	EN116	-11		0.35	
1428	EN116	-11		0.35	
1510		----		----	
1634		----		----	
1635	EN116	-15		-2.63	
1636	D6371	-10		1.10	
1650	EN116	-12		-0.39	
1706		----		----	
1710	EN116	-11		0.35	
1715	IP309	-11		0.35	
1724	EN116	-11		0.35	
1807	EN116	-11		0.35	
1810	EN116	-10		1.10	
1811	EN116	-11		0.35	
1833	EN116	-11		0.35	
1948	EN116	-9		1.84	
2129	EN116	-11		0.35	
2146		----		----	
	normality	not OK			
	n	53			
	outliers	0			
	mean (n)	-11.5			
	st.dev. (n)	1.35			
	R(calc.)	3.79			
	R(EN116:97)	3.76			



Determination of Carbon Residue on 10% dist. res. on sample #11039; result in %M/M

lab	method	value	mark	z(targ)	remarks
150		----		----	
311	ISO10307	<0.1		----	
312		----		----	
323	ISO10307	<0.10		----	
338		----		----	
343	ISO10307	<0.1		----	
353	IP13	0.0792	C	----	First reported 0.792
402		----		----	
431		----		----	
432		----		----	
433		----		----	
444		----		----	
445	IP13	0.053		----	
463	ISO10307	0.027		----	
494	ISO10307	0.06		----	
495	ISO10307	<0.1		----	
496	ISO10307	0.056		----	
540		----		----	
631	D4530	0.05		----	
1006		----		----	
1017	ISO10307	0.0299		----	
1033		----		----	
1047	ISO10307	0.040		----	
1059	ISO10307	0.05		----	
1080	D4530	0.03		----	
1081	ISO10307	0.1		----	
1108	ISO10307	0.07		----	
1126		----		----	
1131		----		----	
1138	D189	0.05		----	
1140	D4530	0.03		----	
1146		----		----	
1161	ISO10307	0.0265		----	
1194		----		----	
1195		----		----	
1203	ISO10307	0.01		----	
1205		----		----	
1218		----		----	
1227	D4530	0.079		----	
1237		----		----	
1259	ISO10307	0.0134		----	
1299	D4530	0.044		----	
1346	ISO10307	0.07	C	----	First reported 0.178
1378	ISO10307	0.0525		----	
1389		----		----	
1397	ISO10307	0.0		----	
1402	ISO10307	<0.01		----	
1404	ISO10307	0.11		----	
1406	ISO10307	0.0473		----	
1407		----		----	
1427	ISO10307	0.06		----	
1428	ISO10307	0.045		----	
1510		----		----	
1634		----		----	
1635	ISO10307	0.04		----	
1636	D4530	0.035		----	
1650	D189	0.035		----	
1706		----		----	
1710	ISO10307	0.08		----	
1715		----		----	
1724	ISO10307	0.03		----	
1807	ISO10307	<0.1		----	
1810		----		----	
1811		----		----	
1833	ISO10307	0.039		----	
1948	ISO10307	0.0507		----	
2129	ISO10307	0.0316		----	
2146		----		----	
	normality	OK			
	n	34			
	outliers	0			
	mean (n)	0.0478			
	st.dev. (n)	0.02392			
	R(calc.)	0.0670			
	R(ISO10370:95)	(0.0316)			(Application range 0.1 – 30 %M/M)



Determination of Ramsbottom Carbon Res. on 10% dist. res. on sample #11039; result in %M/M

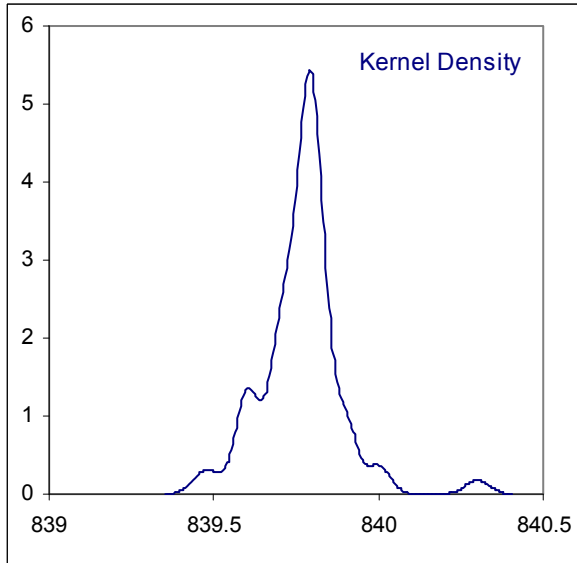
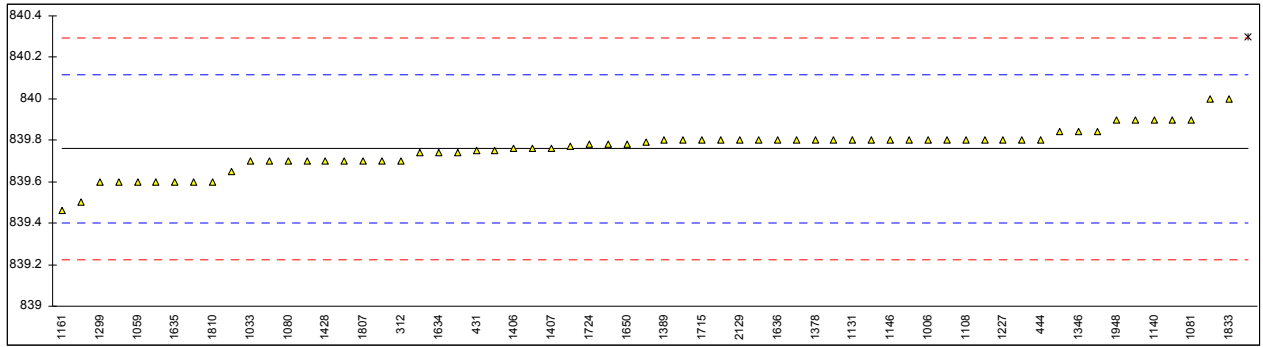
lab	method	value	mark	z(targ)	remarks
150	D524	0.11		1.42	
311		----		----	
312		----		----	
323		----		----	
338		----		----	
343		----		----	
353		----		----	
402		----		----	
431		----		----	
432		----		----	
433		----		----	
444		----		----	
445	D524	0.076		-1.38	
463		----		----	
494		----		----	
495		----		----	
496		----		----	
540		----		----	
631		----		----	
1006	D524	0.0929		0.01	
1017		----		----	
1033		----		----	
1047		----		----	
1059		----		----	
1080		----		----	
1081		----		----	
1108		----		----	
1126		----		----	
1131		----		----	
1138		----		----	
1140		----		----	
1146		----		----	
1161		----		----	
1194		----		----	
1195		----		----	
1203		----		----	
1205		----		----	
1218		----		----	
1227		----		----	
1237		----		----	
1259		----		----	
1299		----		----	
1346		----		----	
1378		----		----	
1389		----		----	
1397		----		----	
1402		----		----	
1404		----		----	
1406		----		----	
1407		----		----	
1427		----		----	
1428		----		----	
1510		----		----	
1634		----		----	
1635		----		----	
1636		----		----	
1650		----		----	
1706		----		----	
1710		----		----	
1715		----		----	
1724		----		----	
1807		----		----	
1810		----		----	
1811		----		----	
1833	D524	0.092		-0.06	
1948		----		----	
2129		----		----	
2146		----		----	
	normality	n.a.			
	n	4			
	outliers	0			
	mean (n)	0.0927			
	st.dev. (n)	0.01390			
	R(calc.)	0.0389			
	R(D524:10)	0.0340			

Determination of Copper Corrosion 3hrs @ 50 °C on sample #11039

lab	method	value	mark	z(targ)	remarks
150	D130	1A		----	
311	ISO2160	1A		----	
312	D130	1A		----	
323	ISO2160	1A		----	
338		----		----	
343	ISO2160	1A		----	
353	ISO2160	1A		----	
402		----		----	
431		----		----	
432		----		----	
433		----		----	
444		----		----	
445	IP154	1A		----	
463	ISO2160	1A		----	
494	ISO2160	1		----	
495	ISO2160	1		----	
496	ISO2160	1A		----	
540	D130	1A		----	
631	D130	1A		----	
1006	D130	1A		----	
1017	ISO2160	1A		----	
1033		----		----	
1047	ISO2160	1		----	
1059	ISO2160	1A		----	
1080	ISO2160	1A		----	
1081	D130	1A		----	
1108	ISO2160	1		----	
1126		----		----	
1131		----		----	
1138	D130	1A		----	
1140	ISO2160	1A		----	
1146		----		----	
1161	ISO2160	1A		----	
1194		----		----	
1195		----		----	
1203	ISO2160	1		----	
1205		----		----	
1218		----		----	
1227	D130	1A		----	
1237	ISO2160	1A		----	
1259	ISO2160	1A		----	
1299	D130	1A		----	
1346	ISO2160	1A		----	
1378	ISO2160	1A		----	
1389	ISO2160	1A		----	
1397	ISO2160	1		----	
1402	ISO2160	1A		----	
1404	ISO2160	1A		----	
1406	ISO2160	1A		----	
1407		----		----	
1427	ISO2160	1A		----	
1428	ISO2160	1		----	
1510	ISO2160	1A		----	
1634	ISO2160	1A		----	
1635	ISO2160	1A		----	
1636	ISO2160	1A		----	
1650	ISO2160	1A		----	
1706		----		----	
1710	ISO2160	1A		----	
1715		----		----	
1724	ISO2160	1A		----	
1807	ISO2160	1A		----	
1810		----		----	
1811	ISO2160	1		----	
1833	ISO2160	1A		----	
1948	ISO2160	1A		----	
2129	ISO2160	1A		----	
2146		----		----	
	normality	unknown			
	n	49			
	outliers	0			
	mean (n)	1A			
	st.dev. (n)	n.a			
	R(calc.)	n.a			
	R(ISO2160:98)	n.a			

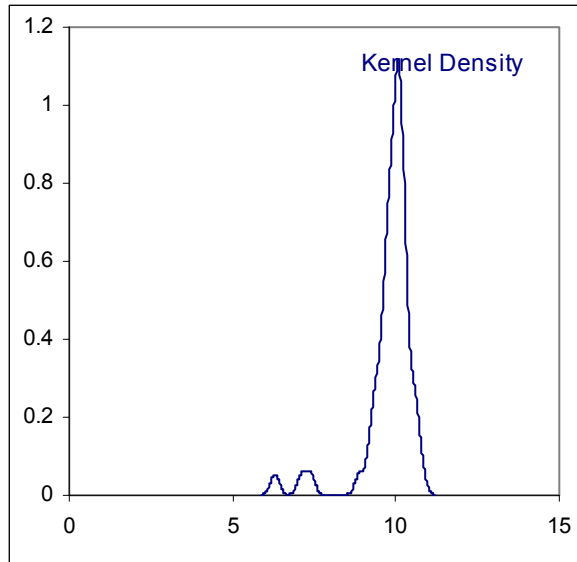
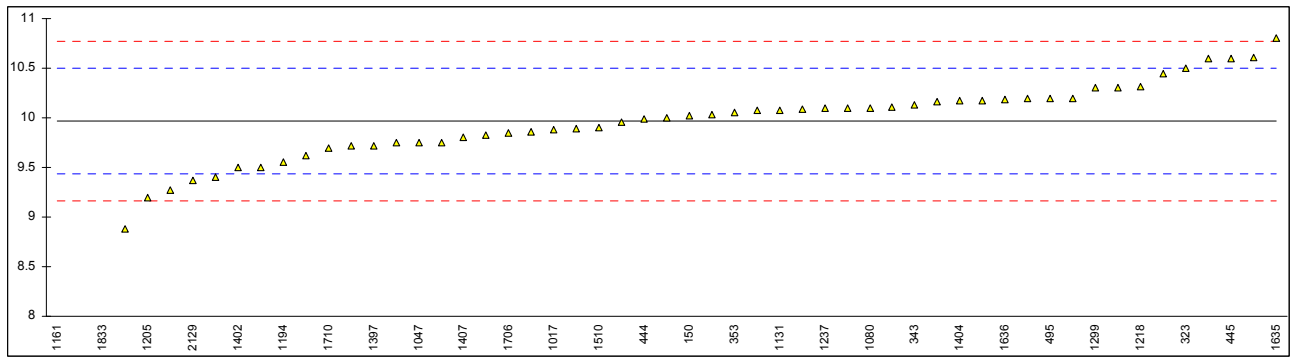
Determination of Density @15 °C on sample #11039; result in kg/m³

lab	method	value	mark	z(targ)	remarks
150	D4052	839.8		0.23	
311	ISO12185	839.8		0.23	
312	D4052	839.7		-0.33	
323	ISO12185	839.6		-0.89	
338	ISO12185	840.3	G(0.01)	3.03	
343	ISO12185	839.8		0.23	
353	ISO12185	839.7		-0.33	
402	ISO12185	839.90		0.79	
431	ISO12185	839.75		-0.05	
432	ISO12185	839.84		0.45	
433	ISO12185	839.8		0.23	
444	D4052	839.8	C	0.23	First reported 0.8398
445	IP365	839.9		0.79	
463	ISO12185	839.77		0.06	
494	ISO12185	839.75		-0.05	
495	ISO12185	839.8		0.23	
496	ISO12185	839.65		-0.61	
540		----		----	
631	D4052	840.0		1.35	
1006	D4052	839.8		0.23	
1017	ISO12185	839.76		0.00	
1033	IP365	839.7		-0.33	
1047	ISO12185	839.6		-0.89	
1059	ISO12185	839.6		-0.89	
1080	ISO12185	839.7		-0.33	
1081	ISO12185	839.9		0.79	
1108	ISO12185	839.8		0.23	
1126	ISO12185	839.8		0.23	
1131	ISO12185	839.8		0.23	
1138	D4052	839.8		0.23	
1140	D4052	839.9	C	0.79	First reported 0.8399
1146	ISO12185	839.80		0.23	
1161	ISO12185	839.46		-1.68	
1194		----		----	
1195		----		----	
1203	ISO12185	839.7		-0.33	
1205	ISO12185	839.79		0.17	
1218	ISO12185	839.84		0.45	
1227	D445	839.8		0.23	
1237	ISO12185	839.5		-1.45	
1259	ISO12185	839.8		0.23	
1299	D4052	839.6		-0.89	
1346	ISO12185	839.84		0.45	
1378	D4052	839.8		0.23	
1389	D4052	839.8		0.23	
1397	ISO12185	839.74		-0.11	
1402	ISO12185	839.6		-0.89	
1404	ISO12185	839.8		0.23	
1406	ISO12185	839.76		0.00	
1407	ISO12185	839.76		0.00	
1427	ISO12185	839.78		0.12	
1428	ISO12185	839.7		-0.33	
1510	ISO12185	839.8		0.23	
1634	ISO12185	839.740		-0.11	
1635	ISO12185	839.6		-0.89	
1636	D4052	839.8		0.23	
1650	D4052	839.78		0.12	
1706	ISO12185	839.74		-0.11	
1710	ISO12185	839.7		-0.33	
1715	ISO12185	839.8		0.23	
1724	ISO12185	839.78		0.12	
1807	ISO12185	839.7		-0.33	
1810	ISO12185	839.6		-0.89	
1811	ISO12185	839.7		-0.33	
1833	ISO12185	840.0		1.35	
1948	ISO12185	839.9		0.79	
2129	ISO12185	839.8		0.23	
2146		----		----	
	normality	not OK			
	n	63			
	outliers	1			
	mean (n)	839.759			
	st.dev. (n)	0.1025			
	R(calc.)	0.287			
	R(ISO12185:96)	0.500			



Determination of Fatty Acid Methyl Esters content on sample #11039; result in %V/V

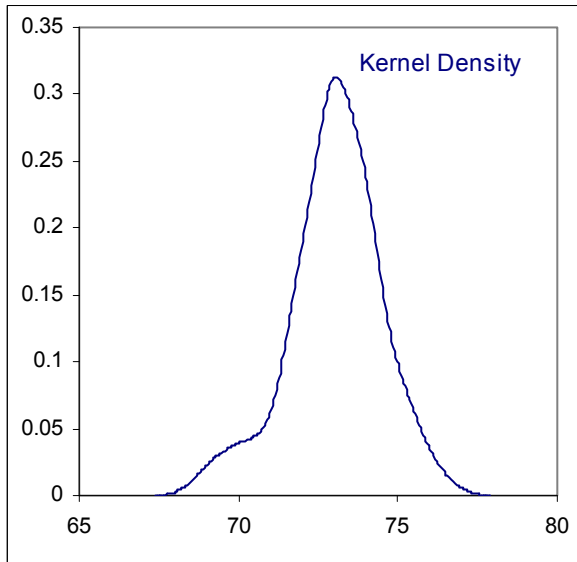
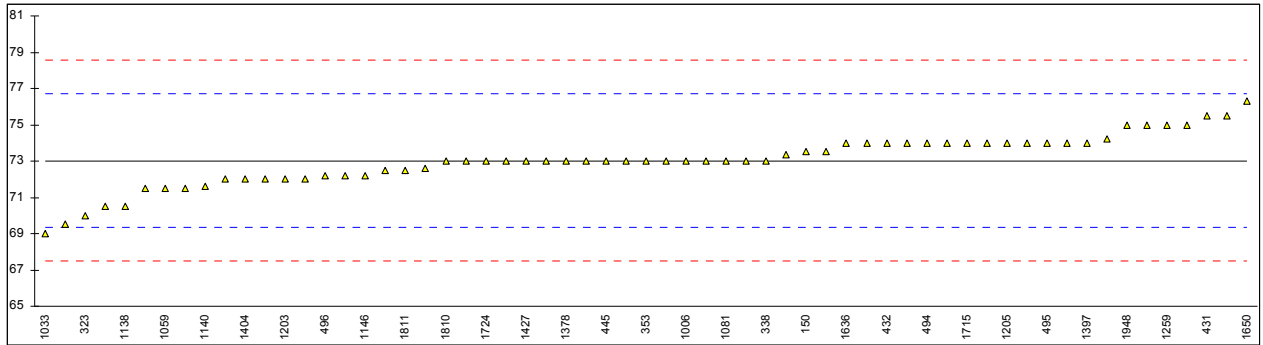
lab	method	value	mark	z(targ)	remarks
150	D7371	10.02		0.20	
311	EN14078	10.2	C	0.87	First reported 7.5
312	EN14078	9.96		-0.03	
323	EN14078	10.5		1.99	
338	EN14078	9.624		-1.28	
343	EN14078	10.135		0.63	
353	EN14078	10.051		0.31	
402	EN14078	10.03		0.23	
431		----		----	
432		----		----	
433		----		----	
444	EN14078	9.99		0.08	
445	EN14078	10.60		2.36	
463	EN14078	9.821		-0.55	
494		----		----	
495	EN14078	10.2		0.87	
496	EN14078	10.11		0.53	
540		----		----	
631		----		----	
1006	EN14078	10.08		0.42	
1017	EN14078	9.8816		-0.32	
1033	EN14078	10.16		0.72	
1047	EN14078	9.75		-0.81	
1059	EN14078	10.6		2.36	
1080	EN14078	10.1		0.50	
1081		----		----	
1108	EN14078	9.4		-2.12	
1126		----		----	
1131	EN14078	10.08		0.42	
1138		----		----	
1140	EN14078	10.45		1.80	
1146	in house	10.177		0.78	
1161	EN14078	6.3	C,G(0.01)	-13.71	First reported 5.5
1194	in house	9.55		-1.56	
1195	EN14078	7.1212	G(0.01)	-10.64	
1203	EN14078	10.00		0.12	
1205	EN14078	9.2		-2.87	
1218	EN14078	10.32		1.32	
1227		----		----	
1237	EN14078	10.1		0.50	
1259	EN14078	10.10		0.50	
1299	EN14078	10.3		1.24	
1346	EN14078	9.86		-0.40	
1378	EN14078	10.09		0.46	
1389	EN14078	9.27		-2.61	
1397	EN14078	9.72		-0.92	
1402	EN14078	9.5		-1.75	
1404	EN14078	10.17		0.76	
1406	EN14078	9.7150		-0.94	
1407	EN14078	9.8		-0.63	
1427	EN14078	10.3		1.24	
1428	EN14078	9.746		-0.83	
1510	EN14078	9.9		-0.25	
1634		----		----	
1635	EN14078	10.8		3.11	
1636	EN14078	10.19		0.83	
1650	EN14078	9.89		-0.29	
1706	EN14078	9.85		-0.44	
1710	EN14078	9.7		-1.00	
1715		----		----	
1724	EN14078	10.61		2.40	
1807	EN14078	10.2		0.87	
1810	EN14078	9.5		-1.75	
1811	EN14078	9.75		-0.81	
1833	EN14078	7.4	G(0.01)	-9.60	
1948	EN14078	8.88		-4.06	
2129	EN14078	9.371		-2.23	
2146		----		----	
	normality	OK			
	n	52			
	outliers	3			
	mean (n)	9.967			
	st.dev. (n)	0.3798			
	R(calc.)	1.063			
	R(EN14078:09)	0.749			Range B



Determination of Flash Point PMcc on sample #11039; result in °C

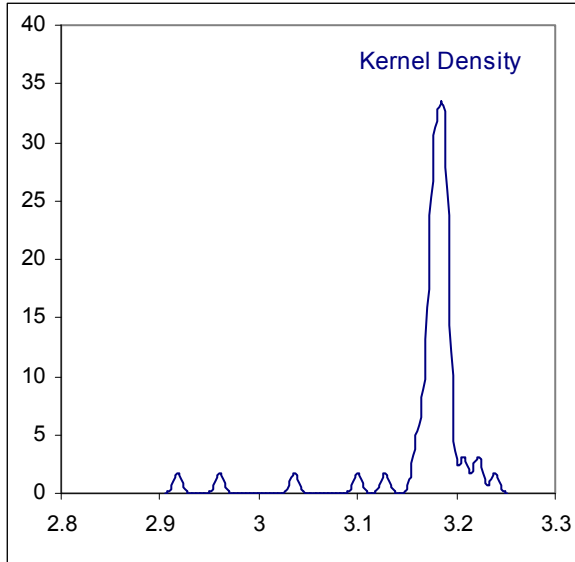
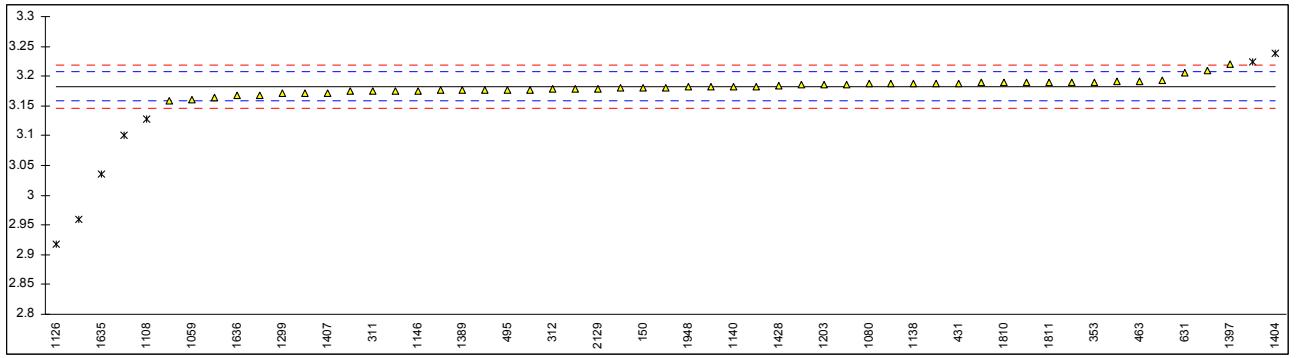
lab	method	value	mark	z(targ)	remarks
150	D93-A	73.5		0.26	
311	ISO2719	73		-0.01	
312	D93-A	74		0.53	
323	ISO2719-A	70.0		-1.63	
338	ISO2719	73		-0.01	
343	ISO2719	74.0		0.53	
353	ISO2719	73.0		-0.01	
402	ISO2719	73.32	C	0.16	First reported 78.32
431	ISO2719	75.5		1.34	
432	ISO2719	74.0		0.53	
433	D7094	73.0		-0.01	
444	D93	72.6		-0.23	
445	IP34-A	73.0		-0.01	
463	D93	73		-0.01	
494	ISO2719	74.0		0.53	
495	ISO2719	74.0		0.53	
496	ISO2719	72.2		-0.45	
540		----		----	
631	D93	70.5		-1.36	
1006	D93	73		-0.01	
1017	ISO2719	73.0		-0.01	
1033	IP34	69	C	-2.17	First reported 64.0
1047	ISO2719	72.5		-0.28	
1059	ISO2719	71.5		-0.82	
1080	ISO2719	71.5		-0.82	
1081	D93-A,E	73.0		-0.01	
1108	ISO2719	73.0		-0.01	
1126	ISO2719	72.0		-0.55	
1131		----		----	
1138	IP34-A	70.5		-1.36	
1140	D93	71.6		-0.77	
1146	D93	72.2		-0.45	
1161	ISO2719	75.5		1.34	
1194		----		----	
1195		----		----	
1203	ISO2719	72.0		-0.55	
1205	D93	74.0		0.53	
1218		----		----	
1227	D93	74.2		0.63	
1237	ISO2719	72		-0.55	
1259	ISO2719	75.0		1.07	
1299	D93	73.5		0.26	
1346	ISO2719-A,E	74		0.53	
1378	D93	73		-0.01	
1389	D93-M,F	71.5		-0.82	
1397	ISO2719	74.0		0.53	
1402	ISO2719	74.0		0.53	
1404	ISO2719	72.0		-0.55	
1406	ISO2719	73.0		-0.01	
1407	ISO2719	73.0		-0.01	
1427	ISO2719	73.0		-0.01	
1428	ISO2719	69.5		-1.90	
1510	ISO2719	74		0.53	
1634	ISO2719	72.2		-0.45	
1635	ISO2719	73.0		-0.01	
1636	D93	74.0		0.53	
1650	D93	76.3		1.77	
1706		----		----	
1710	ISO2719-A,E	74		0.53	
1715	D93	74		0.53	
1724	ISO2719	73		-0.01	
1807	ISO2719	75.0		1.07	
1810	ISO2719	73.0		-0.01	
1811	ISO2719	72.5		-0.28	
1833	ISO2719	72		-0.55	
1948	ISO2719	75		1.07	
2129	ISO2719	75.0		1.07	
2146		----		----	
	normality	not OK			
	n	61			
	outliers	0			
	mean (n)	73.02			
	st.dev. (n)	1.417			
	R(calc.)	3.97			
	R(ISO2719:02)	5.18			

M = manual; A = Automated; E = Electric; F = Flame



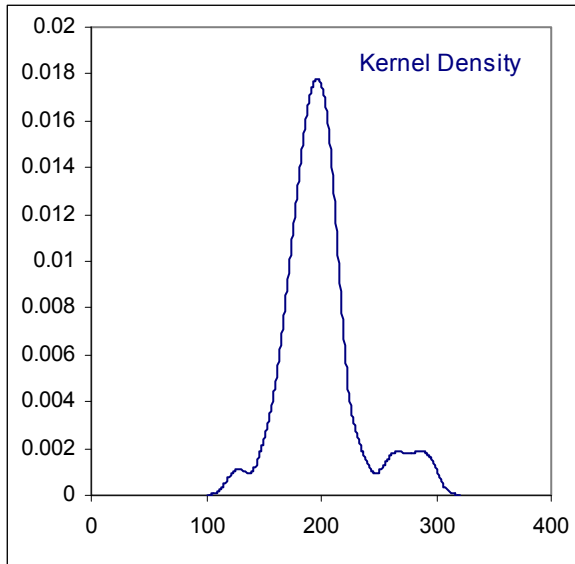
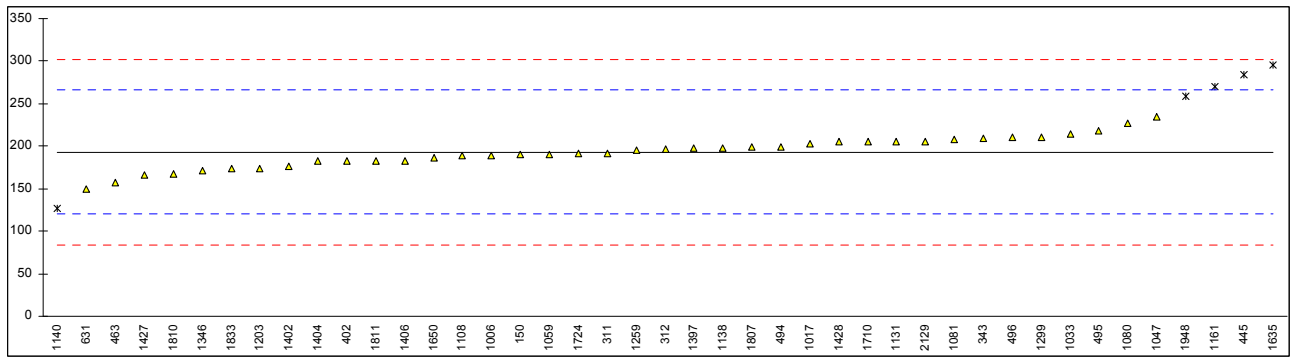
Determination of Kinematic Viscosity @ 40°C on sample #11039; result in mm²/s

lab	method	value	mark	z(targ)	remarks
150	D445	3.181		-0.11	
311	ISO3104	3.175		-0.60	
312	D445	3.178		-0.35	
323		----		----	
338		----		----	
343	ISO3104	3.189		0.55	
353	ISO3104	3.190		0.63	
402		----		----	
431	ISO3104	3.1884		0.50	
432	ISO3104	3.183		0.06	
433		----		----	
444	D445	3.100	CG(0.01)	-6.72	First reported 3.1140
445	IP71	3.1870		0.38	
463	ISO3104	3.1917		0.77	
494	ISO3104	3.194		0.95	
495	ISO3104	3.177		-0.43	
496	ISO3104	3.1830		0.06	
540	ISO3104	3.1787		-0.30	
631	D445	3.205		1.85	
1006	D445	3.1804		-0.16	
1017	D445	3.1772		-0.42	
1033	IP71	3.186		0.30	
1047	ISO3104	3.175		-0.60	
1059	ISO3104	3.160		-1.82	
1080	ISO3104	3.187		0.38	
1081	D445	3.171		-0.92	
1108	ISO3104	3.128	G(0.05)	-4.43	
1126	inhouse	2.918	G(0.01)	-21.58	
1131		----		----	
1138	IP71	3.188		0.46	
1140	D445	3.183		0.06	
1146	ISO3104	3.1756		-0.55	
1161	ISO3104	2.960	C,G(0.01)	-18.15	First reported 3.214
1194		----		----	
1195		----		----	
1203	ISO3104	3.185		0.22	
1205		----		----	
1218		----		----	
1227	D445	3.1755		-0.56	
1237	ISO3104	3.224	G(0.05)	3.40	
1259	ISO3104	3.1685		-1.13	
1299	D445	3.171		-0.92	
1346	ISO3104	3.1580		-1.99	
1378	D445	3.209		2.18	
1389	D445	3.1762		-0.50	
1397	ISO3104	3.22		3.08	
1402	ISO3104	3.164		-1.50	
1404	ISO3104	3.239	G(0.05)	4.63	
1406	ISO3104	3.1765		-0.47	
1407	ISO3104	3.1718		-0.86	
1427	ISO3104	3.191		0.71	
1428	ISO3104	3.184		0.14	
1510	ISO3104	3.189		0.55	
1634		----		----	
1635	ISO3104	3.036	G(0.01)	-11.95	
1636	D445	3.1684		-1.14	
1650	D445	3.1900		0.63	
1706		----		----	
1710	ISO3104	3.188		0.46	
1715		----		----	
1724	ISO3104	3.1811		-0.10	
1807	ISO3104	3.185		0.22	
1810	ISO3104	3.189		0.55	
1811	ISO3104	3.1892		0.56	
1833	ISO3104	3.176		-0.52	
1948	ISO3104	3.1814		-0.07	
2129	ISO3104	3.1795		-0.23	
2146		----		----	
	normality	OK			
	n	48			
	outliers	7			
	mean (n)	3.18231			
	st.dev. (n)	0.011309			
	R(calc.)	0.03167			
	R(ISO3104:94)	0.03430			



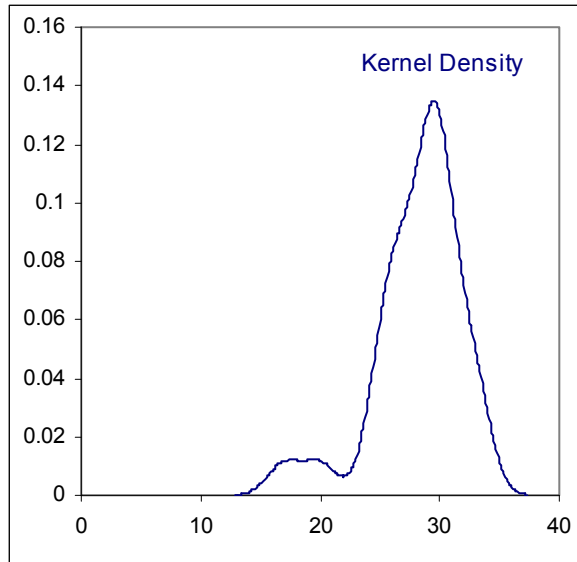
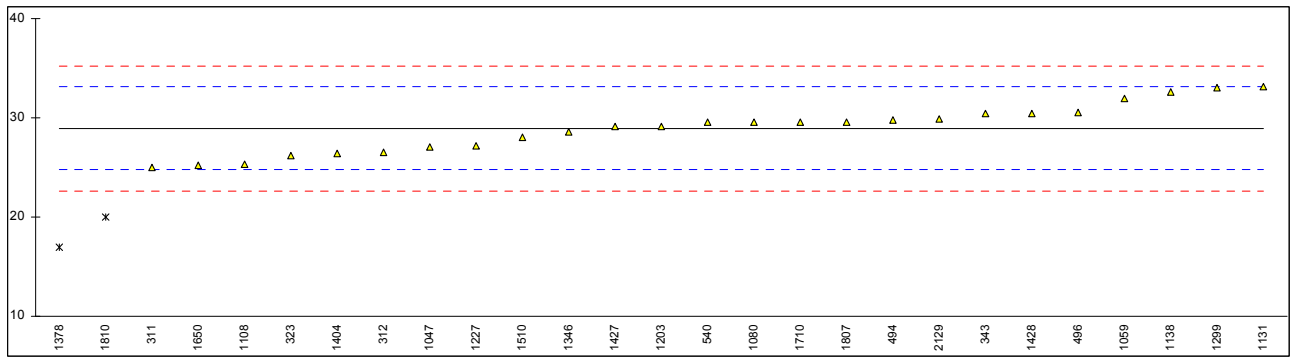
Determination of Lubricity by HFRR on sample #11039; result in μm

lab	method	value	mark	z(targ)	remarks
150	D6079	190		-0.08	
311	ISO12156	192	C	-0.03	First reported 319
312	ISO12156	196		0.08	
323		----		----	
338		----		----	
343	ISO12156	209		0.44	
353		----		----	
402	ISO12156	182		-0.30	
431		----		----	
432		----		----	
433		----		----	
444		----		----	
445	ISO12156	284	D,G(0.05)	2.50	
463	ISO12156	157.6		-0.97	
494	ISO12156	199		0.16	
495	ISO12156	218		0.69	
496	ISO12156	210		0.47	
540		----		----	
631	D7688	150		-1.18	
1006	D6078	189		-0.11	
1017	ISO12156	203		0.27	
1033	IP450	214		0.58	
1047	ISO12156	235		1.15	
1059	ISO12156	190		-0.08	
1080	ISO12156	227		0.93	
1081	ISO12156	208		0.41	
1108	ISO12156	189		-0.11	
1126		----		----	
1131	ISO12156	206		0.36	
1138	IP450	198		0.14	
1140	IP450	127	G(0.05)	-1.81	
1146		----		----	
1161	ISO12156	270	C,DG(0.05)	2.11	First reported 341
1194		----		----	
1195		----		----	
1203	ISO12156	174		-0.52	
1205		----		----	
1218		----		----	
1227		----		----	
1237		----		----	
1259	ISO12156	195		0.05	
1299	ISO12156	211		0.49	
1346	ISO12156	171		-0.60	
1378		----		----	
1389		----		----	
1397	ISO12156	198		0.14	
1402	ISO12156	176		-0.47	
1404	ISO12156	182		-0.30	
1406	ISO12156	182		-0.30	
1407		----		----	
1427	ISO12156	166		-0.74	
1428	ISO12156	205		0.33	
1510		----		----	
1634		----		----	
1635	ISO12156	295	DG(0.05)	2.80	
1636		----		----	
1650	ISO12156	186		-0.19	
1706		----		----	
1710	ISO12156	206		0.36	
1715		----		----	
1724	ISO12156	191		-0.06	
1807	ISO12156	199		0.16	
1810	ISO12156	168		-0.69	
1811	ISO12156	182		-0.30	
1833	ISO12156	174		-0.52	
1948	ISO12156	258.76	DG(0.05)	1.80	
2129	ISO12156	206		0.36	
2146		----		----	
	normality	OK			
	n	38			
	outliers	5			
	mean (n)	193.02			
	st.dev. (n)	18.384			
	R(calc.)	51.48			
	R(ISO12156-1:06)	102.00			



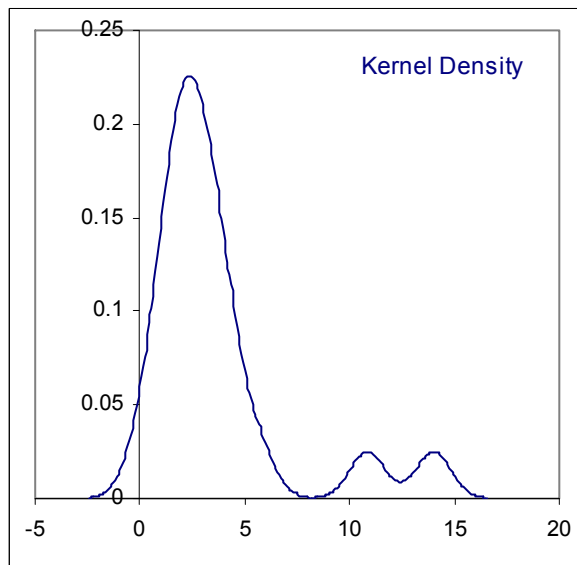
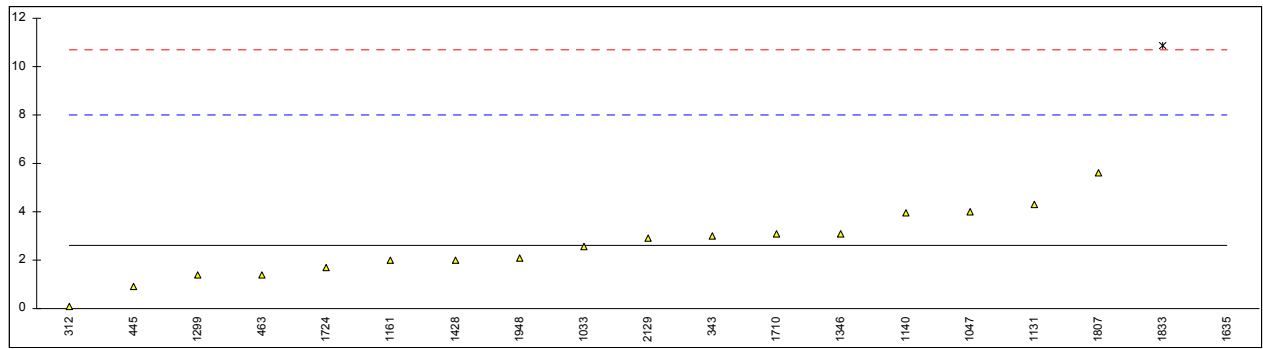
Determination of Oxidation Stability EN15751 on sample #11039; result in hours

lab	method	value	mark	z(targ)	remarks
150		----		----	
311	EN15751	25		-1.88	
312	EN15751	26.5		-1.17	
323	EN15751	26.2		-1.31	
338		----		----	
343	EN15751	30.4		0.69	
353		----		----	
402		----		----	
431		----		----	
432		----		----	
433		----		----	
444		----		----	
445		----		----	
463		----		----	
494	EN15751	29.79		0.40	
495		----		----	
496	EN15751	30.56		0.76	
540	EN15751	29.59		0.30	
631		----		----	
1006		----		----	
1017		----		----	
1033	IP574	>20		----	
1047	EN15751	27.1		-0.88	
1059	EN15751	32.0		1.45	
1080	EN15751	29.6		0.31	
1081		----		----	
1108	EN15751	25.3		-1.74	
1126		----		----	
1131	EN15751	33.14		1.99	
1138	EN15751	32.6		1.73	
1140		----		----	
1146		----		----	
1161		----		----	
1194		----		----	
1195		----		----	
1203	EN15751	29.1		0.07	
1205		----		----	
1218		----		----	
1227	EN15751	27.2		-0.84	
1237		----		----	
1259		----		----	
1299	EN15751	33.0		1.92	
1346	EN15751	28.58		-0.18	
1378	EN15751	17	G(0.05)	-5.69	
1389		----		----	
1397	EN15751	>27		----	
1402		----		----	
1404	EN15751	26.4		-1.22	
1406		----		----	
1407		----		----	
1427	EN15751	29.1		0.07	
1428	EN15751	30.42		0.70	
1510	EN15751	28.0		-0.45	
1634		----		----	
1635		----		----	
1636		----		----	
1650	EN15751	25.2		-1.79	
1706		----		----	
1710	EN15751	29.6		0.31	
1715		----		----	
1724		----		----	
1807	EN15751	29.6		0.31	
1810	EN15751	20	G(0.05)	-4.26	
1811		----		----	
1833		----		----	
1948		----		----	
2129	EN15751	29.93		0.45	
2146		----		----	
	normality	OK			
	n	25			
	outliers	2			
	mean (n)	28.955			
	st.dev. (n)	2.3922			
	R(calc.)	6.698			
	R(EN15751:09)	5.885			



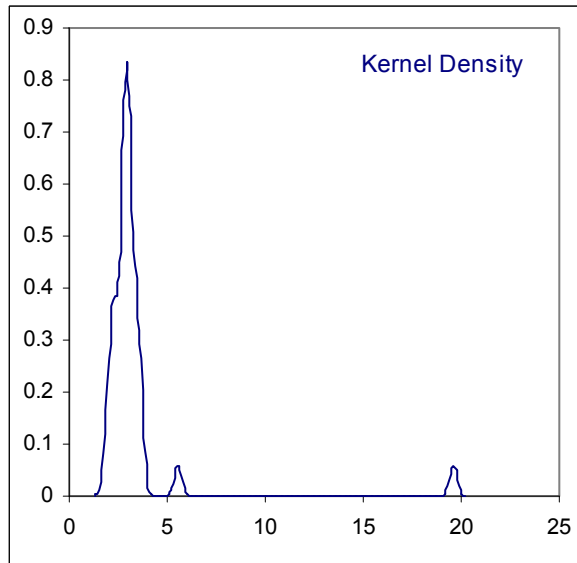
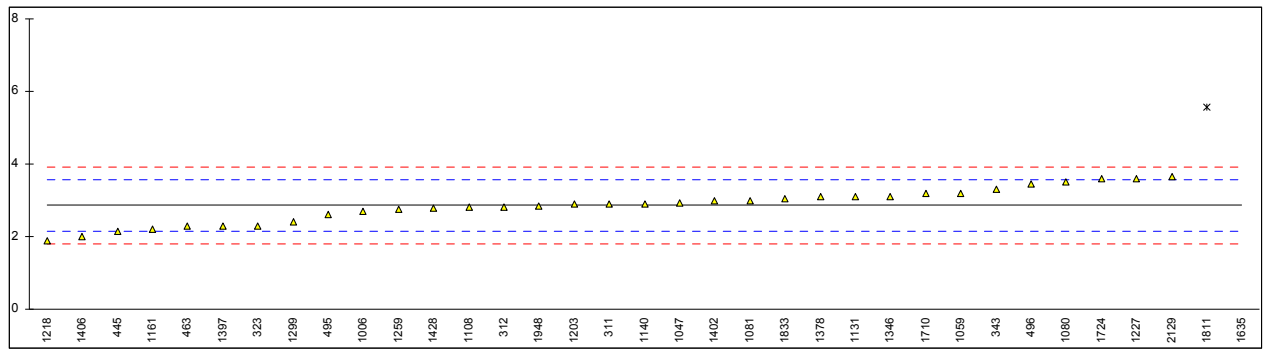
Determination of Oxidation Stability ISO12205 on sample #11039; result in g/m³

lab	method	value	mark	z(targ)	remarks
150		----		----	
311		----		----	
312	D2274	0.1		-0.92	
323		----		----	
338		----		----	
343	ISO12205	3		0.15	
353		----		----	
402		----		----	
431		----		----	
432		----		----	
433		----		----	
444		----		----	
445	IP388	0.9		-0.63	
463	ISO12205	1.4		-0.44	
494		----		----	
495		----		----	
496		----		----	
540		----		----	
631		----		----	
1006		----		----	
1017		----		----	
1033	D2274	2.57		-0.01	
1047	ISO12205	4.0	C	0.52	First reported 12
1059	ISO12205	<1		----	
1080		----		----	
1081		----		----	
1108		----		----	
1126		----		----	
1131	ISO12205	4.3		0.63	
1138		----		----	
1140	D2274	3.96		0.50	
1146		----		----	
1161	ISO12205	2		-0.22	
1194		----		----	
1195		----		----	
1203		----		----	
1205		----		----	
1218		----		----	
1227		----		----	
1237		----		----	
1259		----		----	
1299	D2274	1.4		-0.44	
1346	ISO12205	3.1		0.19	
1378		----		----	
1389		----		----	
1397		----		----	
1402		----		----	
1404		----		----	
1406		----		----	
1407		----		----	
1427		----		----	
1428	ISO12205	2		-0.22	
1510		----		----	
1634		----		----	
1635	ISO12205	14	G(0.01)	4.22	
1636		----		----	
1650		----		----	
1706		----		----	
1710	ISO12205	3.1		0.19	
1715		----		----	
1724	ISO12205	1.7143		-0.33	
1807	ISO12205	5.6		1.11	
1810		----		----	
1811		----		----	
1833	ISO12205	10.85	G(0.01)	3.05	
1948	ISO12205	2.09		-0.19	
2129	ISO12205	2.9		0.11	
2146		----		----	
	normality	OK			
	n	17			
	outliers	2			
	mean (n)	2.596			
	st.dev. (n)	1.3746			
	R(calc.)	3.849			
	R(ISO12205:96)	7.566			



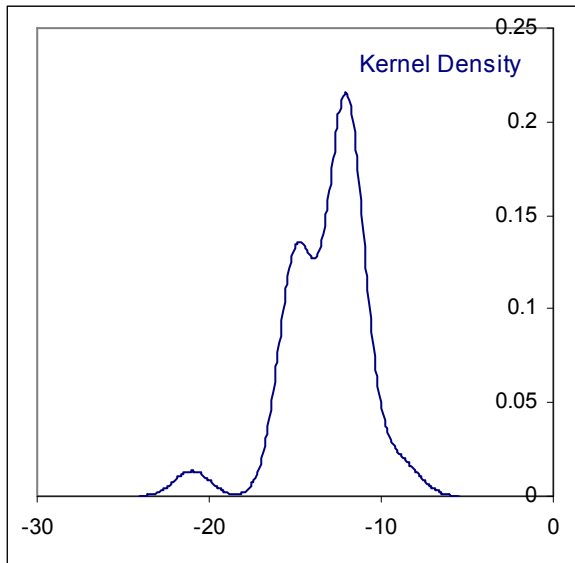
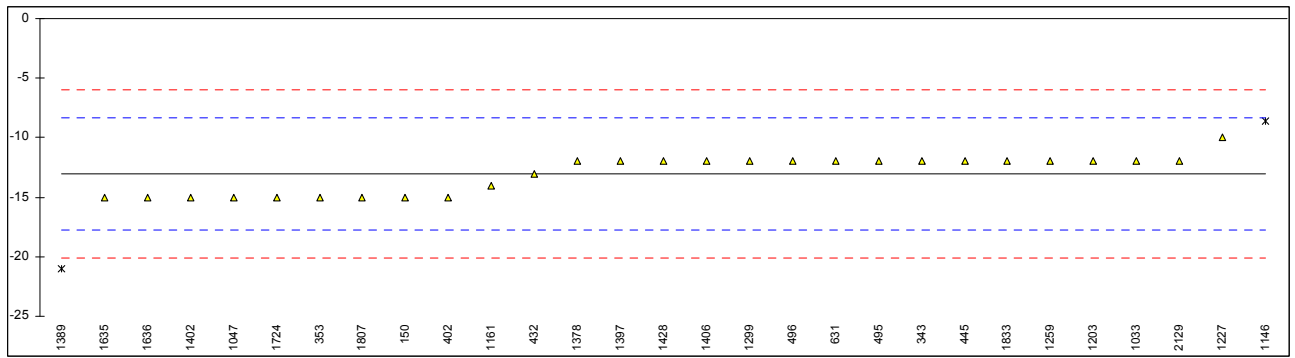
Determination of Polycyclic Aromatic Hydrocarbons on sample #11039; result in %M/M

lab	method	value	mark	z(targ)	remarks
150		----		----	
311	EN12916	2.9		0.12	
312	EN12916	2.81		-0.13	
323	EN12916	2.3		-1.57	
338		----		----	
343	EN12916	3.3		1.25	
353		----		----	
402		----		----	
431		----		----	
432		----		----	
433		----		----	
444		----		----	
445	IP391	2.1389		-2.02	
463	EN12916	2.295		-1.58	
494		----		----	
495	EN12916	2.60		-0.72	
496	EN12916	3.45		1.67	
540		----		----	
631		----		----	
1006	D6591	2.7		-0.44	
1017		----		----	
1033		----		----	
1047	EN12916	2.94		0.24	
1059	EN12916	3.2		0.97	
1080	EN12916	3.51		1.84	
1081	IP391	3.0		0.40	
1108	EN12916	2.8		-0.16	
1126		----		----	
1131	EN12916	3.1	C	0.69	First reported 5.1
1138		----		----	
1140	IP391	2.9		0.12	
1146		----		----	
1161	EN12916	2.21		-1.82	
1194		----		----	
1195		----		----	
1203	EN12916	2.89		0.09	
1205		----		----	
1218	EN12916	1.88		-2.75	
1227	EN12916	3.6		2.10	
1237		----		----	
1259	EN12916	2.741		-0.33	
1299	EN12916	2.4		-1.29	
1346	EN12916	3.11		0.71	
1378	IP391	3.1		0.69	
1389		----		----	
1397	EN12916	2.3		-1.57	
1402	EN12916	3.0		0.40	
1404		----		----	
1406	EN12916	2.00		-2.41	
1407		----		----	
1427		----		----	
1428	EN12916	2.79		-0.19	
1510		----		----	
1634		----		----	
1635	EN12916	19.6	G(0.01)	47.19	
1636		----		----	
1650		----		----	
1706		----		----	
1710	EN12916	3.2		0.97	
1715		----		----	
1724	EN12916	3.58		2.04	
1807		----		----	
1810		----		----	
1811	EN12916	5.56	G(0.01)	7.62	
1833	EN12916	3.03		0.49	
1948	EN12916	2.83		-0.07	
2129	EN12916	3.6562		2.25	
2146		----		----	
	normality	OK			
	n	33			
	outliers	2			
	mean (n)	2.856			
	st.dev. (n)	0.4701			
	R(calc.)	1.316			
	R(EN12916:06)	0.993			



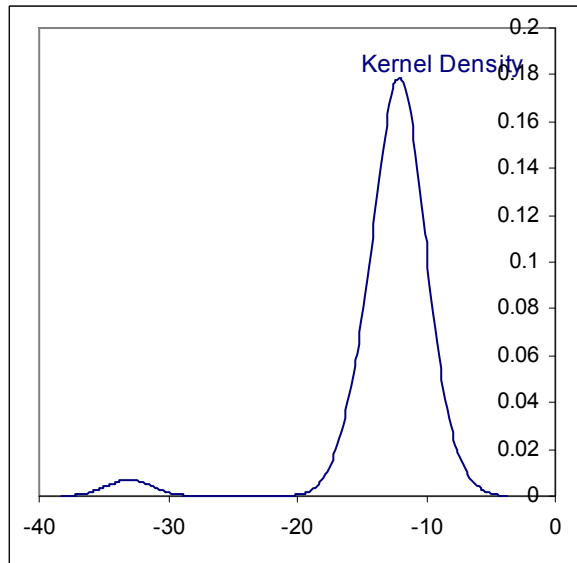
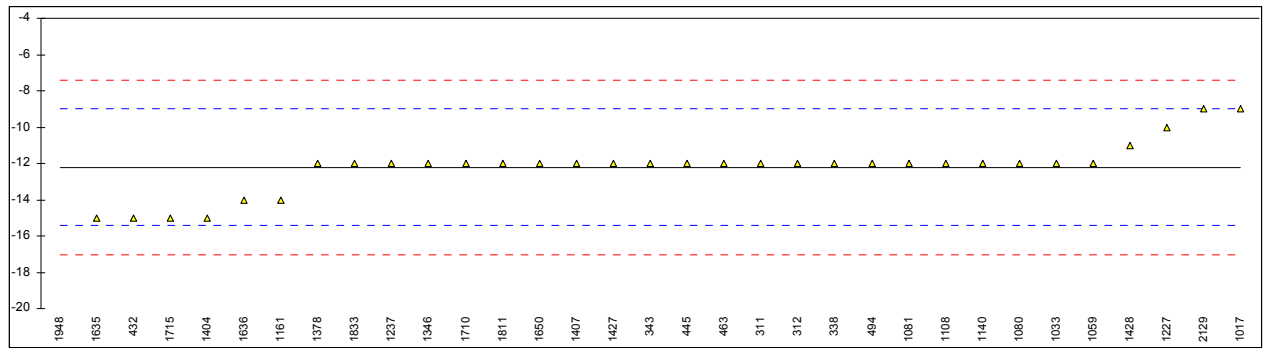
Determination of Pour Point (manual) on sample #11039; results in °C

lab	method	value	mark	z(targ)	remarks
150	D97	-15		-0.83	
311		----		----	
312		----		----	
323		----		----	
338		----		----	
343	D97	-12	C	0.44	Reported under automated method
353	ISO3016	-15		-0.83	
402	ISO3016	-15		-0.83	
431		----		----	
432	ISO3016	-13		0.02	
433		----		----	
444		----		----	
445	IP15	-12		0.44	
463		----		----	
494		----		----	
495	ISO3016	-12		0.44	
496	ISO3016	-12		0.44	
540		----		----	
631	D97	-12		0.44	
1006		----		----	
1017		----		----	
1033	IP15	-12	C	0.44	Reported under automated method
1047	ISO3016	-15		-0.83	
1059		----		----	
1080		----		----	
1081		----		----	
1108		----		----	
1126		----		----	
1131		----		----	
1138		----		----	
1140		----		----	
1146	ISO3016	-8.6	D(0.01)	1.88	
1161	D97	-14		-0.41	
1194		----		----	
1195		----		----	
1203	ISO3016	-12		0.44	
1205		----		----	
1218		----		----	
1227	D97	-10	C	1.29	Reported under automated method
1237		----		----	
1259	ISO3016	-12		0.44	
1299	D97	-12		0.44	
1346		----		----	
1378	D97	-12		0.44	
1389	D97	-21	G(0.01)	-3.38	
1397	ISO3016	-12		0.44	
1402	ISO3016	-15		-0.83	
1404		----		----	
1406	ISO3016	-12		0.44	
1407		----		----	
1427		----		----	
1428	ISO3016	-12		0.44	
1510		----		----	
1634		----		----	
1635	D97	-15		-0.83	
1636	D97	-15		-0.83	
1650		----		----	
1706		----		----	
1710		----		----	
1715		----		----	
1724	ISO3016	-15		-0.83	
1807	ISO3016	-15		-0.83	
1810		----		----	
1811		----		----	
1833	ISO3016	-12		0.44	
1948		----		----	
2129	ISO3016	-12		0.44	
2146		----		----	
	normality	not OK			
	n	27			
	outliers	2			
	mean (n)	-13.04			
	st.dev. (n)	1.531			
	R(calc.)	4.29			
	R(ISO3016:94)	6.60			



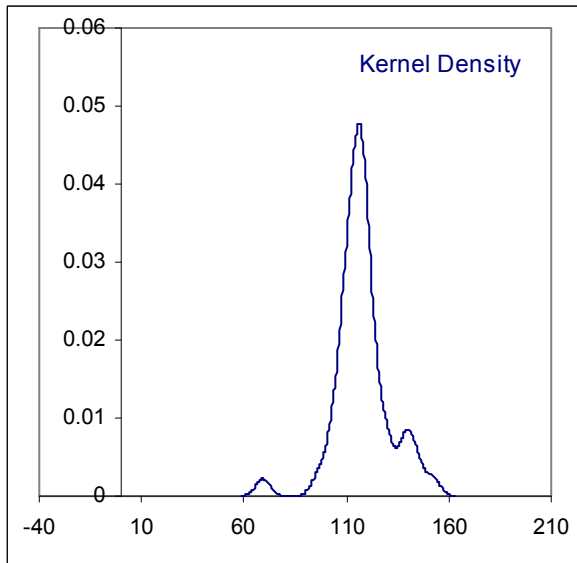
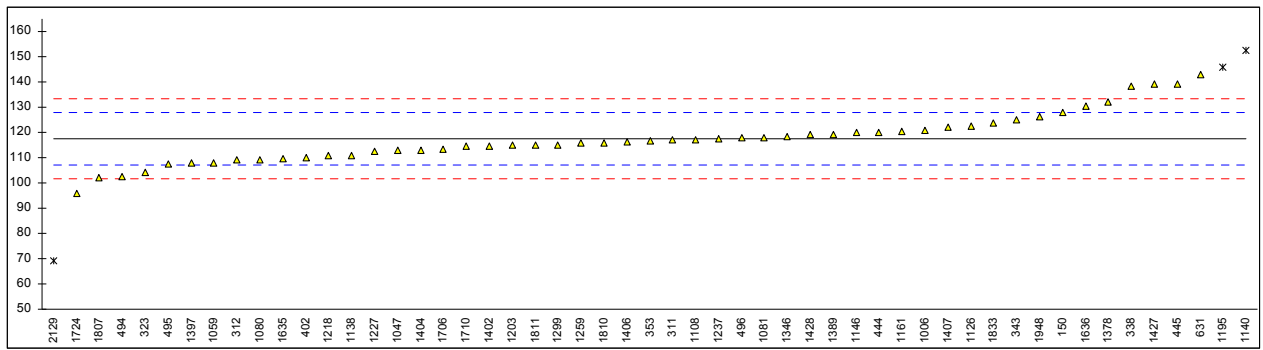
Determination of Pour Point (automated) on sample #11039; results in °C

lab	method	value	mark	z(targ)	remarks
150		----		----	
311	D5950	-12		0.19	
312	D5950	-12		0.19	
323		----		----	
338	D5950	-12.0		0.19	
343	D97	-12	ex	0.19	D97 describes the manual method
353		----		----	
402		----		----	
431		----		----	
432	D5950	-15		-1.67	
433		----		----	
444		----		----	
445	D5950	-12		0.19	
463	D6892	-12		0.19	
494	D5950	-12		0.19	
495		----		----	
496		----		----	
540		----		----	
631		----		----	
1006		----		----	
1017	D5950	-9		2.06	
1033	IP15	-12	ex	0.19	IP 15 describes the manual method
1047		----		----	
1059	ISO3016	-12		0.19	
1080	D5950	-12		0.19	
1081	D5950	-12		0.19	
1108	D5950	-12		0.19	
1126		----		----	
1131		----		----	
1138		----		----	
1140	D5950	-12		0.19	
1146		----		----	
1161	D6749	-14		-1.05	
1194		----		----	
1195		----		----	
1203		----		----	
1205		----		----	
1218		----		----	
1227	D97	-10	ex	1.44	D97 describes the manual method
1237	D5950	-12		0.19	
1259		----		----	
1299		----		----	
1346	D5950	-12		0.19	
1378	D5950	-12		0.19	
1389		----		----	
1397		----		----	
1402		----		----	
1404	in house	-15		-1.67	
1406		----		----	
1407	ISO3016	-12		0.19	
1427	D5950	-12.00		0.19	
1428	D6749	-11		0.82	
1510		----		----	
1634		----		----	
1635	D5950	-15		-1.67	
1636	D6749	-14		-1.05	
1650	D5950	-12		0.19	
1706		----		----	
1710	D5950	-12		0.19	
1715	D6749	-15		-1.67	
1724		----		----	
1807		----		----	
1810		----		----	
1811	D5950	-12		0.19	
1833	D5950	-12		0.19	
1948	D5950	-33	G(0.01)	-12.87	
2129	D5950	-9		2.06	
2146		----		----	
	normality	not OK			
	n	29			
	outliers	1			
	mean (n)	-12.31			
	st.dev. (n)	1.47			
	R(calc.)	4.10			
	R(D5950:07)	4.50			



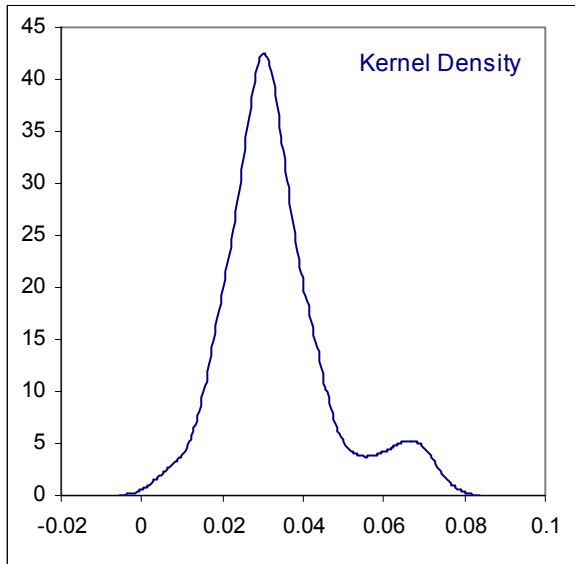
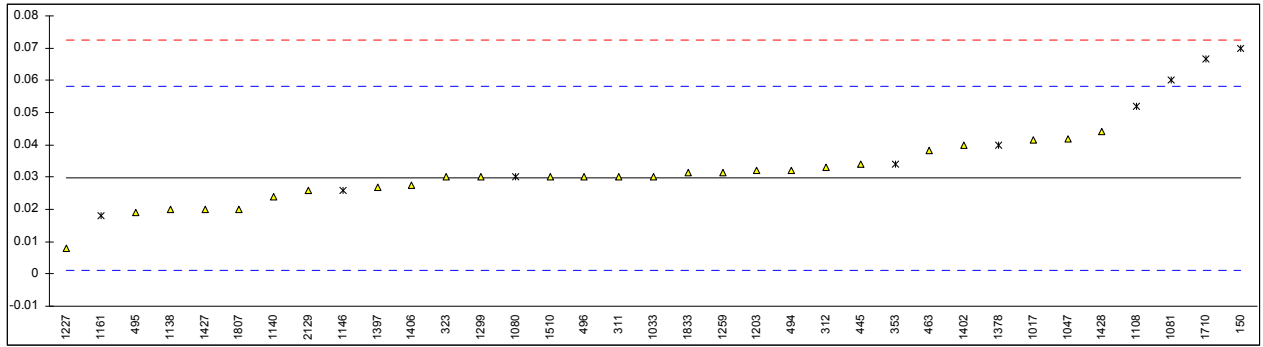
Determination of Sulphur Content on sample #11039; result in mg/kg

lab	method	value	mark	z(targ)	remarks
150	D5453	128		2.07	
311	ISO20846	117.0		-0.09	
312	D2622	109		-1.66	
323	ISO20846	104		-2.64	
338	ISO20846	138.5		4.13	
343	ISO20846	125		1.48	
353	IP531	116.6		-0.17	
402	ISO20846	109.8		-1.50	
431		----		----	
432		----		----	
433		----		----	
444	D5453	120.1		0.52	
445	D5453	139.3		4.28	
463		----		----	
494	ISO20846	102.5		-2.94	
495	ISO20846	107.4		-1.97	
496	ISO20846	117.9		0.09	
540		----		----	
631	D4294	143.0		5.01	
1006	D5453	121		0.69	
1017		----		----	
1033		----		----	
1047	ISO20884	113		-0.88	
1059	ISO20884	108		-1.86	
1080	ISO20846	109.2		-1.62	
1081	D2622	118		0.10	
1108	ISO20846	117		-0.09	
1126	ISO20846	122.7		1.03	
1131		----		----	
1138	IP490	111		-1.27	
1140	D4294	152.6	DG(0.05)	6.89	
1146	ISO14596	120		0.50	
1161	ISO20846	120.3	C	0.56	First reported 101
1194		----		----	
1195	ISO20846	145.694	DG(0.05)	5.54	
1203	ISO20846	115		-0.48	
1205		----		----	
1218	ISO20846	110.9		-1.29	
1227	D5453	112.5		-0.97	
1237	ISO20846	117.5		0.01	
1259	ISO20846	115.90		-0.31	
1299	ISO20846	115.1		-0.46	
1346	ISO20846	118.3		0.16	
1378	D4294	132		2.85	
1389	ISO20846	119.21		0.34	
1397	ISO20846	107.75		-1.91	
1402	ISO20846	114.7		-0.54	
1404	ISO20846	113		-0.88	
1406	ISO20846	116.22		-0.24	
1407	ISO20846	121.9		0.87	
1427	D5453	139.20		4.26	
1428	ISO20846	119		0.30	
1510		----		----	
1634		----		----	
1635	ISO20846	109.6		-1.54	
1636	D5453	130.4		2.54	
1650		----		----	
1706	ISO20846	113.2		-0.84	
1710	ISO20846	114.5		-0.58	
1715		----		----	
1724	ISO20846	95.99		-4.21	
1807	ISO20846	102		-3.03	
1810	ISO20846	116		-0.29	
1811	ISO20846	115		-0.48	
1833	ISO20846	123.7		1.22	
1948	ISO20846	126.4		1.75	
2129	D5453	69.29	G(0.01)	-9.43	
2146		----		----	
	normality	not OK			
	n	50			
	outliers	3			
	mean (n)	117.465			
	st.dev. (n)	9.7487			
	R(calc.)	27.296			
	R(ISO20846:04)	14.686			Compare R(D5453:09) = 20.684



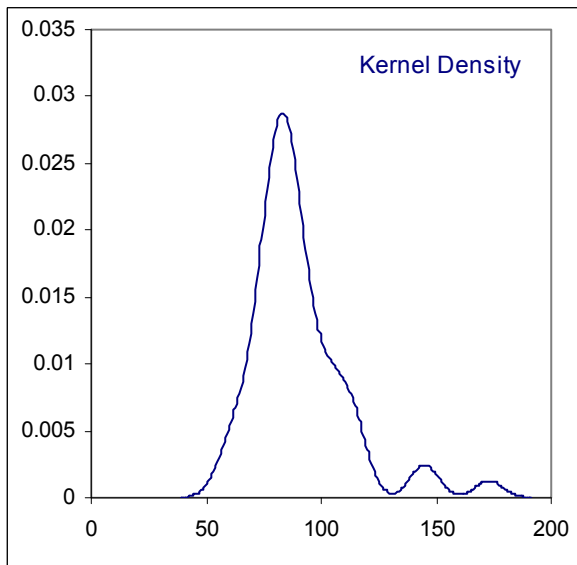
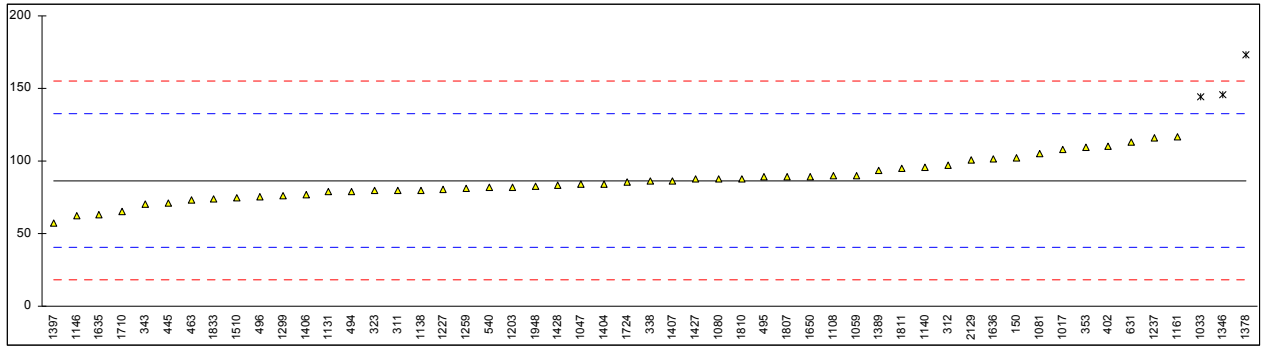
Determination of Total acid Number (TAN) on sample #11039; result in mgKOH/g

lab	method	value	mark	z(targ)	remarks
150	D974	0.07	DG(0.05)	----	
311	D974	0.03		----	
312	D974	0.033		----	
323	D974	0.03		----	
338		----		----	
343	D974	<0.1		----	
353	IP177	0.034	ex	----	method is not equivalent with D974
402		----		----	
431		----		----	
432		----		----	
433		----		----	
444		----		----	
445	D974	0.034		----	
463	D974	0.0384		----	
494	D974	0.032		----	
495	D974	0.019		----	
496	D974	0.030		----	
540		----		----	
631		----		----	
1006		----		----	
1017	D974	0.041548		----	
1033	D664	0.03		----	
1047	D974	0.042		----	
1059	ISO6619	<0.05		----	
1080	D664	0.03	ex	----	method is not equivalent with D974
1081	D664	0.06	ex	----	method is not equivalent with D974
1108	D664	0.052	ex	----	method is not equivalent with D974
1126		----		----	
1131		----		----	
1138	D974	0.02		----	
1140	IP139	0.024		----	
1146	D664	0.026	ex	----	method is not equivalent with D974
1161	D664	0.018	ex	----	method is not equivalent with D974
1194		----		----	
1195		----		----	
1203	D974	0.032		----	
1205		----		----	
1218		----		----	
1227	D974	0.008		----	
1237		----		----	
1259	D974	0.0315		----	
1299	D974	0.03		----	
1346		----		----	
1378	D664	0.04	ex	----	method is not equivalent with D974
1389		----		----	
1397	D974	0.027		----	
1402	D974	0.04		----	
1404	D974	<0.1		----	
1406	D664	0.0275		----	
1407		----		----	
1427	D974	0.02		----	
1428	D664	0.044		----	
1510	D974	0.03		----	
1634		----		----	
1635		----		----	
1636		----		----	
1650		----		----	
1706		----		----	
1710	ISO6618	0.0665	DG(0.05)	----	
1715		----		----	
1724		----		----	
1807	D974	0.02		----	
1810		----		----	
1811		----		----	
1833	D974	0.0315		----	
1948		----		----	
2129	D974	0.0258		----	
2146		----		----	
	normality	OK			
	n	26			
	outliers	9			
	mean (n)	0.0297			
	st.dev. (n)	0.00813			
	R(calc.)	0.0228			
	R(D974:08)	(0.0400)			



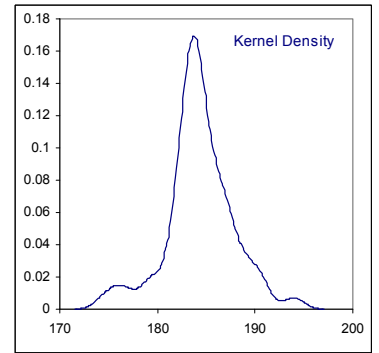
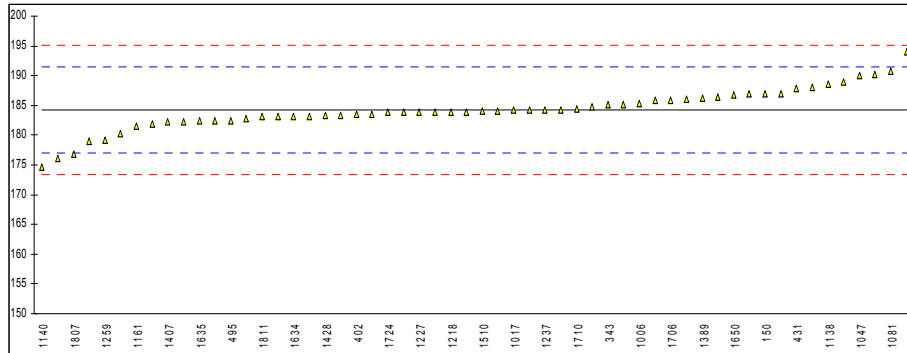
Determination of Water on sample #11039; result in mg/kg

lab	method	value	mark	z(targ)	remarks
150	ISO12937	102		0.67	
311	ISO12937	80		-0.29	
312	ISO12937	97		0.46	
323	ISO12937	80		-0.29	
338	ISO12937	86.33		-0.01	
343	ISO12937	70		-0.73	
353	IP439	109.5		1.00	
402	ISO12937	110.2		1.03	
431		----		----	
432		----		----	
433		----		----	
444		----		----	
445	IP438	71		-0.68	
463	ISO12937	73.5		-0.57	
494	ISO12937	79		-0.33	
495	ISO12937	89		0.11	
496	ISO12937	75.1		-0.50	
540	ISO12937	81.6		-0.22	
631	D6304	113.1		1.16	
1006		----		----	
1017	ISO12937	108.095		0.94	
1033	IP438	144.37	G(0.01)	2.53	
1047	ISO12937	84		-0.11	
1059	ISO12937	90		0.15	
1080	ISO12937	88		0.06	
1081	D6304	105		0.81	
1108	ISO12937	90		0.15	
1126		----		----	
1131	ISO12937	79		-0.33	
1138	IP438	80		-0.29	
1140	IP438	96		0.41	
1146	D6304	62		-1.08	
1161	ISO12937	116.482		1.31	
1194		----		----	
1195		----		----	
1203	ISO12937	82		-0.20	
1205		----		----	
1218		----		----	
1227	D6304	80.7		-0.26	
1237	ISO12937	116		1.29	
1259	ISO12937	81.3		-0.23	
1299	ISO12937	76.1		-0.46	
1346	ISO12937	145.4	G(0.05)	2.57	
1378	D1744	173	G(0.01)	3.78	
1389	ISO12937	93.26		0.29	
1397	ISO12937	57		-1.29	
1402		----		----	
1404	ISO12937	84		-0.11	
1406	ISO12937	77		-0.42	
1407	ISO12937	86.4		-0.01	
1427	ISO12937	88		0.06	
1428	ISO12937	83		-0.16	
1510	ISO12937	75		-0.51	
1634		----		----	
1635	ISO12937	63.4		-1.01	
1636	D6304	101.4		0.65	
1650	ISO12937	89		0.11	
1706		----		----	
1710	ISO12937	65		-0.94	
1715		----		----	
1724	ISO12937	85.4		-0.05	
1807	ISO12937	89		0.11	
1810	ISO12937	88		0.06	
1811	ISO12937	95		0.37	
1833	ISO12937	74		-0.55	
1948	ISO12937	82.4571		-0.18	
2129	ISO12937	101		0.63	
2146		----		----	
	normality	OK			
	n	50			
	outliers	3			
	mean (n)	86.586			
	st.dev. (n)	13.9736			
	R(calc.)	39.126			
	R(ISO12937:00)	63.992			

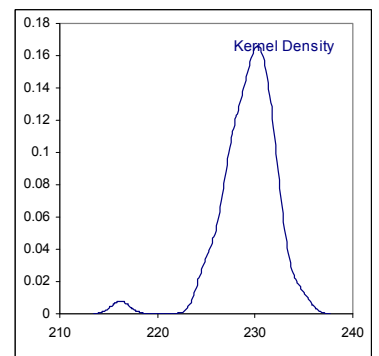
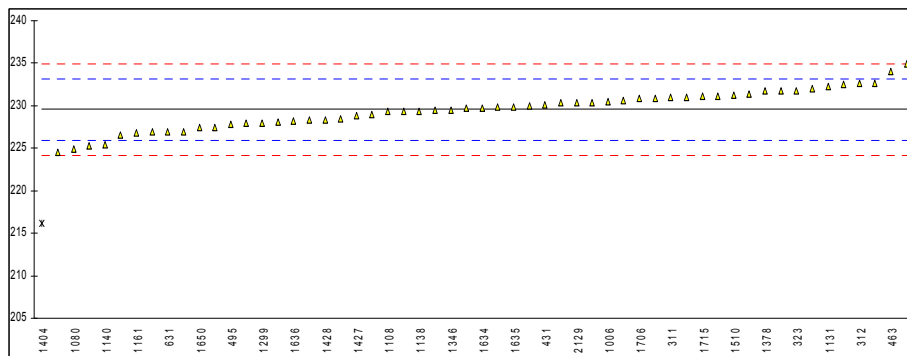


Originally reported results:

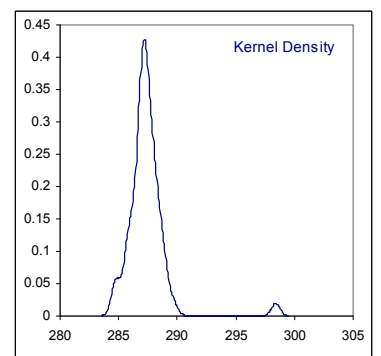
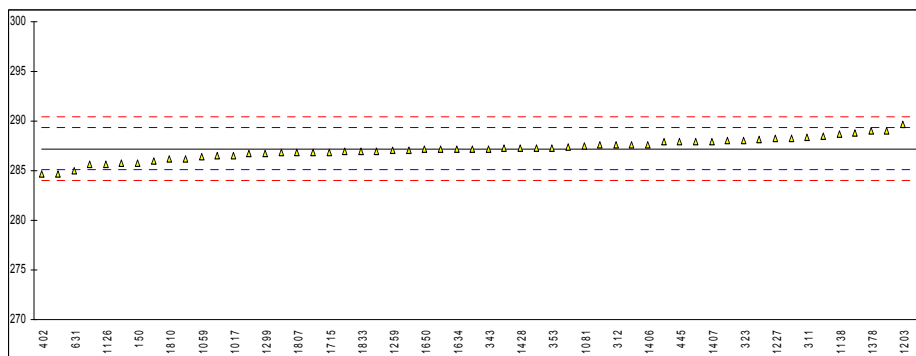
Lab 343 :10% rec: 218.1
 Lab 402 :10% rec: 223.59
 Lab 402 :50% rec: 283.59
 Lab 631 :10% rec: 224.0
 Lab 1080: IBP: 174.3



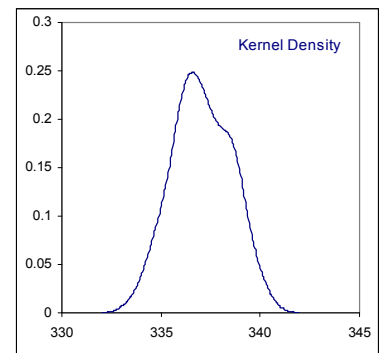
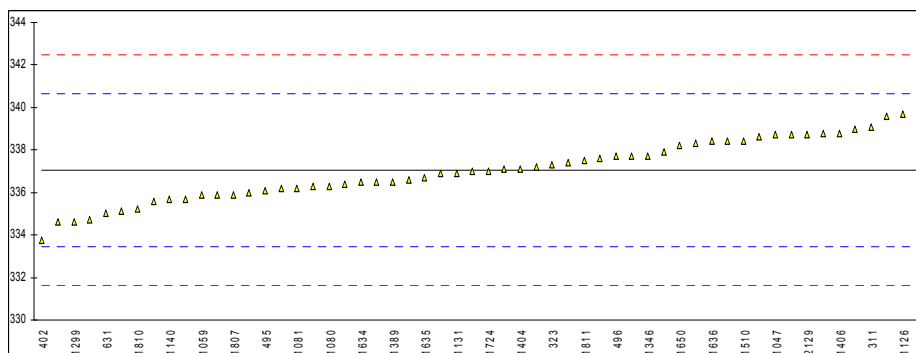
IBP



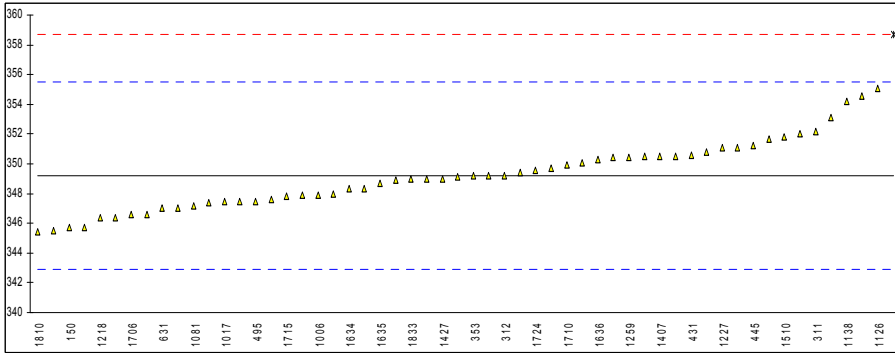
10% rec.



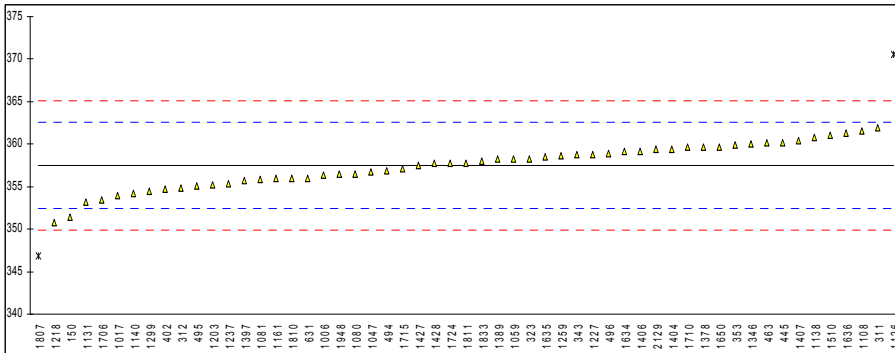
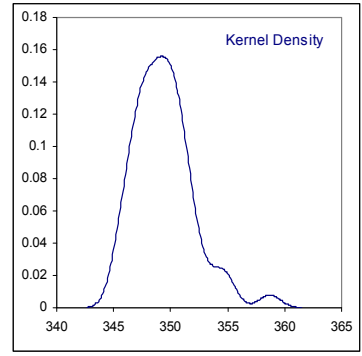
50% rec.



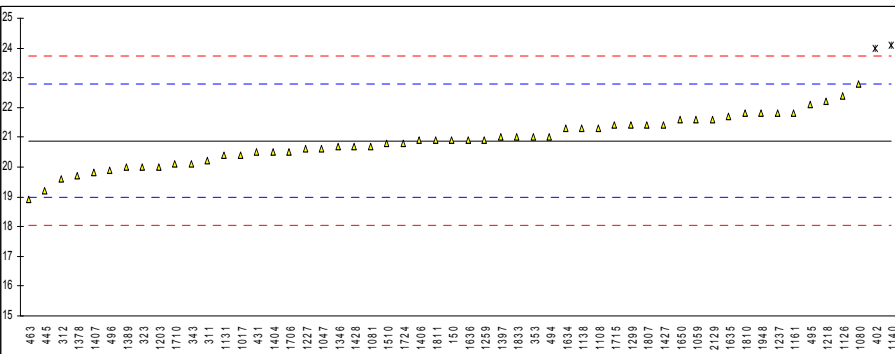
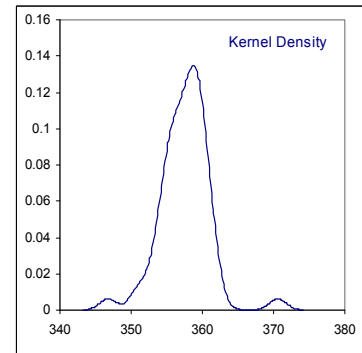
90% rec.



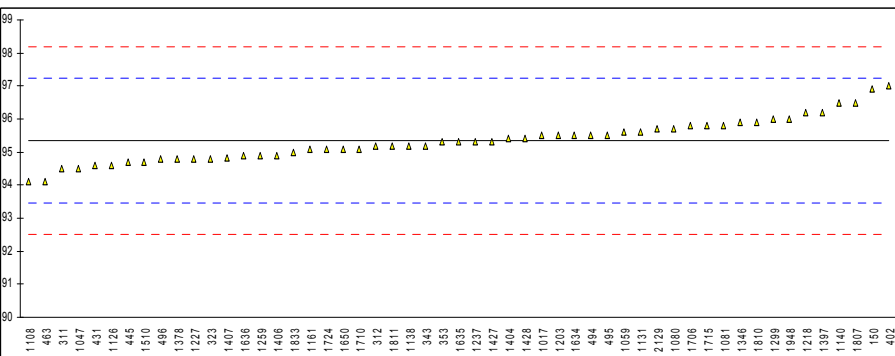
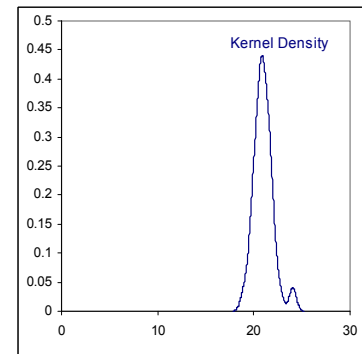
95% rec.



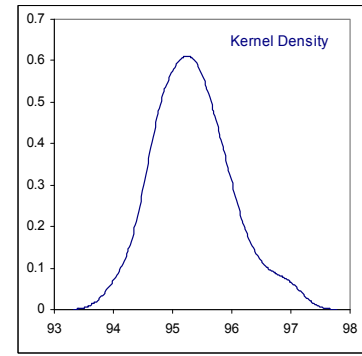
FBP



Volume@250°C



Volume@350°C



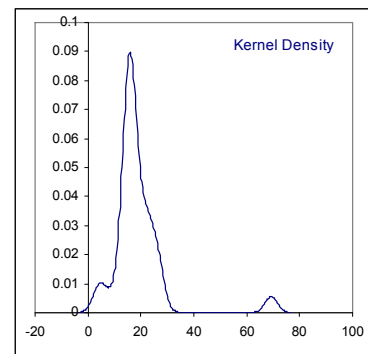
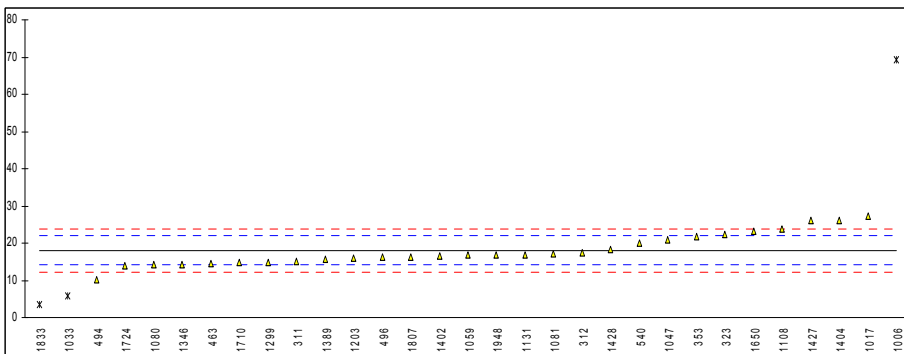
Determination of Distillation (Automated+Manual) on sample #11039; result in %V/V, (continued)

Lab	method	Volume at 250°C	mark	z(target)	Volume at 350°C	mark	z(target)	%residue	mark
150	D86-A	20.9		0.02	96.9		1.64	2.1	
311	ISO3405-A	20.2		-0.72	94.5		-0.89	1.0	
312	D86-A	19.6		-1.35	95.2		-0.15	2.0	
323	ISO3405-A	20.0		-0.93	94.8		-0.57	1.5	
338	----	----		----	----		----	----	
343	ISO3405-A	20.1		-0.82	95.2		-0.15	1.9	
353	ISO3405-A	21.0		0.12	95.3		-0.05	0.8	
402	ISO3405-M	24	DG(0.01)	3.28	97.0		1.74	1.1	
431	ISO3405-A	20.5		-0.40	94.6		-0.78	2.9	G(0.01)
432	----	----		----	----		----	----	
433	----	----		----	----		----	----	
444	----	----		----	----		----	----	
445	IP123-A	19.2		-1.77	94.7		-0.68	1.5	
463	ISO3405-A	18.9		-2.09	94.1		-1.31	1.7	
494	ISO3405-A	21.0		0.12	95.5		0.16	1.7	
495	ISO3405-A	22.1		1.28	95.5		0.16	1.5	
496	ISO3405-A	19.9		-1.04	94.8		-0.57	1.6	
540	----	----		----	----		----	----	
631	----	----		----	----		----	1.3	
1006	D86	----		----	----		----	1.4	
1017	ISO3405-A	20.4		-0.51	95.5		0.16	1.5	
1033	----	----		----	----		----	----	
1047	ISO3405-A	20.6		-0.30	94.5		-0.89	2.0	
1059	ISO3405-A	21.6		0.75	95.6		0.27	1.8	
1080	ISO3405-A	22.8		2.02	95.7		0.37	1.2	
1081	D86A	20.7		-0.19	95.8		0.48	1.3	
1108	ISO3405-A	21.3		0.44	94.1		-1.31	1.3	
1126	in house-A	22.4		1.60	94.6		-0.78	----	
1131	ISO3405-A	20.4		-0.51	95.6		0.27	1.8	
1138	IP123-A	21.3		0.44	95.2		-0.15	1.2	
1140	D86-A	24.1	DG(0.01)	3.39	96.5		1.22	1.4	
1146	----	----		----	----		----	----	
1161	ISO3405-A	21.8		0.96	95.1		-0.26	1.6	
1194	----	----		----	----		----	----	
1195	----	----		----	----		----	----	
1203	ISO3405-A	20.0		-0.93	95.5		0.16	1.6	
1205	----	----		----	----		----	----	
1218	ISO3405-A	22.2		1.39	96.2		0.90	2.3	
1227	D86-A	20.6		-0.30	94.8		-0.57	1.0	
1237	ISO3405-M	21.8		0.96	95.3		-0.05	2.0	
1259	ISO3405-A	20.9		0.02	94.9		-0.47	1.4	
1299	D86-A	21.4		0.54	96.0		0.69	1.5	
1346	ISO3405-A	20.7		-0.19	95.9		0.58	1.5	
1378	D86-A	19.7		-1.25	94.8		-0.57	1.6	
1389	D86-A	20.0		-0.93	----		----	0.7	
1397	ISO3405-A	21.0		0.12	96.2		0.90	1.0	
1402	----	----		----	----		----	----	
1404	ISO3405-A	20.5		-0.40	95.4		0.06	1.4	
1406	ISO3405-A	20.9		0.02	94.9		-0.47	1.3	
1407	ISO3405-A	19.83		-1.11	94.81		-0.56	1.2	
1427	ISO3405-A	21.4		0.54	95.3		-0.05	1.4	
1428	ISO3405-A	20.7		-0.19	95.4		0.06	1.7	
1510	ISO3405-A	20.8		-0.09	94.7		-0.68	1.4	
1634	ISO3405-A	21.3		0.44	95.5		0.16	1.3	
1635	ISO3405-A	21.7		0.86	95.3		-0.05	1.4	
1636	D86-A	20.9		0.02	94.9		-0.47	1.5	
1650	D86-A	21.6		0.75	95.1		-0.26	1.5	
1706	ISO3405-A	20.5		-0.40	95.8		0.48	1.9	
1710	ISO3405-A	20.1		-0.82	95.1		-0.26	1.4	
1715	ISO3405-A	21.4		0.54	95.8		0.48	1.4	
1724	ISO3405-A	20.8		-0.09	95.1		-0.26	1.5	
1807	ISO3405-A	21.4		0.54	96.5		1.22	1.0	
1810	ISO3405-A	21.8		0.96	95.9		0.58	1	
1811	ISO3405-A	20.9		0.02	95.2		-0.15	1.5	
1833	ISO3405-A	21		0.12	95		-0.36	1.9	
1948	D86-A	21.8		0.96	96.0		0.69	1.0	
2129	ISO3405-A	21.6		0.75	95.7		0.37	1.2	
2146	----	----		----	----		----	----	
	normality	OK		OK					
	n	52		53					
	outliers	2		0					
	mean (n)	20.88		95.34					
	st.dev. (n)	0.811		0.634					
	R(calc.)	2.27		1.77					
	R(ISO3405:11)	2.66		2.66					

Determination of Total Contamination on sample #11040; result in mg/kg

lab	method	value	mark	z(target)	remarks
311	EN12662:08	15		-1.59	
312	EN12662:08	17.5		-0.30	
323	EN12662:08	22.3		2.18	
353	IP440:08	21.678		1.86	
463	EN12662:08	14.493		-1.85	
494	EN12662:08	10.22		-4.06	
495		----		----	
496	EN12662:08	16.19		-0.98	
540	EN12662:08	20.00		0.99	
1006	EN12662:08	69.3	G(0.01)	26.43	
1017	EN12662:08	27.25	C	4.73	first reported 0.027
1033	IP440:08	5.7	ex	-6.39	see §4.1
1047	EN12662:08	20.9		1.45	
1059	EN12662:08	16.7		-0.71	
1080	EN12662:09	14.1		-2.06	
1081	EN12662:	17		-0.56	
1108	EN12662:98	23.8		2.95	
1131	EN12662:08	16.9		-0.61	
1203	EN12662	15.9		-1.13	
1299	EN12662:08	14.8		-1.69	
1346	EN12662:08	14.23		-1.99	
1389	EN12662:08	15.53		-1.32	
1402	EN12662:08	16.58		-0.78	
1404	EN12662:08	26.2		4.19	
1427	EN12662:06	26		4.09	
1428	EN12662:08	18.2		0.06	
1650	EN12662:08	23.05		2.56	
1710	EN12662:08	14.8		-1.69	
1724	EN12662	13.97		-2.12	
1807	EN12662:08	16.2		-0.97	
1833	EN12662:08	3.57	ex	-7.49	see §4.1
1948	EN12662:08	16.85		-0.64	

normality not OK
n 28
outliers 3
mean (n) 18.084
st.dev. (n) 4.2718
R(calc.) 11.961
R(EN12662:08) 5.425



APPENDIX 2

z-scores Distillation

lab	IBP	10%	50%	90%	95%	FBP	vol @250°C	vol @350°C
150	0.75	0.58	-1.32	-1.09	-1.12	-2.40	0.02	1.64
311	-0.44	0.80	1.13	1.13	0.94	1.78	-0.72	-0.89
312	-0.69	1.69	0.38	-0.09	-0.01	-1.02	-1.35	-0.15
323	0.75	1.24	0.75	0.13	0.59	0.32	-0.93	-0.57
338	----	----	----	----	----	----	----	----
343	0.25	1.35	0.00	0.02	-0.10	0.52	-0.82	-0.15
353	-1.46	-0.59	0.09	0.68	-0.01	0.95	0.12	-0.05
402	-0.20	-2.75	-2.38	-1.83	-1.10	-1.08	3.28	1.74
431	0.97	0.30	-1.32	-0.81	0.44	----	-0.40	-0.78
432	----	----	----	----	----	----	----	----
433	----	----	----	----	----	----	----	----
444	----	----	----	----	----	----	----	----
445	1.05	2.96	0.66	0.46	0.63	1.07	-1.77	-0.68
463	-2.29	2.52	1.70	1.40	1.23	1.07	-2.09	-1.31
494	0.42	0.13	-0.47	-0.42	-0.29	-0.23	0.12	0.16
495	-0.52	-0.97	-1.13	-0.53	-0.55	-0.94	1.28	0.16
496	0.25	0.41	0.19	0.35	0.40	0.56	-1.04	-0.57
540	----	----	----	----	----	----	----	----
631	0.75	-1.42	-2.07	-1.14	-0.70	-0.59	----	----
1006	0.28	0.52	0.00	0.96	-0.42	-0.43	----	----
1017	0.00	0.85	-0.66	-1.31	-0.55	-1.42	-0.51	0.16
1033	----	----	----	----	----	----	----	----
1047	1.61	0.80	0.66	0.91	0.88	-0.27	-0.30	-0.89
1059	-0.52	-1.47	-0.75	-0.64	-0.51	0.28	0.75	0.27
1080	0.00	-2.58	-1.51	-0.42	-0.58	-0.39	2.02	0.37
1081	1.80	1.63	0.28	-0.48	-0.64	-0.63	-0.19	0.48
1108	-1.13	-0.14	0.09	0.74	1.70	1.58	0.44	-1.31
1126	-0.11	-1.14	-1.41	1.46	1.86	5.17	1.60	-0.78
1131	1.27	1.52	1.04	-0.09	-0.39	-1.69	-0.51	0.27
1138	1.19	-0.09	1.41	1.74	1.58	1.30	0.44	-0.15
1140	-2.68	-2.31	-2.36	-0.76	-0.01	-1.30	3.39	1.22
1146	----	----	----	----	----	----	----	----
1161	-0.77	-1.53	-0.19	0.30	-0.04	-0.59	0.96	-0.26
1194	----	----	----	----	----	----	----	----
1195	----	----	----	----	----	----	----	----
1203	-0.24	0.47	2.36	1.07	0.28	-0.90	-0.93	0.16
1205	----	----	----	----	----	----	----	----
1218	-0.11	-1.64	-0.66	-0.48	-0.89	-2.64	1.39	0.90
1227	-0.13	-0.81	1.04	0.85	0.59	0.52	-0.30	-0.57
1237	0.00	-2.36	10.56	-0.37	0.06	-0.82	0.96	-0.05
1259	-1.41	-0.09	-0.09	0.35	0.37	0.44	0.02	-0.47
1299	0.00	-0.86	-0.47	-1.36	-1.18	-1.22	0.54	0.69
1346	-0.30	-0.03	0.66	0.35	0.50	0.99	-0.19	0.58
1378	1.63	1.19	1.70	0.91	0.40	0.83	-1.25	-0.57
1389	0.56	1.69	0.00	-0.31	-0.55	0.28	-0.93	----
1397	-0.05	-0.86	-0.19	-0.64	-0.89	-0.71	0.12	0.90
1402	----	----	----	----	----	----	----	----
1404	2.68	-7.41	0.09	0.02	-0.07	0.75	-0.40	0.06
1406	-0.55	-0.31	0.38	0.96	0.37	0.67	0.02	-0.47
1407	-0.58	1.19	0.66	0.08	0.40	1.15	-1.11	-0.56
1427	0.11	-0.42	-0.38	-0.26	-0.07	0.00	0.54	-0.05
1428	-0.27	-0.70	0.09	-0.59	-0.42	0.12	-0.19	0.06
1510	-0.08	0.97	0.38	0.74	0.82	1.42	-0.09	-0.68
1634	-0.30	0.08	0.00	-0.31	-0.29	0.63	0.44	0.16
1635	-0.52	0.13	-0.28	-0.20	-0.17	0.40	0.86	-0.05
1636	-0.30	-0.75	0.85	0.74	0.34	1.50	0.02	-0.47
1650	0.69	-1.20	0.00	0.63	0.15	0.87	0.75	-0.26
1706	0.45	0.74	1.23	-1.36	-0.83	-1.61	-0.40	0.48
1710	0.03	1.02	0.75	0.19	0.21	0.83	-0.82	-0.26
1715	0.61	0.85	-0.28	-0.31	-0.45	-0.15	0.54	0.48
1724	-0.13	0.74	-0.09	-0.04	0.12	0.12	-0.09	-0.26
1807	-2.07	-1.42	-0.38	-0.64	3.00	-4.22	0.54	1.22
1810	-0.19	-0.70	-0.94	-1.03	-1.21	-0.59	0.96	0.58
1811	-0.33	-0.03	0.38	0.24	-0.70	0.12	0.02	-0.15
1833	0.47	0.25	-0.19	-0.04	-0.07	0.20	0.12	-0.36
1948	-0.11	0.08	-0.94	-0.76	-0.83	-0.39	0.96	0.69
2129	-0.13	0.47	1.51	0.91	0.78	0.75	0.75	0.37
2146	----	----	----	----	----	----	----	----

APPENDIX 3

Number of participants per country

1 lab in ARGENTINA
2 labs in AUSTRIA
3 labs in BELGIUM
1 lab in BULGARIA
2 labs in CROATIA
1 lab in CYPRUS
2 labs in CZECH REPUBLIC
1 lab in ESTONIA
1 lab in FINLAND
2 labs in FRANCE
3 labs in GERMANY
3 labs in GREECE
2 labs in HUNGARY
2 labs in IRELAND
1 lab in LATVIA
2 labs in POLAND
2 labs in PORTUGAL
2 labs in REPUBLIC OF MACEDONIA
1 lab in SINGAPORE
1 lab in SLOVENIA
2 labs in SPAIN
1 lab in SWEDEN
4 labs in THE NETHERLANDS
4 labs in TURKEY
1 lab in U.S.A.
9 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
W	= result withdrawn
SDS	= Safety Data Sheet

Literature:

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