Results of Proficiency Test
Jet Fuel
September 2013

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Appendices:

1   INTRODUCTION

Since 1995, the Institute for Interlaboratory Studies organises every year proficiency tests for Jet Fuel A1. The interlaboratory study on Jet Fuel was extended with PT's for the determination of Particle Size Distribution, FAME and BOCLE. In the annual proficiency testing program of 2013/2014, it was decided to continue the 4 PT's on Jet Fuel A1.
In the main PT 148 laboratories in 67 different countries have participated. In the PT for FAME in Jet Fuel, 41 laboratories in 18 different countries participated. In the PT for the BOCLE determination, 19 laboratories in 13 different countries and in the PT for the Particle Size Distribution, 60 laboratories in 34 different countries participated.
See appendix 3 for the number of participants per country. In this report, the results of the proficiency test are presented and discussed.

2   SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organiser of this proficiency test. Sample analyses for fit-for-use and homogeneity testing were subcontracted.
In the main Jet Fuel round robin, it was decided to send two identical samples (2 *1 litre bottles sample labelled #13163) for the analyses according to the "Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS)", sometimes referred to as the "Joint Fuelling System Check List ForJet A-1".
Depending on the registration also was sent: 1*0.1 litre sample, labelled #13164 for the BOCLE round robin, 1*0.5 litre sample, labelled #13165 for the Particle Size distribution round robin and/or 1*0.1 litre sample, labelled #13166 for the determination of FAME in Jet Fuel.
The participants were requested to report the analytical results using the indicated units on the report form and to report rounded and unrounded results. The unrounded results were preferably used for statistical evaluation.

2.1   ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in agreement with ISO/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% confidentially of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires

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

2.4.1 JET FUEL (MAIN SAMPLE)

The necessary bulk material was obtained from a local supplier. The approx. 330 litre bulk sample was homogenised and divided over 300 amber glass bottles of one litre with inner and outer caps and labelled #13164. The homogeneity of the subsamples #13164 was checked by the determination of Density in accordance with ASTM D4052:02e1 on 10 stratified randomly selected samples.

	Density @ 15°C in kg/m^3
Sample #13163-1	798.11
Sample #13163-2	798.11
Sample #13163-3	798.12
Sample #13163-4	798.12
Sample #13163-5	798.11
Sample #13163-6	798.11
Sample #13163-7	798.11
Sample #13163-8	798.11
Sample #13163-9	798.11
Sample #13163-10	798.11

table 1: homogeneity test results of sub samples #13163

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

	Density @ 15°C in kg/m^3
r (observed)	0.02
reference method	ASTM D4052:02e1
0.3 x R (ref. method)	0.15

Table 2: evaluation of repeatability of subsamples #13163

The calculated repeatability is less than 0.3 times the reproducibility of the reference method. Therefore, homogeneity of all subsamples was assumed.

2.4.2 BOCLE DETERMINATION

The bulk material for the BOCLE determination was obtained from a local refinery. The approx. 10 litre bulk sample was homogenised and subsequently divided over 25 amber glass bottles of 100 mL and labelled #13164. The homogeneity of the subsamples #13164 was checked by the determination of Density in accordance with ASTM D4052:02e1 on 4 stratified randomly selected samples.

	Density @ 15°C in kg/L
Sample #13164-1	809.33
Sample #13164-2	809.30
Sample #13164-3	809.30
Sample #13164-4	809.30

table 3: homogeneity test results of sub samples #13164

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

	Density @ 15°C in kg/m^3
r (observed)	0.04
reference method	D4052:02e1
0.3 x R (ref. method)	0.15

Table 4: evaluation of repeatability of subsamples #13164

The calculated repeatabilities are all smaller than the repeatabilities of the reference method. Therefore, homogeneity of the subsamples #13164 was assumed.

2.4.3 JET FUEL PARTICLE SIZE DETERMINATION

The third bulk material was obtained from a participating laboratory. From the approx. 200 litre bulk sample, immediately after homogenization 77 amber glass bottles of 0.5 L were filled and labelled #13165. The homogeneity of the subsamples #13165 was checked by the determination of Particle Size Distribution in accordance with IP564:13 on six stratified randomly selected samples.

	> 4 µm	> 6 µm	> 14 µm	> 21 µm	> 25 µm	> 30 µm
Sample #13165-1	6576	1316	22	5	2	1
Sample #13165-2	6537	1286	22	5	2	1
Sample #13165-3	6043	1205	23	5	2	1
Sample #13165-4	6242	1252	26	6	2	1
Sample #13165-5	6322	1289	29	7	3	2
Sample #13165-6	6290	1126	26	8	4	2

Table 5: homogeneity test results of sub samples #13165

From the above test results, the repeatability was calculated and compared with the repeatability of the reference method.

	> 4 µm	> 6 µm	> 14 µm	> 21 µm	> 25 µm	> 30 µm
r (observed)	552.9	195.9	7.9	3.5	2.3	1.4
reference method	IP564:13	IP564:13	IP564:13	IP564:13	IP564:13	IP564:13
r (ref. method)	937.4	275.1	17.1	6.1	2.6	1.7

Table 6: evaluation of repeatabilities of subsamples #13165

The calculated repeatabilities are less than the repeatabilities of the reference method. Therefore, homogeneity of subsamples #13165 was assumed.

2.4.4 DETERMINATION OF FATTY ACID METHYL ESTER (FAME)

It was decided to use a batch of approx. 10 litre from retained samples from previous FAME in Jet Fuel round robins. The batch was thoroughly homogenized and divided over 49 bottles of 100 mL and labelled #13166. The homogeneity of the subsamples #13166 was checked by the determination of Density in accordance with ASTM D4052:02e1 and FAME in accordance with method IP585:10 on 8 stratified randomly selected samples.

Sample	FAME in mg/kg	Density in kg/L
#13166-1	15.0	795.60
#13166-2	15.0	795.60
#13166-3	15.0	795.60
#13166-4	15.0	795.60
#13166-5	15.0	795.61
#13166-6	15.0	795.61
#13166-7	15.0	795.61
#13166-8	15.0	795.60

Table 7: homogeneity test results of sub samples #13166

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

	FAME in mg/kg	Density in kg/L
r (observed)	0.0	0.01
reference method	IP585:10	D4052:02e1
0.3 x R (ref. method)	1.4	0.15

Table 8: evaluation of repeatabilities of subsamples #13166

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

Depending on the registration of each individual participant the following samples were dispatched on August 28, 2013: 2 bottles Jet Fuel (2*1 litre, labelled #13163), 1 bottle especially for the BOCLE test (1*0.1L, labelled #13164), 1 bottle especially for the Particle Size Distribution (1*0.5L, labelled #13165) and 1 bottle especially for the FAME determination (1*0.1 L, labelled #13166).

2.5 STABILITY OF THE SAMPLES

The stability of Jet Fuel A1, packed in the brown glass bottles was checked. The type of bottle was chosen in accordance with ASTM D4306:12b. The material has been found sufficiently stable for the period of the proficiency test.

2.6 ANALYSIS

The participants were requested to determine on sample #13163: Aromatics by FIA, Aromatics by HPLC (in %M/M and %V/V), Colour Saybolt, Density @15°C, Distillation (IBP, 10%, 50%, 90% recovered and FBP), Existent Gum, Flash Point, Freezing Point, JFTOT, Copper, Mercaptans, MSEP, Naphthalenes, Smoke Point, Specific Energy (on Sulphur free basis), Total Acidity, Total Sulphur and Viscosity @ -20°C. The participants were requested to determine BOCLE only on sample #13164.The participants were requested to determine Particle Size only on sample #13165. And the participants were requested to determine FAME only on sample #13166.

The analyses should be performed according to the "Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS)", also referred to as the "Joint Fuelling System Check List" or simply "Check List".

To get comparable results a detailed report form, on which the units were prescribed as 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 submitted subsequently to Dixon and Grubbs outlier tests.

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

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

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

3.2   GRAPHICS

In order to 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 cross. Accepted data are represented as a triangle.

Furthermore, Kernel Density Graphs were made. This is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms (see appendix 4, nr.14-15).

3.3   Z-SCORES

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

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:

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

The $z_{(target)}$ scores are listed in the result tables in appendix 1.
Absolute values for z<2 are very common and absolute values for z>3 are very rare.
Therefore, the usual interpretation of z-scores is as follows:

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

4   EVALUATION

In these interlaboratory studies, some major problems with couriers and/or customs clearance were encountered during dispatch of the samples to laboratories in Azerbaijan, Côte D'Ivoire, Nigeria, Republic of Djibouti, Saudi Arabia, Oman, and Turkmenistan.
For the "main Jet Fuel A1" PT, 33 (!) participants reported the results after the final reporting date and 8 participants did not report any results at all.
For the PT "BOCLE", only 2 participants reported the results after the final reporting date and 5 participants did not report any result at all.
For the PT "Particle Size", 10 participants reported the results after the final reporting date and 15 other participants did not report any results at all.
For the PT "FAME", 13 participants reported the results after the final reporting date and 6 other participants did not report any results at all.
In total, 136 participants of the main round, 14 participants of the BOCLE round, 45 participants of the particle size round and 35 participants of the FAME round reported in total 2538 numerical results. Observed were 69 outlying results, which is 2.7%.
In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

4.1   EVALUATION PER TEST

In this section, the results are discussed per test.
Not all original data sets proved to have a normal distribution. Non Gaussian distributions were found for the following determinations on sample #13163 and sample #13165: Colour Saybolt (D156 & D6045), Density, Distillation (10 % rec, 50% rec on automated mode) and on IBP manual mode , Existent Gum, Flash Point, Freezing Point, JFTOT, Mercaptan Sulphur, Naphthalenes, Smoke Point, Total Acidity, Viscosity and Particle Size >4µm and >25µm.
Therefore, the statistical evaluation for these determinations should be used with care.
Since the checklist is continuously updated, the users are advised to monitor the updates.
The latest version at this moment is "DEF STAN 91-91/Issue 7, dated: 18 February 2011" and ASTM D1655:13. Both standards are part of the specification AFQRJOS issue 27 Februari 2013. One must keep in mind that ISO-methods are not mentioned in the "Checklist".

Aromatics by: FIA (D1319):	This determination was not problematic. No statistical outliers were observed and the calculated reproducibility is in good agreement with ASTM D1319:13.
Aromatics by: HPLC (D6379)	The %M/M determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with ASTM D6379:11. The %V/V determination may be problematic. Regretfully no precision data for the determination in %V/V is mentioned in ASTM D6379:11, but the observed reproducibility is much larger than for the determination in %M/M.
Colour Saybolt:	This determination was very problematic for both the manual (ASTM D156) and the automated (ASTM D6045) mode. In total two statistical outliers were observed. Both calculated reproducibilities are, after rejection of the statistical outliers, not at all in agreement with the respective requirements of ASTM D156:12 and ASTM D6045:12. From the laboratories that performed the Colour Saybolt according to ASTM D156:12 only five laboratories filtered the sample before analysis, therefore no significant conclusions could be drawn on these data.
Density:	This determination was not problematic. Four statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers, is in good agreement with the requirements of ASTM D4052:02e1.
Distillation:	In total five statistical outliers were observed for both the automated and the manual method. All calculated reproducibilities for the automated determination are, after rejection of the statistical outliers, in agreement with the requirements of ASTM D86:12 (group 4, automated). However, the calculated reproducibilities for the manual determination for IBP, 10% rec., 50% rec., and FBP are, after rejection of the statistical outlier, not in agreement with the requirements of ASTM D86:12 (group 4, manual).
Existent Gum:	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 ASTM D381:12.
Flash Point:	This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility, after rejection of the statistical outliers, is in full agreement with the requirements of IP170:09 / ISO13736:13. Twenty-two laboratories reported according to ASTM D56. This method is also mentioned in the Joint Fuelling System Checklist. The calculated reproducibility, after rejection of the two statistical outliers, is in agreement with the requirements of ASTM D56:10.

Six laboratories reported a method that is not mentioned in the Joint Fuelling System Checklist. After exclusion of these 6 test results, the calculated reproducibility is nearly equal and again in good agreement with the requirements of IP170:09.

Freezing Point: This determination was problematic for a number of laboratories. Four statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers, is in good agreement with the requirements of ASTM D2386:12.

JFTOT: This determination was not problematic. Two statistical outliers (false positive results) were observed for the Delta P in mm Hg.
Fifteen laboratories reported a higher volume than the maximum allowed (450 ± 45 mL may be pumped in a valid test, see ASTM D 3241:13a table 2). It should be noted that a pumped volume higher than 495 mL or below 405 mL means that the test is not performed correctly and results obtained are suspect.

Copper: This determination was not problematic. One statistical outlier was observed. Three laboratories reported a test result for Copper Corrosion. The calculated reproducibility, after rejection of the statistical outlier, is in good agreement with the requirements of ASTM D6732:10.

Mercaptan Sulphur: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers, is in full agreement with the requirements of ASTM D3227:13.

MSEP: This determination was problematic for a number of laboratories. Five statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers, is in full agreement with the requirements of ASTM D3948:13.

Naphthalenes: This determination was problematic for a number of laboratories. Five statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers, is in agreement with the requirements of ASTM D1840:07-B. When the ASTM D1840 method A and B data were evaluated separately, the calculated reproducibility for only the method A data is not in agreement with the requirements of ASTM D1840-A. However, the calculated reproducibility for only the method B data is in agreement with the requirements of ASTM D1840-B.

Smoke Point: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D1322:12-manual. When the ASTM 1322:12e1 manual and automated test results were evaluated separately, the calculated reproducibility for the manual data is in agreement with the

requirements of ASTM D1322:12e1-manual. However, the calculated reproducibility for the ASTM D1322:12e1 automated data, is not at all in agreement with the strict requirements of ASTM D1322:12-e1 automated.

Specific Energy: 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 ASTM D3338:09.

Total Acidity: This determination was problematic. Four statistical outliers were observed. The calculated reproducibility, after rejection of the statistical outliers, is not in agreement with the requirements of ASTM D3242:11.

Total Sulphur: This determination was problematic for a number of laboratories. Five statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D5453:09.

Viscosity: This determination was problematic for a number of laboratories. Nine (!) statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers, is in full agreement with the requirements of ASTM D445:12.

BOCLE: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of ASTM D5001:10.

Particle Size: This determination was very problematic. In total eleven statistical outliers were observed.
Three laboratories appeared to have reported inconsistent test results. For laboratory 1081, all the reported results, scored a z-target outside 3s. For laboratory 657, four of the reported results turned out to be statistical outliers. For laboratory 1191, the results for >4 µm and >6 µm are very low. As all test results are correlated to each other, all test results of the laboratories 657, 1081 and 1191 were excluded manually prior to the statistical analysis. After rejection of the suspect test results, all the calculated reproducibilities are not in agreement with the requirements of IP564:13, except for >30 µm. Strict adherence to the test method with regards to homogenisation is advised.

FAME: This determination was problematic. Only one statistical outlier was observed. However, the calculated reproducibility, after rejection of the statistical outlier, is not in agreement with the requirements of IP585:10.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the relevant standard and the reproducibility as found for the group of laboratories that participated. The reproducibilities derived from literature standards (in casu ASTM standards) and the calculated reproducibilities of samples #13163, #13164, #13165 and #13166 are compared in the next tables.

Parameter	unit	n	Average	2.8 * sd	R (lit)
Aromatics by FIA	%V/V	75	17.86	1.95	2.98
Aromatics by HPLC	%M/M	23	21.07	1.55	2.12
Aromatics by HPLC	%V/V	22	18.89	2.30	unknown
Colour Saybolt (ASTM D156)		71	15.9	3.9	2.0
Colour Saybolt (ASTM D6045)		41	15.6	2.5	1.2
Copper	µg/kg	5	3.0	4.0	9.0
Density at 15°C	kg/m^3	126	798.0	0.3	0.5
Initial Boiling Point (Auto)	°C	114	153.0	6.5	8.4
10% recovered (Auto)	°C	113	170.8	2.6	3.8
50% recovered (Auto)	°C	114	195.5	2.2	3.0
90% recovered (Auto)	°C	113	233.1	3.6	3.5
Final Boiling Point (Auto)	°C	113	260.6	5.0	7.1
Initial Boiling Point (Manual)	°C	18	151.8	5.6	4.5
10% recovered (Manual)	°C	19	169.6	3.8	2.9
50% recovered (Manual)	°C	19	193.2	3.2	2.8
90% recovered (Manual)	°C	18	231.6	3.6	3.6
Final Boiling Point (Manual)	°C	19	259.7	4.9	4.3
Existent Gum	mg/100mL	75	0.9	1.5	3.2
Flash Point	°C	123	42.4	3.1	3.2
Freezing Point	°C	108	-54.9	2.0	2.5
JFTOT - Tube Rating		41	0.93	0.74	n.a
JFTOT - Delta P	mmHg	60	0.29	1.60	n.a
Mercaptan Sulphur	%M/M	75	0.0004	0.0003	0.0003
MSEP	rating	83	91.2	11.3	11.0
Naphthalenes	%V/V	65	0.66	0.06	0.07
Smoke Point	mm	91	23.6	3.3	3.7
Specific Energy	MJ/kg	65	43.273	0.036	0.046
Total Acidity	mg KOH/g	79	0.0016	0.0018	0.0016
Total Sulphur	mg/kg	98	359.8	45.3	47.9
Viscosity @ -20°C	cSt	69	3.701	0.067	0.070

table 9: comparison of the observed and target reproducibilities of sample #13163

Parameter	unit	n	Average	2.8 * sd	R (lit)
Wear Scar Diameter (BOCLE)	mm	13	0.65	0.06	0.06

table 10: comparison of the observed and target reproducibility of sample #13164

Parameter	unit	n	Average	2.8 * sd	R (lit)
Particle Size >4 µm	mL^{-1}	39	8488	7370	1696
Particle Size >6 µm	mL^{-1}	39	2361	2380	766
Particle Size >14 µm	mL^{-1}	38	89.6	121.5	51.6
Particle Size >21 µm	mL^{-1}	38	15.1	21.4	19.1
Particle Size >25 µm	mL^{-1}	38	6.2	9.6	8.3
Particle Size >30 µm	mL^{-1}	36	2.2	3.5	3.6

table 11: comparison of the observed and target reproducibilities of sample #13165

Parameter	unit	n	Average	2.8 * sd	R (lit)
FAME	mg/kg	33	14.04	6.57	4.49

table 12: comparison of the observed and target reproducibility of sample #13166

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

4.3 COMPARISON OF THE PROFICIENCY TEST OF SEPTEMBER 2013 WITH PREVIOUS PTS

	September 2013	March 2013	September 2012	March 2012
Number of reporting labs	136	92	128	91
Number of results reported	2538	1705	2631	1704
Statistical outliers	69	45	123	53
Percentage outliers	2.7%	2.6%	4.6%	3.1%

table 13: Comparison with previous proficiency tests

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

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

Parameter	September 2013	March 2013	September 2012	March 2012
Aromatics by FIA	+	++	++	++
Aromatics by HPLC	++	+/-	+	+/-
Colour Saybolt	--	--	--	--
Density at 15°C	++	++	++	++
Distillation automated	+	+	++	++
Distillation manual	-	++	-	--
Existent Gum	++	+/-	++	++
Flash Point	+	+	+	+/-
Freezing Point	+	+/-	++	++
Mercaptan Sulphur	+/-	--	-	+/-
MSEP	+/-	-	(++)	+/-
Naphthalenes	+	+	-	+/-
Smoke Point	+	++	--	--
Specific Energy	+	-	+/-	-
Total Acidity	-	-	-	--
Total Sulphur	+	+	-	+/-
Viscosity @ -20°C	+	-	--	-
BOCLE	+/-	n.e.	-	n.e.
FAME	--	n.e.	--	n.e.
Particle Size Distribution	--	--	--	--

table 14: comparison determinations against the standard requirements
results between brackets are below/outside the application range

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 Aromatics by FIA on sample #13163; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D1319	17.8		-0.06	1017		-----		-----
62	D1319	17.23		-0.59	1021		-----		-----
120	D1319	16.7		-1.09	1026		-----		-----
132	D1319	17.97		0.10	1038	D1319	18.1		0.23
140	D1319	18.3		0.41	1039		-----		-----
150	D1319	16.72		-1.07	1049		-----		-----
159	D1319	17.9		0.04	1059	D1319	18.2		0.32
169	D1319	17.1		-0.71	1062	D1319	17.9		0.04
171	D1319	18.23		0.35	1064	D1319	17.59		-0.25
175	D1319	18.5		0.60	1065		-----		-----
177	D1319	17.1		-0.71	1079	D1319	18.4		0.51
194	D1319	18.31		0.42	1080		-----		-----
216		-----		-----	1081	D1319	17.8		-0.06
221		-----		-----	1082		-----		-----
224		-----		-----	1097	D1319	17.570		-0.27
225		-----		-----	1108		-----		-----
228		-----		-----	1109	D1319	17.15		-0.67
230	D1319	17.70		-0.15	1126		-----		-----
237		-----		-----	1140	D1319	17.71		-0.14
238		-----		-----	1146		-----		-----
252	D1319	18.54		0.64	1150		-----		-----
253		-----		-----	1191		-----		-----
254	D1319	19.24		1.30	1201		-----		-----
256	D1319	18.50		0.60	1231	D1319	17.5		-0.34
258		-----		-----	1279		-----		-----
273		-----		-----	1284	D1319	18.0		0.13
311	D1319	17.9		0.04	1297		-----		-----
323	D1319	16.8		-1.00	1299	D1319	17.7		-0.15
333		-----		-----	1316		-----		-----
334		-----		-----	1318		-----		-----
335	D1319	17.8		-0.06	1357		-----		-----
340	D1319	17.91		0.05	1372	D1319	18.41		0.52
353		-----		-----	1376	D1319	17.18		-0.64
369	D1319	17.53		-0.31	1395		-----		-----
370	D1319	18.09		0.22	1417		-----		-----
371		-----		-----	1429		-----		-----
372	D1319	17.7		-0.15	1447	D1319	19.9	C	1.92
391	D1319	17.8		-0.06	1448		-----		-----
399		-----		-----	1483		-----		-----
402	D1319	18.16		0.28	1491		-----		-----
440	D1319	17.73		-0.12	1496	D1319	17.8		-0.06
445	IP156	18.1		0.23	1520	D1319	17.36		-0.47
447	D1319	17.5		-0.34	1538		-----		-----
448	D1319	17.9		0.04	1564	D1319	18.3		0.41
463	D1319	17.7		-0.15	1585		-----		-----
468		-----		-----	1586		-----		-----
473		-----		-----	1587	D1319	18.39		0.50
485		-----		-----	1610	IP156	19.015		1.09
495	D1319	17.28		-0.54	1611		-----		-----
496	D1319	18.30		0.41	1616		-----		-----
601		-----		-----	1631	D1319	16.93		-0.87
604		-----		-----	1634		-----		-----
606		-----		-----	1635	D1319	17.25		-0.57
608		-----		-----	1636	D1319	18.77		0.86
631	D1319	19.575		1.61	1650	D1319	17.94		0.08
657	D1319	17.5		-0.34	1669	D1319	16.8		-1.00
663	D1319	15.60		-2.13	1694		-----		-----
671		-----		-----	1697		-----		-----
732		-----		-----	1698		-----		-----
823	D1319	17.2		-0.62	1699	D1319	18.62		0.72
851		-----		-----	1713		-----		-----
862	D1319	18.36		0.47	1715		-----		-----
869	D1319	19.47		1.52	1720		-----		-----
922		-----		-----	1724	D1319	18.05		0.18
962		-----		-----	1811	D1319	18.35		0.46
963	D1319	18.39		0.50	1833	D1319	17.2		-0.62
974	D1319	17.2		-0.62	1842	D1319	17.3		-0.53
994		-----		-----	1913	D1319	18.15		0.27
995		-----		-----	1948		-----		-----
996		-----		-----	1951		-----		-----
997		-----		-----	2129	D1319	18.0		0.13
998		-----		-----	2130	D1319	17.5		-0.34
1011	D1319	18.0		0.13	2133	D1319	17.27		-0.55
1016		-----		-----	4043		-----		-----

normality	OK
n	75
outliers	0
mean (n)	17.859
st.dev. (n)	0.6977
R(calc.)	1.954
R(D1319:13)	2.977

Lab 1447: first reported 20.0

Determination of Aromatics by HPLC on sample #13163; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1017		-----		-----
62		-----		-----	1021		-----		-----
120		-----		-----	1026		-----		-----
132		-----		-----	1038		-----		-----
140		-----		-----	1039		-----		-----
150		-----		-----	1049	D6379	21.514		0.59
159		-----		-----	1059		-----		-----
169		-----		-----	1062		-----		-----
171	D6379	21.167		0.13	1064		-----		-----
175		-----		-----	1065		-----		-----
177		-----		-----	1079		-----		-----
194		-----		-----	1080	EN12916	20.79		-0.37
216		-----		-----	1081		-----		-----
221		-----		-----	1082		-----		-----
224		-----		-----	1097		-----		-----
225		-----		-----	1108		-----		-----
228		-----		-----	1109	D6591	21.28		0.28
230		-----		-----	1126		-----		-----
237		-----		-----	1140		-----		-----
238		-----		-----	1146		-----		-----
252		-----		-----	1150		-----		-----
253		-----		-----	1191		-----		-----
254		-----		-----	1201	D6379	22.2		1.49
256		-----		-----	1231		-----		-----
258		-----		-----	1279		-----		-----
273		-----		-----	1284		-----		-----
311		-----		-----	1297	EN12916	21.12		0.07
323		-----		-----	1299	D6379	21.7		0.83
333	D6379	21.0		-0.09	1316		-----		-----
334		-----		-----	1318	D6379	21.149		0.11
335		-----		-----	1357		-----		-----
340		-----		-----	1372		-----		-----
353		-----		-----	1376		-----		-----
369	D6379	21.30		0.31	1395		-----		-----
370	D6379	21.33		0.34	1417		-----		-----
371		-----		-----	1429		-----		-----
372	D6379	21.1		0.04	1447	D6379	21.9		1.10
391		-----		-----	1448		-----		-----
399		-----		-----	1483		-----		-----
402		-----		-----	1491		-----		-----
440		-----		-----	1496		-----		-----
445		-----		-----	1520		-----		-----
447		-----		-----	1538		-----		-----
448		-----		-----	1564		-----		-----
463		-----		-----	1585		-----		-----
468		-----		-----	1586		-----		-----
473		-----		-----	1587		-----		-----
485		-----		-----	1610		-----		-----
495	D6379	20.67		-0.53	1611		-----		-----
496		-----		-----	1616		-----		-----
601		-----		-----	1631		-----		-----
604		-----		-----	1634		-----		-----
606		-----		-----	1635	D6379	20.3		-1.01
608		-----		-----	1636		-----		-----
631		-----		-----	1650		-----		-----
657	IP436	23.6	G(0.01)	3.34	1669		-----		-----
663		-----		-----	1694		-----		-----
671		-----		-----	1697		-----		-----
732		-----		-----	1698		-----		-----
823	D6379	19.92	C	-1.52	1699		-----		-----
851	D6379	20.72		-0.46	1713		-----		-----
862	D6379	21.20		0.17	1715		-----		-----
869		-----		-----	1720		-----		-----
922		-----		-----	1724		-----		-----
962		-----		-----	1811	D6379	20.99		-0.10
963	D6379	20.6		-0.62	1833	IP391	20.5		-0.75
974		-----		-----	1842		-----		-----
994		-----		-----	1913		-----		-----
995		-----		-----	1948	D6379	20.3	C	-1.01
996		-----		-----	1951		-----		-----
997		-----		-----	2129	IP391	21.8282		1.00
998		-----		-----	2130		-----		-----
1011		-----		-----	2133		-----		-----
1016		-----		-----	4043		-----		-----

normality   OK
n   23
outliers   1
mean (n)   21.069
st.dev. (n)   0.5544
R(calc.)   1.552
R(D6379:11)   2.123

Lab 823: first reported 19.3
Lab 1948: first reported 1.05
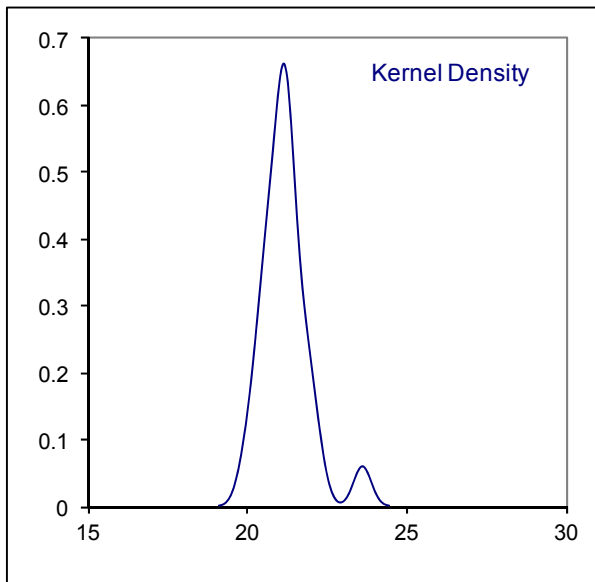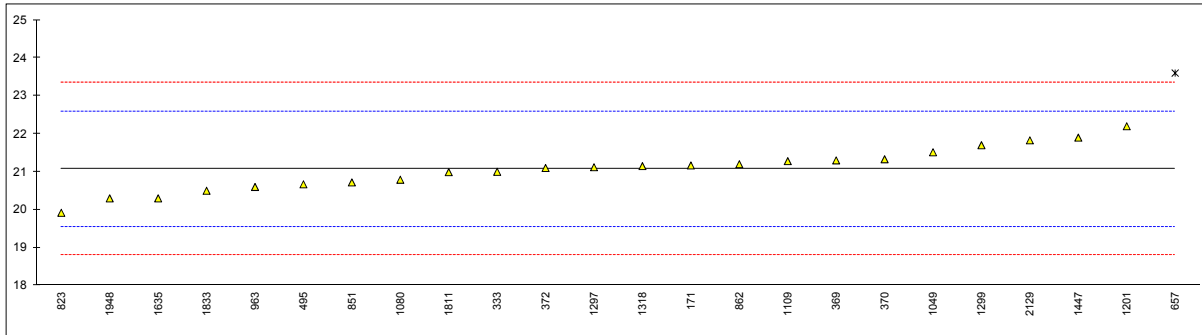
Determination of Aromatics by HPLC on sample #13163; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1017		-----		-----
62		-----		-----	1021		-----		-----
120		-----		-----	1026	IP436	19.0		-----
132		-----		-----	1038		-----		-----
140		-----		-----	1039	D6379	18.9		-----
150		-----		-----	1049	D6379	19.53145		-----
159		-----		-----	1059		-----		-----
169		-----		-----	1062		-----		-----
171		19.444		-----	1064		-----		-----
175		-----		-----	1065		-----		-----
177		-----		-----	1079		-----		-----
194		-----		-----	1080		-----		-----
216		-----		-----	1081		-----		-----
221		-----		-----	1082		-----		-----
224		-----		-----	1097		-----		-----
225		-----		-----	1108		-----		-----
228		-----		-----	1109		-----		-----
230		-----		-----	1126		-----		-----
237		-----		-----	1140		-----		-----
238		-----		-----	1146		-----		-----
252		-----		-----	1150		-----		-----
253		-----		-----	1191		-----		-----
254		-----		-----	1201		17.8		-----
256		-----		-----	1231		-----		-----
258		-----		-----	1279		-----		-----
273		-----		-----	1284		-----		-----
311		-----		-----	1297	EN12916	18.37		-----
323		-----		-----	1299		19.6		-----
333		18.9		-----	1316	IP391	18.1		-----
334		-----		-----	1318	D6379	19.093		-----
335		-----		-----	1357		-----		-----
340		-----		-----	1372		-----		-----
353		-----		-----	1376		-----		-----
369	D6379	19.22		-----	1395		-----		-----
370		18.88		-----	1417	IP416	15.93	G(0.05)	-----
371		-----		-----	1429		-----		-----
372	D6379	18.9		-----	1447		19.9		-----
391		-----		-----	1448		-----		-----
399		-----		-----	1483		-----		-----
402		-----		-----	1491		-----		-----
440		-----		-----	1496		-----		-----
445		-----		-----	1520		-----		-----
447		-----		-----	1538		-----		-----
448		-----		-----	1564		-----		-----
463		-----		-----	1585		-----		-----
468		-----		-----	1586		-----		-----
473		-----		-----	1587		-----		-----
485		-----		-----	1610		-----		-----
495		18.66		-----	1611		-----		-----
496		-----		-----	1616		-----		-----
601		-----		-----	1631		-----		-----
604		-----		-----	1634		-----		-----
606		-----		-----	1635		-----		-----
608		-----		-----	1636		-----		-----
631		-----		-----	1650		-----		-----
657	IP436	20.1		-----	1669		-----		-----
663		-----		-----	1694		-----		-----
671		-----		-----	1697		-----		-----
732		-----		-----	1698		-----		-----
823	D6379	17.6		-----	1699		-----		-----
851	D6379	18.80		-----	1713		-----		-----
862		-----		-----	1715		-----		-----
869		-----		-----	1720		-----		-----
922		-----		-----	1724		-----		-----
962		-----		-----	1811		-----		-----
963		18.14		-----	1833		-----		-----
974		-----		-----	1842		-----		-----
994		-----		-----	1913		-----		-----
995		-----		-----	1948		-----		-----
996		-----		-----	1951	D6379	20.8		-----
997		-----		-----	2129	IP391	17.4252		-----
998		-----		-----	2130		-----		-----
1011		-----		-----	2133		-----		-----
1016	IP436	18.5		-----	4043		-----		-----

normality	OK
n	22
outliers	1
mean (n)	18.894
st.dev. (n)	0.8219
R(calc.)	2.301
R(lit)	unknown

Compare R(iis13J01) = 3.063

Kernel Density
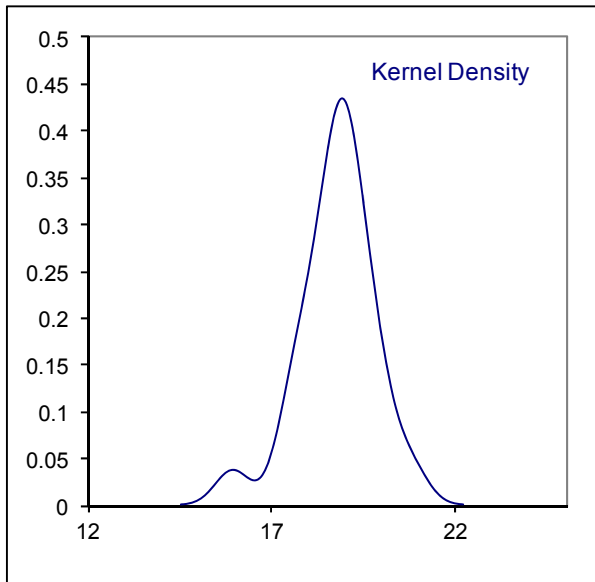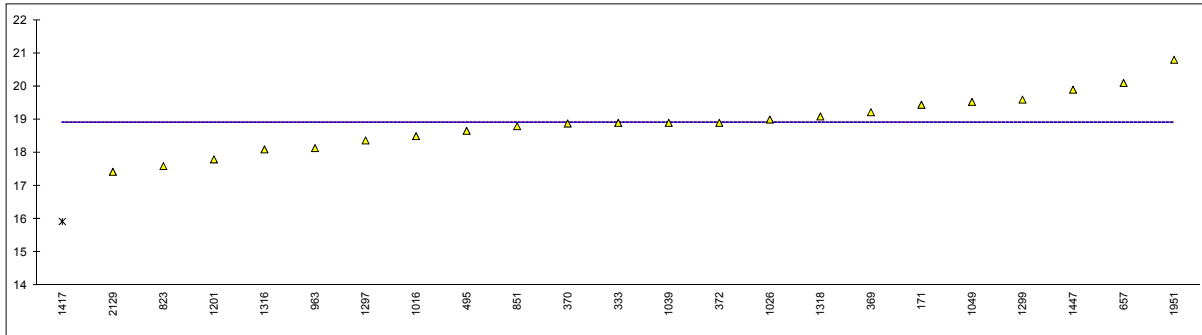
Determination of Colour Saybolt (D156) on sample #13163;

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1017		-----		-----
62	D156-N	17		1.54	1021		-----		-----
120		-----		-----	1026	D156-N	16		0.14
132	D156-N	18+		2.94	1038		-----		-----
140	D156-N	19+		4.34	1039	D156-N	16		0.14
150		-----		-----	1049		-----		-----
159	D156-N	16		0.14	1059	D156-N	16+		0.14
169		-----		-----	1062	D156-Y	14		-2.66
171	D156-N	14+		-2.66	1064	D156-N	15+		-1.26
175		-----		-----	1065		-----		-----
177	D156-N	17+		1.54	1079		-----		-----
194	D156-N	16+		0.14	1080	D156-N	17		1.54
216		-----		-----	1081		-----		-----
221		-----		-----	1082		-----		-----
224		-----		-----	1097	INH-003-Y	16+		0.14
225		-----		-----	1108		-----		-----
228		-----		-----	1109	D156-N	16		0.14
230	D156-N	16+		0.14	1126		-----		-----
237		-----		-----	1140		-----		-----
238		-----		-----	1146		-----		-----
252	D156-N	16+		0.14	1150		-----		-----
253		-----		-----	1191		-----		-----
254	D156-N	15+		-1.26	1201	D156-N	15+		-1.26
256	D156-N	16+		0.14	1231	D156	17+		1.54
258	D156-N	19+		4.34	1279	D156-N	14+		-2.66
273	D156	14+		-2.66	1284		-----		-----
311		-----		-----	1297		-----		-----
323	D156	16+		0.14	1299		-----		-----
333		-----		-----	1316	D156-N	15+		-1.26
334	D156-N	15+		-1.26	1318		-----		-----
335	D156-N	14+		-2.66	1357		-----		-----
340	D156-N	16+		0.14	1372		-----		-----
353		-----		-----	1376		-----		-----
369	D156-N	15+		-1.26	1395		-----		-----
370	D156-N	14+		-2.66	1417	D156	19		4.34
371		-----		-----	1429		-----		-----
372	D156-N	15+		-1.26	1447	D156-N	16.0		0.14
391		-----		-----	1448		-----		-----
399	D156-Y	16+		0.14	1483		-----		-----
402	D156-N	15+		-1.26	1491		-----		-----
440	D156-N	15		-1.26	1496	D156-N	16+		0.14
445	D156-N	10+	G(0.01)	-8.26	1520	D156-N	16+		0.14
447		-----		-----	1538	D156-N	15		-1.26
448	D156-N	16		0.14	1564	D156-N	15+		-1.26
463	D156-N	18+		2.94	1585	D156-N	14+		-2.66
468		-----		-----	1586		-----		-----
473		-----		-----	1587		-----		-----
485		-----		-----	1610	D156-N	18+		2.94
495	D156-Y	15		-1.26	1611		-----		-----
496		-----		-----	1616		-----		-----
601		-----		-----	1631		-----		-----
604		-----		-----	1634	D156-N	14		-2.66
606		-----		-----	1635	D156-N	17		1.54
608	D156-N	17+		1.54	1636	D156-Y	16+		0.14
631		-----		-----	1650	D156-N	17+	C	1.54
657	D156-N	14+	C	-2.66	1669		-----		-----
663	D156-N	14+		-2.66	1694		-----		-----
671	D156-N	17+		1.54	1697		-----		-----
732		-----		-----	1698		-----		-----
823	D156-N	13+	C	-4.06	1699		-----		-----
851	D156-N	17+		1.54	1713		-----		-----
862		-----		-----	1715		-----		-----
869	D156-N	17+		1.54	1720		-----		-----
922	D156-N	17+		1.54	1724	D156-N	16+		0.14
962		-----		-----	1811	D156-N	15		-1.26
963	D156-N	16		0.14	1833	D156-Y	17+		1.54
974	D156-N	16+		0.14	1842	D156-N	16+		0.14
994		-----		-----	1913	D156-N	15+		-1.26
995		-----		-----	1948	D156-N	15		-1.26
996		-----		-----	1951	D156-N	15		-1.26
997	D156-N	15+		-1.26	2129	D156-N	20+		5.74
998	D156-N	17+		1.54	2130		-----		-----
1011	D156-N	17+		1.54	2133		-----		-----
1016		-----		-----	4043		-----		-----

		Only D156-N data	Only D156-Y data
normality	not OK	not OK	OK
n	71	61	5
outliers	1	1	0
mean (n)	15.90	15.89	15.60
st.dev. (n)	1.385	1.380	1.140
R(calc.)	3.88	3.86	3.19
R(D156:12)	2.00	2.00	2.00

N: sample is not filtered before measurement
Y: sample is filtered before measurement

Lab 657: first reported 11+
Lab 823: first reported 11+
Lab 1650: first reported 23

Kernel Density
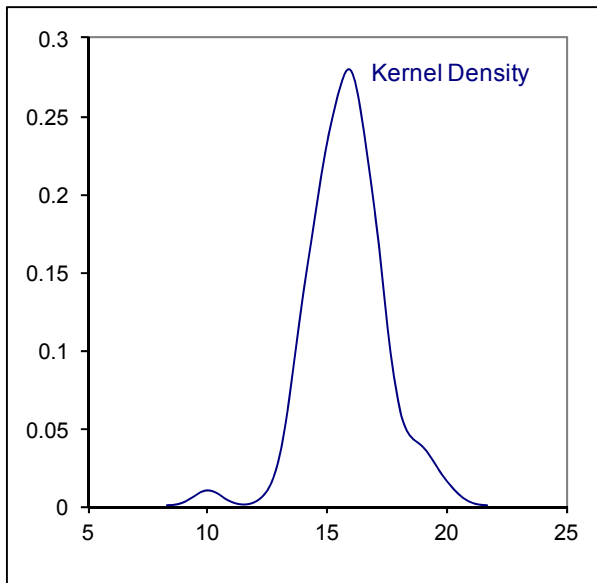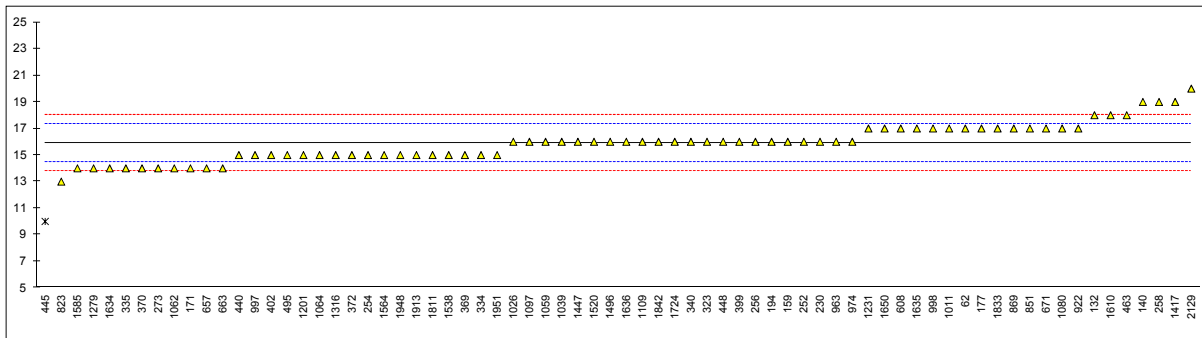
Determination of Colour Saybolt (D6045) on sample #13163;

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D6045-N	14+		-3.66	1017		-----		-----
62		-----		-----	1021	D6045-N	15		-1.40
120	D6045-N	15		-1.40	1026		-----		-----
132		-----		-----	1038	D6045-N	16+		0.85
140		-----		-----	1039		-----		-----
150	D6045-N	16		0.85	1049	D6045-N	18		5.37
159		-----		-----	1059		-----		-----
169	D6045-N	14.7		-2.08	1062		-----		-----
171	D6045-N	16+		0.85	1064	D6045-N	16+		0.85
175		-----		-----	1065		-----		-----
177		-----		-----	1079	D6045-N	16		0.85
194		-----		-----	1080		-----		-----
216		-----		-----	1081	D6045-N	13		-5.92
221		-----		-----	1082	D6045-N	16		0.85
224		-----		-----	1097		-----		-----
225		-----		-----	1108		-----		-----
228		-----		-----	1109	D6045-N	16		0.85
230		-----		-----	1126		-----		-----
237		-----		-----	1140	D6045-N	16		0.85
238		-----		-----	1146		-----		-----
252		-----		-----	1150		-----		-----
253		-----		-----	1191	D6045-N	16		0.85
254		-----		-----	1201		-----		-----
256		-----		-----	1231		-----		-----
258		-----		-----	1279		-----		-----
273		-----		-----	1284	D6045	14+		-3.66
311	D6045-N	14	C	-3.66	1297		-----		-----
323		-----		-----	1299	D6045-N	16+		0.85
333	D6045-N	15		-1.40	1316		-----		-----
334		-----		-----	1318	D6045-N	16+		0.85
335		-----		-----	1357		-----		-----
340		-----		-----	1372	D6045-N	16	C	0.85
353	D6045-N	16		0.85	1376	D6045-Y	17+		3.11
369	D6045-N	15+		-1.40	1395		-----		-----
370		-----		-----	1417		-----		-----
371	D6045-N	16+		0.85	1429	D6045-N	16		0.85
372	D6045-N	15+		-1.40	1447		-----		-----
391		-----		-----	1448		-----		-----
399		-----		-----	1483		-----		-----
402	D6045-N	16+		0.85	1491		-----		-----
440		-----		-----	1496	D6045-N	17+		3.11
445		-----		-----	1520		-----		-----
447	D6045-N	16		0.85	1538		-----		-----
448		-----		-----	1564		-----		-----
463		-----		-----	1585		-----		-----
468		-----		-----	1586	D6045-N	15		-1.40
473	D6045-N	15		-1.40	1587	D6045-N	15.0		-1.40
485		-----		-----	1610		-----		-----
495		-----		-----	1611		-----		-----
496		-----		-----	1616		-----		-----
601		-----		-----	1631	D6045-Y	16		0.85
604		-----		-----	1634		-----		-----
606		-----		-----	1635		-----		-----
608		-----		-----	1636		-----		-----
631	D6045-N	16+		0.85	1650		-----		-----
657		-----		-----	1669	D6045-N	10+	G(0.01)	-12.69
663		-----		-----	1694		-----		-----
671		-----		-----	1697		-----		-----
732		-----		-----	1698		-----		-----
823		-----		-----	1699	D6045-N	15.8		0.40
851		-----		-----	1713		-----		-----
862		-----		-----	1715	D6045-N	16		0.85
869		-----		-----	1720		-----		-----
922		-----		-----	1724		-----		-----
962		-----		-----	1811		-----		-----
963	D6045	16		0.85	1833		-----		-----
974		-----		-----	1842		-----		-----
994		-----		-----	1913		-----		-----
995		-----		-----	1948		-----		-----
996		-----		-----	1951		-----		-----
997		-----		-----	2129	D6045-N	15+	C	-1.40
998		-----		-----	2130	D6045-N	16+		0.85
1011		-----		-----	2133		-----		-----
1016	D6045-N	16		0.85	4043		-----		-----

normality	not OK
n	41
outliers	1
mean (n)	15.62
st.dev. (n)	0.893
R(calc.)	2.50
R(D6045:12)	1.24

N: sample is not filtered before measurement
Y: sample is filtered before measurement

Lab 311: first reported 12+
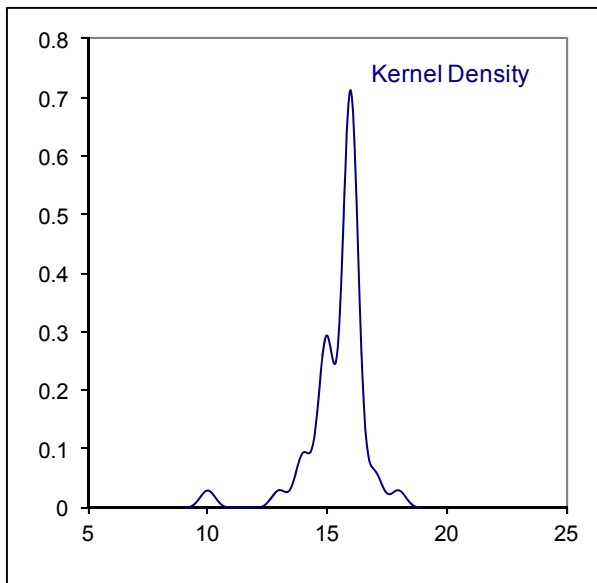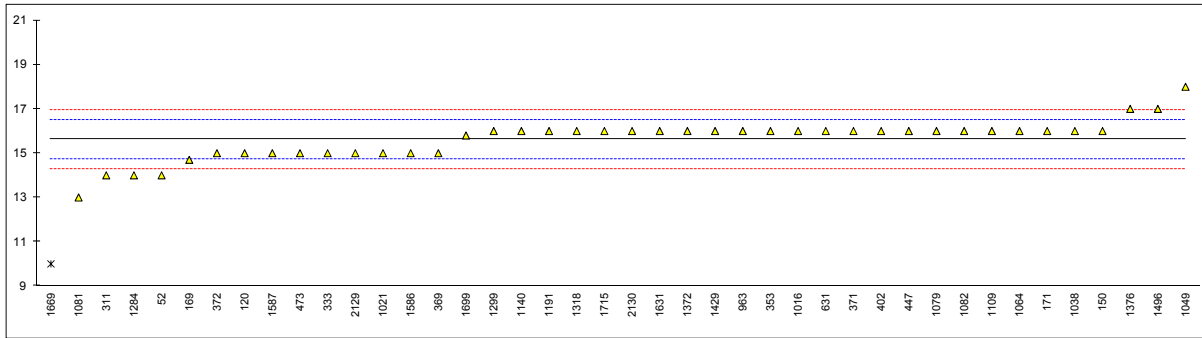Lab 1372: first reported 12
Lab 2129: first reported 22+

Determination of Density @ 15°C on sample #13163; results in kg/m^3

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4052	798.0		-0.28	1017		-----		-----
62	D4052	798.03		-0.11	1021	D4052	798.0		-0.28
120	D4052	798.2	C	0.84	1026	D4052	798.0		-0.28
132	D4052	798.06	C	0.06	1038	D4052	798.1		0.28
140	D4052	798.2		0.84	1039	ISO12185	798.1		0.28
150		-----		-----	1049	D4052	798.02		-0.17
159	D4052	798.1		0.28	1059	D4052	798.1		0.28
169	D4052	798.0		-0.28	1062	D4052	797.9		-0.84
171	D4052	797.68		-2.07	1064	D4052	797.9		-0.84
175	D4052	798.0		-0.28	1065	D4052	797.96		-0.50
177	D4052	797.8	C	-1.40	1079	D4052	798.2		0.84
194	D4052	798.0		-0.28	1080	D4052	798.0		-0.28
216	D1298	798.1		0.28	1081	D4052	798.2		0.84
221	D4052	798.2		0.84	1082	D4052	798.0		-0.28
224	D1298	798.17	C	0.67	1097	ISO12185	798.0		-0.28
225		-----		-----	1108		-----		-----
228	D4052	798.3		1.40	1109	D4052	798.07		0.11
230	D1298	798.0		-0.28	1126	ISO12185	798.05		0.00
237		-----		-----	1140	D4052	798.1	C	0.28
238		-----		-----	1146	D4052	798.03		-0.11
252	D1298	798.08		0.17	1150	ISO12185	797.9		-0.84
253		-----		-----	1191	D4052	798.1		0.28
254	D4052	798.2		0.84	1201	D4052	798.0		-0.28
256	D4052	798.1		0.28	1231	D4052	798.0		-0.28
258	D4052	798.0		-0.28	1279	D4052	798.05		0.00
273	D4052	797.9		-0.84	1284	D4052	798.02		-0.17
311	D4052	798.1		0.28	1297	D4052	798.0		-0.28
323	D4052	798.1		0.28	1299	D4052	798.0		-0.28
333	D4052	798.1		0.28	1316	D4052	798.1		0.28
334	D4052	798.01		-0.22	1318	D4052	798.02		-0.17
335	D4052	798.1		0.28	1357		-----		-----
340	D4052	797.99		-0.33	1372	D4052	798.0		-0.28
353	IP365	798.0		-0.28	1376	D4052	798.1		0.28
369	D4052	798.0		-0.28	1395	D4052	798.3		1.40
370	D4052	798.0		-0.28	1417	IP365	798.0		-0.28
371	D4052	798.0		-0.28	1429	D4052	798.0		-0.28
372	D4052	798.0		-0.28	1447	D4052	797.7	C	-1.96
391	D4052	798.0		-0.28	1448	D4052	798.03		-0.11
399	D4052	797.8		-1.40	1483		-----		-----
402	D4052	797.9		-0.84	1491	D4052	798.04		-0.05
440	D4052	798.0		-0.28	1496	D1298	798.0		-0.28
445	D4052	798.1		0.28	1520	D4052	798.00		-0.28
447	D4052	798.03		-0.11	1538		-----		-----
448	D4052	798.2		0.84	1564	D4052	798.0		-0.28
463	D4052	798.02		-0.17	1585	D4052	797.9	C	-0.84
468	D4052	798.1		0.28	1586	D4052	798.1		0.28
473	D4052	877.8	G(0.01)	446.60	1587	D4052	798.16		0.62
485	D4052	798.0		-0.28	1610	IP365	797.8		-1.40
495	D4052	798.0		-0.28	1611	D4052	798.05		0.00
496	D4052	798.04		-0.05	1616		-----		-----
601	D1298	798.2		0.84	1631	D4052	798.1		0.28
604	D4052	798.14		0.51	1634	D4052	798.044		-0.03
606	D4052	798.1		0.28	1635	D4052	797.9		-0.84
608	D4052	798.1		0.28	1636	D4052	798.0		-0.28
631	D4052	798.1		0.28	1650	D4052	798.06		0.06
657	D4052	798.1		0.28	1669	D4052	798.1		0.28
663	D4052	798.00		-0.28	1694		-----		-----
671	D4052	798.2		0.84	1697	D4052	798.1		0.28
732	D4052	798.09		0.23	1698	D4052	798.01		-0.22
823	D4052	798.1		0.28	1699	D4052	796.3	G(0.01)	-9.80
851	D4052	798.0		-0.28	1713	D4052	798.10		0.28
862	D4052	798.30		1.40	1715	ISO12185	798.1		0.28
869	D4052	798.10		0.28	1720	D4052	798.2		0.84
922	D4052	798.2		0.84	1724	D4052	798.06		0.06
962		-----		-----	1811		-----		-----
963	D4052	798.0		-0.28	1833	D4052	798.1		0.28
974	D4052	798.1		0.28	1842	IP365	797.9		-0.84
994		-----		-----	1913	D4052	798.0		-0.28
995	D4052	798.03		-0.11	1948	D4052	798.2	C	0.84
996		-----		-----	1951	D4052	798.07		0.11
997	D4052	798.2		0.84	2129	D4052	798.2		0.84
998	D4052	798.5	G(0.01)	2.52	2130	D4052	798.0		-0.28
1011	D4052	798.07		0.11	2133	D4052	795.29	G(0.01)	-15.45
1016		-----		-----	4043		-----		-----

normality	not OK
n	126
outliers	4
mean (n)	798.05
st.dev. (n)	0.104
R(calc.)	0.29
R(D4052:02e1)	0.50

Lab 120: first reported 793.7
Lab 132: first reported 798.06
Lab 177: first reported 0.7978
Lab 224: first reported 796.45
Lab 1140: probably unit error, reported 0.7981
Lab 1447: first reported 795.7
Lab 1585: probably unit error, reported 0.7979
Lab 1948: first reported 797.6
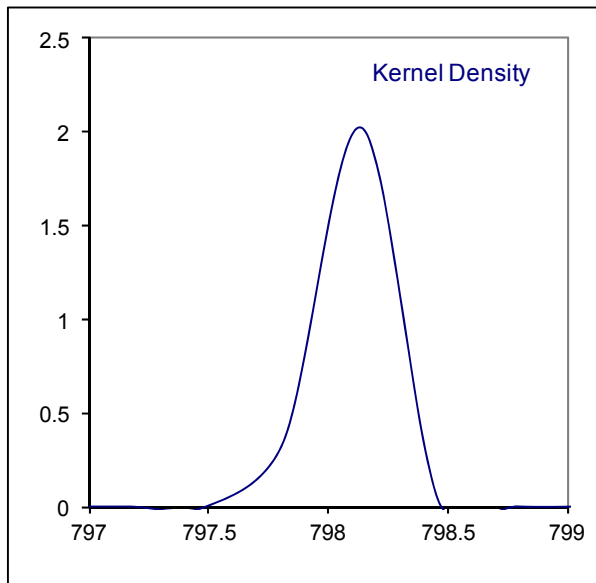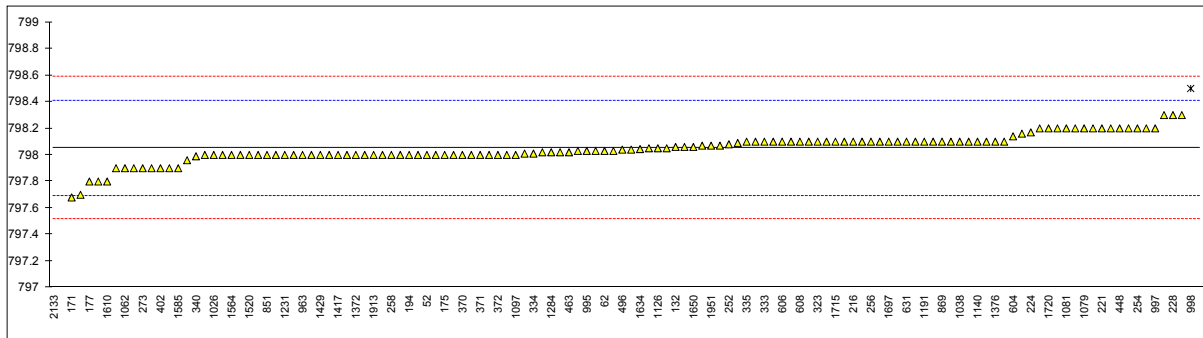
Determination of Distillation ASTM D86 (automated) on sample #13163; results in °C and %

lab	method	IBP	mark	10%	mark	50%	mark	90%	mark	FBP	mark	Residue	
52	D86	153.2		170.7		194.2		234.1		263.1		1.2	
62	D86-A	157.1		171.7		195.3		233.9		262.1		1.0	
120	D86-A	149.6		169.6		193.5		231.9		256.1		1.1	
132	D86-A	151.8		170.1		194.2		233.4		259.3		1.3	
140	D86-A	151.0		172.0		196.2		234.8		261.0		1.4	
150	D86-A	154.0		171.0		195.1	C	233.9		260.2		1.4	
159	D86-A	153.8		172.3		195.1		233.3		258.8		1.0	
169	D86-A	146.4		169.3		193.5		231.1		258.8		1.2	
171	D86-A	149.4		172.8		195.5		233.5		262.5		1.1	
175	D86-A	156.0		171.1		195.4		234.4		263.3		1.0	
177	D86-A	156.1	C	172.5	C	194.4	C	231.2	C	260.3	C	1.0	
194	D86-A	155.28		171.72		195.22		232.94		261.78		1.2	
230	D86-A	156.6	C	170.1	C	193.8	C	235.0	C	262.1	C	1.3	
258	D86-A	156.5		171.7		194.6		232.7		259.3		0.8	
273	D86-A	148.4		170.0		193.6		232.7		259.5		1.5	
311	D86-A	155.2		170.5		195.2		234.7		262.1		1.4	
323	D86-A	153.0		170.8		194.8		233.3		260.1		1.4	
333	D86-A	156.1		170.1		194.4		232.5		261.7		1.2	
334	D86-A	155.0		171.3		194.5		233.2		265.3		1.0	
335	D86-A	157.1		170.6		195.5		235.5		259.9		1.4	
340	D86-A	156.4		171.6		195.1		234.5		260.5		1.0	
353	D86-A	153.5		170.8		195.1		234.5		263.8		1.0	
369	D86-A	152.8		169.7		194.6		232.5		260.9		1.1	
370	D86-A	152.3		170.9		194.5		232.4		260.4		0.7	
371	D86-A	155.7		170.7		195.2		233.3		261.3		1.2	
372	D86-A	153.2		170.3		194.3		232.7		260.5		1.4	
391		-----		-----		-----		-----		-----		-----	
399	D86-A	150.0		170.2		193.6		232.0		258.8		0.5	G(0.05)
402	D86-A	153.6		172.5		195.3		234.3		260.1		1.0	
440	IP123-A	154.8		170.8		195.3		233.6		263.4		1.0	
445	IP123-A	151.9		170.2		194.0		232.7		258.6		1.4	
447	D86-A	153.0		171.6		195.3		234.9		261.1		1.2	
448	D86-A	154.7		168.8		194.2		234.9		262.5		1.1	
463	D86-A	152.1		170.4		193.6		232.9		260.5		1.5	
468	D86-A	151.6		170.6		194.8		235.0		261.8		1.2	
473	D86-A	151.4		170.7		194.6		233.3		259.2		1.2	
485	D86-A	151.20		170.75		193.85		231.45		257.40		1.25	
495	D86-A	155.6		170.0		193.4		231.9		259.9		1.2	
496	D86-A	151.5		169.8		193.3		231.7		258.8		1.2	
601		-----		-----		-----		-----		-----		-----	
604	D86-A	150.0		169.9		192.9		232.1		259.1		1.2	
606	D86-A	153.8		171.5		194.6		233.1		262.3		1.2	
608	D86-A	153.8		171.8		195.3		232.8		261.7		1.2	
631		-----		-----		-----		-----		-----		-----	
657	D86-A	153.2		171.8		195.8		235.9		261.4		1.4	
663	D86-A	153.6		171.3		194.5		233.1		261.7		1.4	
671	D86-A	148.8		170.7		193.7		231.1		248.7	G(0.01)	1.2	
732		-----		-----		-----		-----		-----		-----	
823	D86-A	152.7		169.6		194.5		232.0		261.3		1.0	
851	D86-A	152.7		170.9		194.7		234.1		258.7		0.9	
862	D86-A	149.5		169.0		193.7		231.8		260.5		1.1	
869		-----		-----		-----		-----		-----		-----	
922		-----		-----		-----		-----		-----		-----	
962		-----		-----		-----		-----		-----		-----	
963	D86-A	155.3		171.4		195.1		232.2		262.2		1.0	
974	D86-A	154.5		171.5		194.5		232.5		264.5		1.0	
994		-----		-----		-----		-----		-----		-----	
995		-----		-----		-----		-----		-----		-----	
996		-----		-----		-----		-----		-----		-----	
997		-----		-----		-----		-----		-----		-----	
998		-----		-----		-----		-----		-----		-----	
1011	D86-A	153.8		172.3		194.8		233.7		262.3		1.4	
1016		-----		-----		-----		-----		-----		-----	
1017		-----		-----		-----		-----		-----		-----	
1021	D86-A	154.3		170.8		195.1		235.1		260.1		1.2	
1026	ISO3405-A	154.3		170.9		194.6		233.5		260.1		1.2	
1038	D86-A	150.3		169.5		193.8		232.8		259.1		1.1	
1039	ISO3405-A	149.7		171.6		194.7		233.8		259.7		1.3	
1049	D86-A	149.9		170.9		194.5		233.0		261.9		1.2	
1059	D86-A	151.7		170.0		193.3		231.7		259.1		1.4	
1062	D86-A	153.4		171.4		195.0		233.6		260.5		1.2	
1064	D86-A	155.4		171.5		195.0		234.5		262.3		1.2	
1065	D86-A	152.5		168.7		192.9		232.2		259.2		1.3	
1079	D86-A	154.8		170.7		194.9		234.4		261.1		1.2	
1080	D86-A	149.0		167.0	G(0.05)	192.8		233.3		257.1		1.1	
1081	D86-A	152.9		171.3		194.7		233.6		260.8		0.8	

Lab	Method							
1082	D86-A	154.0	171.0	194.9	233.4	259.3	1.5	
1097	ISO3405-A	156.1	172.2	195.2	233.1	260.4	0.7	
1108		-----	-----	-----	-----	-----	-----	
1109	D86-A	152.4	170.3	195.2	234.9	260.6	1.2	
1126	in house-A	148.5	168.5	195.5	231.4	262.3	-----	
1140	D86-A	151.1	170.2	194.2	233.4	259.9	1.2	
1146	D86-A	152.4	169.4	193.3	231.5	259.0	0.5	G(0.05)
1150	ISO3405-A	156.25	170.70	193.03	230.95	262.17	1.0	
1191	D86	153.5	170.7	194.9	233.9	259.9	1.6	
1201	D86-A	154.5	170.6	195.0	234.9	259.5	1.4	
1231	D86	153.7	171.2	195.0	232.4	260.3	1.2	
1279	D86-A	154.2	171.8	195.3	234.2	261.9	1.2	
1284	D86-A	152.0	170.3	193.4	231.5	256.8	1.2	
1297	D86-A	152.7	170.6	193.1	232.4	258.2	1.2	
1299	D86-A	150.7	170.8	195.1	234.7	260.4	1.2	
1316	D86-A	152.3	171.1	194.9	233.5	259.9	1.2	
1318	D86-A	152.0	170.5	194.4	232.8	260.1	1.2	
1357		-----	-----	-----	-----	-----	-----	
1372	D86-A	151.2	171.7	194.4	233.5	261.0	1.2	
1376	D86-A	152.2	169.3	194.3	231.4	259.9	1.0	
1395	D86-A	150.8	170.2	194.0	232.4	254.6	0.9	
1417	IP123-A	153.7	171.1	195.2	235.7	261.3	1.3	
1429	D86-A	151.8	169.5	192.5	230.1	258.0	1.0	
1447	D86-A	152.1	170.1	193.6	232.1	259.1	1.2	
1448	D86-A	151.7	171.1	194.5	233.2	261.0	1.3	
1483		-----	-----	-----	-----	-----	-----	
1491	D86-A	156.2	171.6	195.4	235.2	262.4	1.2	
1496	D86-A	154.0	171.9	195.5	235.9	261.3	1.4	
1520		-----	-----	-----	-----	-----	-----	
1538	D86-A	153.8	170.6	194.5	232.2	261.8	1.2	
1564	D86-A	153.8	171.5	193.9	230.8	259.5	1.4	C
1585	D86-A	156.5	172.5	194.9	231.6	260.7	0.4	G(0.05)
1586	D86-A	152.7	171.4	194.1	233.0	262.5	0.9	
1587	D86-A	153.3	171.4	194.5	231.9	260.5	1.1	
1610	IP123-A	155.6	170.3	194.1	233.2	260.0	1.4	
1611	D86-A	154.6	171.1	193.6	232.2	260.0	1.2	
1616		-----	-----	-----	-----	-----	-----	
1631	D86-A	153.0	170.3	194.4	233.5	261.0	1.2	
1634	D86-A	150.8	170.8	194.7	233.6	260.9	1.2	
1635	D86-A	160.9	172.7	194.9	233.4	260.6	1.3	
1636	D86-A	151.7	170.8	194.9	232.8	259.3	1.3	
1650	D86-A	153.7	169.2	192.9	232.0	262.0	1.1	
1669	D86-A	152.5	171.6	195.0	233.0	262.8	1.1	
1694		-----	-----	-----	-----	-----	-----	
1697	D86	153.9	171.4	194.7	232.8	261.2	1.1	
1698	D86-A	152.95	170.70	194.55	234.00	260.75	1.35	
1699		-----	-----	-----	-----	-----	-----	
1713	D86-A	151.51	170.65	194.11	232.04	257.94	1.16	
1715	D86-A	154.8	170.7	193.8	231.4	258.8	0.9	
1720	D86-A	150.4	170.8	193.6	230.8	259.4	1.2	
1724	D86-A	149.3	170.6	193.7	231.4	259.4	1.2	
1811	D86-A	152.6	169.1	192.6	230.8	258.8	1	
1833	D86-A	153.8	170.7	194.4	232.0	261.5	1.0	
1842		-----	-----	-----	-----	-----	-----	
1913	D86-A	155.3	172.1	195.6	235.1	262.0	1.3	
1948	D86-A	152.9	171.3	195.3	233.8	260.4	1.5	
1951	D86-A	150.1	170.1	194.7	235.5	262.2	1.0	
2129	D86-A	151.0	171.3	194.3	232.0	259.0	1.2	
2130	D86-A	156.0	172.5	195.6	234.9	264.4	1.0	
2133	D86-A	148.5	168.2	195.8	239.7 G(0.01)	266.6	1.2	
	normality	OK	not OK	not OK	OK	OK		
	n	114	113	114	113	113		
	outliers	0	1	0	1	1		
	mean (n)	153.01	170.80	194.48	233.10	260.59		
	st.dev. (n)	2.320	0.935	0.780	1.294	1.798		
	R(calc.)	6.50	2.62	2.18	3.62	5.03		
	R(D86:12)	8.42	3.76	2.97	3.50	7.10		

Lab 150: first reported 188.7   Lab 230: first reported IBM 150.2
               10% rec 167.5   Lab 1564: first reported 0.4
               50% rec 198.4
               90% rec 240.0
               FBP 273.0
Lab 177: first reported IBM 299.1
               10% rec 337.3
               50% rec 379.8
               90% rec 447.6
               FBP 499.1

Initial Boiling Point

Kernel Density

10% rec

Kernel Density

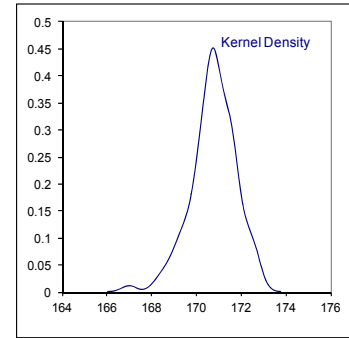50% rec

Kernel Density
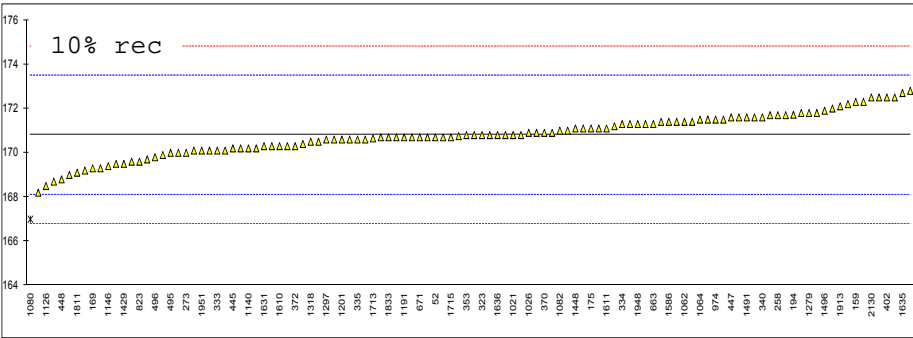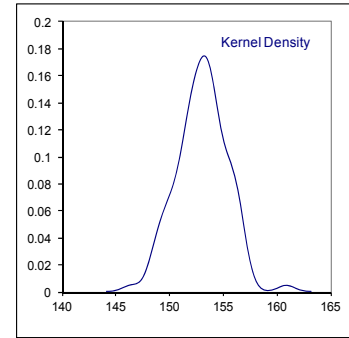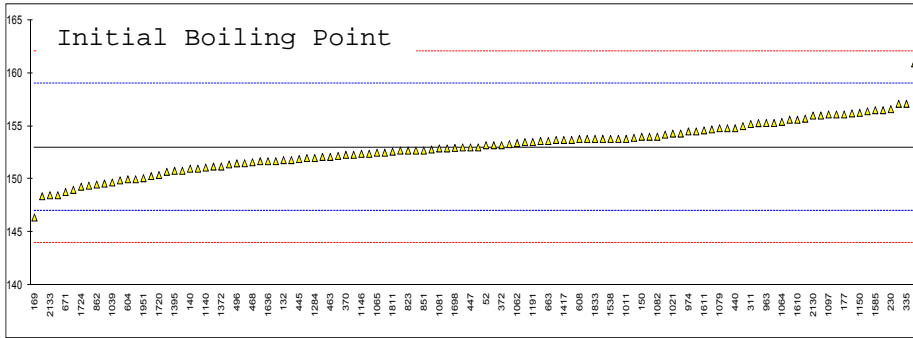
90% rec

Kernel Density

FBP

Kernel Density
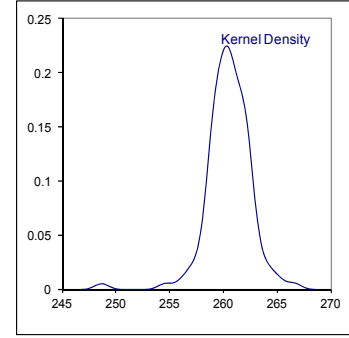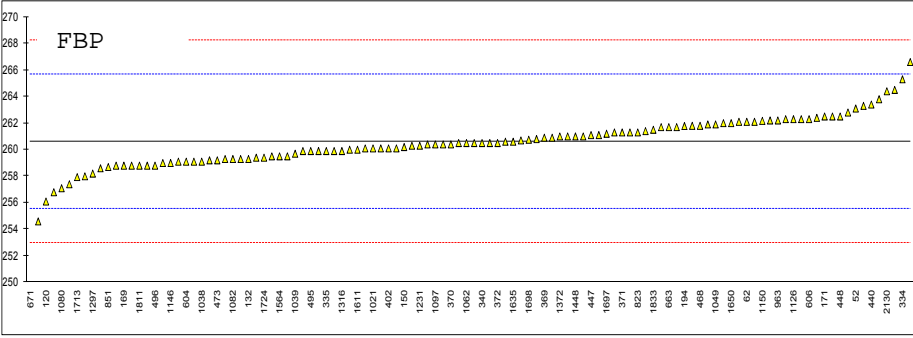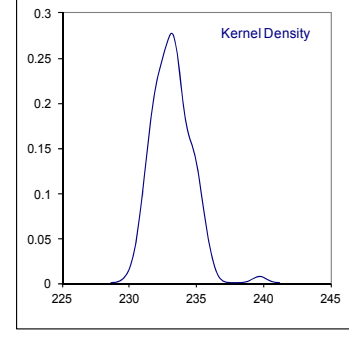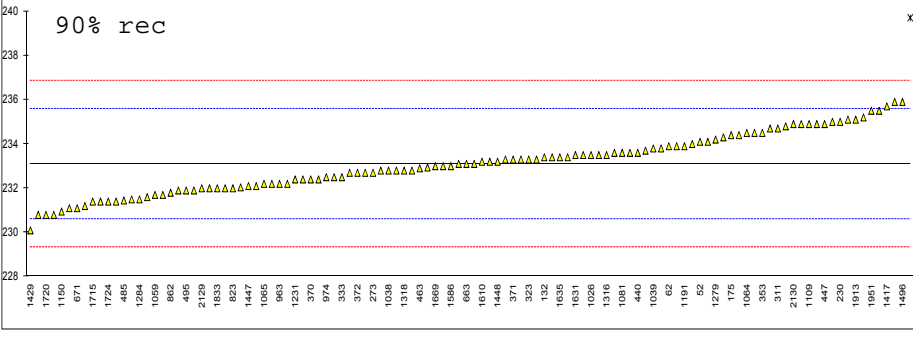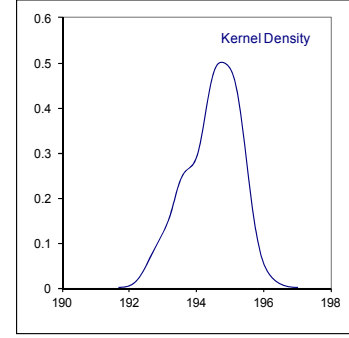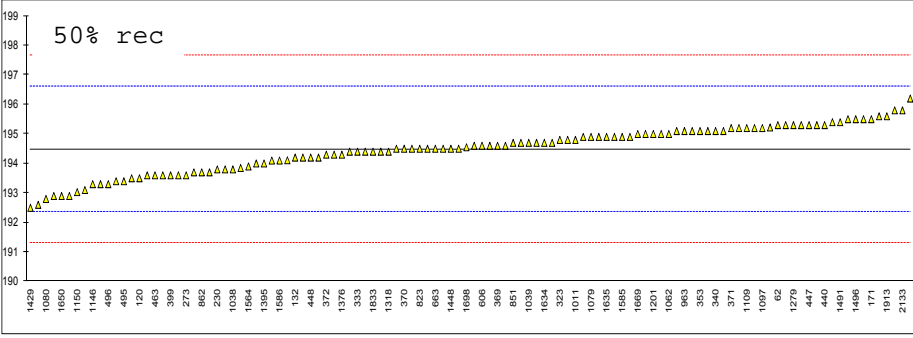
Determination of Distillation ASTM D86 (manual) on sample #13163; results in °C and %

lab	method	IBP	mark	10%	mark	50%	mark	90%	mark	FBP	mark	Residue
52		-----		-----		-----		-----		-----		-----
62		-----		-----		-----		-----		-----		-----
120		-----		-----		-----		-----		-----		-----
132		-----		-----		-----		-----		-----		-----
140		-----		-----		-----		-----		-----		-----
150		-----		-----		-----		-----		-----		-----
159		-----		-----		-----		-----		-----		-----
169		-----		-----		-----		-----		-----		-----
171		-----		-----		-----		-----		-----		-----
175		-----		-----		-----		-----		-----		-----
177		-----		-----		-----		-----		-----		-----
194		-----		-----		-----		-----		-----		-----
216	D86-M	147.5		172.0		194.0		232.5		259.5		1.4
221	D86-M	154.0		171.0		195.0		234.0		262.0		1.6
224	D86-M	155.02		171.03		194.01		230.08		260.68		1.4
225		-----		-----		-----		-----		-----		-----
228	D86-M	153.0		169.0		192.0		230.0		260.0		1.0
230		-----		-----		-----		-----		-----		-----
237		-----		-----		-----		-----		-----		-----
238		-----		-----		-----		-----		-----		-----
252	D86-M	151.0		170.0		194.0		232.0		262.0		-----
253		-----		-----		-----		-----		-----		-----
254	D86-M	152.0		170.0		193.0		231.0		261.0		-----
256	D86-M	151.0		170.0		194.0		232.0		262.0		-----
258		-----		-----		-----		-----		-----		-----
273		-----		-----		-----		-----		-----		-----
311		-----		-----		-----		-----		-----		-----
323		-----		-----		-----		-----		-----		-----
333		-----		-----		-----		-----		-----		-----
334		-----		-----		-----		-----		-----		-----
335		-----		-----		-----		-----		-----		-----
340		-----		-----		-----		-----		-----		-----
353		-----		-----		-----		-----		-----		-----
369		-----		-----		-----		-----		-----		-----
370		-----		-----		-----		-----		-----		-----
371		-----		-----		-----		-----		-----		-----
372		-----		-----		-----		-----		-----		-----
391	D86-M	152		172		195		232		261		1.3
399		-----		-----		-----		-----		-----		-----
402		-----		-----		-----		-----		-----		-----
440		-----		-----		-----		-----		-----		-----
445		-----		-----		-----		-----		-----		-----
447		-----		-----		-----		-----		-----		-----
448		-----		-----		-----		-----		-----		-----
463		-----		-----		-----		-----		-----		-----
468		-----		-----		-----		-----		-----		-----
473		-----		-----		-----		-----		-----		-----
485		-----		-----		-----		-----		-----		-----
495		-----		-----		-----		-----		-----		-----
496		-----		-----		-----		-----		-----		-----
601		-----		-----		-----		-----		-----		-----
604		-----		-----		-----		-----		-----		-----
606		-----		-----		-----		-----		-----		-----
608		-----		-----		-----		-----		-----		-----
631	D86-M	153.0		168.5		192.0		231.5		257.5		1.0
657		-----		-----		-----		-----		-----		-----
663		-----		-----		-----		-----		-----		-----
671		-----		-----		-----		-----		-----		-----
732	D86-M	151.0		168.0		193.0		232.0		259.0		1.0
823		-----		-----		-----		-----		-----		-----
851		-----		-----		-----		-----		-----		-----
862		-----		-----		-----		-----		-----		-----
869	D86-M	154.0		170.5		193.0		232.0		260.0		1.0
922	D86-M	147.45		167.95		191.94		232.94	C	258.94		1.10
962		-----		-----		-----		-----		-----		-----
963		-----		-----		-----		-----		-----		-----
974		-----		-----		-----		-----		-----		1
994		-----		-----		-----		-----		-----		-----
995	D86-M	150.5		168.2		192.5		230.8		260.0		1.3
996		-----		-----		-----		-----		-----		-----
997	D86-M	151.0		168.5		193.0		232.0		260.0		1.3
998	D86-M	152.0		169.0		192.5		230.5		259.0		1.1
1011		-----		-----		-----		-----		-----		-----
1016		-----		-----		-----		-----		-----		-----
1017		-----		-----		-----		-----		-----		-----
1021		-----		-----		-----		-----		-----		-----

lab	method						
1026		-----	-----	-----	-----	-----	-----
1038		-----	-----	-----	-----	-----	-----
1039		-----	-----	-----	-----	-----	-----
1049		-----	-----	-----	-----	-----	-----
1059		-----	-----	-----	-----	-----	-----
1062		-----	-----	-----	-----	-----	-----
1064		-----	-----	-----	-----	-----	-----
1065		-----	-----	-----	-----	-----	-----
1079		-----	-----	-----	-----	-----	-----
1080		-----	-----	-----	-----	-----	-----
1081		-----	-----	-----	-----	-----	-----
1082		-----	-----	-----	-----	-----	-----
1097		-----	-----	-----	-----	-----	-----
1108		-----	-----	-----	-----	-----	-----
1109		-----	-----	-----	-----	-----	-----
1126		-----	-----	-----	-----	-----	-----
1140		-----	-----	-----	-----	-----	-----
1146		-----	-----	-----	-----	-----	-----
1150		-----	-----	-----	-----	-----	-----
1191		-----	-----	-----	-----	-----	-----
1201		-----	-----	-----	-----	-----	-----
1231		-----	-----	-----	-----	-----	-----
1279	D86-M	153.0	169.0	195.0	234.0	261.0	1.5
1284		-----	-----	-----	-----	-----	-----
1297		-----	-----	-----	-----	-----	-----
1299		-----	-----	-----	-----	-----	-----
1316		-----	-----	-----	-----	-----	-----
1318		-----	-----	-----	-----	-----	-----
1357		-----	-----	-----	-----	-----	-----
1372		-----	-----	-----	-----	-----	-----
1376		-----	-----	-----	-----	-----	-----
1395		-----	-----	-----	-----	-----	-----
1417		-----	-----	-----	-----	-----	-----
1429		-----	-----	-----	-----	-----	-----
1447		-----	-----	-----	-----	-----	-----
1448		-----	-----	-----	-----	-----	-----
1483		-----	-----	-----	-----	-----	-----
1491		-----	-----	-----	-----	-----	-----
1496		-----	-----	-----	-----	-----	-----
1520	D86-M	151.3	168.3	191.3	229.8	257.4	1.4
1538		-----	-----	-----	-----	-----	-----
1564		-----	-----	-----	-----	-----	-----
1585		-----	-----	-----	-----	-----	-----
1586		-----	-----	-----	-----	-----	-----
1587		-----	-----	-----	-----	-----	0.8
1610		-----	-----	-----	-----	-----	-----
1611		-----	-----	-----	-----	-----	-----
1616		-----	-----	-----	-----	-----	-----
1631		-----	-----	-----	-----	-----	-----
1634		-----	-----	-----	-----	-----	-----
1635		-----	-----	-----	-----	-----	-----
1636		-----	-----	-----	-----	-----	-----
1650		-----	-----	-----	-----	-----	-----
1669		-----	-----	-----	-----	-----	-----
1694	D86-M	145 G(0.05)	168	192	230	256	1
1697		-----	-----	-----	-----	-----	-----
1698		-----	-----	-----	-----	-----	-----
1699	D86-M	153	171	193	228 G(0.05)	257	-----
1713		-----	-----	-----	-----	-----	-----
1715		-----	-----	-----	-----	-----	-----
1720		-----	-----	-----	-----	-----	-----
1724		-----	-----	-----	-----	-----	-----
1811		-----	-----	-----	-----	-----	-----
1833		-----	-----	-----	-----	-----	-----
1842		-----	-----	-----	-----	-----	-----
1913		-----	-----	-----	-----	-----	-----
1948		-----	-----	-----	-----	-----	-----
1951		-----	-----	-----	-----	-----	-----
2129		-----	-----	-----	-----	-----	-----
2130		-----	-----	-----	-----	-----	-----
2133		-----	-----	-----	-----	-----	-----
4043		-----	-----	-----	-----	-----	-----
	normality	OK	OK	OK	OK	OK	
	n	18	19	19	18	19	
	outliers	1	0	0	1	0	
	mean (n)	151.76	169.58	193.17	231.62	259.69	
	st.dev. (n)	1.997	1.369	1.130	1.283	1.747	
	R(calc.)	5.59	3.83	3.16	3.59	4.89	
	R(D86:12-M)	4.46	2.91	2.83	3.57	4.28	

Initial Boiling Point

Kernel Density

10% rec

Kernel Density

50% rec

Kernel Density

90% rec

Kernel Density

FBP

Kernel Density
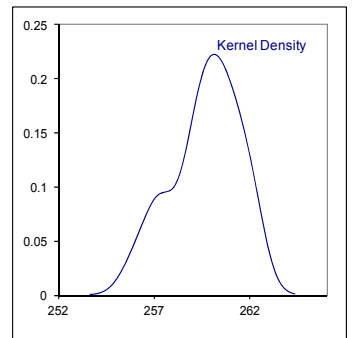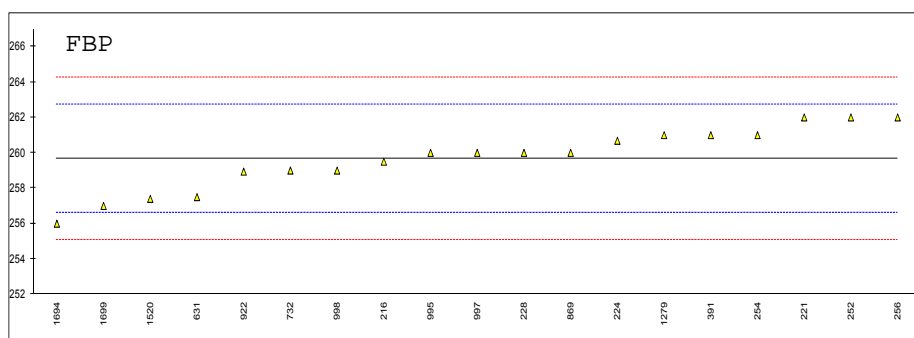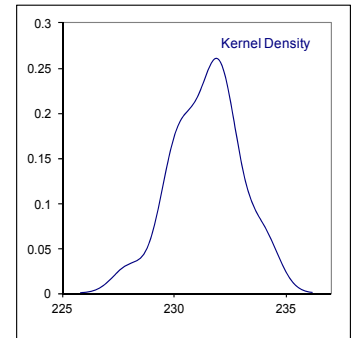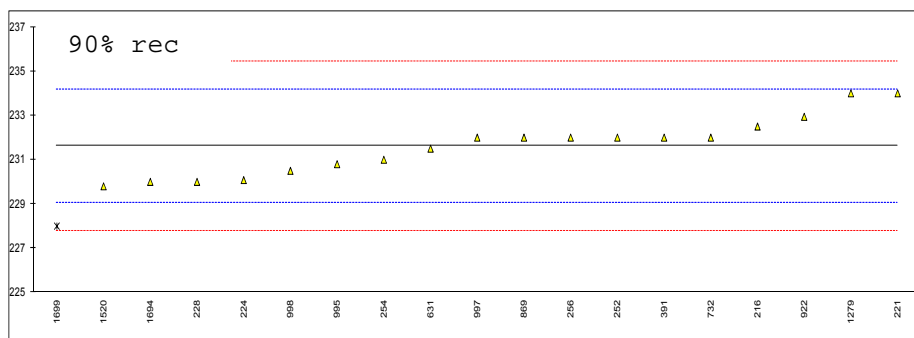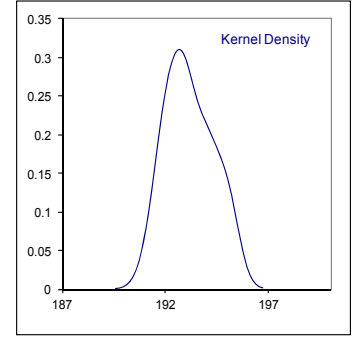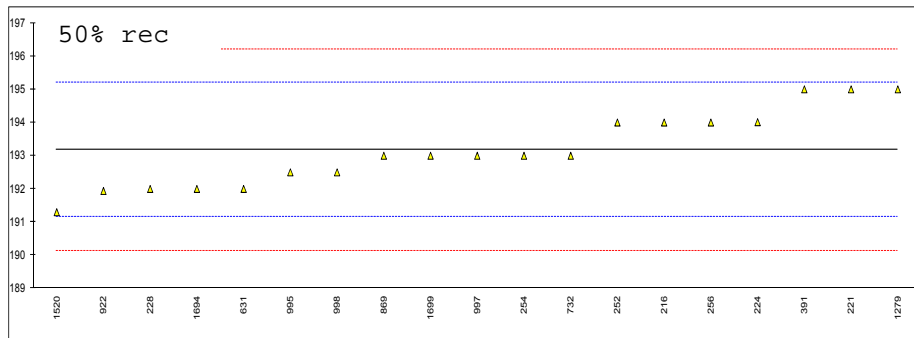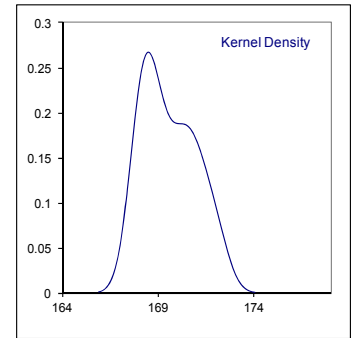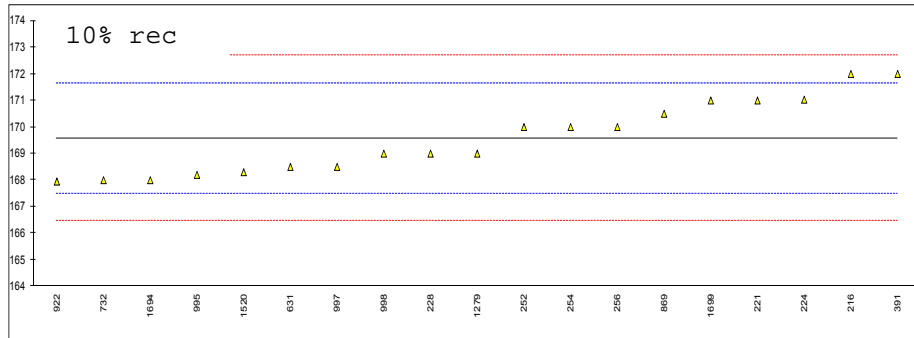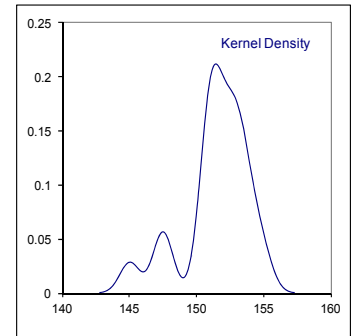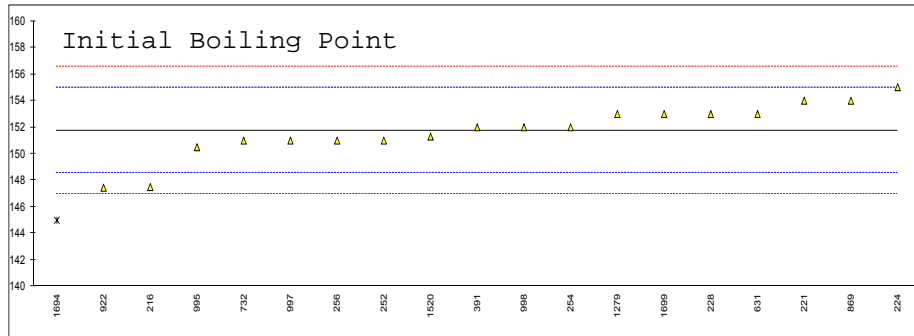
Determination of Existent Gum on sample #13163; results in mg/100 mL

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D381	<1		-----	1017		-----		-----
62	D381	0.79		-0.13	1021		-----		-----
120		-----		-----	1026	ISO6246	<1		-----
132	D381	<1.0		-----	1038	IP540	0		-0.82
140	D381	0.0		-0.82	1039	IP540	1		0.05
150	D381	0.2		-0.65	1049		-----		-----
159		-----		-----	1059	D381Mod.	0.4		-0.47
169	D381	1.0		0.05	1062	D381	<1		-----
171	D381	<1		-----	1064	D381	0.0		-0.82
175	D381	<1		-----	1065		-----		-----
177	D381	2.0		0.93	1079	D381	1		0.05
194	D381	<1		-----	1080	ISO6246	1.3		0.31
216	D381	1.8		0.75	1081	IP540	1.0		0.05
221	D381	1		0.05	1082	IP540	0.93		-0.01
224		-----		-----	1097	IP540	0.4		-0.47
225		-----		-----	1108		-----		-----
228		-----		-----	1109	IP540	0.1		-0.74
230	IP540	0.9		-0.04	1126		-----		-----
237		-----		-----	1140	IP540	0.2		-0.65
238		-----		-----	1146		-----		-----
252	D381	1		0.05	1150	ISO6246	1.5		0.49
253		-----		-----	1191		-----		-----
254		-----		-----	1201	D381	<1		-----
256	D381	1.50		0.49	1231	D381	0.3		-0.56
258	D381	<1.0		-----	1279		-----		-----
273	D381	<1		-----	1284	IP540	1.8		0.75
311	IP540	<1		-----	1297		-----		-----
323	IP540	<1		-----	1299	D381	0		-0.82
333		-----		-----	1316	D381	1.1		0.14
334		-----		-----	1318	D381	0.5		-0.39
335	D381	2		0.93	1357		-----		-----
340	D381	1.0		0.05	1372	D381	0.6		-0.30
353	IP540	<1		-----	1376	D381	0.2		-0.65
369	D381	1.1		0.14	1395		-----		-----
370	D381	1.2		0.23	1417	IP540	1		0.05
371		-----		-----	1429		-----		-----
372		-----		-----	1447	D381	1.1		0.14
391		-----		-----	1448		-----		-----
399		-----		-----	1483		-----		-----
402		-----		-----	1491	D381	1.0		0.05
440	IP540	1.4		0.40	1496	D381	0.72		-0.19
445	IP540	<1		-----	1520	D381	1.6		0.58
447	IP540	1.0		0.05	1538		-----		-----
448	D381	1		0.05	1564	IP540	1		0.05
463	D381	0.2		-0.65	1585		-----		-----
468	D381	0.5		-0.39	1586	D381	1		0.05
473	IP540	<1		-----	1587	D381	0.8		-0.12
485		-----		-----	1610	IP540	0.4		-0.47
495	D381	1.2		0.23	1611		-----		-----
496		-----		-----	1616		-----		-----
601		-----		-----	1631	IP540	1.0		0.05
604		-----		-----	1634	D381	1.5		0.49
606	IP540	0.66		-0.25	1635	D381	0.6		-0.30
608	D381	<1		-----	1636	IP540	0.35		-0.52
631	IP540	1.4		0.40	1650		-----		-----
657	D381	1		0.05	1669	D381	1		0.05
663		-----		-----	1694		-----		-----
671	D381	0.4		-0.47	1697		-----		-----
732		-----		-----	1698		-----		-----
823	D381	1		0.05	1699	D381	1.5		0.49
851	IP540	0.7		-0.21	1713		-----		-----
862	D381	0.6		-0.30	1715		-----		-----
869	D381	0.8		-0.12	1720	D381	5.6	G(0.01)	4.07
922	D381	1.9		0.84	1724	D381	1.8		0.75
962		-----		-----	1811	D381	1.73		0.69
963	D381	1.2		0.23	1833	D381	1.0		0.05
974	D381	1		0.05	1842	D381	0.6		-0.30
994		-----		-----	1913	D381	0.50		-0.39
995		-----		-----	1948	D381	2.4		1.27
996		-----		-----	1951	IP540	1.0		0.05
997		-----		-----	2129	D381	1.0		0.05
998		-----		-----	2130	D381	1		0.05
1011	D381	<1		-----	2133	D381	1.20		0.23
1016		-----		-----	4043		-----		-----

|	
normality	not OK
n	75
outliers	1
mean (n)	0.941
st.dev. (n)	0.5258
R(calc.)	1.472
R(D381:12)	3.200
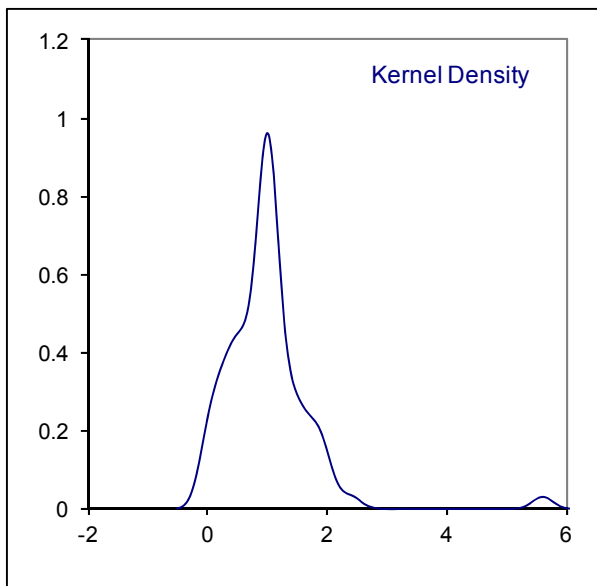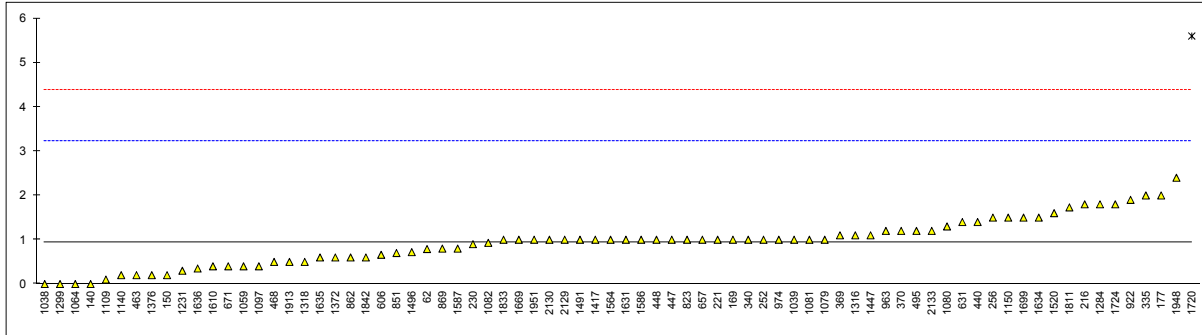
Determination of Flash Point on sample #13163; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D56-E	43.5		0.93	1017		-----		-----
62	D56-F	41.0		-1.26	1021	D56-AE	44.0		1.37
120	D56-E	42.0		-0.38	1026	IP170-AE	43.5		0.93
132	D56-E	42.5		0.06	1038	IP170-MF	41.5		-0.82
140	D56-E	48.9	G(0.01)	5.66	1039	IP170-AE	43.5		0.93
150	IP170-E	44.5		1.81	1049	ISO13736-AE	42.0		-0.38
159	D56E-AE	42.22		-0.19	1059	IP170-AF	42.0		-0.38
169	D56-F	43.8		1.19	1062	IP170-F	42.5		0.06
171	D56-E	49.0	G(0.01)	5.74	1064	IP170-E	42.0		-0.38
175	D56-F	41.5		-0.82	1065		-----		-----
177	IP170-MF	40.0		-2.13	1079	IP170-E	44.5		1.81
194	D56-AF	41.7		-0.64	1080		-----	W	-----
216	IP170-F	40.5		-1.69	1081	IP170	44.0		1.37
221	D3828-MF	42		-0.38	1082	D56-AF	42.4		-0.03
224	IP170-MF	42.02		-0.36	1097	ISO13736-AF	41.5		-0.82
225		-----		-----	1108		-----		-----
228	IP523-MF	41.0		-1.26	1109	IP170-AF	41.5		-0.82
230	IP170-MF	42.5		0.06	1126	ISO2719-AE	43.5		0.93
237		-----		-----	1140	IP170-AF	41.8		-0.56
238		-----		-----	1146		-----		-----
252	IP170-MF	42.5		0.06	1150	ISO2719-AF	43.0		0.49
253		-----		-----	1191	IP170-AF	43.0		0.49
254	IP170-F	42.0		-0.38	1201	IP170-AE	42.5		0.06
256	IP170-AE	42.5		0.06	1231	IP170	42.5		0.06
258	IP170-MF	41.5		-0.82	1279	D56-F	41.0		-1.26
273	IP170-E	42.0		-0.38	1284	IP170-AF	43.0		0.49
311	IP170-E	43.0		0.49	1297	D56-AE	42.0		-0.38
323	IP170-AF	43.5		0.93	1299	IP170-AF	44.0		1.37
333	IP170-AF	43.5		0.93	1316	IP170-E	42.5		0.06
334	IP170-AF	41.5		-0.82	1318	IP170-E	42.0		-0.38
335	IP170-AF	41.0		-1.26	1357		-----		-----
340	IP170-F	43.0		0.49	1372	IP170-AE	42.5		0.06
353	IP170-MF	42.325		-0.10	1376	D56-AF	43.0		0.49
369	IP170-AE	42.5		0.06	1395		-----		-----
370	IP170-MF	44.5		1.81	1417	IP170	42.0		-0.38
371		-----		-----	1429	IP170-MF	42.5		0.06
372	IP170-AE	41.5		-0.82	1447	IP170-AE	43.5		0.93
391	IP170-MF	41.5		-0.82	1448	IP170-AE	41.5		-0.82
399	IP170-MF	42.0		-0.38	1483		-----		-----
402	D56-AE	42.5		0.06	1491	IP170-E	41.5		-0.82
440	IP170	41.9		-0.47	1496	IP170-MF	43.8		1.19
445	IP170	42.6		0.14	1520	D56-AE	42.75		0.27
447	IP170-AF	42.5		0.06	1538		-----		-----
448	IP170	41.8		-0.56	1564	IP170-AF	45.0		2.24
463	IP170-E	45.0		2.24	1585	IP170-F	42.05		-0.34
468	IP170-AE	43.5		0.93	1586	IP170-F	42.0		-0.38
473	IP170-AE	43.5		0.93	1587	IP170-E	41.5		-0.82
485	D56-MF	41.5		-0.82	1610	IP170-AE	42.0		-0.38
495	IP170-AE	43.5		0.93	1611		-----		-----
496		-----		-----	1616		-----		-----
601	IP170-MF	42.5		0.06	1631	IP170-AE	43.0		0.49
604	IP170-AE	43.5		0.93	1634	IP170-E	41.1		-1.17
606	IP170-AE	43.0		0.49	1635	D56-MF	44.0		1.37
608	IP170-F	44.0		1.37	1636	IP170-AE	43.5		0.93
631	D56-MF	42.5		0.06	1650	IP170-AE	42.5		0.06
657	IP170-F	43.0		0.49	1669	IP170-E	43.0		0.49
663	D56-MF	42.5		0.06	1694	IP170-E	43.83		1.22
671	IP170-AF	41		-1.26	1697		-----		-----
732	D93-ME	44.0		1.37	1698	D56-MF	41.50		-0.82
823		-----		-----	1699	IP170-F	41.5		-0.82
851	IP170-MF	40.1		-2.04	1713		-----		-----
862	IP170-MF	41.5		-0.82	1715	D56-E	42.0		-0.38
869	IP170-MF	40.0		-2.13	1720	D3828-AF	43.0		0.49
922	IP170-E	42.5		0.06	1724	IP170-F	42.0		-0.38
962		-----		-----	1811	D56-F	40		-2.13
963	IP170-ME	42.0		-0.38	1833	IP170-AF	43.0		0.49
974	IP170-MF	42		-0.38	1842	IP170-E	42.5		0.06
994		-----		-----	1913	IP170-F	41.7		-0.64
995	IP170-MF	41.2		-1.08	1948	IP170-AF	43.0		0.49
996		-----		-----	1951	IP170-AF	43.1		0.58
997	IP170-MF	41.5		-0.82	2129	IP170-MF	40.5		-1.69
998	IP170-F	40.5		-1.69	2130	IP170-AF	42.0		-0.38
1011	IP170-E	43.5		0.93	2133	D93-E	45.0		2.24
1016	IP170-E	41.5		-0.82	4043	ISO15267-AE	45		2.24

		Without D93/ISO2719/ IP523 /ISO15267	Only IP170 /ISO13736/ D3828	Only D56
normality	not OK	not OK	not OK	OK
n	123	117	94	22
outliers	2	2	0	2
mean (n)	42.44	42.39	42.42	42.27
st.dev. (n)	1.101	1.0575	1.052	1.013
R(calc.)	3.08	2.96	2.95	2.84
R(IP170:09)	3.20	3.20	3.20	4.30

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

Lab 1080 result withdrawn: first reported 45.4
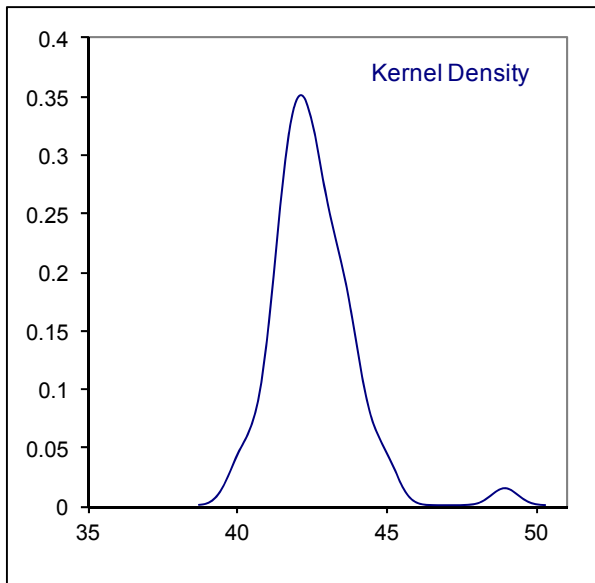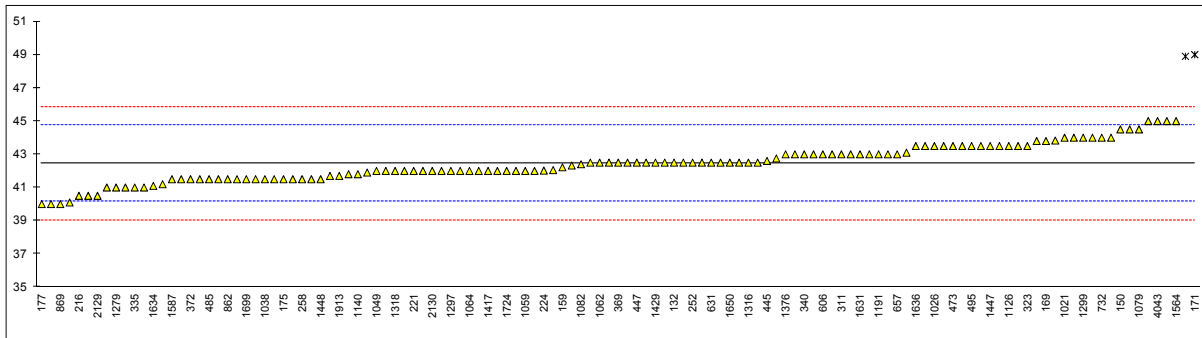
Determination of Freezing Point on sample #13163; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5972-A	-54.8		0.07	1017		-----		-----
62	D5972-A	-55.1		-0.27	1021		-----		-----
120	D2386-M	-55.0		-0.15	1026	D5972-A	-55.5		-0.71
132	D2386-M	-55.0		-0.15	1038		-----		-----
140	D5972-A	-55.1		-0.27	1039	IP529	-55.5		-0.71
150	D2386	-54.5		0.41	1049	D7153-A	-54.5		0.41
159	D2386-A	-56.24		-1.54	1059	D2386-M	-53.5		1.53
169	D2386-M	-55.0		-0.15	1062	D2386-M	-55.0		-0.15
171	D2386-M	-55.5		-0.71	1064	D7153-A	-54.6		0.29
175	D2386-M	-54		0.97	1065		-----		-----
177	D2386-M	-55.0		-0.15	1079	D2386-A	-55.3		-0.49
194	D2386-M	-56.0		-1.27	1080		-----		-----
216	D2386-M	-56.5		-1.83	1081	D7153-A	-54.3		0.63
221	D2386-M	-56		-1.27	1082	IP529-A	-54.7		0.18
224		-----		-----	1097	IP529-A	-54.5		0.41
225		-----		-----	1108		-----		-----
228		-----		-----	1109	D5972-A	-56.1		-1.39
230	D2386-M	-54.3		0.63	1126		-----		-----
237		-----		-----	1140	D5972-A	-54.3		0.63
238		-----		-----	1146		-----		-----
252	D2386-M	-54.5		0.41	1150	D2386-M	-55.0		-0.15
253		-----		-----	1191	IP529-A	-54.9		-0.04
254		-----		-----	1201	D5972-A	-55.0		-0.15
256		-----		-----	1231	D2386	55.75	G(0.01)	123.89
258	D2386-M	-54.0		0.97	1279	D56-M	-55.0		-0.15
273	D2386	-55.5		-0.71	1284	D5771-A	-55.1		-0.27
311	D2386-M	-55.0		-0.15	1297	D5972-A	-55.9		-1.16
323	D2386-M	-55.0		-0.15	1299	D2386-M	-53.5		1.53
333	IP529-A	-54.8		0.07	1316	D2386-A	-54.8		0.07
334	IP529-A	-54.4		0.52	1318	D2386-A	-54.4		0.52
335	IP529-A	-54.9		-0.04	1357		-----		-----
340	D7153-A	-54.5		0.41	1372	D7153-A	-55.1		-0.27
353	IP16-M	-55.43		-0.63	1376	D2386-M	-53.69		1.31
369	D2386-M	-55.0		-0.15	1395		-----		-----
370	D2386-M	-54.5		0.41	1417	IP529	-54.5		0.41
371	D2386-M	-55.0		-0.15	1429		-----		-----
372	D2386-M	-54.5		0.41	1447	D2386-A	-50.0	C,G(0.01)	5.45
391	D2386-M	-55.5		-0.71	1448		-----		-----
399		-----		-----	1483		-----		-----
402	D2386-M	-52.65		2.48	1491	D2386-M	-54.0		0.97
440	IP16-M	-55.5		-0.71	1496	D2386-M	-55.3		-0.49
445	D2386	-54.73		0.15	1520	D2386-M	-54.3		0.63
447	IP529-A	-54.3		0.63	1538		-----		-----
448	D2386-A	-54.6		0.29	1564	D2386-M	-55.0		-0.15
463	D2386-M	-55.5		-0.71	1585	D2386-M	-55.5		-0.71
468	D2386-M	-55.0		-0.15	1586	D2386-M	-55		-0.15
473	D2386-M	-55.0		-0.15	1587	IP529-A	-54.6		0.29
485		-----		-----	1610	IP16-M	-55.5		-0.71
495	D2386-M	-56		-1.27	1611		-----		-----
496	D2386-M	-53.0		2.09	1616		-----		-----
601	D2386-M	-55.0		-0.15	1631	D7153-A	-55.0		-0.15
604	D2386-M	-54.0		0.97	1634	D2386-M	-55.5		-0.71
606	D2386-M	-53.5		1.53	1635	D2386-M	-55		-0.15
608	D2386-M	-54.0		0.97	1636	D2386-M	-54.5		0.41
631	D2386-M	-54.0		0.97	1650	D2386-M	-54.5		0.41
657	D7153-A	-55.1		-0.27	1669	D2386-M	-55.0		-0.15
663	D2386-M	-56.0		-1.27	1694	D2386-A	55.00	G(0.01)	123.05
671	D2386-M	-54.5		0.41	1697		-----		-----
732		-----		-----	1698		-----		-----
823	D2386-M	-50.5	C,G(0.01)	4.89	1699	D2386-A	-56		-1.27
851	D2386-M	-55.05		-0.21	1713		-----		-----
862	D2386-M	-54.5		0.41	1715	D5972-A	-55.0		-0.15
869	D2386-M	-55.5		-0.71	1720	D2386-A	-54.4		0.52
922	D2386-M	-56.0		-1.27	1724	D2386-M	-56.5		-1.83
962		-----		-----	1811	D5972-A	-52.93		2.17
963	D2386-M	-54.5		0.41	1833	IP435-A	-54.4		0.52
974	D2386-M	-56.0		-1.27	1842	D2386-M	-55.5		-0.71
994		-----		-----	1913	D7153-A	-55.0		-0.15
995	D2386-M	-55		-0.15	1948		-----		-----
996		-----		-----	1951	IP529-A	-54.1		0.85
997	D2386-M	-55.0		-0.15	2129	D2386-M	-54.5		0.41
998	D2386-M	-55.5		-0.71	2130	D2386-M	-53.5		1.53
1011	D2386-M	-54.5	C	0.41	2133		-----		-----
1016	D5972-A	-55.5		-0.71	4043		-----		-----

normality	not OK
n	108
outliers	4
mean (n)	-54.86
st.dev. (n)	0.728
R(calc.)	2.04
R(D2386:12)	2.50

Lab 823: first reported -52.5
Lab 1011: first reported -52.0
Lab 1447: first reported -50.2

Kernel Density
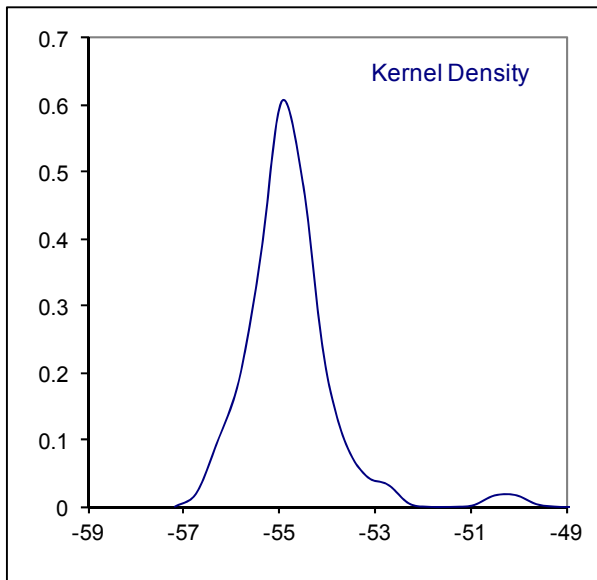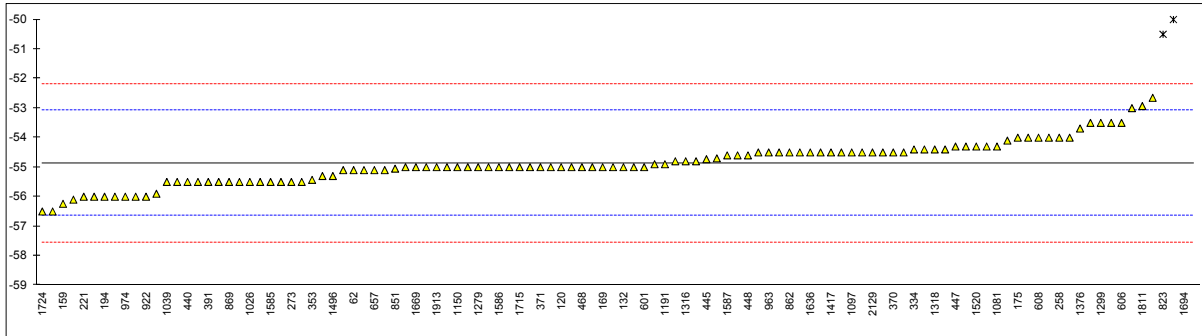
Determination of JFTOT; Tube Rating, Delta P in mmHg, Pumped Vol. in mL, Temp. in °C

lab	method	tube	mark	Delta P	mark	volume	mark	temp	mark	software type	remarks
52		-----		-----		-----		-----		-----	
62		-----		-----		-----		-----		-----	
120	D3241	1		-----		475		260		-----	
132	D3241	<1		0.1		450		260		Alcor JFTOT III	
140	D3241	<1		0		450		260		-----	
150	D3241	<1		0		450		260		-----	
159	D3241	1		0		450		260		vers. 3.4	
169	D3241	<2		2		450		260		-----	
171	D3241	<1		0		450		260		2.1	
175	D3241	<1		2		445		260		-----	
177	D3241	1		0		450		260		-----	
194	D3241	<1		1		450		260		230 v 2.1	
230	D3241	<1		<1		450		260		-----	
237		-----		-----		-----		-----		-----	
238		-----		-----		-----		-----		-----	
252	D3241	1		0		450		260		2.0	
253		-----		-----		-----		-----		-----	
254	D3241	1		0		450		260		1.5	
256		-----		-----		-----		-----		-----	
258	D3241	1.0		0.5		415		260		-----	
273		-----		-----		-----		-----		-----	
311	D3241	<1		<1		460		260		-----	
323	D3241	<1		<1		450		261		-----	
333	D3241	1		1		480		260		3.4	
334	D3241	0		0		450		260		v 3.4	
335	D3241	<1		0		>495		260		-----	
340	D3241	1		0.1		510		260		-----	
353		-----		-----		-----		-----		-----	
369	D3241	1		<1		450		260		-----	
370	D3241	<1		<3		510		260		3.2	
371		-----		-----		-----		-----		-----	
372	D3241	<1		0		450		260		JFTOT 230, ver.2.1	
391	D3241	0		0		450		260		-----	
399		-----		-----		-----		-----		-----	
402		-----		-----		-----		-----		-----	
440	IP323	<1		0		420		260		Alcor, JFTOT 230-3	
445	D3241	1		<1		460		260		JFTOT 230, MK III ver. 3.4	
447	D3241	1		<1		450		260		3.4	
448	D3241	1		<1		455		260		-----	
495	D3241	1		0		480		260		JFTOT Mark III, ver.3.4	
631	D3241	1		<1.0		495		260	C	-----	
657	D3241	1		1		450		260		JFTOT II ver.2.1	
663		-----		-----		-----		-----		-----	
671	D3241	1		0.3		450		260		-----	
732		-----		-----		-----		-----		-----	
823		-----		-----		-----		-----		-----	
851	D3241	<1		0		450		260		ver.3.4	
862	D3241	<1		0		490		260		3.6	
869	D3241	<1		0		450		260		3.4	
922		-----		-----		-----		-----		-----	
962		-----		-----		-----		-----		-----	
963	D3241	<1		0		450		260		JFTOT 230 Mark III, ver.3.4	
974	D3241	<1		0		450		260	C	version 2.1	
994		-----		-----		-----		-----		-----	
995		-----		-----		-----		-----		-----	
996		-----		-----		-----		-----		-----	
997		-----		-----		-----		-----		-----	
998		-----		-----		-----		-----		-----	
1011	D3241	1		0.1		510		260		JFTOT 230 Mark III, ver.3.4	
1016	D3241	<1		<1		-----		260		-----	
1017		-----		-----		-----		-----		-----	
1021		-----		-----		-----		-----		-----	
1026	D3241	<1		3.0	G(0.01)	-----		260		-----	
1038		-----		-----		-----		-----		-----	
1039	D3241	<2	C	0		450		260		JFTOT ver.3.2	
1049	D3241	1		0.0		462		260		3.4	
1059		-----		-----		-----		-----		-----	
1062	D3241	0		<3		500		260		Mark III v.3.2	
1064	D3241	1		0.1		510		260		JFTOT III 3.4	
1065		-----		-----		-----		-----		-----	
1079	D3241	<1		0		450		260		-----	
1080		-----		-----		-----		-----		-----	
1081	D3241	1		1		485		260		-----	
1082	D3241	1		0		450		260		-----	
1097	D3241	1		0		455		260		JFTOT 230 Mark III, ver.3.4	

1108		-----	-----		-----	-----	-----
1109	D3241	<1	0		450	260	JFTOT II ver.2.1
1126		-----	-----		-----	-----	-----
1140	D3241	<1.0	0.0		507	260	Mark 3 ver.3.2
1146		-----	-----		-----	-----	-----
1150		-----	-----		-----	-----	-----
1191	D3241	1	0		450	260	-----
1201	D3241	<1	1		450	260	-----
1231	D3241	<1	4.3	G(0.01)	449.1	260	Firmware vers.1.62 JFTOT IV
1279	D3241	<1	0.0		510	260	JFTOT III ver.3.2
1284		-----	-----		-----	-----	-----
1297		-----	-----		-----	-----	-----
1299	D3241	1	1		450	260	JFTOT 230 Mark III, ver.3.4
1316	D3241	<2	0		425	260	-----
1318	D3241	1	0.1		510	260	III
1357		-----	-----		-----	-----	-----
1372	D3241	<1	0.0		460	260	Mark III ver.3.4
1376	D3241	1	0.1		510	260	-----
1395		-----	-----		-----	-----	-----
1417	IP323	<1	1		450	260	-----
1429		-----	-----		-----	-----	-----
1447	D3241	<1	0		510	260	ver.3.4
1448		-----	-----		-----	-----	-----
1483		-----	-----		-----	-----	-----
1491		-----	-----		-----	-----	-----
1496	D3241	1	0.0		450	260	-----
1520	D3241	1	<1		460	260	2.1
1538		-----	-----		-----	-----	-----
1564	D3241	1	0	C	450	260	-----
1585		-----	-----		-----	-----	-----
1586	D3241	1	0.1		510	260	JFTOT III ver.3.4
1587	D3241	1	0.0		510	260	JFTOT III
1610	IP323	<1	<1		450	260	-----
1611		-----	-----		-----	-----	-----
1616		-----	-----		-----	-----	-----
1631	D3241	1	0.0		450	260	-----
1634		-----	-----		-----	-----	-----
1635	D3241	1	1.0		600	260	-----
1636		-----	-----		-----	-----	-----
1650	D3241	1	0.0		450	260	JFTOT III
1699	D3241	<1	2.0		450	-----	ALCOR JFTOT-II VER 2.1
1724	D3241	1	0		510	260	3.4
1811		-----	-----		-----	-----	-----
1833	D3241	<1	0		510	260	-----
1842	D3241	1	<1		-----	-----	-----
1913	D3241	<1	0.0		450	260	JFTOT III 3.4
1948		-----	-----		-----	-----	-----
1951		-----	-----		-----	-----	-----
2129	D3241	1	2		455	260	Mk 2 JFTOT
2130	D3241	1	0		450	C	260	III
2133	D3241	<1	<0.1		510	260	3.4
4043		-----	-----		-----	-----	-----

normality	not OK	not OK
n	41	60
outliers	0	2
mean (n)	0.93	0.29
st.dev. (n)	0.264	0.572
R(calc.)	0.74	1.60
R(D3241)	n.a	n.a

Lab 631: first reported 240
Lab 974: first reported 240
Lab 1039: first reported 2
Lab 1564: first reported 2
Lab 2130: first reported 625

Determination of Copper on sample #13163; results in µg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1017		-----		-----
62		-----		-----	1021		-----		-----
120		-----		-----	1026		-----		-----
132		-----		-----	1038		-----		-----
140		-----		-----	1039		-----		-----
150		-----		-----	1049		-----		-----
159		-----		-----	1059		-----		-----
169		-----		-----	1062		-----		-----
171	INH-014	29	G(0.01)	8.14	1064		-----		-----
175		-----		-----	1065		-----		-----
177		-----		-----	1079		-----		-----
194		-----		-----	1080		-----		-----
216		-----		-----	1081		-----		-----
221		-----		-----	1082		-----		-----
224		-----		-----	1097		-----		-----
225		-----		-----	1108		-----		-----
228		-----		-----	1109		-----		-----
230		-----		-----	1126		-----		-----
237		-----		-----	1140		-----		-----
238		-----		-----	1146		-----		-----
252		-----		-----	1150	EN2160	1b		-----
253		-----		-----	1191		-----		-----
254		-----		-----	1201		-----		-----
256		-----		-----	1231		-----		-----
258		-----		-----	1279		-----		-----
273		-----		-----	1284		-----		-----
311		-----		-----	1297		-----		-----
323		-----		-----	1299		-----		-----
333		-----		-----	1316		<10		-----
334		-----		-----	1318	D6732	2.9		-0.02
335		-----		-----	1357		-----		-----
340		-----		-----	1372		-----		-----
353		-----		-----	1376		-----		-----
369		-----		-----	1395		-----		-----
370		-----		-----	1417		-----		-----
371		-----		-----	1429		-----		-----
372		-----		-----	1447		-----		-----
391		-----		-----	1448		-----		-----
399		-----		-----	1483		-----		-----
402		-----		-----	1491		-----		-----
440		-----		-----	1496	D130	1a		-----
445		-----		-----	1520		-----		-----
447		-----		-----	1538		-----		-----
448		1		-0.61	1564		-----		-----
463		-----		-----	1585		-----		-----
468		-----		-----	1586		-----		-----
473		-----		-----	1587		-----		-----
485		-----		-----	1610		-----		-----
495		-----		-----	1611		-----		-----
496		-----		-----	1616		-----		-----
601		-----		-----	1631		-----		-----
604		-----		-----	1634	D130	1A		-----
606		-----		-----	1635		-----		-----
608		-----		-----	1636		-----		-----
631		-----		-----	1650		-----		-----
657		-----		-----	1669		-----		-----
663		-----		-----	1694		-----		-----
671		-----		-----	1697		-----		-----
732		-----		-----	1698		-----		-----
823		-----		-----	1699		-----		-----
851		-----		-----	1713		-----		-----
862	INH-15337	3		0.01	1715		-----		-----
869		-----		-----	1720		-----		-----
922		-----		-----	1724		-----		-----
962		-----		-----	1811		-----		-----
963		-----		-----	1833		-----		-----
974		-----		-----	1842	INH-15337	5.00		0.64
994		-----		-----	1913		-----		-----
995		-----		-----	1948		-----		-----
996		-----		-----	1951		-----		-----
997		-----		-----	2129		-----		-----
998		-----		-----	2130		-----		-----
1011		-----		-----	2133	in house	2.9		-0.02
1016		-----		-----	4043		-----		-----

normality	OK
n	5
outliers	1
mean (n)	2.96
st.dev. (n)	1.415
R(calc.)	3.96
R(D6732:10)	8.95
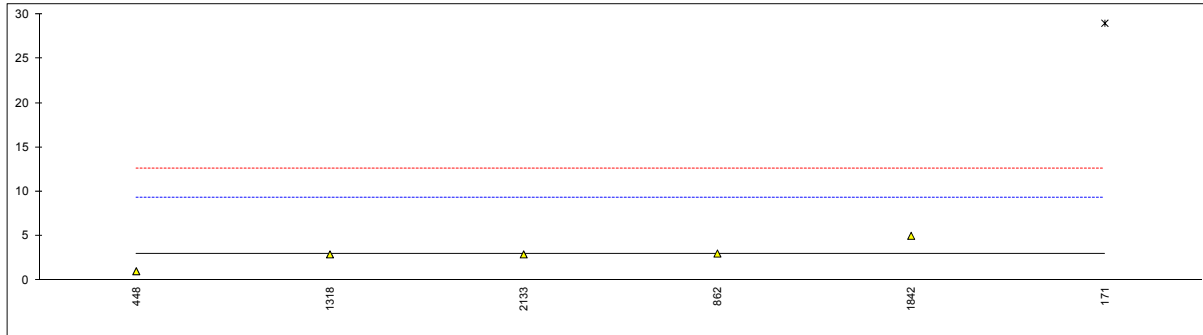
## Determination of Mercaptan Sulphur on sample #13163; results in % M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3227	0.0004		-0.27	1017		-----		-----
62	D3227	0.00044		0.07	1021		-----		-----
120	D3227	0.0007		2.29	1026	D3227	≤0.0001		-----
132	D3227	0.0005		0.58	1038		-----		-----
140		-----		-----	1039	UOP163	0.0005		0.58
150	D3227	0.0004		-0.27	1049	D3227	0.000375		-0.49
159	D3227	0.00034		-0.78	1059	D3227	0.0006		1.43
169	D3227	0.0005		0.58	1062	D3227	0.0005		0.58
171	D3227	0.01787	G(0.01)	148.80	1064	D3227	0.00038		-0.44
175	D3227	0.0005		0.58	1065		-----		-----
177		-----		-----	1079	D3227	0.0004		-0.27
194	D3227	0.0005		0.58	1080		-----		-----
216		-----		-----	1081		-----		-----
221		-----		-----	1082		-----		-----
224		-----		-----	1097	ISO 3012	0.00054		0.92
225		-----		-----	1108		-----		-----
228		-----		-----	1109	D3227	0.00042		-0.10
230	D3227	0.00062		1.60	1126		-----		-----
237		-----		-----	1140	D3227	0.00044	C	0.07
238		-----		-----	1146		-----		-----
252		-----		-----	1150		-----		-----
253		-----		-----	1191		-----		-----
254		-----		-----	1201	D3227	0.0004		-0.27
256		-----		-----	1231		-----		-----
258		-----		-----	1279		-----		-----
273	D3227	0.000447		0.13	1284	D3227	0.00043		-0.02
311	D3227	0.0004		-0.27	1297	D3227	0.000406		-0.22
323	D3227	0.0004		-0.27	1299	D3227	0.0004		-0.27
333	D3227	0.0004		-0.27	1316	D3227	0.0005		0.58
334	D3227	0.00041		-0.19	1318		-----		-----
335	D3227	0.0005		0.58	1357		-----		-----
340	D3227	0.00040		-0.27	1372	D3227	0.00061		1.52
353		-----		-----	1376	D3227	0.00039		-0.36
369	D3227	0.00042		-0.10	1395		-----		-----
370	D3227	0.00033		-0.87	1417		-----		-----
371	D3227	0.0004		-0.27	1429		-----		-----
372	D3227	0.00043		-0.02	1447	D3227	0.0007		2.29
391	UOP163	0.00039		-0.36	1448		-----		-----
399		-----		-----	1483		-----		-----
402	D3227	0.00052		0.75	1491		-----		-----
440	D3227	0.00035		-0.70	1496	D3227	0.00036		-0.61
445	D3227	0.0005		0.58	1520	D3227	0.00037		-0.53
447	D3227	0.0004		-0.27	1538		-----		-----
448	D3227	0.0004		-0.27	1564	D3227	0.0003		-1.13
463	IP30	positive		-----	1585	D3227	0.00036		-0.61
468		-----		-----	1586	D3227	0.0001		-2.83
473		-----		-----	1587		-----		-----
485		-----		-----	1610	IP342	0.000414		-0.15
495	D3227	0.00052		0.75	1611		-----		-----
496		-----		-----	1616		-----		-----
601		-----		-----	1631	D3227	0.00041		-0.19
604		-----		-----	1634		-----		-----
606		-----		-----	1635	D3227	0.0005		0.58
608		-----		-----	1636	D3227	0.00048		0.41
631		-----		-----	1650	D3227	0.0004		-0.27
657	D3227	0.0004		-0.27	1669	D3227	0.0094	C,G(0.01)	76.52
663		-----		-----	1694		-----		-----
671		-----		-----	1697		-----		-----
732	D3227	0.000395		-0.32	1698		-----		-----
823		-----		-----	1699	D3227	0.000497	C	0.56
851	D3227	0.00034		-0.78	1713		-----		-----
862	D3227	0.00040		-0.27	1715		-----		-----
869	D3227	0.00039		-0.36	1720		-----		-----
922	D3227	0.00036		-0.61	1724	D3227	0.00041		-0.19
962		-----		-----	1811		-----		-----
963	D3227	0.0006		1.43	1833	D3227	0.0004		-0.27
974		-----		-----	1842	IP342	0.0004		-0.27
994		-----		-----	1913	D3227	0.00058		1.26
995	D3227	0.00052		0.75	1948	D3227	0.0006		1.43
996		-----		-----	1951	D3227	0.0002		-1.98
997		-----		-----	2129	D3227	0.0004		-0.27
998		-----		-----	2130	D3227	0.0004		-0.27
1011	D3227	0.0004		-0.27	2133	D3227	0.00012		-2.66
1016	D3227	0.00038		-0.44	4043		-----		-----

normality	not OK
n	75
outliers	2
mean (n)	0.00043
st.dev. (n)	0.000102
R(calc.)	0.00029
R(D3227:13)	0.00033

Lab 1140: probably unit error, reported: 4.40
Lab 1669: first reported 94
Lab 1699: probably unit error, reported: 4.97
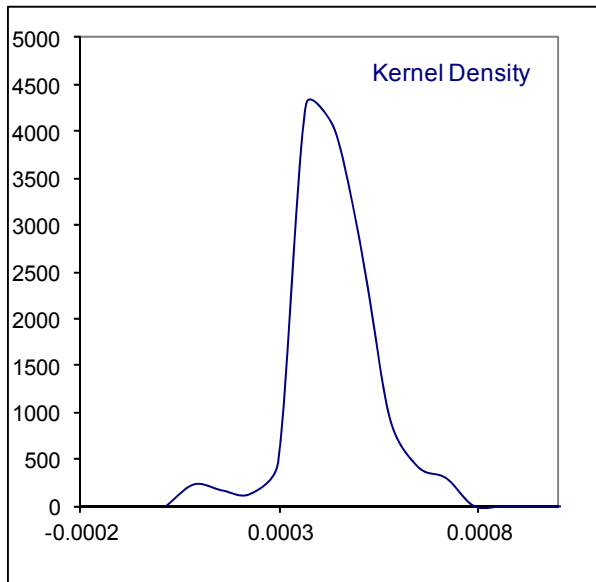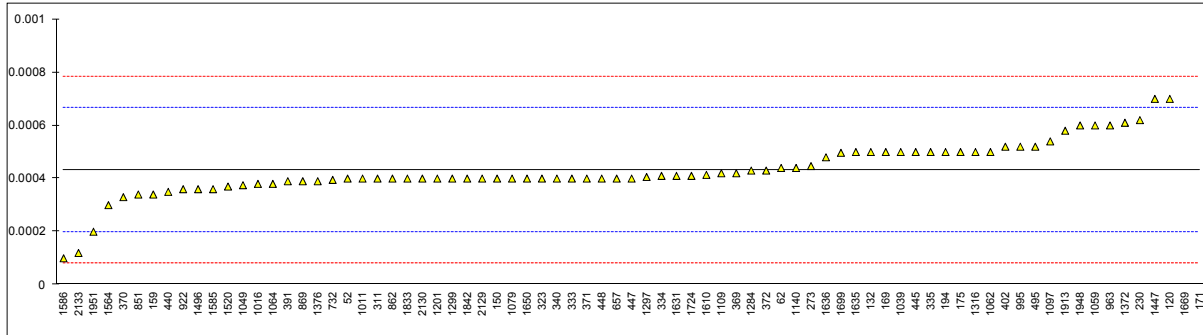
Determination of MSEP on sample #13163;

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3948	91		-0.04	1017		-----		-----
62	D3948	96		1.23	1021		-----		-----
120	D3948	97		1.48	1026		-----		-----
132	D3948	95		0.97	1038	D3948	92		0.21
140		-----		-----	1039	D3948	96		1.23
150	D3948	86		-1.31	1049	D3948	85		-1.56
159	D3948	87		-1.06	1059	D3948	91		-0.04
169	D3948	40	G(0.01)	-12.98	1062	D3948	90		-0.29
171	D3948	90		-0.29	1064	D3948	94		0.72
175	D3948	86		-1.31	1065		-----		-----
177	D3948	90		-0.29	1079	D3948	95		0.97
194	D3948	83		-2.07	1080		-----		-----
216		-----		-----	1081	D3948	100		2.24
221		-----		-----	1082	D3948	85		-1.56
224		-----		-----	1097	D3948	92		0.21
225		-----		-----	1108		-----		-----
228		-----		-----	1109	D3948	88		-0.80
230	D3948	98		1.73	1126		-----		-----
237		-----		-----	1140	D3948	89		-0.55
238		-----		-----	1146		-----		-----
252	D3948	91		-0.04	1150	D3948	80.3		-2.75
253		-----		-----	1191	D3948	94		0.72
254	D3948	90		-0.29	1201	D3948	94		0.72
256		-----		-----	1231	D3948	94		0.72
258	D3948	95		0.97	1279	D3948	97		1.48
273		-----		-----	1284		-----		-----
311	D3948	89		-0.55	1297		-----		-----
323	D3948	87		-1.06	1299	D3948	92		0.21
333	D3948	91		-0.04	1316	D3948	75	DG(0.01)	-4.10
334	D3948	89		-0.55	1318	D3948	90		-0.29
335	D3948	94		0.72	1357		-----		-----
340	D3948	92		0.21	1372	D3948	90		-0.29
353	D3948	95		0.97	1376	D3948	86		-1.31
369	D3948	91		-0.04	1395		-----		-----
370	D3948	93		0.47	1417		-----		-----
371		-----		-----	1429		-----		-----
372	D3948	92		0.21	1447		-----		-----
391		-----		-----	1448		-----		-----
399		-----		-----	1483		-----		-----
402	D3948	87		-1.06	1491		-----		-----
440	D3948	88		-0.80	1496	D3948	91		-0.04
445	D3948	76	G(0.05)	-3.85	1520		-----		-----
447	D3948	93		0.47	1538	D3948	91		-0.04
448		-----		-----	1564	D3948	99		1.99
463	D3948	84		-1.82	1585	D3948	89		-0.55
468		-----		-----	1586	D3948	94		0.72
473	D3948	82		-2.32	1587	D3948	89		-0.55
485		-----		-----	1610	D3948	89		-0.55
495	D3948	92.0		0.21	1611		-----		-----
496	D3948	90		-0.29	1616		-----		-----
601	D3948	91		-0.04	1631	D3948	90		-0.29
604		-----		-----	1634	D3948	92		0.21
606	D3948	95		0.97	1635	D3948	71	G(0.05)	-5.11
608	D3948	96		1.23	1636		-----		-----
631	D3948	89		-0.55	1650	D3948	88		-0.80
657	D3948	89		-0.55	1669		-----		-----
663		-----		-----	1694		-----		-----
671	D3948	89		-0.55	1697		-----		-----
732		-----		-----	1698		-----		-----
823		-----		-----	1699	D3948	96		1.23
851	D3948	88		-0.80	1713		-----		-----
862	D3948	90		-0.29	1715		-----		-----
869	D3948	92		0.21	1720		-----		-----
922		-----		-----	1724	D3948	95		0.97
962		-----		-----	1811		-----		-----
963	D3948	97		1.48	1833	D3948	93		0.47
974	D3948	86		-1.31	1842	D3948	89		-0.55
994		-----		-----	1913	D3948	95		0.97
995		-----		-----	1948		-----		-----
996		-----		-----	1951	D3948	93		0.47
997		-----		-----	2129	D3948	94		0.72
998		-----		-----	2130	D3948	95		0.97
1011	D3948	99		1.99	2133	D3948	75	DG(0.01)	-4.10
1016	D3948	85		-1.56	4043		-----		-----

normality	OK
n	83
outliers	5
mean (n)	91.2
st.dev. (n)	4.02
R(calc.)	11.3
R(D3948:13)	11.0
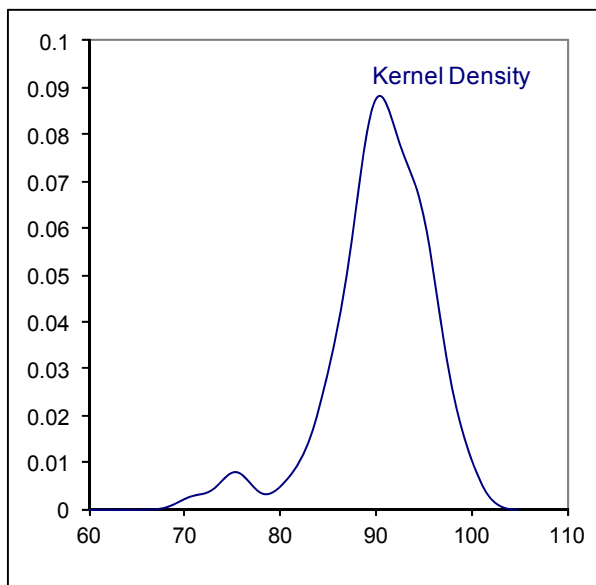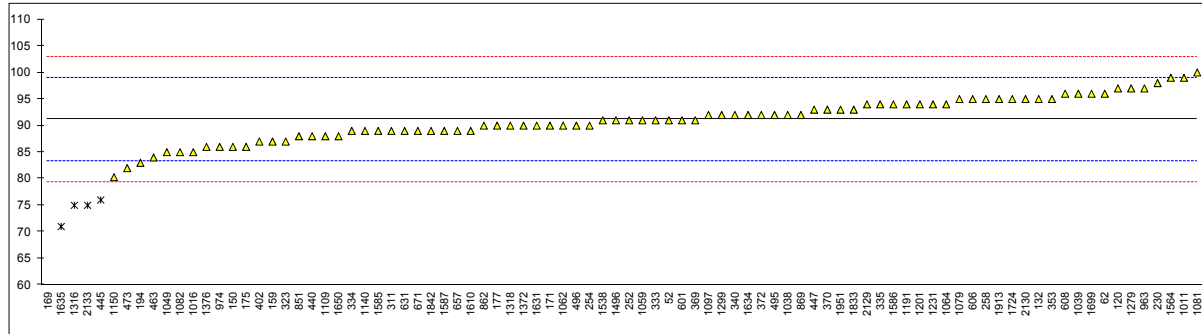
Determination of Naphthalenes on sample #13163; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D1840	0.65		-0.25	1017		-----		-----
62	D1840-A	0.634		-0.86	1021		-----		-----
120	D1840-B	0.65		-0.25	1026		-----		-----
132	D1840-B	0.665		0.32	1038	D1840-B	0.63		-1.02
140		-----		-----	1039	D1840-B	0.71		2.05
150	D1840-A	0.66		0.13	1049	D1840-A	0.646		-0.40
159	D1840-B	0.6606		0.16	1059		-----		-----
169	D1840-B	0.65		-0.25	1062	D1840-B	0.67		0.52
171	D1840-B	0.65		-0.25	1064	D1840-A	0.643		-0.52
175	D1840-B	0.664		0.29	1065		-----		-----
177	D1840	0.71		2.05	1079	D1840-A	0.64		-0.63
194	D1840-B	0.65		-0.25	1080		-----		-----
216		-----		-----	1081	D1840-B	0.7		1.67
221		-----		-----	1082		-----		-----
224		-----		-----	1097	D1840-A	0.647		-0.37
225		-----		-----	1108		-----		-----
228		-----		-----	1109	D1840-B	0.651		-0.21
230	D1840-A	1.692	C,G(0.01)	39.70	1126		-----		-----
237		-----		-----	1140	D1840-B	0.66		0.13
238		-----		-----	1146		-----		-----
252		-----		-----	1150		-----		-----
253		-----		-----	1191		-----		-----
254		-----		-----	1201		-----		-----
256		-----		-----	1231	D1840	0.665		0.32
258		-----		-----	1279		-----		-----
273		-----		-----	1284		-----		-----
311	D1840-B	0.65		-0.25	1297		-----		-----
323	D1840-A	0.63		-1.02	1299	D1840	0.49	G(0.01)	-6.39
333	D1840-B	0.63		-1.02	1316	D1840-A	0.673	C	0.63
334	D1840-B	0.651		-0.21	1318	D1840-B	0.69		1.28
335	D1840-A	0.65		-0.25	1357		-----		-----
340	D1840-B	0.658		0.06	1372		-----		-----
353		-----		-----	1376	D1840-A	0.667		0.40
369	D1840-B	0.667		0.40	1395		-----		-----
370	D1840-A	0.658		0.06	1417		-----		-----
371	D1840-B	0.63		-1.02	1429		-----		-----
372	D1840	0.65		-0.25	1447	D1840-B	0.68		0.90
391		-----		-----	1448		-----		-----
399		-----		-----	1483		-----		-----
402	D1840	0.650		-0.25	1491		-----		-----
440	D1840-B	0.645		-0.44	1496	D1840-B	0.654		-0.10
445	D1840-B	0.652		-0.17	1520	D1840-B	0.646		-0.40
447	D1840-B	0.64		-0.63	1538		-----		-----
448	D1840-A	0.615		-1.59	1564	D1840	0.65		-0.25
463	D1840-B	0.6591		0.10	1585		-----		-----
468		-----		-----	1586		-----		-----
473		-----		-----	1587		-----		-----
485		-----		-----	1610	D1840-A	0.6627		0.24
495		-----		-----	1611		-----		-----
496	D1840-A	0.631		-0.98	1616		-----		-----
601		-----		-----	1631		-----		-----
604		-----		-----	1634		-----		-----
606		-----		-----	1635	D1840-B	0.6603		0.14
608		-----		-----	1636	D1840-B	0.645		-0.44
631	D1840-A	0.67	C	0.52	1650		-----		-----
657	D1840-A	0.64		-0.63	1669	D1840-B	0.51	C,G(0.01)	-5.62
663	D1840-A	0.66		0.13	1694		-----		-----
671		-----		-----	1697		-----		-----
732		-----		-----	1698		-----		-----
823	D1840-A	0.66		0.13	1699	D1840-A	1.378	G(0.01)	27.66
851	D1840-A	0.666		0.36	1713		-----		-----
862	D1840-B	0.649		-0.29	1715		-----		-----
869	D1840-A	0.649		-0.29	1720	D1840-B	0.37	G(0.01)	-10.99
922		-----		-----	1724		-----		-----
962		-----		-----	1811		-----		-----
963	D1840-B	0.64		-0.63	1833		-----		-----
974	D1840-A	0.66		0.13	1842	D1840-A	0.69		1.28
994		-----		-----	1913	D1840-B	0.6315		-0.96
995		-----		-----	1948		-----		-----
996		-----		-----	1951	D1840-A	0.6496		-0.27
997		-----		-----	2129	D1840-B	0.645		-0.44
998		-----		-----	2130		-----		-----
1011	D1840-B	0.67		0.52	2133	D1840-A	0.726		2.66
1016	D1840-B	0.67		0.52	4043		-----		-----

		Only method A	Only method B
normality	not OK	OK	OK
n	65	24	35
outliers	5	2	2
mean (n)	0.657	0.655	0.656
st.dev. (n)	0.0201	0.0222	0.0183
R(calc.)	0.056	0.062	0.051
R(D1840:07-B)	0.073	0.049	0.073

Lab 230: first reported 1.232
Lab 631: first reported 0.783
Lab 1316: first reported 0.36
Lab 1669: first reported 0.51, corrected result: 15.6, first reported result placed in report

Kernel Density
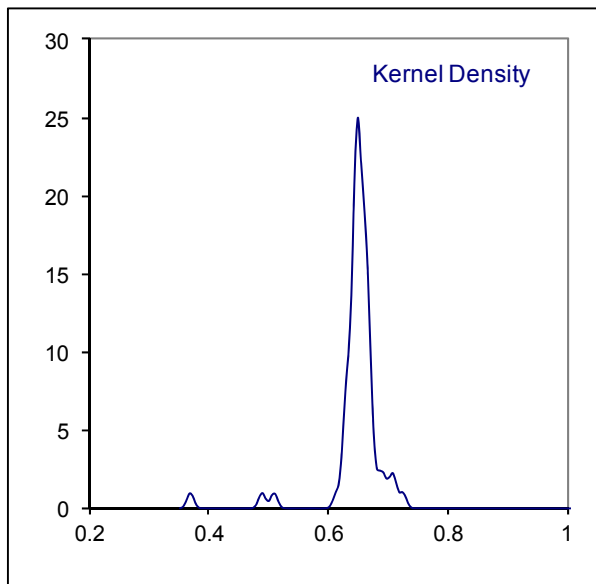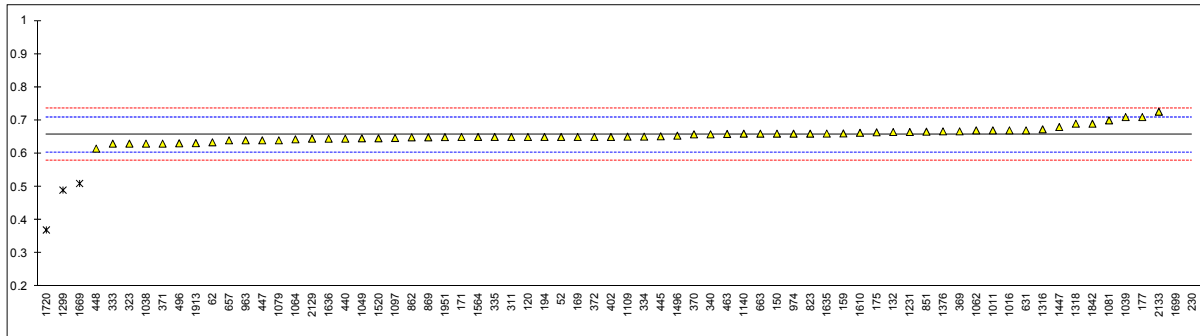
Determination of Smoke Point on sample #13163; results in mm

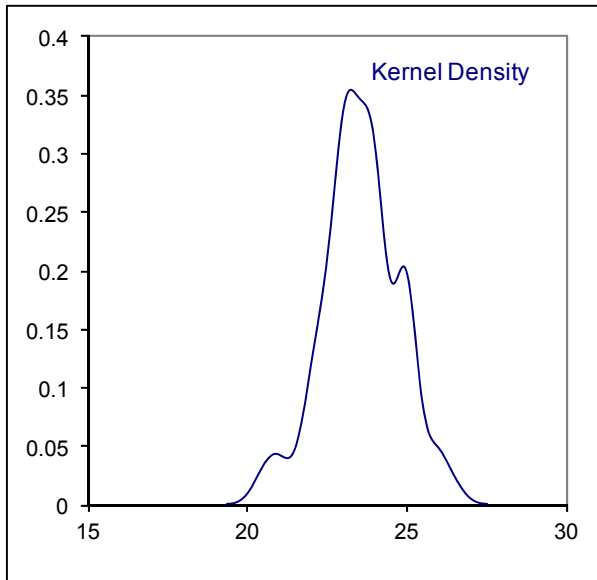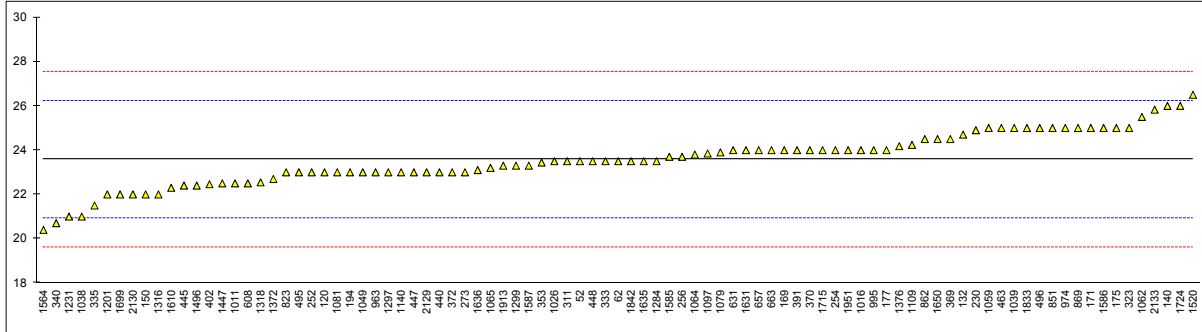| lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D1322	23.5		-0.06	1017		-----		-----
62	D1322-M	23.5		-0.06	1021		-----		-----
120	D1322-M	23		-0.43	1026	D1322	23.5		-0.06
132	D1322-M	24.7		0.85	1038	D1322-M	21.0		-1.95
140	D1322-M	26		1.83	1039	D1322-M	25.0		1.08
150	D1322-M	22		-1.19	1049	D1322-M	23		-0.43
159		-----		-----	1059	D1322-M	25.0		1.08
169	D1322-M	24.0		0.32	1062	D1322-A	25.5		1.45
171	D1322-M	25.0		1.08	1064	D1322-A	23.8		0.17
175	D1322-M	25		1.08	1065	D1322-A	23.2		-0.28
177	D1322-M	24		0.32	1079	D1322-A	23.9		0.25
194	D1322-M	23.0		-0.43	1080		-----		-----
216		-----		-----	1081	D1322	23.0		-0.43
221		-----		-----	1082		-----		-----
224		-----		-----	1097	D1322-M	23.85		0.21
225		-----		-----	1108		-----		-----
228		-----		-----	1109	D1322-M	24.24		0.50
230	D1322-M	24.9		1.00	1126		-----		-----
237		-----		-----	1140	D1322-M	23.0		-0.43
238		-----		-----	1146		-----		-----
252	D1322-M	23.0		-0.43	1150		-----		-----
253		-----		-----	1191		-----		-----
254	D1322-M	24.0		0.32	1201	D1322-M	22.0		-1.19
256	D1322-M	23.7		0.09	1231	D1322	21		-1.95
258		-----		-----	1279		-----		-----
273	D1322	23		-0.43	1284	D1322-M	23.5		-0.06
311	D1322-M	23.5		-0.06	1297	D1322-M	23		-0.43
323	D1322-M	25.0		1.08	1299	D1322-A	23.3		-0.21
333	D1322-A	23.5		-0.06	1316	D1322-M	22		-1.19
334		-----		-----	1318	D1322-M	22.547		-0.78
335	D1322-M	21.5		-1.57	1357		-----		-----
340	D1322-M	20.7		-2.17	1372	D1322-M	22.7		-0.66
353	IP57-M	23.44		-0.10	1376	D1322-M	24.18		0.46
369	D1322-M	24.5		0.70	1395		-----		-----
370	D1322-M	24.0		0.32	1417		-----		-----
371		-----		-----	1429		-----		-----
372	D1322-M	23.0		-0.43	1447	D1322-M	22.5		-0.81
391	D1322-M	24		0.32	1448		-----		-----
399		-----		-----	1483		-----		-----
402	D1322-M	22.46		-0.84	1491		-----		-----
440	D1322-M	23.0		-0.43	1496	D1322-M	22.4		-0.89
445	D1322-M	22.4		-0.89	1520	D1322-M	26.5		2.21
447	D1322-M	23.0		-0.43	1538		-----		-----
448	D1322	23.5		-0.06	1564	D1322-M	20.4		-2.40
463	D1322-M	25.0		1.08	1585	D1322-M	23.7		0.09
468		-----		-----	1586	D1322-M	25		1.08
473		-----		-----	1587	D1322-A	23.3		-0.21
485		-----		-----	1610	IP57-M	22.3		-0.96
495	D1322-M	23.0		-0.43	1611		-----		-----
496	D1322-M	25		1.08	1616		-----		-----
601		-----		-----	1631	D1322-A	24		0.32
604		-----		-----	1634		-----		-----
606		-----		-----	1635	D1322-M	23.5		-0.06
608	D1322-M	22.5		-0.81	1636	D1322-M	23.1		-0.36
631	D1322-M	24.0		0.32	1650	D1322-M	24.5		0.70
657	D1322-M	24.0		0.32	1669		-----		-----
663	D1322-M	24		0.32	1694		-----		-----
671		-----		-----	1697		-----		-----
732		-----		-----	1698		-----		-----
823	D1322-A	23.0		-0.43	1699	D1322-M	22		-1.19
851	D1322-M	25.0		1.08	1713		-----		-----
862	D1322-M	24.5		0.70	1715	D1322-M	24.0		0.32
869	D1322-M	25.0		1.08	1720		-----		-----
922		-----		-----	1724	D1322-M	26.0		1.83
962		-----		-----	1811		-----		-----
963	D1322-M	23.0		-0.43	1833	D1322-M	25		1.08
974	D1322-M	25.0		1.08	1842	D1322-A	23.5		-0.06
994		-----		-----	1913	D1322-A	23.3		-0.21
995	D1322-M	24.0		0.32	1948		-----		-----
996		-----		-----	1951	D1322-M	24.0		0.32
997		-----		-----	2129	D1322-M	23.00		-0.43
998		-----		-----	2130	D1322-M	22.0		-1.19
1011	D1322-M	22.5		-0.81	2133	D1322-M	25.83		1.70
1016	IP598-A	24.0		0.32	4043		-----		-----

|		Only D1322-M data	Only D1322-A data
normality	not OK	OK	OK
n	91	71	13
outliers	0	0	0
mean (n)	23.58	23.63	23.79
st.dev. (n)	1.189	1.272	0.727
R(calc.)	3.33	3.56	2.04
R(D1322:12e1-M)	3.71	3.71	0.89

Determination of Specific Energy on sample #13163; results in MJ/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3338	43.269		-0.22	1017		-----		-----
62		-----		-----	1021		-----		-----
120	D3338	43.291		1.12	1026		-----		-----
132	D3338	43.280		0.45	1038		-----		-----
140	D3338	43.29		1.06	1039	D3338	43.265		-0.46
150	D3338	43.299		1.61	1049	D3338	43.2697		-0.18
159	D3338	43.281		0.51	1059	D3338	43.266		-0.40
169	D3338	43.274		0.08	1062	D3338	43.269		-0.22
171	D3338	43.2811		0.52	1064	D3338	43.2886		0.97
175	D3338	43.272		-0.04	1065		-----		-----
177	D3338	43.273		0.02	1079	D3338	43.258		-0.89
194	D3338	43.273		0.02	1080		-----		-----
216		-----		-----	1081	D3338	43.268		-0.28
221		-----		-----	1082		-----		-----
224		-----		-----	1097	D3338	43.275		0.15
225		-----		-----	1108		-----		-----
228		-----		-----	1109	D3338	43.28		0.45
230	D3338	43.293		1.24	1126		-----		-----
237		-----		-----	1140		-----		-----
238		-----		-----	1146		-----		-----
252		-----		-----	1150		-----		-----
253		-----		-----	1191		-----		-----
254		-----		-----	1201	D3338	43.290		1.06
256		-----		-----	1231	D3338	43.272		-0.04
258		-----		-----	1279		-----		-----
273		-----		-----	1284	D3338	43.269		-0.22
311	D3338	43.28		0.45	1297		-----		-----
323		-----		-----	1299	D3338	43.27		-0.16
333	D3338	43.247		-1.56	1316	D3338	43.264		-0.52
334		-----		-----	1318		-----		-----
335		-----		-----	1357		-----		-----
340	D3338	43.283		0.63	1372	D3338	43.2580		-0.89
353		-----		-----	1376	D3338	43.2690		-0.22
369	D3338	43.270		-0.16	1395		-----		-----
370	D3338	43.2737		0.07	1417		-----		-----
371		-----		-----	1429		-----		-----
372	D3338	43.278		0.33	1447	D3338	43.267		-0.34
391		-----		-----	1448		-----		-----
399		-----		-----	1483		-----		-----
402		-----		-----	1491		-----		-----
440	D3338	43.283		0.63	1496	D3338	43.2875		0.91
445	D3338	43.258		-0.89	1520	D3338	43.2730		0.02
447	D3338	43.290	C	1.06	1538		-----		-----
448	D3338	43.275		0.15	1564		-----		-----
463	D3338	43.28		0.45	1585		-----		-----
468		-----		-----	1586		-----		-----
473		-----		-----	1587	D3338	43.2662		-0.39
485		-----		-----	1610	D3338	43.26028		-0.75
495	D3338	43.278		0.33	1611		-----		-----
496	D3338	43.253		-1.19	1616		-----		-----
601		-----		-----	1631	D3338	43.269		-0.22
604		-----		-----	1634		-----		-----
606		-----		-----	1635	D3338	43.294		1.30
608		-----		-----	1636	D3338	43.2632		-0.57
631	D3338	43.2373		-2.15	1650	D3338	43.2694		-0.20
657	D3338	43.292		1.18	1669		-----		-----
663		-----		-----	1694		-----		-----
671		-----		-----	1697		-----		-----
732		-----		-----	1698		-----		-----
823	D3338	43.285		0.75	1699	D3338	43.256		-1.01
851	D3338	43.270		-0.16	1713		-----		-----
862	D3338	43.248		-1.50	1715		-----		-----
869	D3338	43.2452		-1.67	1720		-----		-----
922		-----		-----	1724	D3338	43.257		-0.95
962		-----		-----	1811		-----		-----
963	D3338	43.270		-0.16	1833	D3338	43.27		-0.16
974	D3338	43.289		1.00	1842		-----		-----
994		-----		-----	1913	D3338	43.28		0.45
995		-----		-----	1948		-----		-----
996		-----		-----	1951		-----		-----
997		-----		-----	2129	D3338	43.258		-0.89
998		-----		-----	2130	D3338	43.292	C	1.18
1011	D3338	43.265		-0.46	2133	D3338	43.330	G(0.01)	3.49
1016		-----		-----	4043		-----		-----

normality	OK
n	65
outliers	1
mean (n)	43.2726
st.dev. (n)	0.01304
R(calc.)	0.0365
R(D3338:09)	0.0460

Lab 447: first reported 43.209
Lab 2130: first reported 42.292 correction on correction
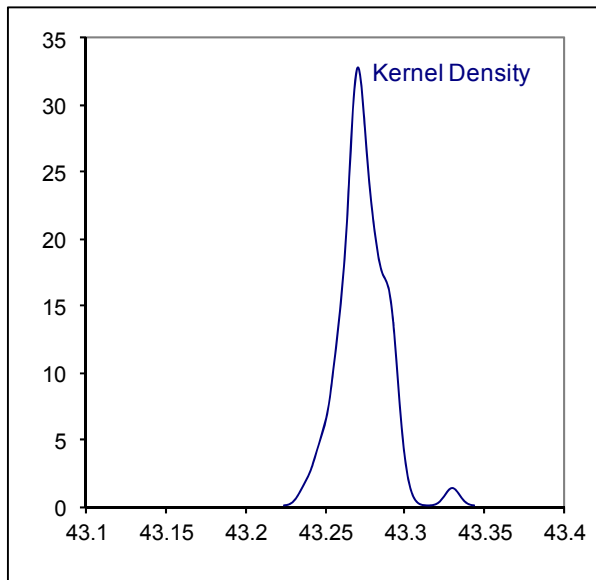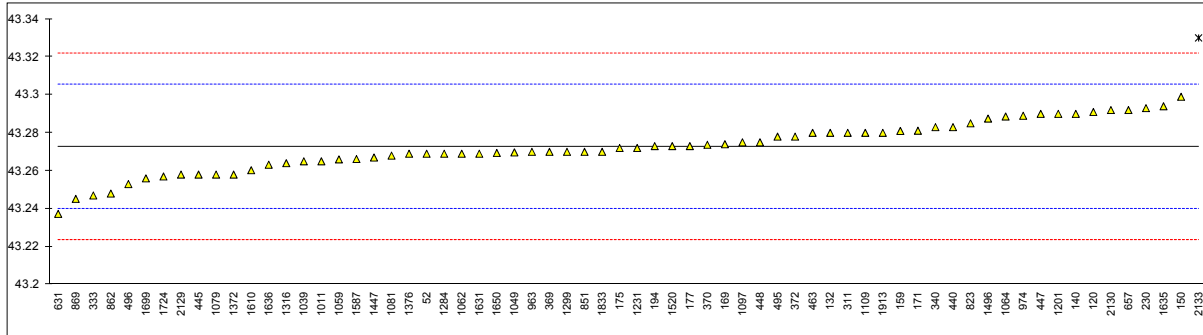
Determination of Total Acidity on sample #13163; results in mg KOH/g

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3242-Y	<0.001		-----	1017		-----		-----
62	D3242-Y	0.0022		1.02	1021		-----		-----
120		-----		-----	1026	D3242	0.002		0.67
132	D3242-Y	0.0011		-0.87	1038	D3242-Y	0.002		0.67
140	D3242-Y	0.002		0.67	1039	D3242-Y	0.002		0.67
150	D3242-Y	0.0027		1.88	1049	D3242-Y	0.00226		1.12
159	D3242-Y	0.00196		0.60	1059	D3242-Y	0.001		-1.05
169	D3242-Y	0.002		0.67	1062	D3242-N	0.0010		-1.05
171	D3242-Y	0.0033		2.91	1064	D3242-Y	0.0009		-1.22
175	D3242-Y	0.002		0.67	1065	D3242	0.0033		2.91
177	D3242-Y	0.0011		-0.87	1079	D3242-Y	<0.001		-----
194	D3242-Y	0.00083		-1.34	1080		-----		-----
216		-----		-----	1081	D3242-Y	0.001		-1.05
221		-----		-----	1082		-----		-----
224		-----		-----	1097	D3242-Y	0.0018		0.33
225		-----		-----	1108		-----		-----
228		-----		-----	1109	D3242-Y	0.0009		-1.22
230	D3242-Y	0.0006		-1.73	1126		-----		-----
237		-----		-----	1140	D3242-Y	0.0018		0.33
238		-----		-----	1146		-----		-----
252		-----		-----	1150		-----		-----
253		-----		-----	1191	D3242-Y	0.00136		-0.43
254		-----		-----	1201	D3242-Y	0.0014		-0.36
256		-----		-----	1231		-----		-----
258		-----		-----	1279	D3242-Y	0.00131		-0.51
273		-----		-----	1284	D3242-Y	0.0015		-0.19
311	D3242-Y	0.002		0.67	1297		-----		-----
323	D3242-Y	<0.001		-----	1299	D3242-Y	0.001		-1.05
333	D3242-Y	0	ex	-2.77	1316	D3242-Y	0.0006		-1.73
334		-----		-----	1318	D3242-Y	0.0009		-1.22
335	D3242-Y	0.005	G(0.01)	5.83	1357		-----		-----
340	D3242-Y	0.0016		-0.02	1372	D3242-Y	0.0006		-1.73
353		-----		-----	1376	D3242-Y	0.0015		-0.19
369	D3242-Y	0.0024		1.36	1395		-----		-----
370	D3242-Y	0.0014		-0.36	1417		-----		-----
371	D3242-Y	0.00175		0.24	1429		-----		-----
372	D3242-Y	0.001		-1.05	1447	D3242-N	0.001		-1.05
391		-----		-----	1448		-----		-----
399	D3242	0.0016		-0.02	1483		-----		-----
402	D3242-Y	0.0017	C	0.16	1491		-----		-----
440	D3242-Y	0.0011		-0.87	1496	D3242-Y	0.0013		-0.53
445	D3242-Y	0.0019		0.50	1520	D3242-Y	0.0011		-0.87
447	D3242-Y	0.002		0.67	1538		-----		-----
448	D3242	0.00211		0.86	1564	D3242-Y	0.002		0.67
463	D3242-Y	0.00196		0.60	1585	D3242-Y	0.0012		-0.70
468		-----		-----	1586	D3242-Y	0.003		2.39
473		-----		-----	1587	D3242-Y	0.00082		-1.36
485		-----		-----	1610	IP354-Y	0.00445	G(0.05)	4.89
495	D3242-Y	0.00103		-1.00	1611		-----		-----
496	D3242-Y	0.0017		0.16	1616		-----		-----
601		-----		-----	1631	D3242-Y	0.0011		-0.87
604		-----		-----	1634		-----		-----
606		-----		-----	1635		-----		-----
608		-----		-----	1636	D3242-Y	0.0009		-1.22
631	D3242-Y	0.00097		-1.10	1650	D3242-Y	0.0011		-0.87
657	D3242-Y	0.0018		0.33	1669	D3242-Y	0.0026		1.70
663	D3242-Y	0.002		0.67	1694		-----		-----
671	D3242-Y	0.0024		1.36	1697		-----		-----
732		-----		-----	1698		-----		-----
823	D3242-Y	0.002		0.67	1699		-----		-----
851	D3242-Y	0.0013		-0.53	1713		-----		-----
862	D3242-Y	0.0017		0.16	1715		-----		-----
869	D3242-Y	0.0019		0.50	1720	D3242-Y	0.001		-1.05
922		-----		-----	1724	D3242-Y	0.00136		-0.43
962		-----		-----	1811		-----		-----
963	D3242-Y	0.0023		1.19	1833	D3242-Y	0.004	DG(0.05)	4.11
974	D3242-Y	0.003		2.39	1842	IP354-Y	0.002		0.67
994		-----		-----	1913	D3242-Y	0.00165		0.07
995	D3242-Y	0.00127		-0.58	1948		-----		-----
996		-----		-----	1951	D3242-Y	0.0038	C,DG(0.05)	3.77
997	D3242-Y	0.0012		-0.70	2129	D3242-Y	0.0008		-1.39
998		-----		-----	2130	D3242-Y	0.001		-1.05
1011	D3242	0.003		2.39	2133	D3242-Y	0.0007		-1.56
1016	D3242-Y	0.00246		1.46	4043		-----		-----
				-----					

normality	not OK	
n	79	
outliers	4	+1 excluded
mean (n)	0.00161	
st.dev. (n)	0.000656	
R(calc.)	0.00184	
R(D3242:11)	0.00163	

Lab 333: result excluded, zero is not a real value
Lab 402: first reported 0.0039
Lab 1951: first reported 0.00474
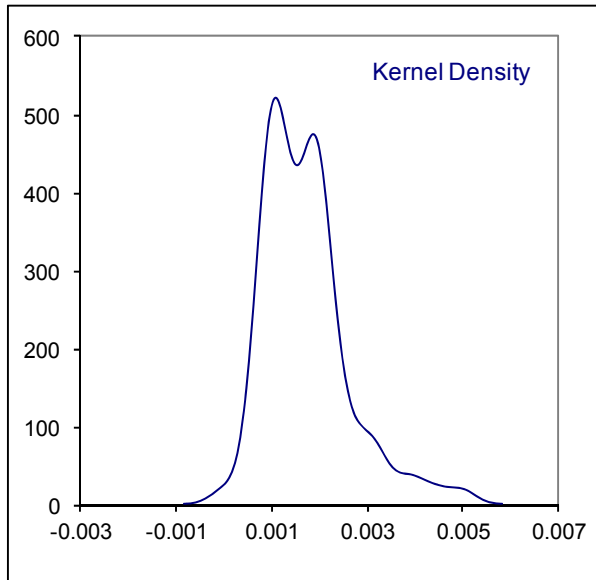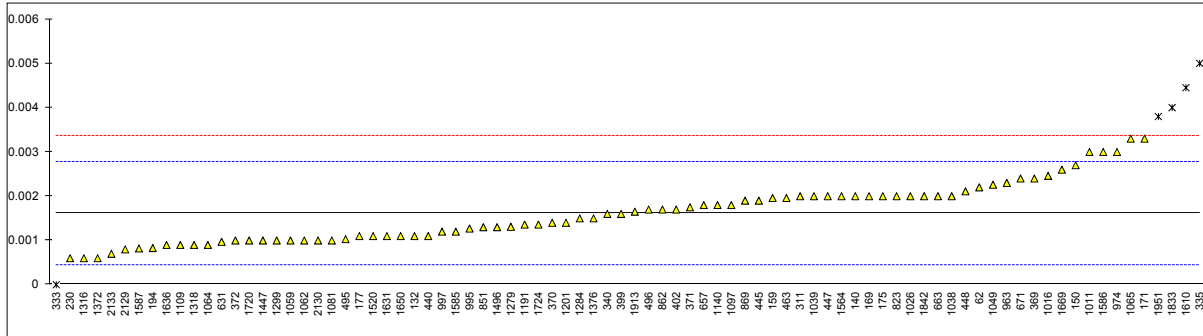
Determination of Total Sulphur on sample #13163; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5453	351		-0.52	1017		-----		-----
62	D5453	343		-0.98	1021	D2622	365		0.30
120	D4294	334		-1.51	1026	ISO20884	300	DG(0.05)	-3.50
132	D2622	367.8		0.47	1038	D4294	365.0		0.30
140	D5453	290	DG(0.01)	-4.08	1039	D2622	363.0		0.19
150	D2622	370.2		0.61	1049	D5453	324.6		-2.06
159	D4294	370.7		0.64	1059	ISO14596	360		0.01
169	D4294	274	G(0.01)	-5.02	1062	D5453	384		1.41
171	D5453	371.32		0.67	1064	D5453	358.9		-0.05
175		-----		-----	1065	D7212	361.2		0.08
177	D4294	340	C	-1.16	1079	D5453	331		-1.68
194	D5453	351.9		-0.46	1080		-----	W	-----
216		-----		-----	1081	D4294	353		-0.40
221		-----		-----	1082	ISO8754	357		-0.16
224		-----		-----	1097	D5453	364.00		0.24
225		-----		-----	1108		-----		-----
228		-----		-----	1109	D2622	369.0	C	0.54
230		-----		-----	1126	ISO20846	370.02		0.60
237		-----		-----	1140	IP377	377		1.00
238		-----		-----	1146		-----		-----
252		-----		-----	1150		-----		-----
253		-----		-----	1191	ISO8754	378		1.06
254	D4294	368		0.48	1201	D5453	304	DG(0.05)	-3.26
256	D4294	355		-0.28	1231	D5453	389		1.71
258	D5453	310		-2.91	1279		-----		-----
273	D5453	367		0.42	1284	D5453	361.5		0.10
311	D2622	352		-0.46	1297	D4294	365.3	C	0.32
323	D2622	364		0.24	1299	D2622	380		1.18
333	D2622	343		-0.98	1316	D4294	0.03551	CG(0.01)	-0.28
334	D5453	339		-1.22	1318	D4294	365.9		0.36
335	D5453	370		0.60	1357		-----		-----
340	D4294	384		1.41	1372	D4294	375	C	0.89
353	IP336	364		0.24	1376	D5453	356.9		-0.17
369	D2622	369		0.54	1395	D5453	377.6		1.04
370	D5453	373.1		0.78	1417	in house	294	DG(0.01)	-3.85
371	D4294	357.7		-0.12	1429	IP490	377		1.00
372	D5453	360		0.01	1447	D5453	335	C	-1.45
391	D5453	358		-0.11	1448		-----		-----
399	D5453	355		-0.28	1483		-----		-----
402	D5453	355		-0.28	1491	ISO8754	370		0.60
440	D5453	364.4		0.27	1496	D4294	0.03424	G(0.01)	-1.02
445	D5453	381.2		1.25	1520	D4294	359		-0.05
447	IP336	360		0.01	1538		-----		-----
448	D5453	370		0.60	1564	EN20846	403		2.52
463	D5453	345.1		-0.86	1585	D4294	385		1.47
468		-----		-----	1586	D5453	365		0.30
473		-----		-----	1587	D4294	376.7		0.99
485		-----		-----	1610	IP336	346		-0.81
495	D5453	360		0.01	1611		-----		-----
496	D2622	349.7		-0.59	1616		-----		-----
601		-----		-----	1631	D5453	385		1.47
604		-----		-----	1634		-----		-----
606		-----		-----	1635	D4294	400		2.35
608		-----		-----	1636	D5453	349.1		-0.63
631	D4294	343	C	-0.98	1650	D5453	344		-0.92
657	D5453	323		-2.15	1669	D5453	359.2		-0.04
663	D5453	366.4		0.38	1694		-----		-----
671	D5453	361		0.07	1697		-----		-----
732	D4294	345.0		-0.87	1698		-----		-----
823	D5453	344		-0.92	1699	D4294	376		0.95
851	D2622	346.64		-0.77	1713		-----		-----
862	D5453	365.4		0.33	1715		-----		-----
869	D4294	344		-0.92	1720	D5453	350.0		-0.57
922	D5453	328.21	C	-1.85	1724	IP336	375	C	0.89
962		-----		-----	1811		-----		-----
963	D4294	348.4		-0.67	1833	IP336	355		-0.28
974		-----		-----	1842		-----		-----
994		-----		-----	1913	D4294	343.0		-0.98
995	D5453	351.3		-0.50	1948	D5453	371.8	C	0.70
996		-----		-----	1951	IP497	345		-0.87
997	D4294	350		-0.57	2129	D5453	376.4		0.97
998		-----		-----	2130	IP496	372		0.71
1011	D4294	351	C	-0.52	2133	D5453	353.2		-0.39
1016		-----		-----	4043		-----		-----

normality	OK
n	98
outliers	5
mean (n)	359.82
st.dev. (n)	16.183
R(calc.)	45.31
R(D5453:09)	47.89

Lab 177: first reported 0.0280%
Lab 631: first reported 0.0323
Lab 922: first reported 268.70
Lab 1011: first reported 425
Lab 1080: result withdrawn, first reported 303
Lab 1109: first reported 446.2
Lab 1297: first reported 577.8
Lab 1316: reported 0.03551 probably in %M/M
Lab 1372: first reported 411
Lab 1447: first reported 305.0
Lab 1496: reported 0.03424 probably in %M/M
Lab 1724: first reported 407
Lab 1948: first reported 407.8
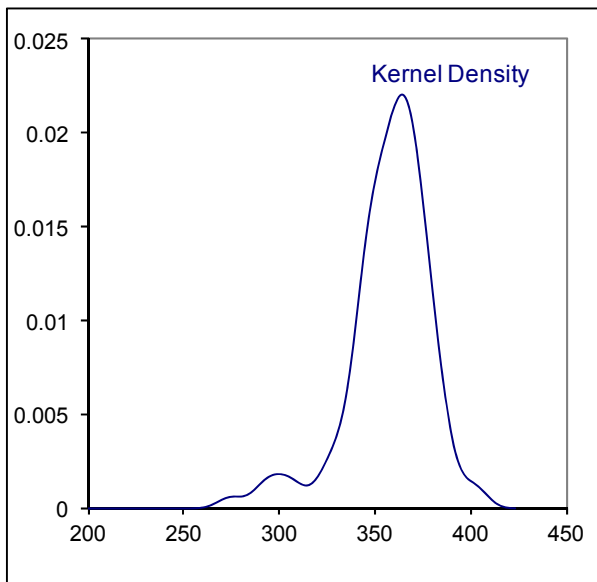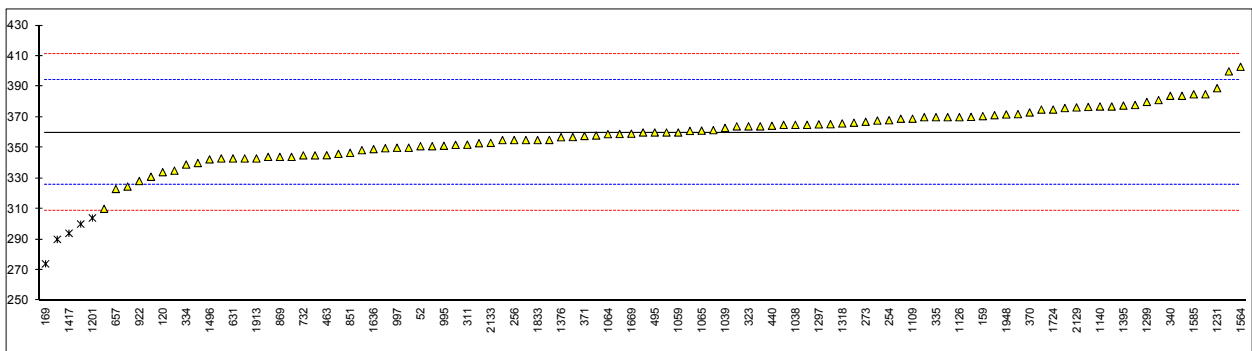
Determination of Viscosity @ -20°C on sample #13163; results in cSt

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D445-M	3.692		-0.35	1017		-----		-----
62	D445-M	3.705		0.17	1021		-----		-----
120	D445-M	3.699		-0.07	1026	D445	3.698		-0.11
132	D445-M	3.6765		-0.96	1038	D445-M	3.708		0.29
140	D445	3.194	G(0.01)	-20.18	1039	ISO3104	3.700		-0.03
150	D445-A	3.709		0.33	1049	D445-M	3.700		-0.03
159	D445-M	3.70945		0.35	1059		-----		-----
169	D445-M	3.6846		-0.64	1062	D445-A	3.678		-0.90
171	D445-A	3.695		-0.23	1064	D445-A	3.7051		0.18
175	D445-M	3.713		0.49	1065		-----		-----
177	D445-M	3.709		0.33	1079	D445-M	3.725		0.97
194	D445-M	3.708		0.29	1080		-----		-----
216		-----		-----	1081	D445-M	3.726		1.01
221		-----		-----	1082		-----		-----
224		-----		-----	1097	ISO3104	3.698		-0.11
225		-----		-----	1108		-----		-----
228		-----		-----	1109	D445-M	3.7562		2.21
230	D445-M	3.7051		0.18	1126		-----		-----
237		-----		-----	1140	D445-M	3.679		-0.86
238		-----		-----	1146		-----		-----
252		-----		-----	1150		-----		-----
253		-----		-----	1191		-----		-----
254		-----		-----	1201	D445-M	3.508	G(0.01)	-7.67
256		-----		-----	1231	D445	3.034	G(0.01)	-26.55
258		-----		-----	1279		-----		-----
273		-----		-----	1284		-----		-----
311	D445-A	3.678		-0.90	1297		-----		-----
323	D445-M	3.686		-0.58	1299	D445-M	3.626		-2.97
333	D445-M	3.747		1.85	1316	D445-M	3.702		0.05
334		-----		-----	1318	D7042-A	3.6939		-0.27
335	D445	3.734		1.33	1357		-----		-----
340	D445-M	3.7128		0.48	1372	D445-M	3.6936		-0.28
353		-----		-----	1376	D445-M	3.5991	G(0.05)	-4.04
369	D445-M	3.6921		-0.34	1395		-----		-----
370	D445-M	3.6773		-0.93	1417	D445	3.70		-0.03
371		-----		-----	1429		-----		-----
372	D445-M	3.701		0.01	1447	D445-A	3.752		2.04
391	D445-A	3.710		0.37	1448		-----		-----
399		-----		-----	1483		-----		-----
402	D445	3.7323		1.26	1491		-----		-----
440	D445-M	3.6971		-0.14	1496	D445-A	3.70158		0.04
445	D445-M	3.711		0.41	1520	D445-M	3.6780		-0.90
447	D445-M	3.706		0.21	1538		-----		-----
448	D445-M	3.613		-3.49	1564	D445-M	3.677	C	-0.94
463		-----		-----	1585	D445-M	3.6956		-0.20
468		-----		-----	1586	D445-M	3.959	G(0.01)	10.29
473		-----		-----	1587	D445-A	3.6934	C	-0.29
485		-----		-----	1610	IP21-M	3.72313		0.89
495	D445-M	3.7005	C	-0.01	1611		-----		-----
496	D445-M	3.6965		-0.17	1616		-----		-----
601		-----		-----	1631	D445-M	3.703		0.09
604		-----		-----	1634		-----		-----
606		-----		-----	1635	D445-M	3.669		-1.26
608		-----		-----	1636		-----		-----
631	D445-M	3.7052		0.18	1650	D445-M	3.7105		0.39
657	D445-M	3.712		0.45	1669	D445-A	3.918	G(0.01)	8.65
663		-----		-----	1694		-----		-----
671		-----		-----	1697		-----		-----
732		-----		-----	1698		-----		-----
823	D445-M	3.690		-0.42	1699		-----		-----
851	D445-M	3.7064		0.23	1713		-----		-----
862	D445-M	3.7146		0.55	1715		-----		-----
869	D445-M	3.6900		-0.42	1720		-----		-----
922		-----		-----	1724	D445-M	3.6995		-0.05
962		-----		-----	1811		-----		-----
963	D445-M	3.658		-1.70	1833	D445-M	3.697		-0.15
974	D445-M	3.446	G(0.01)	-10.14	1842		-----		-----
994		-----		-----	1913	D445-A	3.701		0.01
995	D445-M	3.709		0.33	1948		-----		-----
996		-----		-----	1951	D445-M	3.605	CG(0.05)	-3.81
997		-----		-----	2129	D445-M	3.6835		-0.68
998		-----		-----	2130	D445-M	3.916	G(0.01)	8.57
1011	D445-M	3.738	C	1.49	2133	D445-A	3.7533		2.10
1016	D445-A	3.6964		-0.17	4043		-----		-----

| normality	not OK
n	69
outliers	9
mean (n)	3.7007
st.dev. (n)	0.02381
R(calc.)	0.0667
R(D445:12)	0.0703

Lab 495: first reported 3.595
Lab 1011: first reported 2.710
Lab 1564: first reported 3.624
Lab 1587: first reported 3.6534
Lab 1951: first reported 3.8376
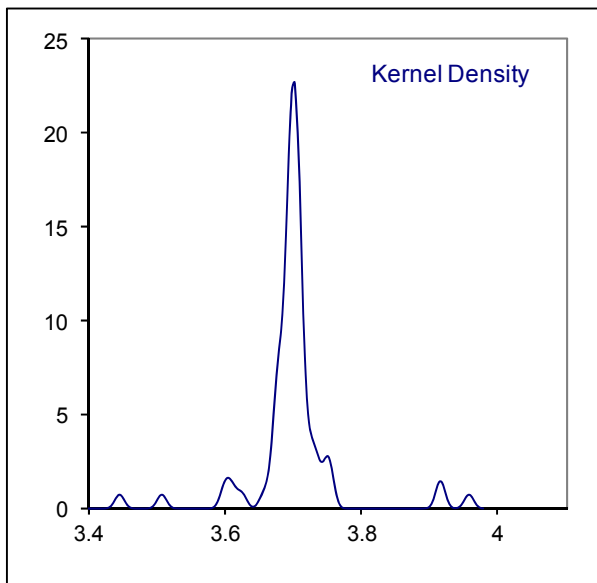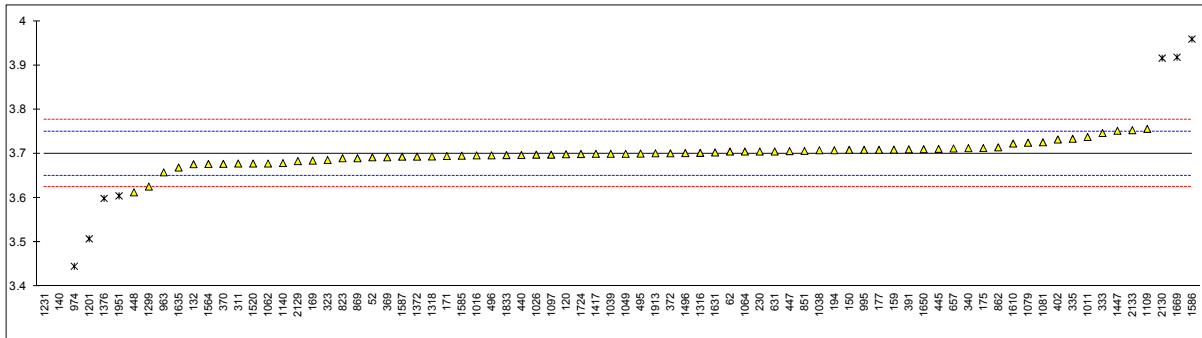
Determination of BOCLE on sample #13164; results in mm

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171	D5001	0.641		-0.59	
237		-----		-----	
334	D5001	0.645		-0.41	
496	D5001	0.622		-1.48	
1016	D5001	0.6415		-0.57	
1026		-----		-----	
1064	D5001	0.647		-0.31	
1081	D5001	0.66		0.29	
1082	D5001	0.6713		0.82	
1316	D5001	0.695		1.92	
1318	D5001	0.676		1.04	
1395	D5001	0.67		0.76	
1585		-----		-----	
1616		-----		-----	
1631		-----		-----	
1724	D5001	0.62		-1.57	
1833	D5001	0.67		0.76	
1913	D5001	0.640		-0.64	

normality	OK	
n	13	
outliers	0	
mean (n)	0.6538	
st.dev. (n)	0.02207	
R(calc.)	0.0618	
R(D5001:10)	0.0601	

Kernel Density
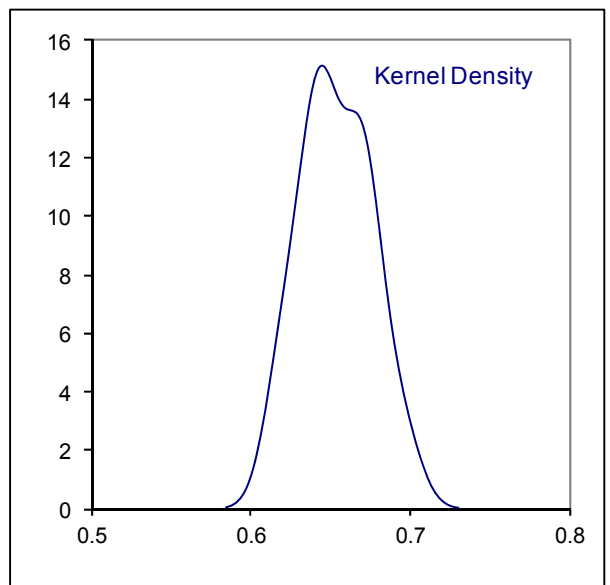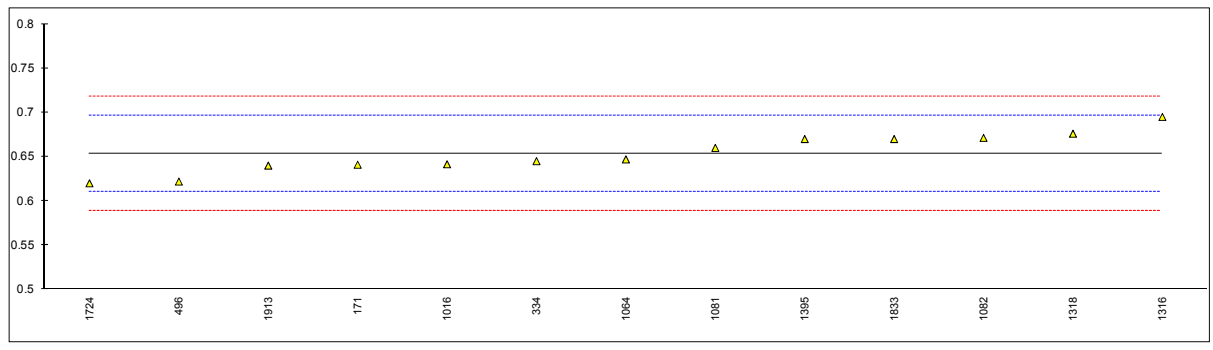
Determination of Particle Size Distribution on sample #13165; results per mL

lab	method	>4 µm	mark	z(targ)	>6 µm	mark	z(targ)	>14µm	mark	z(targ)
171	IP565	6508.3		-3.27	2219.3		-0.52	70.1		-1.06
225		-----		-----	-----		-----	-----		-----
230	IP564	8838.7		0.58	1738.5		-2.28	38.3		-2.78
237		-----		-----	-----		-----	-----		-----
253		-----		-----	-----		-----	-----		-----
311	IP564	7072		-2.34	1451		-3.33	39		-2.74
323	IP564	7092		-2.30	1505		-3.13	38		-2.80
333	IP565	8961		0.78	3047		2.51	123		1.81
334	IP565	12384		6.43	3712		4.94	119		1.60
335	IP564	9156		1.10	2892		1.94	146		3.06
369	IP564	3795.0		-7.75	1234.7		-4.12	46.1		-2.36
370	IP564	5495.7		-4.94	850.2		-5.53	43.8		-2.48
372		-----		-----	-----		-----	-----		-----
391		-----		-----	-----		-----	-----		-----
445		-----		-----	-----		-----	-----		-----
495	IP564	6910		-2.60	2007		-1.29	56		-1.82
657	IP565	12631.9	C,ex	6.84	3595.7	C,ex	4.52	194.65	C, G(0.05)	5.70
671		-----		-----	-----		-----	-----		-----
823	IP565	10661		3.59	2204		-0.57	80		-0.52
851	IP564	5959.4		-4.17	1008.4		-4.95	9.7		-4.33
869	IP565	11770.7		5.42	3096.3		2.69	112.8		1.26
963		-----		-----	-----		-----	-----		-----
974	IP564	5363.6		-5.16	1438.7		-3.37	70.7		-1.02
1011	IP565	11217.9		4.51	3380.7		3.73	143.4		2.92
1016	IP565	10052.7		2.58	3067.3		2.58	126.5		2.00
1017		-----		-----	-----		-----	-----		-----
1026		-----		-----	-----		-----	-----		-----
1038		-----		-----	-----		-----	-----		-----
1039	IP564	8663		0.29	3271		3.33	135		2.46
1062	IP565	9047		0.92	2713		1.29	119.5		1.62
1064	IP564	7250.8		-2.04	1876.5		-1.77	59.3		-1.64
1065	IP564	4683.3		-6.28	1325.6		-3.79	29.6		-3.25
1079	IP564	10812.5		3.84	2625.8		0.97	104.0		0.78
1081	IP564	75	ex	-13.89	9	ex	-8.60	0.1	ex	-4.85
1082		-----		-----	-----		-----	-----		-----
1097	IP564	7497.1		-1.63	1932.7		-1.57	43.4		-2.50
1108		-----		-----	-----		-----	-----		-----
1109	IP565	10427.7		3.20	4004.0		6.01	168.9		4.30
1146	ISO11500	10286.0		2.97	2532.2	C	0.63	149.07	C	3.23
1191	IP564	1464.3	G(0.05)	-11.59	486.1	G(0.05)	-6.86	25.8	ex	-3.46
1200		-----		-----	-----		-----	-----		-----
1201	IP565	5011.9		-5.74	1828.0		-1.95	603.1	G(0.01)	27.86
1299	IP564	4984.7		-5.78	1639.0		-2.64	50.0		-2.15
1316	IP564	7060		-2.36	2140		-0.81	97		0.40
1357		-----		-----	-----		-----	-----		-----
1395	IP564	6424		-3.41	1969		-1.43	86		-0.19
1564		-----		-----	-----		-----	-----		-----
1585	IP565	7032.9		-2.40	2479.0		0.43	150.3		3.29
1587	IP564	6758.5		-2.85	1472.9		-3.25	47.3		-2.29
1610	IP565	11213.5		4.50	2731.7		1.36	69.0		-1.12
1616		-----		-----	-----		-----	-----		-----
1631	IP564	11305		4.65	3870		5.52	131.5		2.27
1669	IP564	11335		4.70	3069		2.59	117		1.49
1720		-----		-----	-----		-----	-----		-----
1724	IP565	12750.0	C	7.04	3187.5		3.02	127.5		2.06
1811	IP565	12027.8		5.84	2925.7		2.07	97.2		0.41
1833	IP565	12750.1		7.04	3777.3		5.18	152.6		3.42
1913	IP564	11378.5		4.77	2724.3		1.33	114.8		1.37
1951	IP564	4882.2		-5.95	1375.1		-3.61	47.6		-2.28
2130	IP564	6198		-3.78	1752		-2.23	45		-2.42
	normality	not OK			OK			OK		
	n	39			39			38		
	outliers	1			1			2		
	mean (n)	8487.63			2360.86			89.58		
	st.dev. (n)	2632.249			850.029			43.395		
	R(calc.)	7370.30			2380.08			121.50		
	R(IP564:13)	1696.39			765.53			51.62		

Determination of Particle Size Distribution on sample #13165; results per mL, continued

| lab	method	>21 µm	mark	z(targ)	>25 µm	mark	z(targ)	>30µm	mark	z(targ)
171	IP565	5.5		-1.40	1.8		-1.49	0.4		-1.38
225		-----		-----	-----		-----	-----		-----
230	IP564	8.6		-0.95	3.6		-0.88	1.2		-0.76
237		-----		-----	-----		-----	-----		-----
253		-----		-----	-----		-----	-----		-----
311	IP564	11		-0.60	5		-0.41	2		-0.14
323	IP564	6		-1.33	2		-1.42	<1		-----
333	IP565	16		0.13	5		-0.41	2		-0.14
334	IP565	14		-0.16	5		-0.41	1		-0.91
335	IP564	24		1.31	10		1.27	4		1.42
369	IP564	8.9		-0.90	3.8		-0.81	1.0		-0.91
370	IP564	9.7		-0.79	3.7		-0.85	1.8		-0.29
372		-----		-----	-----		-----	-----		-----
391		-----		-----	-----		-----	-----		-----
445		-----		-----	-----		-----	-----		-----
495	IP564	13		-0.30	7		0.26	3		0.64
657	IP565	41.7	DG(0.01)	3.90	15.65	C,G(0.05)	3.18	7.5	DG(0.05)	4.13
671		-----		-----	-----		-----	-----		-----
823	IP565	12		-0.45	6		-0.07	2		-0.14
851	IP564	2.6		-1.83	1.8		-1.49	1.3		-0.68
869	IP565	18.7		0.53	8.0		0.60	3.0		0.64
963		-----		-----	-----		-----	-----		-----
974	IP564	12.3		-0.41	4.9		-0.44	2.3		0.09
1011	IP565	26.1		1.61	12.5		2.12	5.8		2.81
1016	IP565	24.4		1.37	8.4		0.74	3.0		0.64
1017		-----		-----	-----		-----	-----		-----
1026		-----		-----	-----		-----	-----		-----
1038		-----		-----	-----		-----	-----		-----
1039	IP564	23		1.16	10		1.27	4		1.42
1062	IP565	15.4		0.05	5.0		-0.41	1.3		-0.68
1064	IP564	10.8		-0.63	4.5		-0.58	1.5		-0.53
1065	IP564	5.4		-1.42	2.3		-1.32	1.4		-0.60
1079	IP564	18.7		0.53	6.8		0.20	2.6		0.33
1081	IP564	0.1	ex	-2.19	0	ex	-2.09	0	ex	-1.69
1082		-----		-----	-----		-----	-----		-----
1097	IP564	8.1		-1.02	3.6		-0.88	1.1		-0.84
1108		-----		-----	-----		-----	-----		-----
1109	IP565	20.7		0.82	7.6		0.47	2.8		0.48
1146	ISO11500	46.27	C,DG(0.01)	4.57	24.67	C,G(0.01)	6.21	7.80	C,DG(0.05)	4.37
1191	IP564	5.5	ex	-1.40	2.1	ex	-1.38	0.8	ex	-1.07
1200		-----		-----	-----		-----	-----		-----
1201	IP565	8.7		-0.93	3.2		-1.01	1.0		-0.91
1299	IP564	9.8		-0.77	3.2		-1.01	0.6		-1.23
1316	IP564	16		0.13	7		0.26	2		-0.14
1357		-----		-----	-----		-----	-----		-----
1395	IP564	18		0.43	7		0.26	2		-0.14
1564		-----		-----	-----		-----	-----		-----
1585	IP565	31.2		2.36	13.3		2.39	7.0	G(0.05)	3.75
1587	IP564	7.7		-1.08	3.2		-1.01	1.1		-0.84
1610	IP565	7.4		-1.12	2.0		-1.42	0.6		-1.23
1616		-----		-----	-----		-----	-----		-----
1631	IP564	28.6		1.98	12.8		2.22	3.6	C	1.10
1669	IP564	22		1.01	11		1.61	3		0.64
1720		-----		-----	-----		-----	-----		-----
1724	IP565	28.8		2.01	13.0		2.28	3.8	C	1.26
1811	IP565	12.5		-0.38	4.7		-0.51	1.1		-0.84
1833	IP565	26.3		1.64	10.1		1.31	3.3		0.87
1913	IP564	21.7		0.97	9.0		0.94	4.3		1.65
1951	IP564	12.4		-0.39	6.3		0.03	2.5		0.25
2130	IP564	7		-1.18	2		-1.42	1		-0.91
	normality	OK			not OK			OK		
	n	38			38			36		
	outliers	2			2			3		
	mean (n)	15.08			6.21			2.18		
	st.dev. (n)	7.654			3.445			1.249		
	R(calc.)	21.43			9.65			3.50		
	R(IP564:13)	19.12			8.32			3.60		

Lab 657: first reported   >4 µm 11635.7   Lab 1631: first reported >30 µm 6.6
                              >6 µm 3553.6   Lab 1724: first reported >30 µm 6.8
   >14 µm 182.5   Lab 1811: first reported >4 µm 127.8
                              >21µm 37.5
                              >25µm 13.3
                              >30µm 6.2
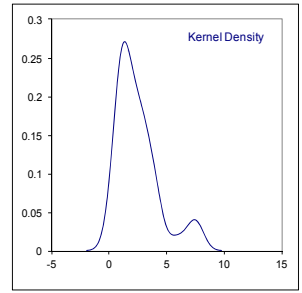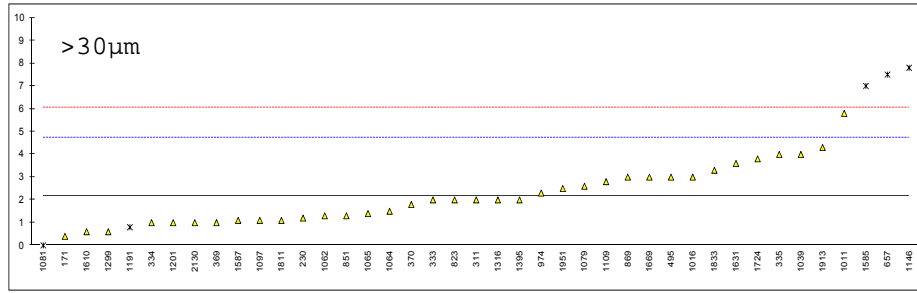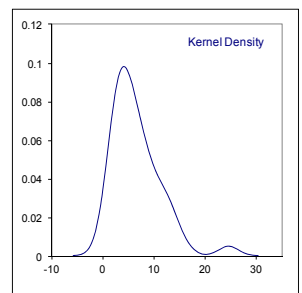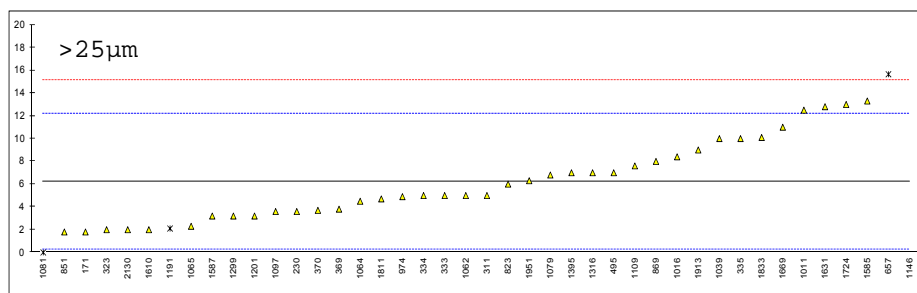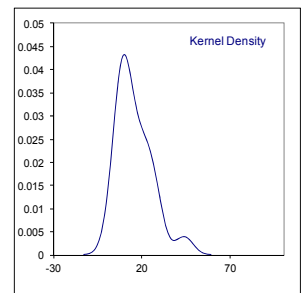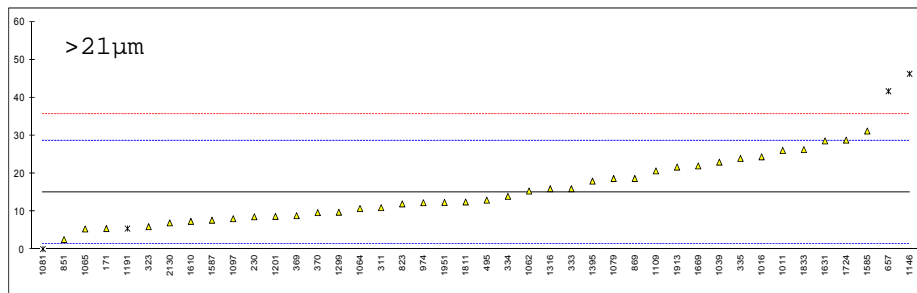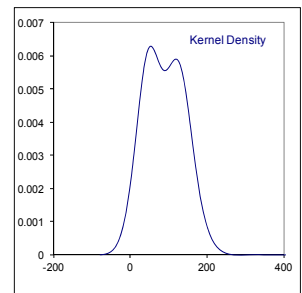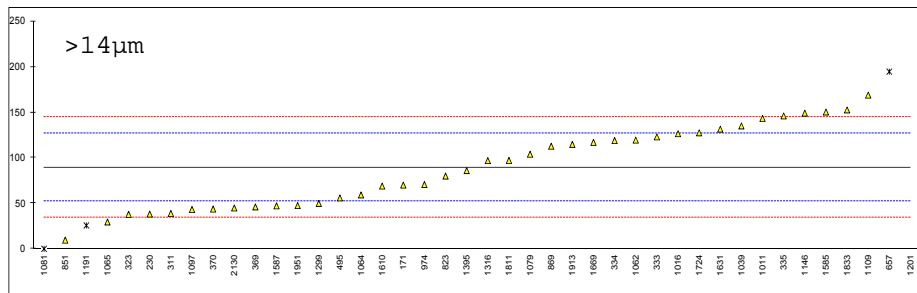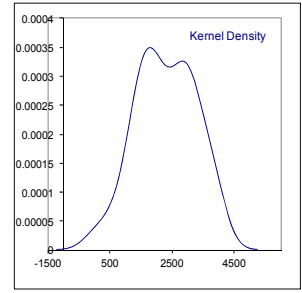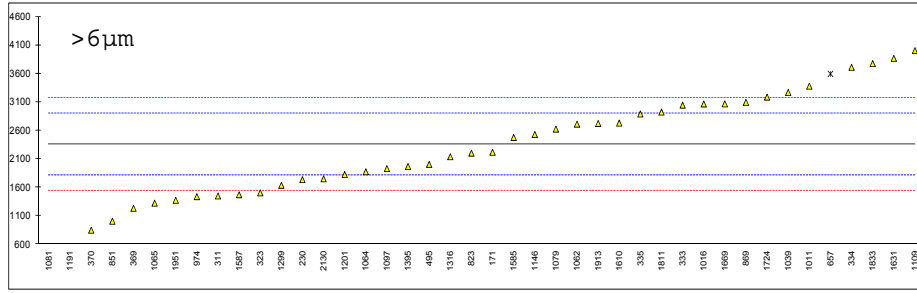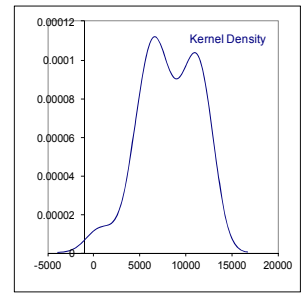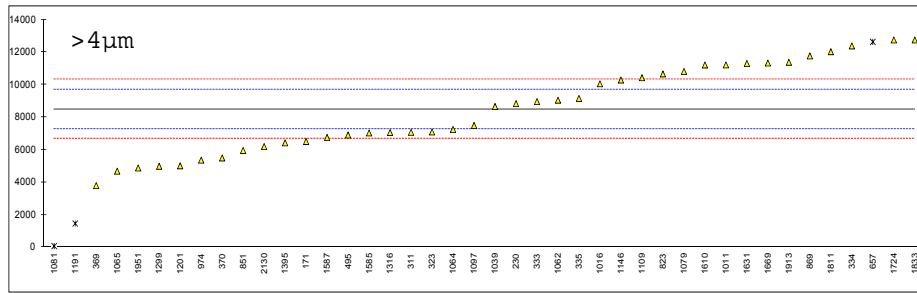
Determination of FAME on sample #13166; results in mg/kg

lab	method	value	mark	z(targ)	remarks
171	IP585	9.68		-2.95	
311	IP585	15		0.37	
323	IP585	23.6	G(0.05)	5.74	
333	IP585	13.9		-0.31	
334	IP585	15.8		0.87	
335	IP585	13.1		-0.81	
336	IP585	14.5		0.06	
445	IP585	13.31		-0.68	
447	IP585	11.40		-1.87	
448		-----		-----	
496	IP585	16.35		1.21	
657	IP585	13.67		-0.46	
823	IP585	12		-1.50	
851	IP PM-DY/09	12.818		-0.99	
862		-----		-----	
869		-----		-----	
1011	IP585	16.2		1.12	
1016	IP585	15.592		0.74	
1017		-----		-----	
1026	IP590	16.9		1.56	
1062	in house	18		2.24	
1064	IP PM-DY/09	12.3		-1.31	
1080	in house	10.65		-2.34	
1081	IP585	16		1.00	
1082	IP585	12.85		-0.97	
1140	IP585	16.40		1.25	
1201	IP585	11.99		-1.51	
1299	IP585	15.3		0.56	
1316		-----		-----	
1585		-----		-----	
1610	IP590	18.175		2.35	
1631	IP585	12.8		-1.00	
1634	IP585	16.53		1.33	
1650		-----		-----	
1669	IP585	14.13		-0.17	
1724	IP590	13.9		-0.31	
1833	IP585	19.34		3.08	
1842	IP590	12.6		-1.13	
1951	IP585	15.5		0.68	
2129	IP590	17.34		1.83	
2130	IP585	11.3		-1.94	

normality	OK	
n	33	
outliers	1	
mean (n)	14.404	
st.dev. (n)	2.3454	
R(calc.)	6.567	
R(IP585:10)	4.488	
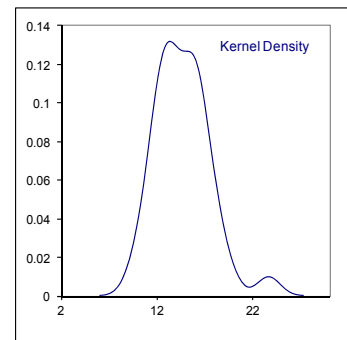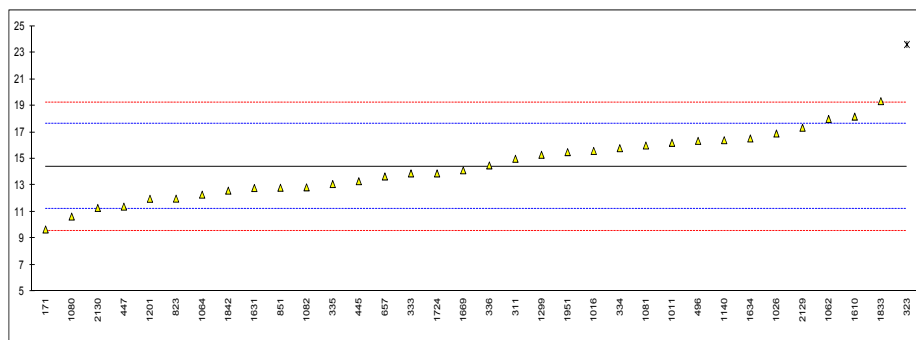
APPENDIX 2

Z-scores of individual participants for distillation of sample #13064

lab	IBP-A	10%-A	50%-A	90%-A	FBP-A	IBP-M	10%-M	50%-M	90%-M	FBP-M
52	0.06	-0.07	-0.26	0.80	0.99	-----	-----	-----	-----	-----
62	1.36	0.67	0.78	0.64	0.60	-----	-----	-----	-----	-----
120	-1.13	-0.89	-0.92	-0.96	-1.77	-----	-----	-----	-----	-----
132	-0.40	-0.52	-0.26	0.24	-0.51	-----	-----	-----	-----	-----
140	-0.67	0.90	1.62	1.36	0.16	-----	-----	-----	-----	-----
150	0.33	0.15	0.59	0.64	-0.15	-----	-----	-----	-----	-----
159	0.26	1.12	0.59	0.16	-0.71	-----	-----	-----	-----	-----
169	-2.20	-1.12	-0.92	-1.60	-0.71	-----	-----	-----	-----	-----
171	-1.20	1.49	0.96	0.32	0.75	-----	-----	-----	-----	-----
175	1.00	0.23	0.87	1.04	1.07	-----	-----	-----	-----	-----
177	1.03	1.27	-0.07	-1.52	-0.11	-----	-----	-----	-----	-----
194	0.76	0.69	0.70	-0.13	0.47	-----	-----	-----	-----	-----
216	-----	-----	-----	-----	-----	-2.68	2.34	0.82	0.69	-0.12
221	-----	-----	-----	-----	-----	1.40	1.37	1.81	1.87	1.51
224	-----	-----	-----	-----	-----	2.05	1.40	0.83	-1.21	0.65
225	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
228	-----	-----	-----	-----	-----	0.78	-0.56	-1.16	-1.27	0.21
230	1.20	-0.52	-0.64	1.52	0.60	-----	-----	-----	-----	-----
237	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
238	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
252	-----	-----	-----	-----	-----	-0.48	0.41	0.82	0.30	1.51
253	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
254	-----	-----	-----	-----	-----	0.15	0.41	-0.17	-0.48	0.86
256	-----	-----	-----	-----	-----	-0.48	0.41	0.82	0.30	1.51
258	1.16	0.67	0.12	-0.32	-0.51	-----	-----	-----	-----	-----
273	-1.53	-0.59	-0.83	-0.32	-0.43	-----	-----	-----	-----	-----
311	0.73	-0.22	0.68	1.28	0.60	-----	-----	-----	-----	-----
323	0.00	0.00	0.30	0.16	-0.19	-----	-----	-----	-----	-----
333	1.03	-0.52	-0.07	-0.48	0.44	-----	-----	-----	-----	-----
334	0.66	0.38	0.02	0.08	1.86	-----	-----	-----	-----	-----
335	1.36	-0.15	0.96	1.92	-0.27	-----	-----	-----	-----	-----
340	1.13	0.60	0.59	1.12	-0.04	-----	-----	-----	-----	-----
353	0.16	0.00	0.59	1.12	1.27	-----	-----	-----	-----	-----
369	-0.07	-0.82	0.12	-0.48	0.12	-----	-----	-----	-----	-----
370	-0.24	0.08	0.02	-0.56	-0.08	-----	-----	-----	-----	-----
371	0.90	-0.07	0.68	0.16	0.28	-----	-----	-----	-----	-----
372	0.06	-0.37	-0.17	-0.32	-0.04	-----	-----	-----	-----	-----
391	-----	-----	-----	-----	-----	0.15	2.34	1.81	0.30	0.86
399	-1.00	-0.44	-0.83	-0.88	-0.71	-----	-----	-----	-----	-----
402	0.20	1.27	0.78	0.96	-0.19	-----	-----	-----	-----	-----
440	0.60	0.00	0.78	0.40	1.11	-----	-----	-----	-----	-----
445	-0.37	-0.44	-0.45	-0.32	-0.79	-----	-----	-----	-----	-----
447	0.00	0.60	0.78	1.44	0.20	-----	-----	-----	-----	-----
448	0.56	-1.49	-0.26	1.44	0.75	-----	-----	-----	-----	-----
463	-0.30	-0.30	-0.83	-0.16	-0.04	-----	-----	-----	-----	-----
468	-0.47	-0.15	0.30	1.52	0.48	-----	-----	-----	-----	-----
473	-0.53	-0.07	0.12	0.16	-0.55	-----	-----	-----	-----	-----
485	-0.60	-0.03	-0.59	-1.32	-1.26	-----	-----	-----	-----	-----
495	0.86	-0.59	-1.02	-0.96	-0.27	-----	-----	-----	-----	-----
496	-0.50	-0.74	-1.11	-1.12	-0.71	-----	-----	-----	-----	-----
601	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
604	-1.00	-0.67	-1.49	-0.80	-0.59	-----	-----	-----	-----	-----
606	0.26	0.52	0.12	0.00	0.67	-----	-----	-----	-----	-----
608	0.26	0.75	0.78	-0.24	0.44	-----	-----	-----	-----	-----
631	-----	-----	-----	-----	-----	0.78	-1.04	-1.16	-0.09	-1.43
657	0.06	0.75	1.25	2.24	0.32	-----	-----	-----	-----	-----
663	0.20	0.38	0.02	0.00	0.44	-----	-----	-----	-----	-----
671	-1.40	-0.07	-0.73	-1.60	-4.69	-----	-----	-----	-----	-----
732	-----	-----	-----	-----	-----	-0.48	-1.52	-0.17	0.30	-0.45
823	-0.10	-0.89	0.02	-0.88	0.28	-----	-----	-----	-----	-----
851	-0.10	0.08	0.21	0.80	-0.75	-----	-----	-----	-----	-----
862	-1.17	-1.34	-0.73	-1.04	-0.04	-----	-----	-----	-----	-----
869	-----	-----	-----	-----	-----	1.40	0.89	-0.17	0.30	0.21
922	-----	-----	-----	-----	-----	-2.71	-1.57	-1.22	1.04	-0.49
962	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
963	0.76	0.45	0.59	-0.72	0.63	-----	-----	-----	-----	-----
974	0.50	0.52	0.02	-0.48	1.54	-----	-----	-----	-----	-----
994	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
995	-----	-----	-----	-----	-----	-0.79	-1.33	-0.66	-0.64	0.21
996	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
997	-----	-----	-----	-----	-----	-0.48	-1.04	-0.17	0.30	0.21
998	-----	-----	-----	-----	-----	0.15	-0.56	-0.66	-0.88	-0.45
1011	0.26	1.12	0.30	0.48	0.67	-----	-----	-----	-----	-----
1016	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

1017	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
1021	0.43	0.00	0.59	1.60	-0.19	-----	-----	-----	-----	-----
1026	0.43	0.08	0.12	0.32	-0.19	-----	-----	-----	-----	-----
1038	-0.90	-0.97	-0.64	-0.24	-0.59	-----	-----	-----	-----	-----
1039	-1.10	0.60	0.21	0.56	-0.35	-----	-----	-----	-----	-----
1049	-1.03	0.08	0.02	-0.08	0.52	-----	-----	-----	-----	-----
1059	-0.43	-0.59	-1.11	-1.12	-0.59	-----	-----	-----	-----	-----
1062	0.13	0.45	0.49	0.40	-0.04	-----	-----	-----	-----	-----
1064	0.80	0.52	0.49	1.12	0.67	-----	-----	-----	-----	-----
1065	-0.17	-1.56	-1.49	-0.72	-0.55	-----	-----	-----	-----	-----
1079	0.60	-0.07	0.40	1.04	0.20	-----	-----	-----	-----	-----
1080	-1.33	-2.83	-1.58	0.16	-1.38	-----	-----	-----	-----	-----
1081	-0.04	0.38	0.21	0.40	0.08	-----	-----	-----	-----	-----
1082	0.33	0.15	0.40	0.24	-0.51	-----	-----	-----	-----	-----
1097	1.03	1.05	0.68	0.00	-0.08	-----	-----	-----	-----	-----
1108	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
1109	-0.20	-0.37	0.68	1.44	0.00	-----	-----	-----	-----	-----
1126	-1.50	-1.71	0.96	-1.36	0.67	-----	-----	-----	-----	-----
1140	-0.63	-0.44	-0.26	0.24	-0.27	-----	-----	-----	-----	-----
1146	-0.20	-1.04	-1.11	-1.28	-0.63	-----	-----	-----	-----	-----
1150	1.08	-0.07	-1.36	-1.72	0.62	-----	-----	-----	-----	-----
1191	0.16	-0.07	0.40	0.64	-0.27	-----	-----	-----	-----	-----
1201	0.50	-0.15	0.49	1.44	-0.43	-----	-----	-----	-----	-----
1231	0.23	0.30	0.49	-0.56	-0.11	-----	-----	-----	-----	-----
1279	0.40	0.75	0.78	0.88	0.52	0.78	-0.56	1.81	1.87	0.86
1284	-0.34	-0.37	-1.02	-1.28	-1.49	-----	-----	-----	-----	-----
1297	-0.10	-0.15	-1.30	-0.56	-0.94	-----	-----	-----	-----	-----
1299	-0.77	0.00	0.59	1.28	-0.08	-----	-----	-----	-----	-----
1316	-0.24	0.23	0.40	0.32	-0.27	-----	-----	-----	-----	-----
1318	-0.34	-0.22	-0.07	-0.24	-0.19	-----	-----	-----	-----	-----
1357	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
1372	-0.60	0.67	-0.07	0.32	0.16	-----	-----	-----	-----	-----
1376	-0.27	-1.12	-0.17	-1.36	-0.27	-----	-----	-----	-----	-----
1395	-0.73	-0.44	-0.45	-0.56	-2.36	-----	-----	-----	-----	-----
1417	0.23	0.23	0.68	2.08	0.28	-----	-----	-----	-----	-----
1429	-0.40	-0.97	-1.86	-2.41	-1.02	-----	-----	-----	-----	-----
1447	-0.30	-0.52	-0.83	-0.80	-0.59	-----	-----	-----	-----	-----
1448	-0.43	0.23	0.02	0.08	0.16	-----	-----	-----	-----	-----
1483	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
1491	1.06	0.60	0.87	1.68	0.71	-----	-----	-----	-----	-----
1496	0.33	0.82	0.96	2.24	0.28	-----	-----	-----	-----	-----
1520	-----	-----	-----	-----	-----	-0.29	-1.23	-1.85	-1.43	-1.50
1538	0.26	-0.15	0.02	-0.72	0.48	-----	-----	-----	-----	-----
1564	0.26	0.52	-0.54	-1.84	-0.43	-----	-----	-----	-----	-----
1585	1.16	1.27	0.40	-1.20	0.04	-----	-----	-----	-----	-----
1586	-0.10	0.45	-0.36	-0.08	0.75	-----	-----	-----	-----	-----
1587	0.10	0.45	0.02	-0.96	-0.04	-----	-----	-----	-----	-----
1610	0.86	-0.37	-0.36	0.08	-0.23	-----	-----	-----	-----	-----
1611	0.53	0.23	-0.83	-0.72	-0.23	-----	-----	-----	-----	-----
1616	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
1631	0.00	-0.37	-0.07	0.32	0.16	-----	-----	-----	-----	-----
1634	-0.73	0.00	0.21	0.40	0.12	-----	-----	-----	-----	-----
1635	2.63	1.42	0.40	0.24	0.00	-----	-----	-----	-----	-----
1636	-0.43	0.00	0.40	-0.24	-0.51	-----	-----	-----	-----	-----
1650	0.23	-1.19	-1.49	-0.88	0.56	-----	-----	-----	-----	-----
1669	-0.17	0.60	0.49	-0.08	0.87	-----	-----	-----	-----	-----
1694	-----	-----	-----	-----	-----	-4.25	-1.52	-1.16	-1.27	-2.41
1697	0.30	0.45	0.21	-0.24	0.24	-----	-----	-----	-----	-----
1698	-0.02	-0.07	0.07	0.72	0.06	-----	-----	-----	-----	-----
1699	-----	-----	-----	-----	-----	0.78	1.37	-0.17	-2.84	-1.76
1713	-0.50	-0.11	-0.35	-0.85	-1.05	-----	-----	-----	-----	-----
1715	0.60	-0.07	-0.64	-1.36	-0.71	-----	-----	-----	-----	-----
1720	-0.87	0.00	-0.83	-1.84	-0.47	-----	-----	-----	-----	-----
1724	-1.23	-0.15	-0.73	-1.36	-0.47	-----	-----	-----	-----	-----
1811	-0.14	-1.26	-1.77	-1.84	-0.71	-----	-----	-----	-----	-----
1833	0.26	-0.07	-0.07	-0.88	0.36	-----	-----	-----	-----	-----
1842	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
1913	0.76	0.97	1.06	1.60	0.56	-----	-----	-----	-----	-----
1948	-0.04	0.38	0.78	0.56	-0.08	-----	-----	-----	-----	-----
1951	-0.97	-0.52	0.21	1.92	0.63	-----	-----	-----	-----	-----
2129	-0.67	0.38	-0.17	-0.88	-0.63	-----	-----	-----	-----	-----
2130	1.00	1.27	1.06	1.44	1.50	-----	-----	-----	-----	-----
2133	-1.50	-1.93	1.25	5.28	2.37	-----	-----	-----	-----	-----
4043	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

APPENDIX 3

Number of participants per country

1 lab in	AFGHANISTAN		1 lab in	MALTA
1 lab in	ALGERIA		2 labs in	MAURITIUS
2 labs in	AUSTRALIA		1 lab in	MOZAMBIQUE
1 lab in	AZERBAIJAN		9 labs in	NETHERLANDS
6 labs in	BELGIUM		2 labs in	NIGERIA
1 lab in	BULGARIA		2 labs in	NORWAY
2 labs in	CANADA		1 lab in	OMAN
5 labs in	CHINA, People's Republic		1 lab in	PAKISTAN
1 lab in	COTE D'IVOIRE		1 lab in	PHILIPPINES
1 lab in	CROATIA		6 labs in	POLAND
1 lab in	CZECH REPUBLIC		3 labs in	PORTUGAL
1 lab in	DENMARK		2 labs in	QATAR
1 lab in	DJIBOUTI		1 lab in	ROMANIA
1 lab in	EGYPT		2 labs in	RUSSIAN FEDERATION
2 labs in	ESTONIA		3 labs in	SAUDI ARABIA
2 labs in	FINLAND		1 lab in	SENEGAL
7 labs in	FRANCE		1 lab in	SINGAPORE
2 labs in	GEORGIA		1 lab in	SLOVENIA
3 labs in	GERMANY		1 lab in	SOUTH AFRICA
2 labs in	GREECE		1 lab in	SOUTH KOREA
1 lab in	GUAM		4 labs in	SPAIN
1 lab in	GUINEA REPUBLIC		1 lab in	SUDAN
1 lab in	HONG KONG		3 labs in	SWEDEN
2 labs in	HUNGARY		1 lab in	TANZANIA
1 lab in	INDIA		2 labs in	THAILAND
1 lab in	IRELAND		1 lab in	TOGO
1 lab in	ISRAEL		1 lab in	TUNISIA
2 labs in	ITALY		4 labs in	TURKEY
1 lab in	KAZAKHSTAN		1 lab in	TURKMENISTAN
2 labs in	KENYA		1 lab in	UNITED ARAB EMIRATES
2 labs in	LATVIA		12 labs in	UNITED KINGDOM
1 lab in	LITHUANIA		10 labs in	UNITED STATES OF AMERICA
2 labs in	MACEDONIA		1 lab in	URUGUAY
5 labs in	MALAYSIA			

APPENDIX 4

Abbreviations:

C   = final result after checking of first reported suspect result
U   = reported in wrong unit
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   = withdrawn on request participant
fr.   = first reported
U   = reported in a deviating unit
SDS   = Safety Data Sheet

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