Results of Proficiency Test
Jet Fuel A1
September 2014

CONTENTS

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 PTs for the determination of Particle Size Distribution, FAME and BOCLE. In the annual proficiency testing program of 2014/2015, it was decided to continue the 4 PTs on Jet Fuel A1. A separate sample for the JFTOT determination was sent this year with the PT on Jet Fuel A1 (iis14J02).
In the main PT 139 laboratories in 62 different countries have participated. In the PT for FAME in Jet Fuel, 38 laboratories in 16 different countries participated. In the PT for the BOCLE determination, 19 laboratories in 14 different countries and in the PT for the Particle Size distribution, 53 laboratories in 30 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. This report is also electronically available through the iis internet site www.iisnl.com.

2   SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the 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 #14170) 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 For Jet A-1". Also a sample, claimed to be off-spec, was sent for JFTOT (1*1 litre bottle #14169). Depending on the registration also was sent: 1*0.1 litre sample, labelled #14171 for the BOCLE PT, 1*0.5 litre sample, labelled #14172 for the Particle Size distribution PT and/or 1*0.1 litre sample, labelled #14173 for the determination of FAME in Jet Fuel.
The participants were requested to report the analytical results using the indicated units 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 PT iis14J02 falls under the accredited scope. It 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 of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: 'Protocol for the Organisation,

Statistics and Evaluation of April 2014' (iis-protocol, version 3.3). This protocol can be downloaded from 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. Approximately 400 litre bulk material was homogenised in a mixing vessel. Out of this batch 330 amber glass bottles of one litre were filled, closed with inner and outer caps and labelled #14170. The homogeneity of the subsamples #14170 was checked by the determination of Density in accordance with ASTM D4052 on 10 stratified randomly selected samples.

	Density at 15°C in kg/m^3
Sample #14170-1	794.66
Sample #14170-2	794.63
Sample #14170-3	794.63
Sample #14170-4	794.61
Sample #14170-5	794.60
Sample #14170-6	794.58
Sample #14170-7	794.56
Sample #14170-8	794.56
Sample #14170-9	794.55
Sample #14170-10	794.54

table 1: homogeneity test results of sub samples #14170

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 ISO13528, Annex B2 in the next table:

	Density at 15°C in kg/m^3
r (observed)	0.11
reference method	D4052:11
0.3 x R (ref. method)	0.15

Table 2: evaluation of repeatability of subsamples #14170

The calculated repeatability is less than 0.3 times the reproducibility of the reference method. Therefore, homogeneity of the subsamples of #14170 was assumed.

2.4.2 JET FUEL - SAMPLE FOR JFTOT DETERMINATION

The necessary bulk material was obtained from a participating laboratory. Approximately 105 litre bulk material was homogenised in a mixing vessel. Out of this batch 148 bottles of 1 litre were filled with 700 ml sample, closed with inner and outer caps and labelled #14169. The homogeneity of the subsamples #14169 was checked by the determination of Density in accordance with ASTM D4052 on 8 stratified randomly selected samples.

	Density at 15°C in kg/m^3
Sample #14169-1	816.06
Sample #14169-2	816.08
Sample #14169-3	816.07
Sample #14169-4	816.09
Sample #14169-5	816.05
Sample #14169-6	816.14
Sample #14169-7	816.11
Sample #14169-8	816.10

table 3: homogeneity test results of sub samples #14169

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 ISO13528, Annex B2 in the next table:

	Density at 15°C in kg/m^3
r (observed)	0.08
reference method	D4052:11
0.3 x R (ref. method)	0.15

Table 4: evaluation of repeatability of subsamples #14169

The calculated repeatability is less than 0.3 times the reproducibility of the reference method. Therefore, homogeneity of the subsamples of #14169 was assumed.

2.4.3 JET FUEL – SAMPLE FOR BOCLE DETERMINATION

The third bulk material was obtained from a participating laboratory. Approximately 30 litre bulk material was homogenized. Out of this batch 46 amber glass bottles of 0.1 liter were filled, closed with inner and outer caps and labelled #14171. The homogeneity of the subsamples #14171 was checked by the determination of Density in accordance with ASTM D4052 on 8 stratified randomly selected samples.

	Density at 15°C in kg/m^3
Sample #14171-1	811.78
Sample #14171-2	811.78
Sample #14171-3	811.78
Sample #14171-4	811.78
Sample #14171-5	811.77
Sample #14171-6	811.77
Sample #14171-7	811.77
Sample #14171-8	811.77

table 5: homogeneity test results of sub samples #14171

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 ISO13528, Annex B2 in the next table:

	Density at 15°C in kg/m^3
r (observed)	0.01
reference method	D4052:11
0.3 x R (ref. method)	0.15

Table 6: evaluation of repeatability of subsamples #14171

The calculated repeatability is less than 0.3 times the reproducibility of the reference method. Therefore, homogeneity of the subsamples #14171 was assumed.

2.4.4 JET FUEL – SAMPLE FOR PARTICLE SIZE determination

The third bulk material was obtained from a participating laboratory. Approximately 200 litre bulk material was homogenized. Out of this batch 80 amber glass bottles of 0.5 liter were filled, closed with inner and outer caps and labelled #14172.

The homogeneity of the subsamples #14172 was checked by the determination of Particle Size Distribution in accordance with IP564 on a number of stratified randomly selected samples. For the particle size ≥4 µm the values ranged from 18300 to 19350. The differences between the test results for homogeneity of the subsamples #14172 were all well within the spread of the laboratory and therefore the homogeneity of the subsamples #14172 was assumed (see below table 7).

	Particle size ≥4 µm
r (observed)	1760
reference method	IP564:13
r (ref. method)	2560

Table 7: evaluation of repeatability of subsamples #14172

2.4.5 JET FUEL – SAMPLE FOR FATTY ACID METHYL ESTER (FAME) DETERMINATION

It was decided to use a batch of approx. 45 litre from a previous Jet Fuel PT and add Biodiesel B100. This batch was divided over 65 bottles of 100 mL and labelled #14173. The homogeneity of the subsamples #14173 was checked by the determination of FAME in accordance with method IP585:10 on 8 stratified randomly selected samples.

Sample	FAME in mg/kg
#14173-1	36
#14173-2	35
#14173-3	35
#14173-4	35
#14173-5	35
#14173-6	35
#14173-7	35
#14173-8	33

Table 8: homogeneity test results of sub samples #14173

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
r (observed)	2.3
reference method	IP585:10
0.3 x R (ref. method)	2.9

Table 9: evaluation of repeatabilities of subsamples #14173

The calculated repeatability is less than 0.3 times the reproducibility of the reference method. Therefore, homogeneity of the subsamples of #14173 was assumed.

Depending on the registration of each individual participant the following samples were dispatched on August 27, 2014: 2 bottles Jet Fuel (2*1 litre, labelled #14170), 1 bottle especially for the JFTOT test (1*1L, labelled #14169), 1 bottle especially for the BOCLE test (1*0.1L, labelled #14171), 1 bottle especially for the Particle Size Distribution (1*0.5L, labelled #14172) and 1 bottle especially for the FAME determination (1*0.1 L, labelled #14173).

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 D4306:13. 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 #14170: Aromatics by FIA, Aromatics by HPLC (in %M/M and %V/V), Colour Saybolt (ASTM D156 and ASTM 6045), Density at 15°C,

Distillation (IBP, 10%, 50%, 90% recovered, FBP, Residue and Loss), Existent Gum, Flash Point, Freezing Point (Manual and Automated), Kinematic Viscosity at -20°C., Mercaptan Sulphur, MSEP, Naphthalenes, Smoke Point, Specific Energy, Total Acidity,Total Sulphur and on sample #14169 JFTOT. The participants were requested to determine BOCLE on #14171, Particle Size only on sample #14172 and Fatty Acid Methyl Ester (FAME) on #14173.

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 well as the required standards and a letter of instructions were prepared and made available on the data entry portal www.kpmd.co.uk/sgs-iis/. The detailed report form was also made available for download on the iis website www.iisnl.com.

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 Organisation, Statistics and Evaluation of April 2014' (iis-protocol, version 3.3). 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 a variant of the Kolmogorov-Smirnov test and by the calculation of skewness and kurtosis. Evaluation of the three normality indicators in combination with the visual evaluation of the graphic Kernel density plot, lead to judgement of the normality being either 'unknown', 'OK', 'suspect' or 'not OK'. After removal of outliers, this check was repeated. Not all data sets proved to have a normal distribution, in which cases the statistical evaluation of the results should be used with due care.
In accordance to 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 and by R(0.01) for the Rosner

General ESD test (see appendix 4, no.16). Stragglers are marked by D(0.05) for the Dixon test, by G(0.05) or DG(0.05) for the Grubbs test and by R(0.05). Both outliers and stragglers were not included in the calculations of the averages and the 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 visualise 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; nos.14 and 15). Also a normal Gauss curve was projected over the Kernel Density Graph.

3.3   Z-SCORES

To evaluate the performance of the participating laboratories the z-scores were calculated. As it was decided to evaluate the performance of the participants in this proficiency test (PT) against the literature requirements, e.g. ASTM reproducibilities, the z-scores were calculated using a target standard deviation. This 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 whether the reported test result is fit-for-use.
The z-scores were calculated in accordance with:

$z_{(target)}$ = (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 maybe as follows:

$$|z| < 1 \quad \text{good}$$
$$1 < |z| < 2 \quad \text{satisfactory}$$
$$2 < |z| < 3 \quad \text{questionable}$$
$$3 < |z| \quad \text{unsatisfactory}$$

4 EVALUATION

In this proficiency test problems were encountered with the despatch of the samples. Several laboratories in Qatar, Saudi Arabia and Tunesia received the samples late or not at all.
For the "main Jet Fuel A1" including the JFTOT PT, 23 participants reported the results after the final reporting date and another 7 participants did not report any results at all.
For the PT "BOCLE", "Particle Size" and "FAME", respectively 4, 8 and 7 participants reported the results after the final reporting date and respectively 1, 7 and 8 participants did not report any results at all.
In total, 132 participants of the main round, 18 participants of the BOCLE round, 46 participants of the Particle Size round and 30 participants of the FAME round reported in total 2729 numerical results. Observed were 62 outlying results, which is 2.3%. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

4.1 EVALUATION PER TEST

In this section, the results are discussed per sample and per test. The methods, which are used by the various laboratories, are taken into account for explaining the observed differences where possible and applicable. These methods are also in the tables together with the reported data. The abbreviations, used in these tables, are listed in appendix 4.
In the iis PT reports, ASTM methods are referred to with a number (e.g. D2086) and an added designation for the year that the method was adopted or revised (e.g. D2086:08). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D2086:08 (2013)). In the results tables of Appendix 1 only the method number and year of adoption or revision will be used.

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

Since the checklist is continuously updated, the users are advised to monitor the updates. The latest version at the time of this PT for the AFQRJOS is "DEF STAN 91-91/Issue 7, dated: February 2011, Note Amendment 2 Implementation date December 2012" and ASTM D1655:12. One must keep in mind that ISO-methods are not mentioned in the "Checklist" (AFQRJOS issue 27 feb 2013).

For Jet Fuel sample #14170

Aromatics by: FIA (D1319):
This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in good agreement with ASTM D1319:13.

Aromatics by: HPLC (D6379)
The %M/M determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with ASTM D6379:11.
The %V/V determination may also be problematic. Regretfully, no precision data for the determination in %V/V is mentioned in ASTM D6379:11, but the observed reproducibility was similar to the determination in %M/M.

Colour Saybolt:
The determination was problematic for the automatic test method ASTM D6045. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D6045:12. Some of the spread may be caused by the fact that some laboratories may have used a different cell than 100 mm. This automatic equipment is designed to measure with smaller cells, although ASTM D6045 prescribes 100 mm.
The manual test method ASTM D156 was very problematic. No statistical outliers were observed. However, the calculated reproducibility is not at all in agreement with the requirements of ASTM D156:12.

Density:
This determination was problematic for a number of laboratories. Seven statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ASTM D4052:11.

Distillation:
This determination was not problematic. In total three statistical outliers were observed. The calculated reproducibilities for IBP, 10% rec, 50% rec, 90% rec and FBP, after rejection of the statistical outliers, are all in agreement with the automated mode requirements of ASTM D86:12. However, when the calculated reproducibilities were evaluated against the manual mode requirements, only the 10%, 50% and 90% recovered were in agreement.

Existent Gum:
This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in good agreement with ASTM D381:12.

Thirty-two participants reported to have used IP540. This method allows an air jet evaporation next to the steam jet evaporation, while the specification of Jet Fuel A1 prefers steam as evaporation medium. When air jet evaporation is used, IP540 may give different results and may not be equivalent to D381:12. But again, the observed spread was very small and no significant effect of possible differences can be observed.

Flash Point: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in good agreement with IP170:14.

                     In the Joint Fuelling System Checklist both P170/ISO13736 and ASTM D56 are mentioned as test methods. Still some participants (seven in total) report methods which are not equivalent, like IP523, D93, ISO2719 and D3828. When the test results from IP170/ISO13736 and ASTM D56 were evaluated separately, also both calculated reproducibilities are in agreement with the respective reproducibility requirements.

Freezing Point: This determination was problematic for a number of laboratories. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D2386:06(2012)/IP16:07.

Kin. Viscosity at -20°C: This determination was problematic for a number of laboratories. Eight statistical outliers were observed. However the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D445:12.

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

MSEP: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D3948:07-B(2013).

Naphthalenes: This determination was not problematic when evaluated against the reproducibility of method B. One statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier is in agreement with the requirements of ASTM D1840:07(2013)-B, but not with ASTM D1840:07(2013)-A.
                     When the results from procedures A and B are evaluated separately, the calculated reproducibility are respectively not in agreement with the requirements of ASTM D1840:07(2013)-A but in agreement with the requirements of ASTM D1840:07(2013)-B.

Smoke Point: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of ASTM D1322:12e2.

Specific Energy: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D3338:09(2014).

When using ASTM D6379 or IP436 for calculating the specific energy, a correction factor of 25/26.5 should be applied.

Total Acidity: This determination was problematic at the low level 0.0021 mg KOH/g. Two statistical outliers were observerd. 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. Six statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5453:09(2014).

For Jet Fuel JFTOT sample #14169

Copper: This determination was problematic. No statistical outliers were observed, although the test results of four laboratories were excluded for performing a copper corrosion test. The calculated reproducibility is not at all in agreement with the requirements of ASTM D6732:04(2010). However, the presence of Copper in this sample has been proven with high certainty.

Density: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ASTM D4052:11.

JFTOT: The reported test results for tube rating vary over a range from <0 to >4. The reported Delta P test results vary from 0 to >280. Visual rating is described in ASTM D3241 Annex A1, automatic rating in ASTM D3241 Annex A2. The JFTOT test can be rated as a pass according to specification ASTM D1655 when the tube rating is 3 or less and Delta P is 25 or less after 2.5 hrs at 260°C. Using these criteria, 25 of the reporting laboratories would rate the sample as a pass, while 40 reporting laboratories would rate it a fail. The presence of copper suggests that the 40 fails are correct.

For Jet Fuel BOCLE sample #14171

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.

For Jet Fuel PS sample #14172

Particle Size: The results from test methods IP564 and IP565 differed significantly in the previous PT iis14J01. Therefore both methods are evaluated separately in this PT. The determination according to IP564 was very problematic. In total eleven statistical outliers were observed. One laboratory (code 851) appeared to have

reported inconsistent test results for ≥21, ≥25 and ≥30µm, therefore these results were excluded. One laboratory (code 150) was excluded, because the results were an obvious duplication of the also reported IP565 results.

After rejection of the suspect data, none of the calculated reproducibilities is in agreement with the requirements of IP564:13.

The test results varied over a large range, for all particle size categories. One laboratory had maximum values that were a thousand times higher than the minimum for that particle size category. Not counting this laboratory, still the difference between the minimum and the maximum value of a category was on average 30 to 50 times the minimum value.

The determination according to IP565 was problematic for the determinations ≥4 and ≥6µm. In total four statistical outliers were observed.

After rejection of statistical outliers, all the calculated reproducibilities are in agreement with the requirements of IP565:13, except for ≥4 en ≥6µm. Also with this test, the test results show a large variation. The difference between the minimum and maximum value can be as high as a factor of 100.

The problems may be caused by the extremely high particle contents, therefore it was decided not to calculate the z-scores for these tests.

For Jet Fuel FAME sample #14173

FAME: This determination was very problematic. Only one statistical outlier was observed. However, the calculated reproducibility, after rejection of the statistical outlier, is not at all in agreement with the requirements of IP585:10. Only IP585 or IP590 are allowed in the current version of Def Stan 91-91.

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 #14170, #14169, #14171, #14172 and #14173 are compared in the next tables.

Parameter	unit	n	Average	2.8 * sd	R (lit)
Aromatics by FIA	%V/V	72	16.35	1.27	2.72
Aromatics by HPLC	%M/M	28	19.17	3.03	1.99
Aromatics by HPLC	%V/V	24	16.91	2.78	unknown
Colour Saybolt (ASTM D6045)		44	18.8	1.7	1.2
Colour Saybolt (ASTM D156)		73	18.9	3.8	2.0
Density at 15°C	kg/m^3	122	794.4	0.3	0.5
Initial Boiling Point	°C	126	153.5	5.3	8.4
10% recovered	°C	126	168.4	2.8	3.7
50% recovered	°C	125	189.1	2.5	3.0
90% recovered	°C	126	224.2	3.6	3.4
Final Boiling Point	°C	124	245.2	5.0	7.1
Existent Gum	mg/100mL	75	0.88	1.28	3.19
Flash Point	°C	122	43.3	2.7	3.2
Freezing Point	°C	111	-57.4	1.8	2.5
Kinematic Viscosity at -20°C	cSt	72	3.393	0.063	0.065
Mercaptan Sulphur	%M/M	78	0.0009	0.0002	0.0004
MSEP	rating	91	90.6	9.9	11.4
Naphthalenes	%V/V	68	1.03	0.08	0.10
Smoke Point	mm	98	24.2	2.9	3.8
Specific Energy	MJ/kg	75	43.305	0.059	0.046
Total Acidity	mg KOH/g	87	0.0021	0.0033	0.0019
Total Sulphur	mg/kg	100	871.9	86.7	93.0

table 10: comparison of the observed and target reproducibilities of sample #14170

Parameter	unit	n	Average	2.8 * sd	R (lit)
Copper as Cu	mg/kg	10	89.1	70.9	42.7
Density at 15°C	kg/m^3	53	815.8	0.3	0.5
JFTOT - Tube Rating		65	see §4.1	n.a.	n.a
JFTOT - Delta P	mmHg	66	see §4.1	n.a.	n.a

table 11: comparison of the observed and target reproducibility of sample #14169

Parameter	unit	n	Average	2.8 * sd	R (lit)
Wear Scar Diameter (BOCLE)	mm	17	0.684	0.059	0.065

table 12: comparison of the observed and target reproducibility of sample #14171

Parameter	unit	n	Average	2.8 * sd	R (lit)
Particle Size >4 µm (IP564)	mL^{-1}	21	20696	23078	3879
Particle Size >6 µm (IP564)	mL^{-1}	20	3366	5340	1055
Particle Size >14 µm (IP564)	mL^{-1}	19	13	24	17
Particle Size >21 µm (IP564)	mL^{-1}	18	3.1	7.2	4.0
Particle Size >25 µm (IP564)	mL^{-1}	19	1.8	4.9	2.4
Particle Size >30 µm (IP564)	mL^{-1}	18	0.8	3.2	1.4
Particle Size >4 µm (IP565)	mL^{-1}	24	29339	37473	3121
Particle Size >6 µm (IP565)	mL^{-1}	24	4082	9789	913
Particle Size >14 µm (IP565)	mL^{-1}	22	12	17	24
Particle Size >21 µm (IP565)	mL^{-1}	22	1.9	2.3	5.1
Particle Size >25 µm (IP565)	mL^{-1}	22	0.9	1.4	2.6
Particle Size >30 µm (IP565)	mL^{-1}	23	0.5	0.9	1.2

table 13: comparison of the observed and target reproducibilities of sample #14172

Parameter	unit	n	Average	2.8 * sd	R (lit)
FAME	mg/kg	29	31.9	15.0	9.0

table 14: comparison of the observed and target reproducibility of sample #14173

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 2014 WITH PREVIOUS PTS

	September 2014	March 2014	September 2013	March 2013	September 2012
Number of reporting labs	132	100	136	92	128
Number of results reported	2729	1741	2538	1705	2631
Statistical outliers	62	29	69	45	123
Percentage outliers	2.3%	1.6%	2.7%	2.6%	4.6%

table 15: 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 2014	March 2014	September 2013	March 2013	September 2012
Aromatics by FIA	++	+	+	++	++
Aromatics by HPLC	-	-	++	+/-	+
Colour Saybolt	--	--	--	--	--
Density at 15°C	++	++	++	++	++
Distillation	+	+	n.e.	n.e.	n.e.
Distillation automated	n.e.	n.e.	+	+	++
Distillation manual	n.e.	n.e.	-	++	-
Existent Gum	++	++	++	+/-	++
Flash Point	+	+	+	+	+
Freezing Point	+	-	+	+/-	++
Kinematic Viscosity @ -20°C	+/-	-	+	-	--
Mercaptan Sulphur	++	+	+/-	--	-
MSEP	+	+	+/-	-	(++)
Naphthalenes	+	+	+	+	-
Smoke Point	+	+/-	+	++	--
Specific Energy	-	-	+	-	+/-
Total Acidity	--	--	-	-	-
Total Sulphur	+	+/-	+	+	-
BOCLE	+	n.e.	+/-	n.e.	-
Particle Size Distribution	n.e.	n.e.	--	--	--
Particle Size Distribution IP565	--	--	n.e.	n.e.	n.e.
Particle Size Distribution IP564	-	-	n.e.	n.e.	n.e.
FAME	--	n.e.	--	n.e.	--

table 16: 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 #14170; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1011	D1319	16.47		0.13
62	D1319	16.54		0.20	1016		-----		-----
120	D1319	16.2		-0.15	1021		-----		-----
131		-----		-----	1039		-----		-----
132	D1319	16.40		0.05	1049		-----		-----
140	D1319	16.1		-0.25	1059	D1319	16.4		0.05
150	D1319	16.2		-0.15	1062	D1319	16.3		-0.05
159	D1319	17.1		0.77	1064	D1319	16.53		0.19
169	D1319	16.4		0.05	1065		-----		-----
171	D1319	16.9		0.57	1079	D1319	17.2		0.88
175	D1319	16.4		0.05	1081	D1319	15.7		-0.66
177	D1319	16.4		0.05	1097	D1319	16.5		0.16
194	D1319	16.3		-0.05	1109	D1319	16.65		0.31
216		-----		-----	1121		-----		-----
221		-----		-----	1126		-----		-----
224		-----		-----	1131	D1319	16.3		-0.05
228		-----		-----	1134	D1319	17.0		0.67
230	D1319	16.08		-0.27	1146		-----		-----
237	D1319	16.4		0.05	1150		-----		-----
238		-----		-----	1161		-----		-----
252	D1319	15.58		-0.79	1182		-----		-----
253	D1319	16.00		-0.36	1201		-----		-----
254	D1319	16.8		0.47	1212	D1319	15.97		-0.39
256	D1319	16.0		-0.36	1231	D1319	17.35		1.03
258		-----		-----	1279		-----		-----
273		-----		-----	1297		-----		-----
311	D1319	16.8		0.47	1299	D1319	14.4	R(0.01)	-2.00
323	D1319	15.9		-0.46	1316		-----		-----
333		-----		-----	1318		-----		-----
334	D1319	16.1		-0.25	1376	D1319	16.05		-0.30
335	D1319	16.1		-0.25	1395		-----		-----
340	D1319	16.76		0.42	1417		-----		-----
353		-----		-----	1429		-----		-----
369	D1319	16.30		-0.05	1448		-----		-----
370	D1319	16.34		-0.01	1491		-----		-----
371		-----		-----	1496	D1319	16.2		-0.15
372	D1319	16.3		-0.05	1520	D1319	16.18		-0.17
399		-----		-----	1538	D1319	16.5		0.16
402	D1319	16.78		0.44	1543		-----		-----
440	D1319	16.14		-0.21	1564	D1319	16.4		0.05
445	D1319	15.8		-0.56	1570		-----		-----
447	D1319	15.2		-1.18	1586	D1319	16.6		0.26
448	D1319	16.16		-0.19	1587		-----		-----
463	D1319	16.5		0.16	1610	IP156	16.813		0.48
473		-----		-----	1616	D1319	16.3		-0.05
485		-----		-----	1631	D1319	15.7		-0.66
496	D1319	17.20		0.88	1634		-----		-----
601		-----		-----	1636	D1319	16.01		-0.35
604		-----		-----	1683	D1319	15.6		-0.77
606		-----		-----	1694		-----		-----
608		-----		-----	1715		-----		-----
631	D1319	15.37		-1.00	1720		-----		-----
657	D1319	16.0	C	-0.36	1724	D1319	16.5		0.16
663	D1319	17.45		1.13	1776		-----		-----
671		-----		-----	1782		-----		-----
732		-----		-----	1787		-----		-----
785		-----		-----	1798	D1319	15.7		-0.66
823	D1319	16.9		0.57	1811	D1319	16.35		0.00
851		-----		-----	1833	D1319	15.99		-0.37
854	D1319	16.55		0.21	1842	D1319	15.8		-0.56
862	D1319	17.21		0.89	1881		-----		-----
869	D1319	16.73		0.39	1883		-----		-----
922	D1319	15.92		-0.44	1913	D1319	16.18		-0.17
962		-----		-----	1914	D1319	16.7		0.36
963		-----		-----	1948		-----		-----
974	D1319	19.54	R(0.01)	3.28	1951		-----		-----
994		-----		-----	2129	D1319	16.4		0.05
995		-----		-----	2130	D1319	16.3		-0.05
996		-----		-----					
997		-----		-----					
998		-----		-----					

normality	OK
n	72
outliers	2
mean (n)	16.347
st.dev. (n)	0.4540
R(calc.)	1.271
R(D1319:13)	2.724

Lab 657 first reported 18.0
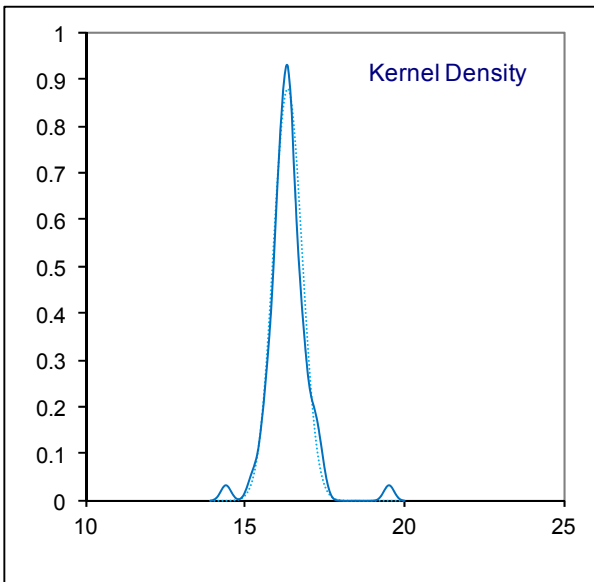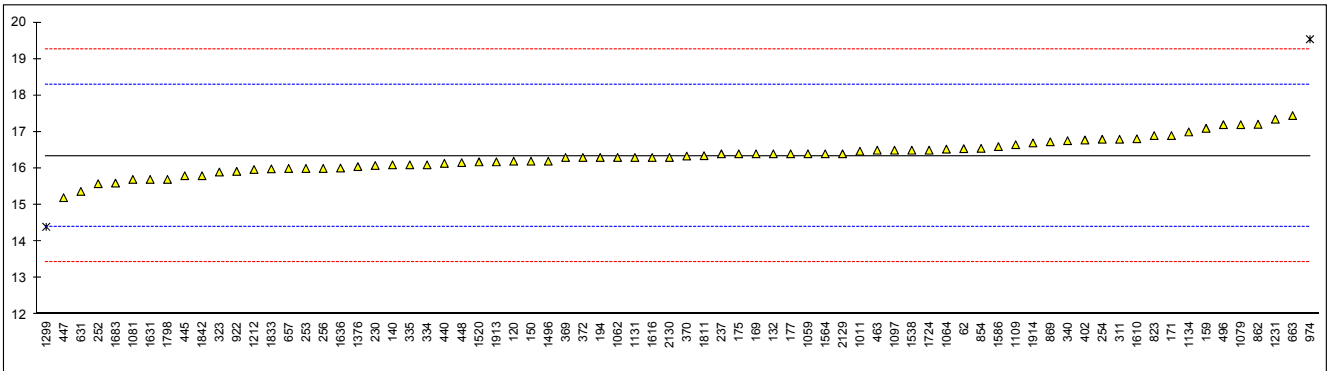
Kernel Density

Determination of Aromatics by HPLC on sample #14170; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1011		-----		-----
62		-----		-----	1016		-----		-----
120		-----		-----	1021		-----		-----
131		-----		-----	1039		-----		-----
132		-----		-----	1049	D6379	18.720		-0.64
140		-----		-----	1059	EN12916	19.8		0.88
150		-----		-----	1062		-----		-----
159		-----		-----	1064		-----		-----
169		-----		-----	1065		-----		-----
171	D6379	16.7		-3.47	1079	D6379	19.7		0.74
175		-----		-----	1081		-----		-----
177		-----		-----	1097		-----		-----
194		-----		-----	1109	D6591	19.14		-0.05
216		-----		-----	1121		-----		-----
221		-----		-----	1126		-----		-----
224		-----		-----	1131		-----		-----
228		-----		-----	1134	IP436	18.64		-0.75
230		-----		-----	1146		-----		-----
237		-----		-----	1150		-----		-----
238		-----		-----	1161	EN12916	18.4		-1.09
252		-----		-----	1182		-----		-----
253		-----		-----	1201	D6379	19.3		0.18
254		-----		-----	1212	IP391	19.6752		0.71
256		-----		-----	1231		-----		-----
258		-----		-----	1279		-----		-----
273		-----		-----	1297	EN12916	19.00		-0.24
311		-----		-----	1299	IP436	21.5		3.27
323		-----		-----	1316		-----		-----
333	D6379	18.9		-0.38	1318	D6379	18.836		-0.47
334		-----		-----	1376		-----		-----
335		-----		-----	1395		-----		-----
340		-----		-----	1417		-----		-----
353		-----		-----	1429		-----		-----
369	D6379	19.15		-0.03	1448		-----		-----
370	D6379	20.44		1.78	1491		-----		-----
371		-----		-----	1496		-----		-----
372	D6379	19.1		-0.10	1520		-----		-----
399		-----		-----	1538		-----		-----
402	D6379	21.31		3.00	1543		-----		-----
440		-----		-----	1564		-----		-----
445		-----		-----	1570		-----		-----
447		-----		-----	1586		-----		-----
448		-----		-----	1587		-----		-----
463	D6379	19.71		0.75	1610		-----		-----
473		-----		-----	1616	D6379	18.52		-0.92
485		-----		-----	1631		-----		-----
496	D6379	20.959		2.51	1634		-----		-----
601		-----		-----	1636		-----		-----
604		-----		-----	1683		-----		-----
606		-----		-----	1694		-----		-----
608		-----		-----	1715		-----		-----
631		-----		-----	1720		-----		-----
657	IP436	18.93		-0.34	1724		-----		-----
663		-----		-----	1776		-----		-----
671		-----		-----	1782		-----		-----
732		-----		-----	1787		-----		-----
785		-----		-----	1798		-----		-----
823		-----		-----	1811	IP391	18.69		-0.68
851	D6379	19.76		0.82	1833		-----		-----
854		-----		-----	1842	IP436	18.3		-1.23
862	D6379	19.19		0.02	1881		-----		-----
869		-----		-----	1883		-----		-----
922		-----		-----	1913		-----		-----
962		-----		-----	1914	IP391	17.3		-2.63
963		-----		-----	1948	D6379	17.56		-2.27
974		-----		-----	1951		-----		-----
994		-----		-----	2129	D6379	19.61	C	0.61
995		-----		-----	2130		-----		-----
996		-----		-----					
997		-----		-----					
998		-----		-----					

normality	OK
n	28
outliers	0
mean (n)	19.173
st.dev. (n)	1.0811
R(calc.)	3.027
R(D6379:11)	1.993

Lab 2129 first reported 22.15
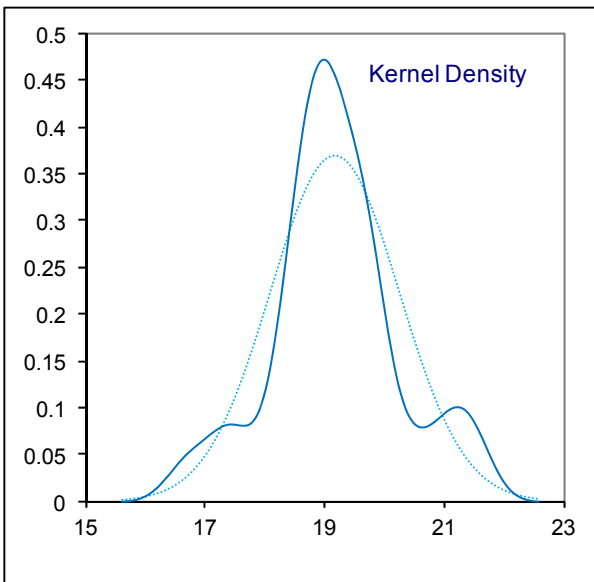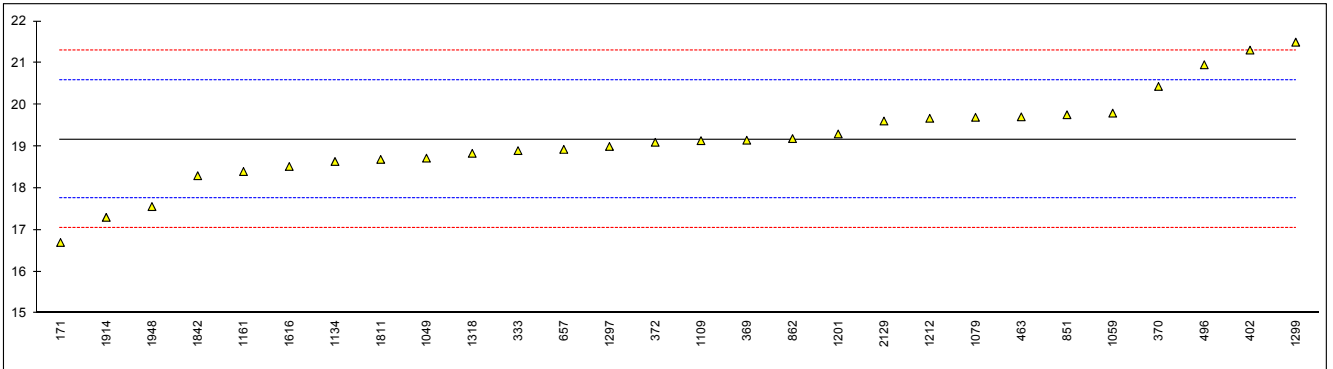
Kernel Density

Determination of Aromatics by HPLC on sample #14170; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1011		-----		-----
62		-----		-----	1016	IP436	15.7		-----
120		-----		-----	1021		-----		-----
131		-----		-----	1039	D6379	17.2		-----
132		-----		-----	1049		16.844		-----
140		-----		-----	1059		-----		-----
150		-----		-----	1062		-----		-----
159		-----		-----	1064		-----		-----
169		-----		-----	1065		-----		-----
171		-----		-----	1079	D6379	17.5		-----
175		-----		-----	1081		-----		-----
177		-----		-----	1097		-----		-----
194		-----		-----	1109		-----		-----
216		-----		-----	1121		-----		-----
221		-----		-----	1126		-----		-----
224		-----		-----	1131		-----		-----
228		-----		-----	1134	IP436	16.84		-----
230		-----		-----	1146		-----		-----
237		-----		-----	1150		-----		-----
238		-----		-----	1161	ISO12916	16.4		-----
252		-----		-----	1182		-----		-----
253		-----		-----	1201	D6379	15.3		-----
254		-----		-----	1212		-----		-----
256		-----		-----	1231		-----		-----
258		-----		-----	1279		-----		-----
273		-----		-----	1297	EN12916	16.52		-----
311		-----		-----	1299	IP436	18.9		-----
323		-----		-----	1316	IP391	15.8		-----
333	D6379	17.0		-----	1318	D6379	16.850		-----
334		-----		-----	1376		-----		-----
335		-----		-----	1395		-----		-----
340		-----		-----	1417		-----		-----
353		-----		-----	1429		-----		-----
369	D6379	17.77		-----	1448		-----		-----
370	D6379	18.25		-----	1491		-----		-----
371		-----		-----	1496		-----		-----
372		17.0		-----	1520		-----		-----
399		-----		-----	1538		-----		-----
402		16.79		-----	1543		-----		-----
440		-----		-----	1564		-----		-----
445		-----		-----	1570		-----		-----
447		-----		-----	1586		-----		-----
448		-----		-----	1587		-----		-----
463		17.59		-----	1610		-----		-----
473		-----		-----	1616	D6379	16.49		-----
485		-----		-----	1631		-----		-----
496	D6379	18.775		-----	1634		-----		-----
601		-----		-----	1636		-----		-----
604		-----		-----	1683	D6379	14.7		-----
606		-----		-----	1694		-----		-----
608		-----		-----	1715		-----		-----
631		-----		-----	1720		-----		-----
657	IP436	16.87		-----	1724		-----		-----
663		-----		-----	1776	D6379	16.069		-----
671		-----		-----	1782		-----		-----
732		-----		-----	1787		-----		-----
785		-----		-----	1798		-----		-----
823		-----		-----	1811		-----		-----
851	D6379	17.43		-----	1833		-----		-----
854		-----		-----	1842		-----		-----
862		-----		-----	1881		-----		-----
869		-----		-----	1883		-----		-----
922		-----		-----	1913		-----		-----
962		-----		-----	1914		-----		-----
963		-----		-----	1948		-----		-----
974		-----		-----	1951		12.6	R(0.01)	-----
994		-----		-----	2129		17.16		-----
995		-----		-----	2130		-----		-----
996		-----		-----					
997		-----		-----					
998		-----		-----					

normality	OK
n	24
outliers	1
mean (n)	16.906
st.dev. (n)	0.9938
R(calc.)	2.783
R(lit)	unknown
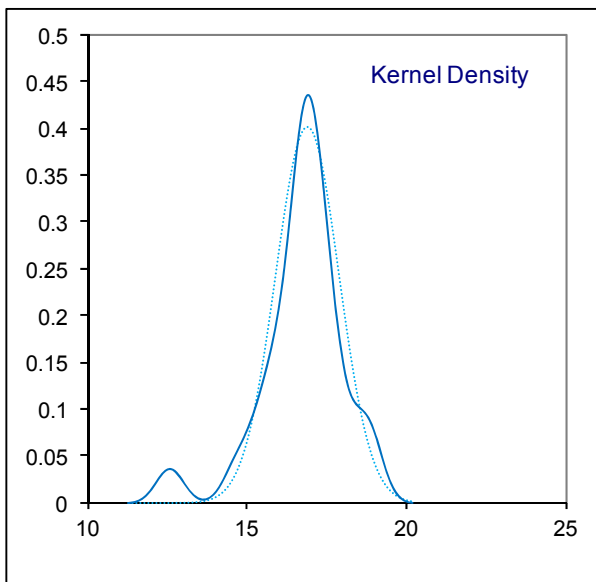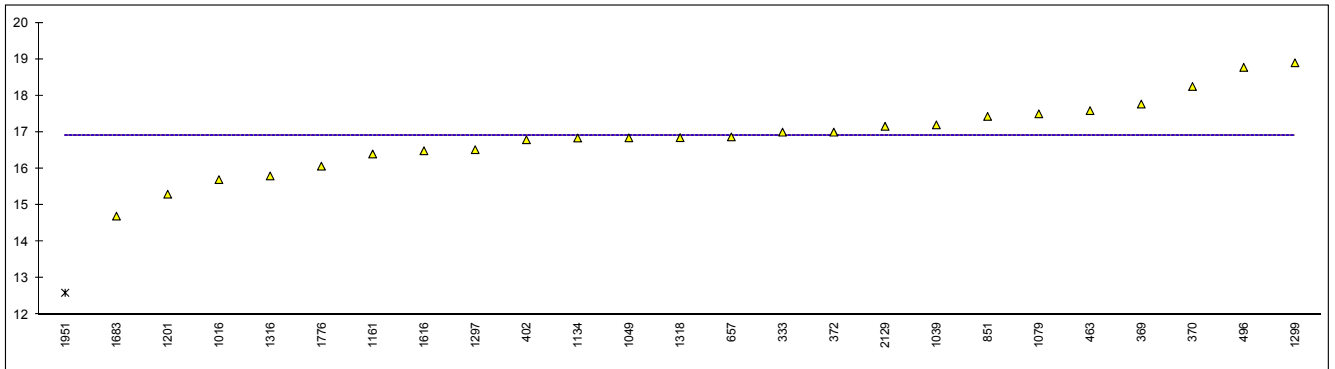
Determination of Colour Saybolt (Automated) on sample #14170;

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D6045	19		0.56	1011		-----		-----
62		-----		-----	1016		-----		-----
120	D6045	20		2.82	1021		-----		-----
131		-----		-----	1039		-----		-----
132		-----		-----	1049	D6045	19		0.56
140		-----		-----	1059		-----		-----
150	D6045	20		2.82	1062	D6045	18		-1.69
159		-----		-----	1064	D6045	20		2.82
169	D6045	18.3		-1.02	1065		-----		-----
171	D6045	18		-1.69	1079	D6045	19		0.56
175		-----		-----	1081	D6045	19		0.56
177		-----		-----	1097		-----		-----
194		-----		-----	1109	D6045	19		0.56
216		-----		-----	1121		-----		-----
221		-----		-----	1126		-----		-----
224		-----		-----	1131		-----		-----
228		-----		-----	1134		-----		-----
230		-----		-----	1146		-----		-----
237		-----		-----	1150		-----		-----
238		-----		-----	1161	D6045	19		0.56
252		-----		-----	1182	D6045	19		0.56
253		-----		-----	1201	D6045	19		0.56
254		-----		-----	1212		-----		-----
256		-----		-----	1231		-----		-----
258		-----		-----	1279	D6045	18		-1.69
273		-----		-----	1297		-----		-----
311	D6045	19		0.56	1299	D6045	19		0.56
323		-----		-----	1316		-----		-----
333	D6045	19		0.56	1318	D6045	19		0.56
334		-----		-----	1376	D6045	19		0.56
335	D6045	18		-1.69	1395		-----		-----
340		-----		-----	1417		-----		-----
353	D6045	18		-1.69	1429	D6045	19		0.56
369	D6045	19		0.56	1448		-----		-----
370		-----		-----	1491		-----		-----
371	D6045	18		-1.69	1496	D6045	19		0.56
372	D6045	19		0.56	1520		-----		-----
399		-----		-----	1538		-----		-----
402	D6045	18.0		-1.69	1543		-----		-----
440		-----		-----	1564		-----		-----
445		-----		-----	1570		-----		-----
447		-----		-----	1586	D6045	18		-1.69
448		-----		-----	1587	D6045	19.0		0.56
463		-----		-----	1610		-----		-----
473	D6045	19		0.56	1616	D6045	19		0.56
485		-----		-----	1631		-----		-----
496		-----		-----	1634		-----		-----
601		-----		-----	1636		-----		-----
604		-----		-----	1683	D6045	18		-1.69
606		-----		-----	1694		-----		-----
608		-----		-----	1715	D6045	19.7		2.15
631	D6045	19		0.56	1720		-----		-----
657		-----		-----	1724		-----		-----
663		-----		-----	1776		-----		-----
671		-----		-----	1782		-----		-----
732		-----		-----	1787		-----		-----
785	D6045	18		-1.69	1798		-----		-----
823	D6045	18		-1.69	1811		-----		-----
851		-----		-----	1833	D6045	19	C	0.56
854		-----		-----	1842		-----		-----
862		-----		-----	1881	D6045	18.0		-1.69
869	D6045	19		0.56	1883		-----		-----
922		-----		-----	1913	D6045	18.0		-1.69
962		-----		-----	1914		-----		-----
963		-----		-----	1948		-----		-----
974		-----		-----	1951	D6045	19		0.56
994		-----		-----	2129	D6045	19.0		0.56
995		-----		-----	2130	D6045	18		-1.69
996		-----		-----					
997		-----		-----					
998		-----		-----					

normality	OK
n	44
outliers	0
mean (n)	18.75
st.dev. (n)	0.595
R(calc.)	1.67
R(D6045:12)	1.24

Lab 1833 first reported 27
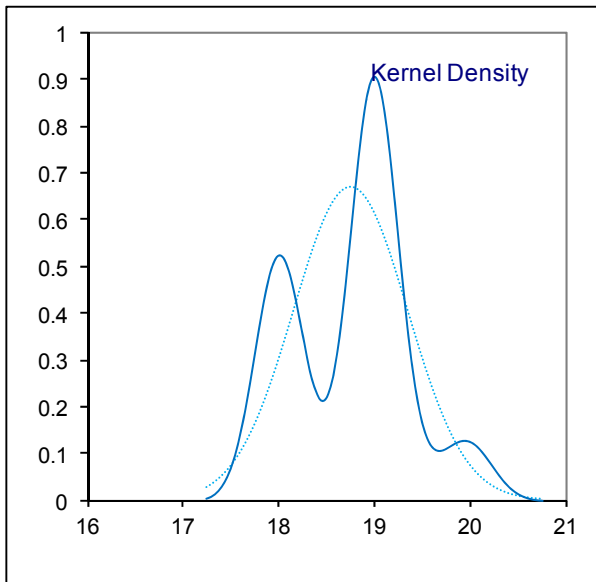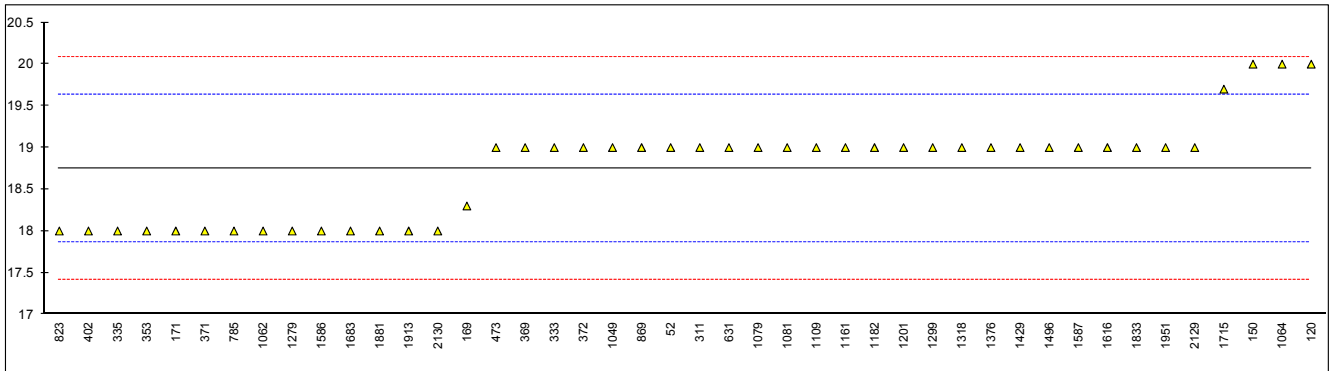
Determination of Colour Saybolt (Manual) on sample #14170;

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1011	D156	18		-1.24
62	D156	22		4.36	1016		-----		-----
120		-----		-----	1021		-----		-----
131		-----		-----	1039	D156	19		0.16
132	D156	20		1.56	1049		-----		-----
140	D156	19	C	0.16	1059	D156	19		0.16
150		-----		-----	1062		-----		-----
159	D156	20		1.56	1064	D156	20		1.56
169		-----		-----	1065		-----		-----
171	D156	19		0.16	1079		-----		-----
175		-----		-----	1081		-----		-----
177	D156	19		0.16	1097	D156	18		-1.24
194	D156	18		-1.24	1109	D156	18		-1.24
216		-----		-----	1121	D156	20		1.56
221		-----		-----	1126		-----		-----
224		-----		-----	1131	D156	19		0.16
228		-----		-----	1134	D156	17		-2.64
230	D156	21		2.96	1146		-----		-----
237	D156	20		1.56	1150		-----		-----
238	D156	20		1.56	1161		-----		-----
252	D156	18		-1.24	1182		-----		-----
253	D156	16		-4.04	1201	D156	20		1.56
254	D156	17		-2.64	1212	D1209	17		-2.64
256	D156	18		-1.24	1231	D156	20		1.56
258	D156	18		-1.24	1279	D156	18		-1.24
273	D156	18		-1.24	1297		-----		-----
311		-----		-----	1299		-----		-----
323	D156	21		2.96	1316		-----		-----
333		-----		-----	1318		-----		-----
334	D156	19		0.16	1376		-----		-----
335		-----		-----	1395		-----		-----
340	D156	20		1.56	1417	D156	18		-1.24
353		-----		-----	1429		-----		-----
369	D156	19		0.16	1448		-----		-----
370	D156	19		0.16	1491		-----		-----
371		-----		-----	1496	D156	18		-1.24
372	D156	19		0.16	1520	D156	19		0.16
399	D156	22		4.36	1538		-----		-----
402	D156	18.0		-1.24	1543		-----		-----
440	D156	19		0.16	1564	D156	19		0.16
445	D156	18		-1.24	1570		-----		-----
447		-----		-----	1586		-----		-----
448	D156	19.0		0.16	1587		-----		-----
463	D156	22		4.36	1610	D156	21		2.96
473		-----		-----	1616		-----		-----
485		-----		-----	1631		-----		-----
496	D156	>30		-----	1634	D156	17		-2.64
601		-----		-----	1636	D156	19		0.16
604		-----		-----	1683		-----		-----
606		-----		-----	1694		-----		-----
608	D156	20		1.56	1715		-----		-----
631		-----		-----	1720		-----		-----
657	D156	19		0.16	1724	D156	21		2.96
663	D156	18		-1.24	1776	D156	16		-4.04
671	D156	20		1.56	1782		-----		-----
732		-----		-----	1787		-----		-----
785		-----		-----	1798	D156	18		-1.24
823	D156	18		-1.24	1811	D156	18.5		-0.54
851	D156	19		0.16	1833	D156	19	C	0.16
854	D156	19		0.16	1842	D156	18.0		-1.24
862	D156	19		0.16	1881		-----		-----
869		-----		-----	1883	D156	17		-2.64
922	D156	22		4.36	1913	D156	18.0		-1.24
962		-----		-----	1914	D156	18.0		-1.24
963		-----		-----	1948	D156	19		0.16
974	D156	21		2.96	1951		-----		-----
994	D156	17		-2.64	2129	D156	19.0		0.16
995	D156	18		-1.24	2130		-----		-----
996	D156	17		-2.64					
997	D156	18		-1.24					
998		-----		-----					

normality	OK
n	73
outliers	0
mean (n)	18.88
st.dev. (n)	1.360
R(calc.)	3.81
R(D156:12)	2.00

Lab 140   first reported: 28
Lab 1833 first reported: 26
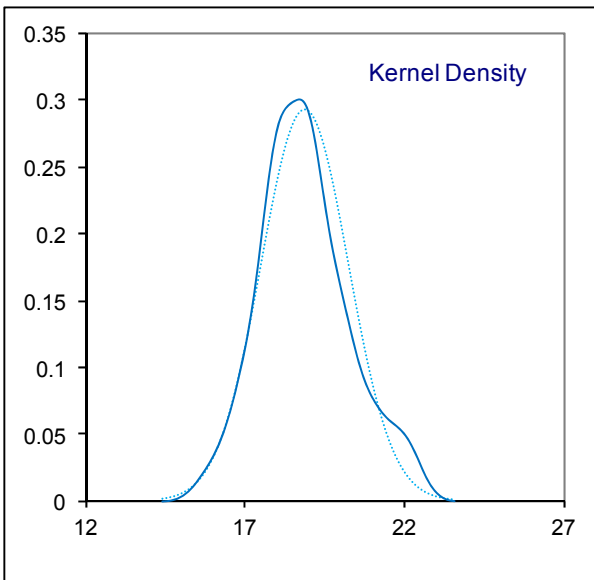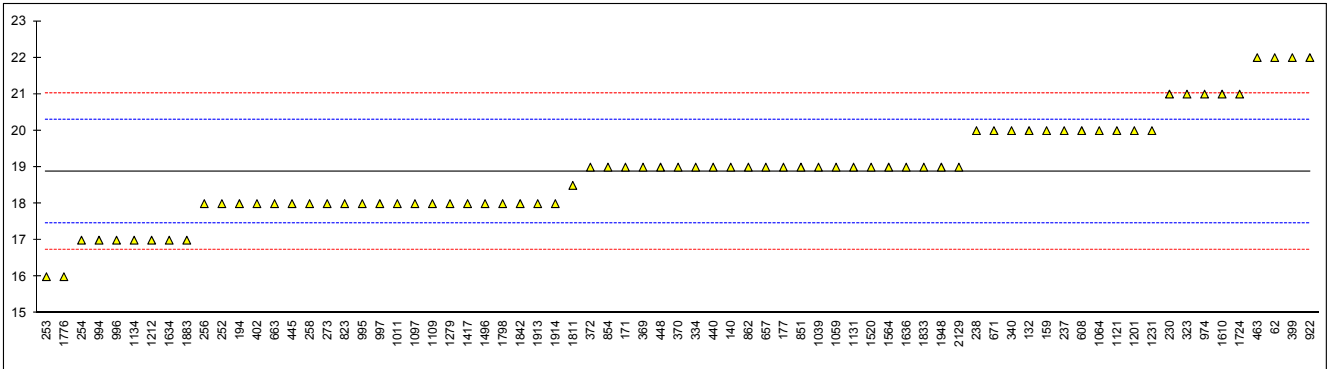
Determination of Density at 15°C on sample #14170; results in kg/m^3

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4052	794.4		0.01	1011	D4052	794.4		0.01
62	D4052	794.35		-0.27	1016		-----		-----
120	D4052	794.1		-1.67	1021		-----		-----
131		-----		-----	1039	D4052	794.4		0.01
132	D4052	794.42		0.12	1049	D4052	794.35		-0.27
140	D4052	794.5		0.57	1059	D4052	794.4		0.01
150	D4052	794.6		1.13	1062	D4052	794.2		-1.11
159	D4052	794.4		0.01	1064	D4052	794.3		-0.55
169	D4052	797.4	R(0.01)	16.81	1065	D4052	794.29		-0.61
171	D4052	794.4		0.01	1079	D4052	794.4		0.01
175	D4052	794.4		0.01	1081	D4052	794.5		0.57
177	D4052	794.8	R(0.01)	2.25	1097	ISO12185	794.3		-0.55
194	D4052	793.9	R(0.01)	-2.79	1109	D4052	794.46		0.34
216		-----		-----	1121	IP365	794.4		0.01
221	D4052	794.4		0.01	1126	D4052	794.39		-0.05
224	D4052	792.56	R(0.01)	-10.30	1131	D4052	794.4		0.01
228	D4052	794.5		0.57	1134	D4052	794.3		-0.55
230	D1298	794.3		-0.55	1146	D4052	794.39		-0.05
237	D4052	794.5		0.57	1150	ISO12185	794.2		-1.11
238		-----		-----	1161	ISO12185	794.25		-0.83
252	D1298	794.6		1.13	1182	ISO12185	794.4419		0.24
253	D4052	794.3		-0.55	1201	D4052	794.3		-0.55
254	D4052	794.5		0.57	1212	D4052	794.4		0.01
256	D4052	794.5		0.57	1231	D4052	794.4		0.01
258	D1298	794.6		1.13	1279	D4052	794.40		0.01
273	D4052	793.8	R(0.01)	-3.35	1297	D4052	794.4		0.01
311	D4052	794.4		0.01	1299	D4052	794.4		0.01
323	D4052	794.2		-1.11	1316	D4052	794.34		-0.33
333	D4052	794.5		0.57	1318	D4052	794.42		0.12
334	D4052	794.4		0.01	1376	D4052	794.50		0.57
335	D4052	794.4		0.01	1395	D4052	794.4		0.01
340	D4052	794.49		0.51	1417	IP365	794.3		-0.55
353	IP365	794.5		0.57	1429	D4052	794.2		-1.11
369	D4052	794.4		0.01	1448	D4052	794.39		-0.05
370	D4052	794.4		0.01	1491	D4052	794.40		0.01
371	D4052	794.4		0.01	1496	D1298	794.3		-0.55
372	D4052	794.4		0.01	1520	D4052	794.37		-0.16
399	D4052	794.5		0.57	1538	D4052	794.37		-0.16
402	D4052	794.3		-0.55	1543		-----		-----
440	D4052	794.4		0.01	1564	D4052	794.3		-0.55
445	D4052	794.5		0.57	1570	D4052	794.2		-1.11
447	D4052	794.4		0.01	1586	D4052	794.4		0.01
448	D4052	794.3		-0.55	1587	D4052	794.32		-0.44
463	D4052	794.39		-0.05	1610	IP365	794.6		1.13
473	D4052	794.2		-1.11	1616	D4052	794.4		0.01
485	D4052	794.3		-0.55	1631	D4052	794.5		0.57
496	D4052	794.39		-0.05	1634	D4052	794.391		-0.04
601	D1298	794.4		0.01	1636	D4052	794.42		0.12
604	D4052	793.65	R(0.01)	-4.19	1683	D4052	794.36		-0.22
606	D4052	794.4		0.01	1694		-----		-----
608	D4052	794.4		0.01	1715	ISO12185	794.4		0.01
631	D4052	794.56		0.90	1720	D4052	791.4	R(0.01)	-16.79
657	D4052	794.4		0.01	1724	D4052	794.5		0.57
663	D4052	794.5		0.57	1776	D4052	794.56		0.90
671	D4052	794.5		0.57	1782	D4052	794.4		0.01
732	D4052	794.4		0.01	1787	D1298	794.4		0.01
785	D4052	794.5		0.57	1798	D4052	794.4		0.01
823	D4052	794.55		0.85	1811	D4052	794.37		-0.16
851	D4052	794.6		1.13	1833	D4052	794.4		0.01
854	D4052	794.40		0.01	1842	D4052	794.4		0.01
862	D4052	794.39		-0.05	1881	D4052	794.5		0.57
869	D4052	794.4		0.01	1883	D1298	794.3		-0.55
922	D4052	794.36		-0.22	1913	D4052	794.3		-0.55
962		-----		-----	1914	D4052	794.35		-0.27
963		-----		-----	1948	D4052	794.7		1.69
974	D4052	794.4		0.01	1951	D4052	794.43	C	0.18
994	D4052	794.4		0.01	2129	D4052	794.3		-0.55
995	D4052	794.42		0.12	2130	D4052	794.4		0.01
996	D1298	794.3		-0.55					
997	D4052	794.4		0.01					
998		-----		-----					

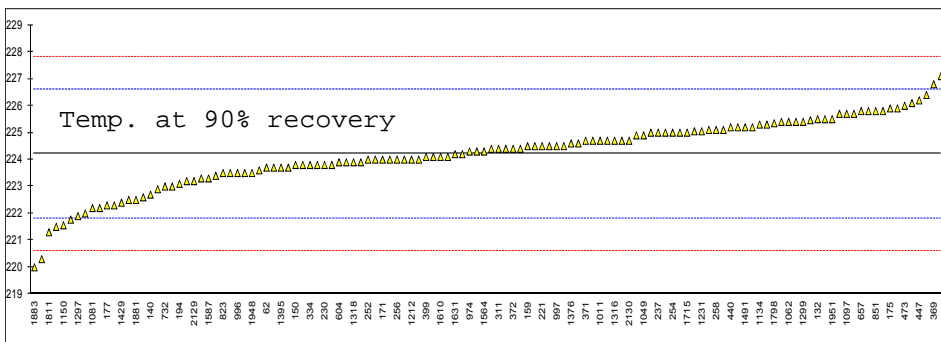| normality	suspect
n	122
outliers	7
mean (n)	794.40
st.dev. (n)	0.095
R(calc.)	0.27
R(D4052:11)	0.50

Lab 1951 reported 0.79443 (probably a unit error)
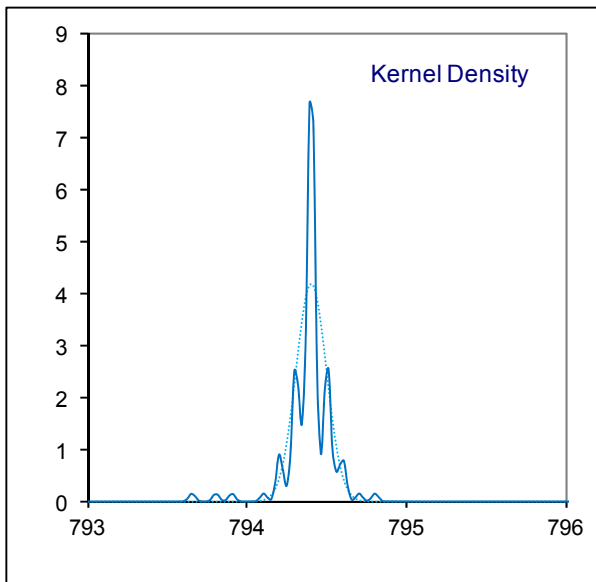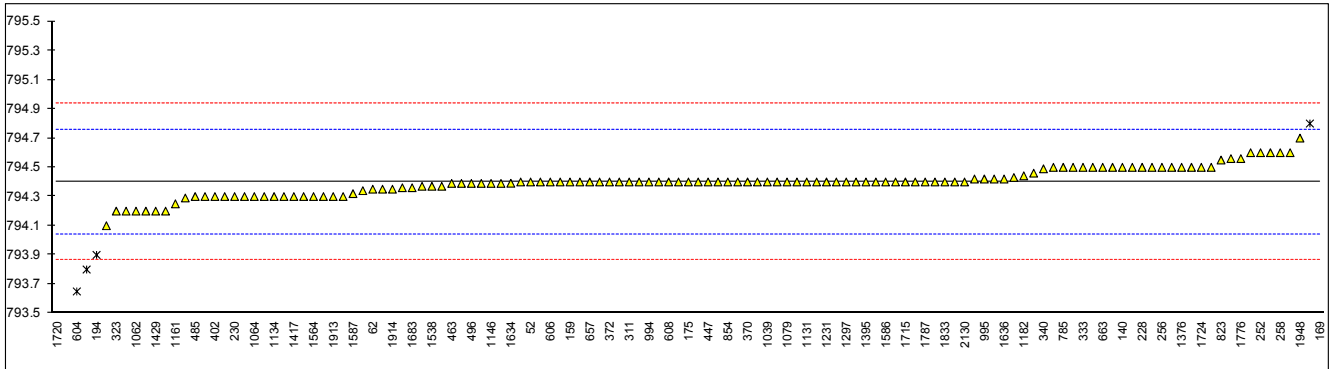
Determination of Distillation ASTM D86 on sample #14170; results in °C

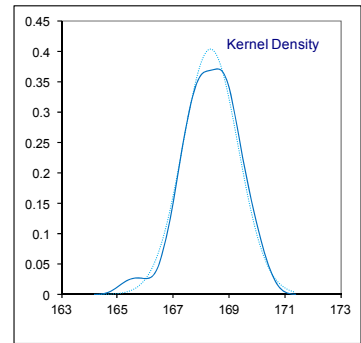| lab	method	mode	IBP	10%	50%	90%	FBP		Residue	Loss
52	D86	Automated	155.8	168.6	189.1	225.0	246.1		1.2	0.5
62	D86	Automated	155.0	170.1	190.6	223.7	247.8		1.0	0.6
120	D86	Automated	154.0	168.0	189.4	224.9	244.4		1.2	1.2
131		-----	-----	-----	-----	-----	-----		-----	-----
132	D86	Automated	150.4	168.8	189.7	225.5	245.0		1.3	1.4
140	D86	Automated	156.4	169.0	188.4	222.7	242.3		1.2	0.8
150	D86	Automated	149.7	167.7	188.7	223.8	244.4		1.1	0.5
159	D86	Automated	152.6	168.5	189.9	224.5	245.3		1.3	0.5
169	D86	Automated	152.0	168.9	189.4	223.9	245.7		1.1	0.3
171	D86	Automated	150.1	167.3	189.2	224.0	243.8		1.0	0.9
175	D86	Automated	154.1	168.1	190.1	225.9	247.8		1.0	0.5
177	D86	Automated	153.1	168.0	188.4 C	222.3	241.3		1.3	0.5
194	D86	Automated	148.9	167.9	188.7	223.1	245.4		1.1	1.0
216		-----	-----	-----	-----	-----	-----		-----	-----
221	D86	Manual	155.0	168.0	190.0	224.5	246.0		1.2	0.3
224	D86	Manual	155.47	168.72	189.46	225.46	245.21		1.5	0.5
228	D86	Manual	154.0	167.0	188.0	222.0	252.0 R(0.05)		0.8	0.2
230	D86	Automated	154.4	166.9	187.5	223.8	245.4		1.3	0.8
237	D86	Manual	153.0	167.5	190.0	225.0	246.0		1.0	0.5
238		-----	-----	-----	-----	-----	-----		-----	-----
252	D86	Manual	154.0	169.0	189.0	224.0	246.0		-----	-----
253	D86	Manual	155.0	169.0	190.5	225.0	245.5		0.8	0.6
254	D86	Manual	154.0	170.0	190.0	225.0	247.0		-----	-----
256	D86	Manual	154.0	169.0	189.0	224.0	246.0		-----	-----
258	D86	Automated	156.8	169.1	189.7	225.1	245.6		1.2	0.1
273	D86	Automated	149.4	167.8	188.9	224.3	245.9		1.3	0.5
311	D86	Automated	154.8	167.6	189.0	224.4	246.0		1.2	<0.1
323	D86	Automated	153.3	167.5	189.2	223.8	245.2		1.4	0.3
333	D86	Automated	151.1	168.5	188.5	222.9	244.9		0.9	0
334	D86	Automated	154.7	168.2	189.6	223.8	249.4		0.3	0.1
335	D86	Automated	153.3	168.3	189.7	225.4	245.0		1.1	0.7
340	D86	Automated	156.2	168.1	189.0	224.7	243.0		1.0	0.6
353	D86	Automated	153.8	169.3	189.4	226.1	246.7		0.9	0.8
369	D86	Automated	153.6	166.9	189.0	226.8	247.6		1.0	1.0
370	D86	Automated	156.5	169.1	190.5	225.8	245.7		1.0	1.0
371	D86	Automated	156.2	168.6	189.9	224.7	245.3		1.1	0.1
372	D86	Automated	153.0	168.1	189.2	224.4	245.4		1.4	0.3
399	D86	Automated	159.5	170.4	190.0	224.1	245.5		0.5	0.5
402	D86	Automated	155.1	167.5	187.5	222.5	242.2		0.8	1.2
440	IP123	Automated	155.5	169.5	190.3	225.2	247.9		1.1	0.3
445	D86	Automated	153.2	168.6	189.8	225.8	246.3		1.4	0.9
447	D86	Automated	151.7	169.6	190.1	226.2	245.7		1.4	1.1
448	D86	Automated	154.6	167.7	188.3	224.0	245.9		1.0	0.4
463	D86	Automated	154.2	168.2	189.3	225.1	246.1		1.3	0.5
473	D86	Automated	153.8	169.3	190.1	226.0	246.1		1.1	1.0
485	D86	Automated	152.90	168.85	189.55	224.10	245.80		1.15	0.25
496	D86	Automated	152.4	168.4	189.2	223.5	245.5		1.1	0.3
601		-----	-----	-----	-----	-----	-----		-----	-----
604	D86	Automated	152.1	167.0	186.7	223.9	241.5		1.2	2.2
606	D86	Automated	154.7	169.2	190.0	224.4	245.0		1.1	0.5
608	D86	Automated	151.8	168.4	188.8	223.3	243.1		1.1	0.6
631	D86	Manual	153.0	168.0 C	187.5	223.0	243.5		0.7	1.0
657	D86	Automated	153.3	169.0	190.2	225.8	246.7		1.2	1.0
663	D86	Automated	154.80	168.70	189.40	225.05	246.00		1.25	0.95
671	D86	Automated	152.3	167.9	189.7	223.2	243.7		1.0	2.2
732	D86	Manual	153.0	165.5	187.5	223.0	243.0		1.0	0.5
785	ISO3405	Automated	152.9	169.0	189.5 C	224.5	246.5		1.1	0.5
823	D86	Automated	152.6	169.4	189.2	223.5	247.4		1.1	0.2
851	D86	Automated	155.0	169.3	189.9	225.8	246.2		1.2	0.5
854	D86	Automated	151.6	169.6	189.8	224.4	244.6		1.1	0.4
862	D86	Automated	152.3	168.8	189.0	223.8	244.4		1.2	0.4
869	D86	Manual	152.0	167.0	188.0	224.0	244.0		1.3	0.7
922	D86	Manual	152.2	167.2	188.3	222.3	245.5		1.1	0.4
962		-----	-----	-----	-----	-----	-----		-----	-----
963		-----	-----	-----	-----	-----	-----		-----	-----
974	D86	Automated	153.5	167.9	188.6	224.3	243.4		1.2	1.4
994	D86	Manual	154.0	166.5	188.0	224.0	244.0		1.5	0.5
995	D86	Manual	153.7	167.2	189.0	224.5	245.0		1.43	0.37
996	D86	Manual	153.0	167.5	188.5	223.5	245.0		1.0	0.5
997	D86	Manual	153.5	168	189	224.5	245		1.4	0.3
998		-----	-----	-----	-----	-----	-----		-----	-----
1011	D86	Automated	153.9	168.4	189.2	224.7	247.3		1.4	0.6
1016		-----	-----	-----	-----	-----	-----		-----	-----
1021		-----	-----	-----	-----	-----	-----		-----	-----

1039	D2887	Automated	150.0	167.7	190.2	223.4	248.3	-----	-----
1049	D86	Automated	152.8	169.7	189.7	224.9	245.5	1.0	0.8
1059	D86	Automated	152.2	169.1	190.0	224.5	246.5	1.4	0.4
1062	D86	-----	152.7	169.6	190.4	225.4	245.7	1.3	0.5
1064	D86	Automated	154.4	168.6	189.6	225.7	245.6	1.0	0.9
1065	D86	Automated	156.2	168.1	188.5	223.8	245.3	1.3	1.0
1079	D86	Automated	153.6	168.6	190.3	225.5	246.3	1.1	0.8
1081	D86	Automated	154.6	167.5	187.9	222.2	243.7	1.3	0.6
1097	ISO3405	Automated	156.3	169.8	190.1	225.7	243.9	1.4	0.5
1109	D86	Automated	154.6	167.4	188.6	223.7	247.2	1.2	0.2
1121	IP123	Manual	150.5	169.5	188.5	223.5	261 C,R(0.01)	1.0	0.0
1126	in house	Automated	153.7	170.4	193.0 R(0.01)	225.4	249.5	-----	-----
1131		-----	-----	-----	-----	-----	-----	-----	-----
1134	D86	Automated	152.1	167.7	188.9	225.3	245.0	1.0	1.3
1146	ISO3405	Automated	152.2	167.7	187.9	222.2	244.5	1.2	-0.5
1150	ISO3405	Automated	156.3	167.33	187.3	221.56	241.5	1.2	0.8
1161	ISO3405	Automated	152.7	165.2	187.7	224.4	246.0	1.0	0
1182	D86	Automated	150.5 C	167.4	188.1	224.7	244.1	1.3	0.9
1201		-----	-----	-----	-----	-----	-----	-----	-----
1212	D86	Automated	152.2	168.9	189.4	224.0	246.2	1.1	0.5
1231	D86	Automated	151.3	168.4	189.4	225.05	244.3	1.3	0.65
1279	D86	Automated	151.9	169.2	189.7	225.2	243.9	1.1	1.2
1297	D86	Automated	152.7	167.4	188.1	221.9	241.3	1.1	0.4
1299	D86	Automated	152.4	168.6	189.5	225.4	245.0	1.1	0.6
1316	D86	Automated	151.5	168.2	189.4	224.7	244.5	1.2	0.8
1318	D86	Automated	151.4	168.8	189	223.9	244.6	1.1	0.6
1376	D86	Automated	152.80	167.50	189.70	224.60	247.00	1.00	0.60
1395	D86	Automated	155.8	168.1	188.4	223.7	241.0	1.1	0.9
1417	IP123	Automated	154.2	168.1	190.4	227.1	246.4	1.2	1.5
1429	D86	Automated	152.1	167.4	187.9	222.4	242.5	1.1	0.6
1448	D86	Automated	152.3	169.2	189.7	225.3	245.3	1.3	1.1
1491	D86	Automated	156.8	169.3	189.9	225.2	248.9	0.6	1.0
1496	D86	Automated	154.7	168.5	189.4	225.0	245.8	1.2	0.2
1520	D86	Manual	152.3	167.3	187.3	220.3	241.4	1.5	0.1
1538	D86	Automated	155.6	168.9	188.9	224.0	242.7	0.9	0.9
1543		-----	-----	-----	-----	-----	-----	-----	-----
1564	D86	Automated	156.5	170.0	189.2	224.3	247.4	1.0	0.9
1570	D86	Automated	152.3	168.4	188.8	222.6	244.9	0.8	0.2
1586	D86	Manual	153.6	168.3	189.4	225.7	244.8	1.2	1.5
1587	D86	Automated	155.0	168.6	189.0	223.3	244.7	1.1	0.0
1610	D86	Manual	155.2	168.1	188.7	224.1	244.2	1.0	0.9
1616	D86	Automated	150.9	168.5	189.2	223.9	243.4	1.5	0.3
1631	D86	Automated	155	168.6	189	224.2	246.3	1.2	0.8
1634	D86	Automated	152.5	168.9	189.5	225.9	246.3	1.2	1.2
1636	D86	Automated	156.6	169.2	190.0	224.7	244.3	1.1	0.3
1683	D86	Automated	152.8	167.9	188.6	224.1	243.3	1.3	1.3
1694		-----	-----	-----	-----	-----	-----	-----	-----
1715	D86	Automated	154.7	168.9	189.4	225.0	245.6	1.4	1.2
1720	D86	Automated	152.3	168.9	189.6	224.6	248.2	1.1	0.4
1724	D86	Automated	153.9	168.6	188.9	223.7	245.2	1.1	0.5
1776	D86	Automated	149.3	167.8	188.9	225.1	244.5	1.2	1.2
1782	D86	Automated	152.7	168.1	188.9	223.6	243.7	1.1	1.0
1787	D86	Manual	151.80	165.8 C	186.79	221.77	241.76	1.2	0.6
1798	D86	Automated	157.15	169.65	189.90	225.35	244.95	1.30	1.05
1811	D86	Automated	152.4	166.7	187.3	221.3	241.3 C	1.1	1.4
1833	D86	Manual	153.8	170	189.6	224.2	247.3	1.4	0.6
1842	D86	Automated	152.1	167.8	189.7	225.2	246.4	1.3	0.5
1881	D86	Manual	152.5	167.0 C	188.0 C	222.5 C	243.0	1.3	0.2
1883	D86	Manual	155	170	187	220	248	0.5	0.5
1913	D86	Automated	156.8	169.6	191.1	226.4	247.1	1.3	0.5
1914	D86	Manual	152.0	166.0	187.5	221.5	242.0	1.4	0.1
1948	D86	Automated	155.2	167.9	189.2	223.5	246.2	1.4	0.0
1951	D86	-----	154.0	169.7	190.2	225.5	246.4	1.10	0.50
2129	D86	Automated	156.4	167.8	188.2	223.2	245.7	1.3	0.1
2130	D86	Automated	155.8	169.2	189.4	224.7	248.0	1.0	0.6

	normality	Autom./Man.	OK	OK	OK	OK	OK		
	n	101 / 25	126	126	125	126	124		
	outliers		0	0	1	0	2		
	mean (n)		153.54	168.35	189.10	224.22	245.20		
	st.dev. (n)		1.877	0.990	0.889	1.269	1.776		
	R(calc.)		5.25	2.77	2.49	3.55	4.97		
	R(D86:12)	Automated	8.44	3.70	2.97	3.36	7.10		
	R(D86:12)	Manual	4.18	2.75	2.73	3.29	3.98		

For z-scores and first reported results: see Appendix 2

IBP

Kernel Density

Temp. at 10% recovery

Kernel Density

Temp. at 50% recovery

Kernel Density

Temp. at 90% recovery

Kernel Density

FBP

Kernel Density
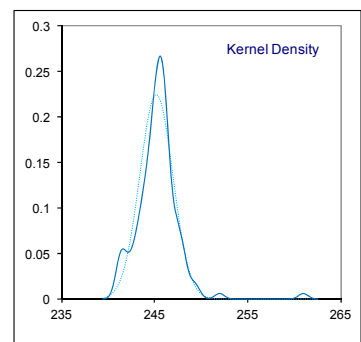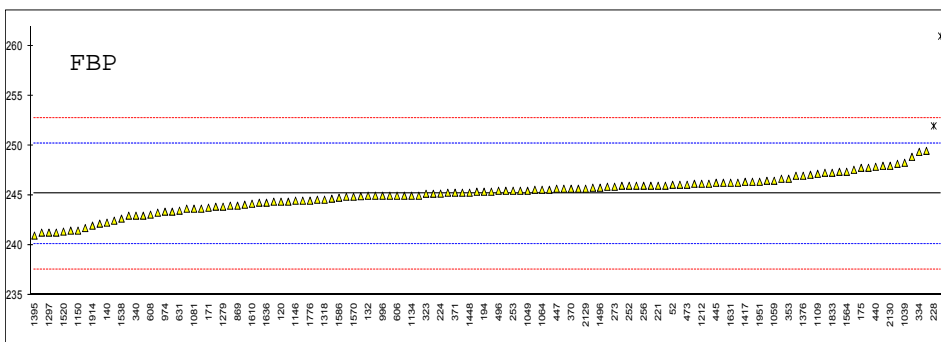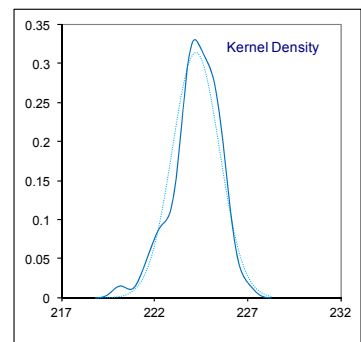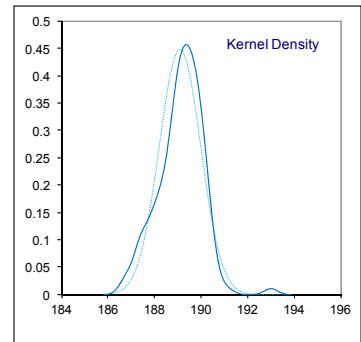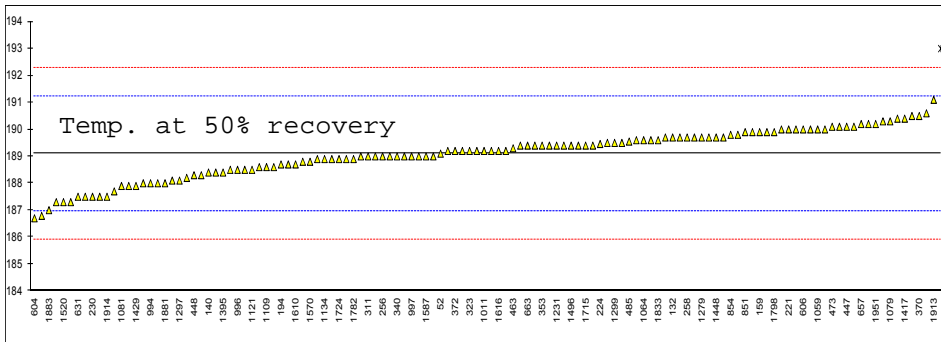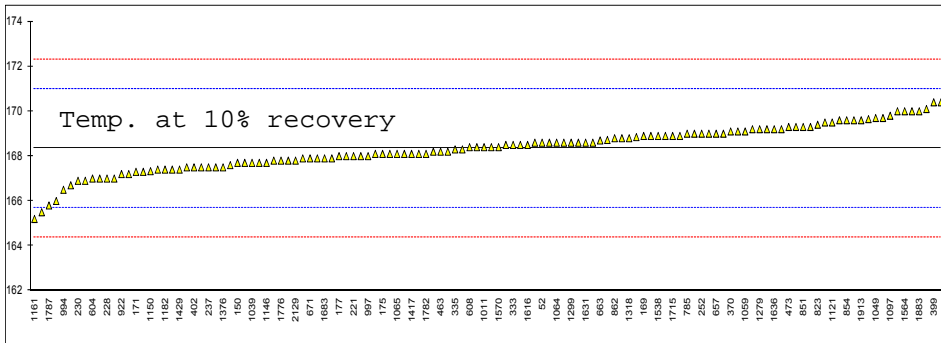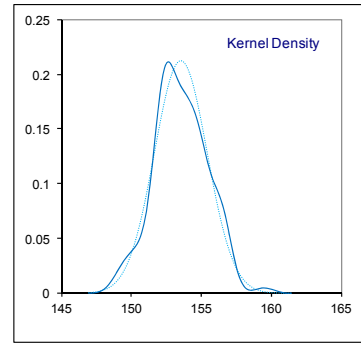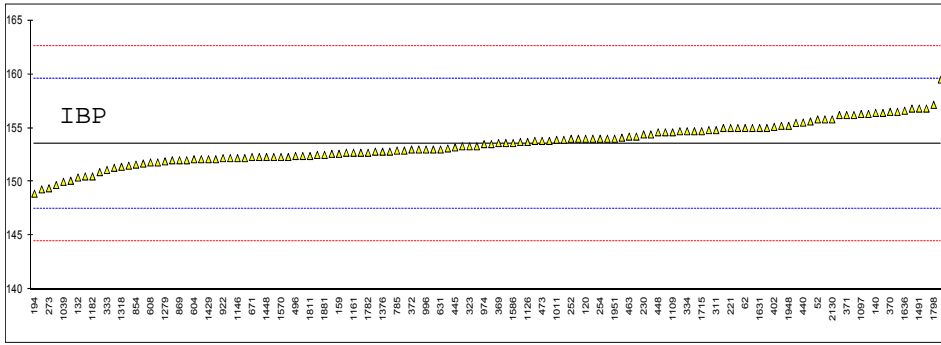
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Determination of Existent Gum on sample #14170; results in mg/100 mL

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D381	0.4		-0.42	1011	D381	1		0.11
62	D381	0.3		-0.51	1016		-----		-----
120	D381	1.0		0.11	1021		-----		-----
131		-----		-----	1039	IP540	<1		-----
132	D381	<1		-----	1049	D381	0.2		-0.60
140		-----		-----	1059	D381	0.8		-0.07
150	D381	<1		-----	1062	D381	1.3		0.37
159		-----		-----	1064	D381	0.4		-0.42
169	D381	0.5		-0.33	1065		-----		-----
171	D381	<1		-----	1079	D381	1.0		0.11
175	D381	<1		-----	1081	D381	<1		-----
177	D381	1.2		0.28	1097	IP540	1.1		0.19
194	D381	2		0.99	1109	IP540	0.2		-0.60
216		-----		-----	1121		-----		-----
221		-----		-----	1126		-----		-----
224		-----		-----	1131	IP540	0.6		-0.24
228		-----		-----	1134	D381	2.9	R(0.01)	1.78
230	IP540	1.6		0.63	1146		-----		-----
237	D381	1.0		0.11	1150	ISO6246	1.2		0.28
238		-----		-----	1161		-----		-----
252	D381	0.6		-0.24	1182		-----		-----
253	D381	1.0		0.11	1201	D381	0.4		-0.42
254		-----		-----	1212	IP540	0.4		-0.42
256	D381	1.0		0.11	1231	D381	<1		-----
258	D381	1.1		0.19	1279		-----		-----
273	D381	0.9		0.02	1297		-----		-----
311	IP540	1		0.11	1299	D381	1		0.11
323	D381	<1.0		-----	1316	IP540	1.1		0.19
333		-----		-----	1318	D381	0.7		-0.16
334	D381	<1		-----	1376	D381	0.60		-0.24
335	IP540	1		0.11	1395		-----		-----
340	D381	0.6		-0.24	1417	IP540	0		-0.77
353	IP540	0.8		-0.07	1429		-----		-----
369	IP540	1		0.11	1448		-----		-----
370	IP540	0.9		0.02	1491	D381	1.0		0.11
371		-----		-----	1496	D381	0.48		-0.35
372	D381	1		0.11	1520	D381	0.3		-0.51
399		-----		-----	1538		-----		-----
402		-----		-----	1543		-----		-----
440	IP540	1.3		0.37	1564	IP540	0.8		-0.07
445	IP540	0.6		-0.24	1570		-----		-----
447	IP540	<1		-----	1586	D381	2.0		0.99
448	D381	1.5		0.55	1587	IP540	1.2		0.28
463	D381	0.2		-0.60	1610	IP540	0.4		-0.42
473	IP540	<1		-----	1616	IP540	0.7		-0.16
485		-----		-----	1631	IP540	1.1		0.19
496	D381	0.7		-0.16	1634	D381	1.1		0.19
601		-----		-----	1636	IP540	1.0		0.11
604		-----		-----	1683	D381	2		0.99
606	IP540	0.24		-0.56	1694		-----		-----
608	D381	<1		-----	1715		-----		-----
631	IP540	0.6		-0.24	1720		-----		-----
657	D381	1.8		0.81	1724	IP540	0.8		-0.07
663		-----		-----	1776	D381	2.2		1.16
671	D381	<0.5		-----	1782	D381	0.6		-0.24
732		-----		-----	1787	IP540	1.2		0.28
785		-----		-----	1798	D381	0.64		-0.21
823	D381	0.6		-0.24	1811	D381	0.9		0.02
851	IP540	1.0		0.11	1833	IP540	1.0		0.11
854	IP540	1		0.11	1842	IP540	<1		-----
862	D381	0.8		-0.07	1881		-----		-----
869	D381	1.0		0.11	1883	D381	1.4		0.46
922	D381	0.90		0.02	1913	D381	0.60		-0.24
962		-----		-----	1914	IP540	< 1.0		-----
963		-----		-----	1948	D381	0.0		-0.77
974	D381	0.9		0.02	1951	D381	<1		-----
994		-----		-----	2129	D381	0.4		-0.42
995		-----		-----	2130	D381	<1		-----
996		-----		-----					
997		-----		-----					
998		-----		-----					

normality	OK
n	75
outliers	1
mean (n)	0.878
st.dev. (n)	0.4558
R(calc.)	1.276
R(D381:12)	3.186

Kernel Density
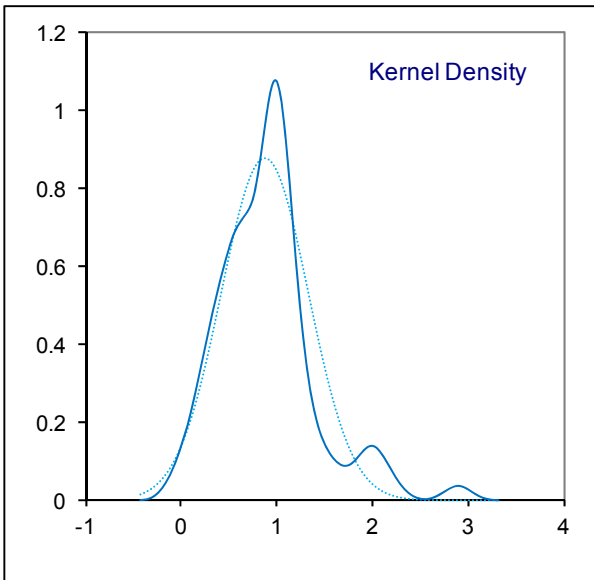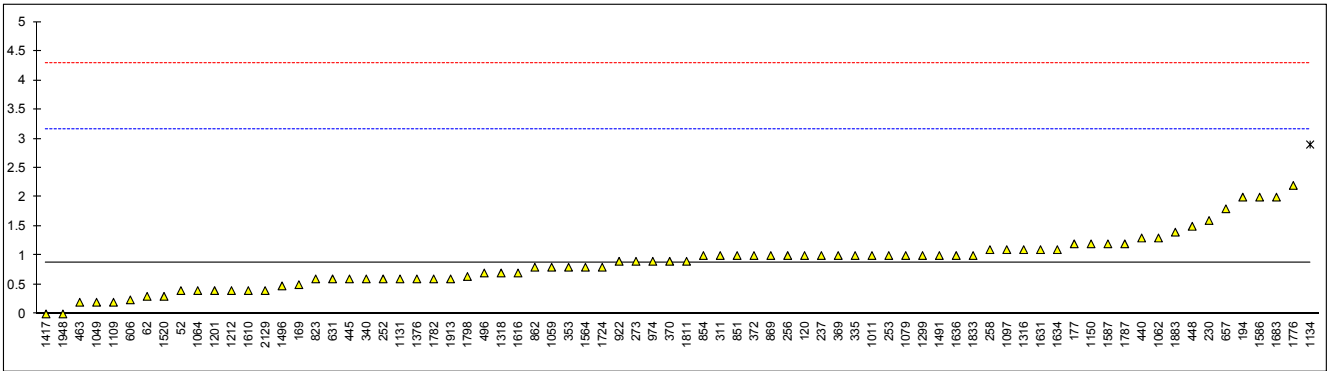
Determination of Flash Point on sample #14170; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D56	44		0.59	1011	IP170	43.5		0.16
62	D56	41.5		-1.59	1016	IP170	42.5		-0.72
120	D56	43.5		0.16	1021		-----		-----
131		-----		-----	1039	IP170	45.5		1.91
132	D56	45.5		1.91	1049	IP170	44.0	C	0.59
140	D56	42.0		-1.16	1059	IP170	44.0		0.59
150	D56	42.8		-0.46	1062	IP170	43.0		-0.28
159	D56	43.33		0.01	1064	IP170	44.5		1.03
169	D56	45.0		1.47	1065		-----		-----
171	D56	43.5		0.16	1079	IP170	44.0		0.59
175	IP170	44.0		0.59	1081	IP170	44.8		1.29
177	D56	42.0		-1.16	1097	ISO13736	42.1		-1.07
194	D56	43.5		0.16	1109	IP170	42.5		-0.72
216		-----		-----	1121	IP170	42		-1.16
221		-----		-----	1126		-----		-----
224	IP170	43.0		-0.28	1131		-----		-----
228	IP523	41.0		-2.03	1134	IP170	44.5		1.03
230	IP170	43.0		-0.28	1146	IP170	43.95		0.55
237	IP170	43.0		-0.28	1150	D56	45.0		1.47
238	IP170	41.0		-2.03	1161	D93	45.8	C	2.17
252	IP170	43.0		-0.28	1182	D93	45		1.47
253	IP170	43.5		0.16	1201	IP170	44.0		0.59
254	IP170	42.5		-0.72	1212	IP170	43.0		-0.28
256	IP170	43.0		-0.28	1231	IP170	43.0		-0.28
258	IP170	43.127		-0.17	1279	D56F	43.5		0.16
273	IP170	43.0		-0.28	1297	D56	43.8		0.42
311	IP170	43.5		0.16	1299	IP170	43.5		0.16
323	IP170	43.5		0.16	1316	IP170	43.8		0.42
333	IP170	42.5		-0.72	1318	IP170	43.0		-0.28
334	IP170	42.5		-0.72	1376	D56	43.00		-0.28
335	IP170	42.0	C	-1.16	1395		-----		-----
340	IP170	43.0		-0.28	1417	IP170	42.5		-0.72
353	IP170	42.425		-0.78	1429		-----		-----
369	IP170	42.5		-0.72	1448	IP170	43.5		0.16
370	IP170	43.0		-0.28	1491	IP170	44.0		0.59
371	IP170	43.0		-0.28	1496	IP170	42.6		-0.63
372	IP170	43.5		0.16	1520	D56	43.0		-0.28
399	IP170	42.0		-1.16	1538	D56	43.3		-0.02
402	D56	45.0		1.47	1543		-----		-----
440	IP170	42.8		-0.46	1564	IP170	45.0		1.47
445	IP170	42.5		-0.72	1570		-----		-----
447	IP170	42.5		-0.72	1586	IP170	43.0		-0.28
448	IP170	43.1		-0.19	1587	IP170	43.5		0.16
463	IP170	43.5		0.16	1610	IP170	42.0		-1.16
473	IP170	43.5		0.16	1616	IP170	42.5		-0.72
485	D56	42.0		-1.16	1631	IP170	45		1.47
496	D3828	44.1		0.68	1634	IP170	43.0		-0.28
601	IP170	43.0		-0.28	1636	IP170	44.0		0.59
604	IP170	44.0		0.59	1683	IP170	44.5		1.03
606	IP170	44.0		0.59	1694		-----		-----
608	IP170	43.5		0.16	1715	D56	43.5		0.16
631	D56	43.0		-0.28	1720	D3828	44.0		0.59
657	IP170	44.0		0.59	1724	IP170	43		-0.28
663		-----		-----	1776	IP170	44.0		0.59
671	IP170	42.5		-0.72	1782	IP170	44.5		1.03
732	D93	43.5		0.16	1787	ISO2719	43.87		0.48
785	ISO13736	42.0		-1.16	1798	IP170	43.50		0.16
823	IP170	42.0		-1.16	1811	D56	42.5		-0.72
851	IP170	42.65		-0.59	1833	IP170	44		0.59
854	IP170	42.0		-1.16	1842	IP170	43.0		-0.28
862	IP170	44.5		1.03	1881	IP170	44.0		0.59
869	IP170	42.5		-0.72	1883	D56	44		0.59
922		-----		-----	1913	IP170	43.2		-0.11
962		-----		-----	1914	IP170	43.0		-0.28
963		-----		-----	1948	IP170	46.0		2.34
974	IP170	42.5		-0.72	1951	IP170	43.0		-0.28
994	D56	44.5		1.03	2129	IP170	42.5		-0.72
995	IP170	42.7		-0.54	2130	IP170	43.0		-0.28
996	D56	43.5		0.16					
997	IP170	43.5		0.16					
998		-----		-----					

		Only IP170/ISO13736	Only D56
normality	OK	OK	OK
n	122	90	25
outliers	0	0	0
mean (n)	43.32	43.24	43.45
st.dev. (n)	0.947	0.814	1.027
R(calc.)	2.65	2.42	2.88
R(IP170:14)	3.20	3.20	4.30

Lab 335   first reported: 89
Lab 1049 reported: 440
Lab 1161 first reported: 47.3
Lab 1279 also reported: 44.0 (Electric), result in table is Flame Ignition result
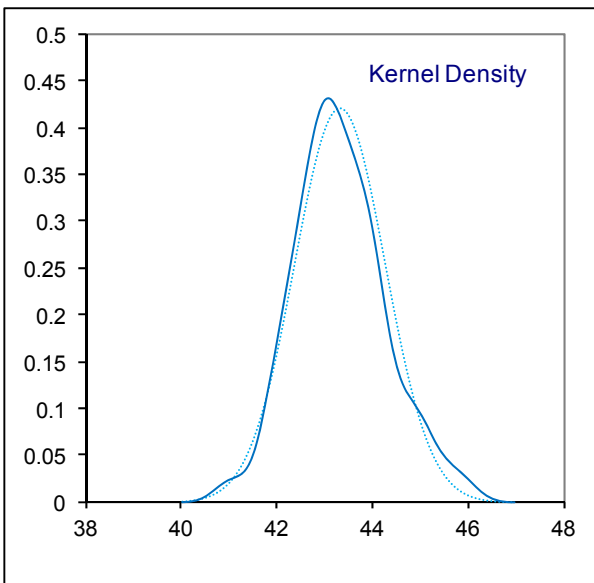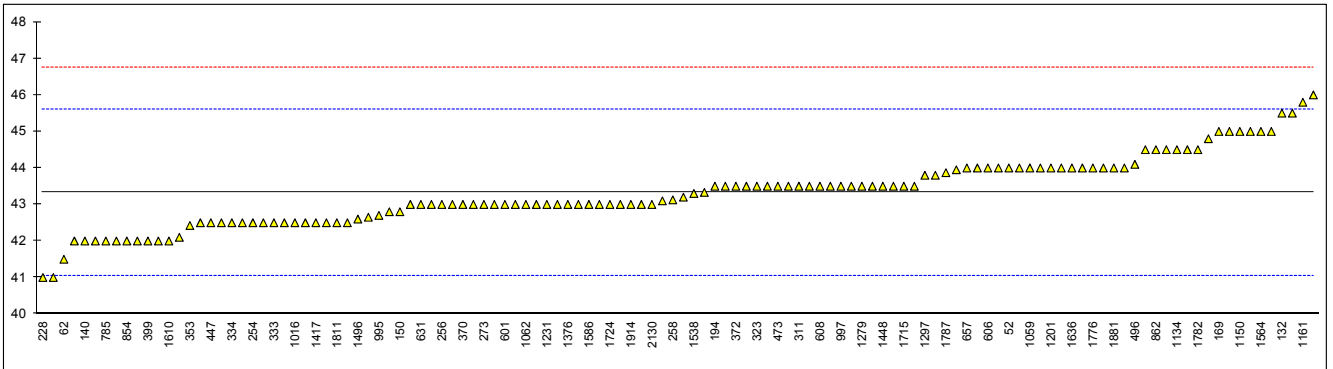
Determination of Freezing Point on sample #14170; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5972	-57.8		-0.48	1011	D5972	-58.0		-0.71
62	D2386	-57.65		-0.31	1016		-----		-----
120	D2386	-58		-0.71	1021		-----		-----
131		-----		-----	1039	IP529	-57.8		-0.48
132	D2386	-58.0		-0.71	1049	D2386	-57.3		0.08
140	D5972	-58.2		-0.93	1059		-----		-----
150	D2386	-58.0		-0.71	1062	D7153	-56.5		0.97
159	D2386	-58.79		-1.59	1064	D2386	-57.0		0.41
169	D2386	-57.0		0.41	1065	D7153	-57.3		0.08
171	D2386	-58.5		-1.27	1079	D5972	-58.0		-0.71
175	D2386	-57		0.41	1081	D7153	-57.2		0.19
177	D2386	-58.0		-0.71	1097	IP529	-56.9		0.53
194	D2386	-57.0		0.41	1109	D5972	-58.6		-1.38
216		-----		-----	1121	D2386	-58		-0.71
221	D2386	-59		-1.83	1126		-----		-----
224		-----		-----	1131	D7153	-57.5		-0.15
228		-----		-----	1134		-----		-----
230	D2386	-58.1		-0.82	1146		-----		-----
237	D2386	-57.0		0.41	1150	D2386	-56.5	C	0.97
238		-----		-----	1161		-----		-----
252	D2386	-57.5		-0.15	1182	D5972	-56.9		0.53
253	D2386	-57.5		-0.15	1201	D5972	-57.5		-0.15
254		-----		-----	1212	D2386	-57.0		0.41
256	D2386	-58.0		-0.71	1231	D2386	-57.75		-0.43
258	D2386	-57.5		-0.15	1279	D2386	-56.5		0.97
273	D2386	-58		-0.71	1297	D5972	-57.2		0.19
311	D2386	-57.5	C	-0.15	1299	D2386	-57.5		-0.15
323	D2386	-58.0	C	-0.71	1316	D2386	-57.2		0.19
333	D7153	-57.0		0.41	1318	D7153	-57.0		0.41
334	D7153	-56.9		0.53	1376	D2386	-57.3		0.08
335	IP529	-57.2	C	0.19	1395		-----		-----
340	D2386	-57.2		0.19	1417		-----		-----
353	IP16	-57.58		-0.24	1429		-----		-----
369	D2386	-57.5		-0.15	1448		-----		-----
370	D2386	-57.0		0.41	1491	D2386	-59.5		-2.39
371	D2386	-58.0		-0.71	1496	D5972	-56.9		0.53
372	D2386	-57.0		0.41	1520	D2386	-57.2		0.19
399	D2386	-57.2		0.19	1538	D5972	-57.0		0.41
402	D2386	-57.0		0.41	1543		-----		-----
440	IP16	-57.5		-0.15	1564	D2386	-64.0	R(0.01)	-7.43
445	IP529	-57.3		0.08	1570		-----		-----
447	IP529	-57.1		-----	1586	D2386	-57.0		0.41
448	D2386	-56.9		0.53	1587	IP529	-57.0		0.41
463	D2386	-57		0.41	1610	IP16	-58.5		-1.27
473	D2386	-56.5		0.97	1616	D7153	-57.2		0.19
485		-----		-----	1631	IP435	-56.9		0.53
496	D2386	-56.50		0.97	1634	D2386	-57.0		0.41
601	D2386	-57.0		0.41	1636	D2386	-58.0		-0.71
604		-----		-----	1683	D2386	-57.0		0.41
606	D2386	-56.5		0.97	1694	D2386	-56.5		0.97
608	D2386	-56.5		0.97	1715	D5972	-57.3		0.08
631	D2386	-57.0	C	0.41	1720	D5972	-57.6		-0.26
657	D7153	-57.6		-0.26	1724	IP435	-57.5		-0.15
663	D2386	-56.0		1.53	1776	IP529	-56.9		0.53
671	D2386	-57.0		0.41	1782	D2386	-57.5		-0.15
732		-----		-----	1787	D2386	-58.5	C	-1.27
785	D2386	-58.0		-0.71	1798	D2386	-56.5		0.97
823	D2386	-58.0		-0.71	1811	D7153	-56.4		1.09
851	D2386	-57.03		0.38	1833	IP435	-57.1		0.30
854	D2386	-56.5		0.97	1842	D2386	-58.0		-0.71
862	D2386	-57.48		-0.12	1881	D2386	-58.5		-1.27
869	D2386	-57.5		-0.15	1883	D2386	-51	R(0.01)	7.13
922	D2386	-56.0		1.53	1913	D7153	-57.8		-0.48
962		-----		-----	1914	D2386	-57.50		-0.15
963		-----		-----	1948		-----		-----
974	D2386	-59.0		-1.83	1951	D2386	-56.8		0.64
994	D2386	-57.0		0.41	2129	D2386	-57.0		0.41
995	D2386	-57		0.41	2130	IP16	-57.5		-0.15
996	D2386	-57.0		0.41					
997	D2386	-57		0.41					
998		-----		-----					

|	
normality	OK
n	111
outliers	2
mean (n)	-57.37
st.dev. (n)	0.639
R(calc.)	1.79
R(D2386:06)	2.50

Lab 311   first reported: -51.5
Lab 323   first reported: -49.5
Lab 447   reported also: -57.5 (IP 16 Manual method)
Lab 335   first reported: -59.0
Lab 631   first reported: -59.0
Lab 1150 first reported: -55.5
Lab 1587 reported also: -57.5 (D2386)
Lab 1787 first reported: 58.5
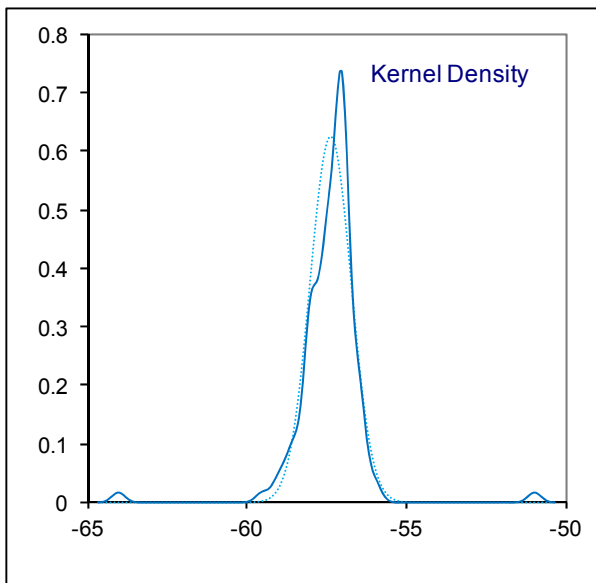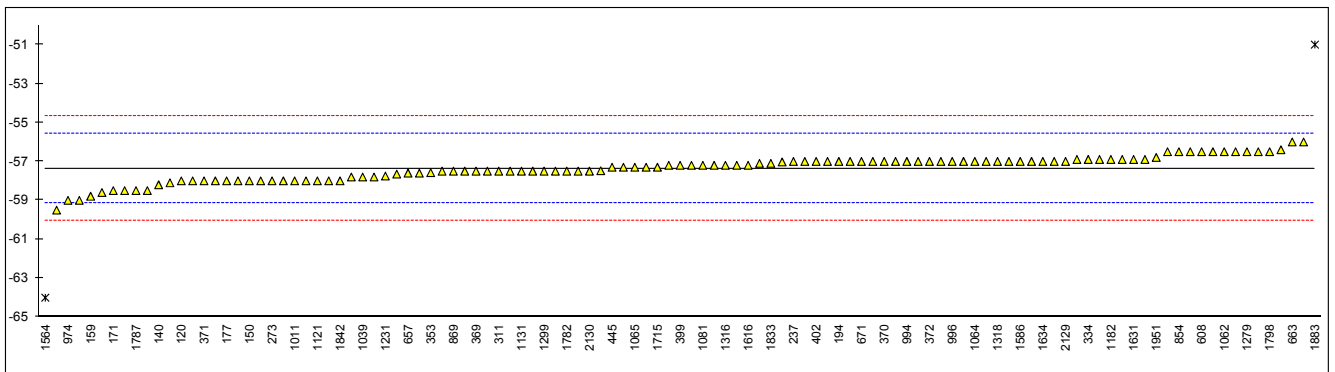
Determination of Kinematic Viscosity at -20°C on sample #14170; results in cSt

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D445	3.379		-0.59	1011	D445	3.398		0.24
62	D445	3.4495		2.47	1016	D445	3.395		0.11
120	D445	3.382		-0.46	1021		-----		-----
131		-----		-----	1039	D445	3.423		1.32
132	D445	3.374		-0.81	1049	D445	3.396		0.15
140	D445	3.446		2.32	1059	D445	3.505	R(0.01)	4.89
150	D445	3.404		0.50	1062	D445	3.39		-0.11
159	D445	3.3873		-0.23	1064	D445	3.3827		-0.43
169	D445	3.4121		0.85	1065		-----		-----
171	D445	3.403		0.45	1079	D445	3.398		0.24
175	D445	3.517	R(0.01)	5.41	1081	D445	3.390		-0.11
177	D445	3.394		0.06	1097	ISO3104	3.38756		-0.22
194	D445	4.046	R(0.01)	28.39	1109	D445	3.3873		-0.23
216		-----		-----	1121		-----		-----
221		-----		-----	1126		-----		-----
224		-----		-----	1131	D445	3.3926		0.00
228		-----		-----	1134		-----		-----
230	D445	3.3872		-0.23	1146		-----		-----
237	D445	3.3947		0.09	1150	ISO3104	3.4455		2.30
238		-----		-----	1161		-----		-----
252		-----		-----	1182		-----		-----
253	D445	3.466		3.19	1201	D445	3.389		-0.15
254		-----		-----	1212	D7042	3.33356		-2.56
256	D445	3.388		-0.20	1231		-----		-----
258		-----		-----	1279		-----		-----
273		-----		-----	1297		-----		-----
311	D445	3.367		-1.11	1299	D445	3.413		0.89
323	D445	3.278	R(0.01)	-4.98	1316	D445	3.383		-0.41
333	D445	3.570	R(0.01)	7.71	1318	D7042	3.2634	R(0.01)	-5.61
334	D445	3.405		0.54	1376	D445	3.3574		-1.53
335	D445	3.387		-0.24	1395		-----		-----
340	D445	3.3912		-0.06	1417	D445	3.3922		-0.01
353		-----		-----	1429		-----		-----
369	D445	3.3880		-0.20	1448		-----		-----
370	D445	3.3902		-0.10	1491		-----		-----
371		-----		-----	1496	D445	3.401		0.37
372	D445	3.392		-0.02	1520	D445	3.379475		-0.57
399		-----		-----	1538		-----		-----
402	D445	3.3682		-1.06	1543		-----		-----
440	D445	3.3873		-0.23	1564	D445	3.386		-0.28
445	D445	3.394		0.06	1570	D445	3.452		2.58
447	D445	3.389		-0.15	1586	D445	3.406		0.58
448	D445	3.3815		-0.48	1587	D445	3.38468		-0.34
463		-----		-----	1610	IP71	3.38544		-0.31
473		-----		-----	1616	D445	3.393		0.02
485		-----		-----	1631		-----		-----
496	D445	3.38983		-0.12	1634		-----		-----
601		-----		-----	1636		-----		-----
604		-----		-----	1683	D445	3.395		0.11
606		-----		-----	1694		-----		-----
608		-----		-----	1715		-----		-----
631	D445	3.3975		0.22	1720		-----		-----
657	D445	3.366		-1.15	1724	D445	3.40		0.32
663		-----		-----	1776	D7042	3.350		-1.85
671		-----		-----	1782	D7042	3.368		-1.07
732		-----		-----	1787		-----		-----
785		-----		-----	1798	D445	3.3770		-0.67
823	D445	3.413		0.89	1811	D445	3.3851		-0.32
851	D445	3.3913		-0.05	1833	D445	3.508	R(0.01)	5.02
854	D445	3.3951		0.11	1842	IP71	3.389		-0.15
862	D445	3.3945		0.09	1881		-----		-----
869	D445	3.4003		0.34	1883		-----		-----
922		-----		-----	1913	D445	3.366		-1.15
962		-----		-----	1914	D445	3.420		1.19
963		-----		-----	1948		-----		-----
974		-----		-----	1951	D445	4.014	R(0.01)	27.00
994		-----		-----	2129	D445	3.3750		-0.76
995	D445	3.3923		-0.01	2130	D445	3.349		-1.89
996		-----		-----					
997		-----		-----					
998		-----		-----					

|	
normality	not OK
n	72
outliers	8
mean (n)	3.3925
st.dev. (n)	0.02235
R(calc.)	0.0626
R(D445:12)	0.0645
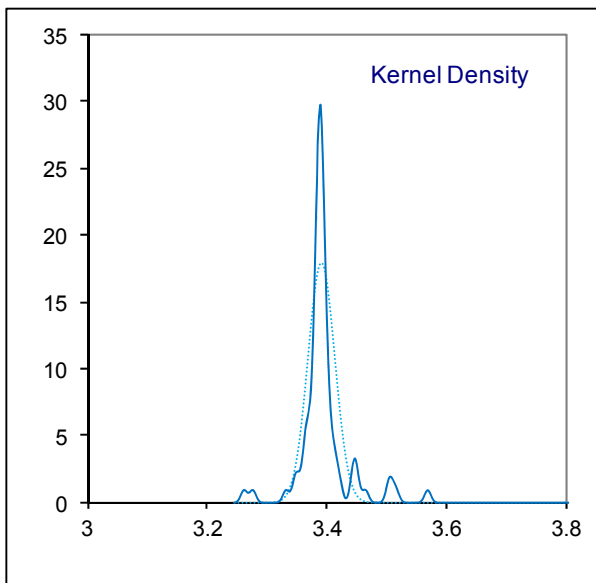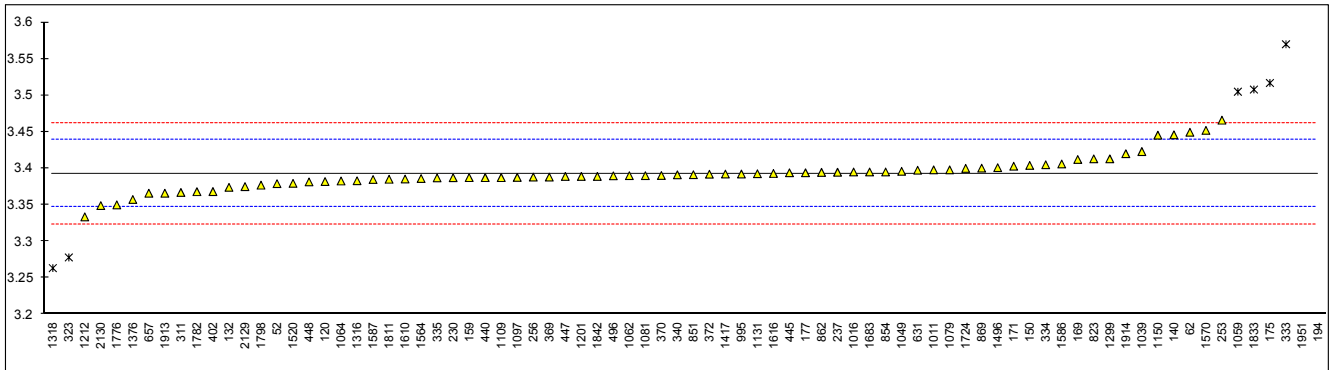
Determination of Mercaptan Sulphur on sample #14170; results in % M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3227	0.0008		-0.45	1011	D3227	0.0008		-0.45
62	D3227	0.0009		0.36	1016	D3227	0.0008		-0.45
120		-----		-----	1021		-----		-----
131		-----		-----	1039	D3227	0.0008		-0.45
132	D3227	0.0009		0.36	1049	D3227	0.000803		-0.43
140	D3227	0.00096		0.85	1059	D3227	0.0010		1.17
150	D3227	0.0008		-0.45	1062	D3227	0.0009		0.36
159	D3227	0.0008		-0.45	1064	D3227	0.00082		-0.29
169	D3227	0.0009		0.36	1065		-----		-----
171	D3227	0.0009		0.36	1079	D3227	0.0009		0.36
175	D3227	0.0009		0.36	1081	D3227	0.00090		0.36
177		-----		-----	1097	ISO3012	0.00080		-0.45
194	D3227	0.0008		-0.45	1109	D3227	0.00082		-0.29
216		-----		-----	1121		-----		-----
221		-----		-----	1126		-----		-----
224		-----		-----	1131	D3227	0.000855		0.00
228		-----		-----	1134	D3227	0.000875	C	0.16
230	D3227	0.00089		0.28	1146		-----		-----
237	D3227	0.0009		0.36	1150		-----		-----
238		-----		-----	1161	D3227	0.00082	C	-0.29
252		-----		-----	1182		-----		-----
253	D3227	0.0007	C	-1.26	1201	D3227	0.00034	R(0.01)	-4.17
254		-----		-----	1212	D3227	0.00079		-0.53
256		-----		-----	1231		-----		-----
258		-----		-----	1279		-----		-----
273	D3227	0.0008		-0.45	1297	D3227	0.000888		0.26
311	D3227	0.0008		-0.45	1299	D3227	0.0008		-0.45
323	D3227	0.0008	C	-0.45	1316	D3227	0.00082		-0.29
333	D3227	0.0009		0.36	1318		-----		-----
334		-----		-----	1376	D3227	0.00088		0.20
335	D3227	0.0009		0.36	1395		-----		-----
340	D3227	0.00072		-1.10	1417		-----		-----
353		-----		-----	1429		-----		-----
369	D3227	0.0008		-0.45	1448		-----		-----
370	D3227	0.00082		-0.29	1491		-----		-----
371	D3227	0.00082		-0.29	1496	D3227	0.00097		0.93
372	D3227	0.00094		0.68	1520	D3227	0.00080		-0.45
399		-----		-----	1538		-----		-----
402	D3227	0.00108		1.82	1543		-----		-----
440	D3227	0.0007		-1.26	1564	D3227	0.0008		-0.45
445	D3227	0.0008		-0.45	1570		-----		-----
447	D3227	0.0009		0.36	1586	D3227	0.0010		1.17
448	D3227	0.0010	C	1.17	1587		-----		-----
463		-----		-----	1610	IP342	0.000803		-0.43
473		-----		-----	1616	D3227	0.000742	C	-0.92
485		-----		-----	1631	D3227	0.0010		1.17
496		-----		-----	1634		-----		-----
601		-----		-----	1636	D3227	0.00085		-0.04
604		-----		-----	1683	D3227	0.0010		1.17
606		-----		-----	1694		-----		-----
608		-----		-----	1715		-----		-----
631		-----		-----	1720		-----		-----
657	D3227	0.0008		-0.45	1724	D3227	0.0008		-0.45
663		-----		-----	1776		-----		-----
671		-----		-----	1782	D3227	0.0009		0.36
732	D3227	0.00086		0.04	1787		-----		-----
785	D3227	0.0008		-0.45	1798	D3227	0.000812		-0.35
823	D3227	0.0007		-1.26	1811	D3227	0.00087	C	0.12
851	D3227	0.00088		0.20	1833	D3227	0.0009		0.36
854	D3227	0.00092		0.52	1842		-----		-----
862	D3227	0.00081		-0.37	1881	D3227	0.00082		-0.29
869	D3227	0.00089		0.28	1883		-----		-----
922	D3227	0.00096		0.85	1913	D3227	0.0009		0.36
962		-----		-----	1914	D3227	0.0009		0.36
963		-----		-----	1948	D3227	0.0013	R(0.01)	3.60
974	D3227	0.000815		-0.33	1951		-----		-----
994	UOP163	0.00085		-0.04	2129	D3227	0.0010		1.17
995	D3227	0.00078		-0.61	2130	D3227	0.0008	C	-0.45
996		-----		-----					
997		-----		-----					
998		-----		-----					

normality	OK
n	78
outliers	2
mean (n)	0.00086
st.dev. (n)	0.000077
R(calc.)	0.00022
R(D3227:13)	0.00035

Lab 253   first reported: 0.00045
Lab 323   first reported: 8% M/M
Lab 448   first reported: 0.0006
Lab 1134 reported: 8.75 (probably a unit error)
Lab 1161 first reported: 0.00126
Lab 1616 first reported: 0.000185
Lab 1811 first reported: 0.00125
Lab 2130 first reported: 8.1
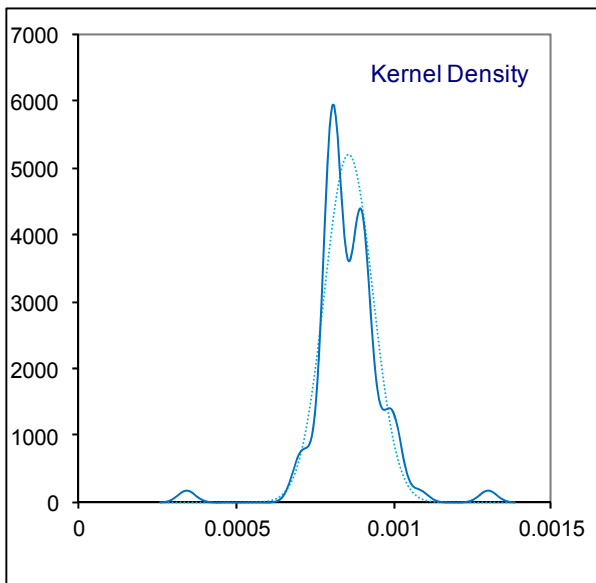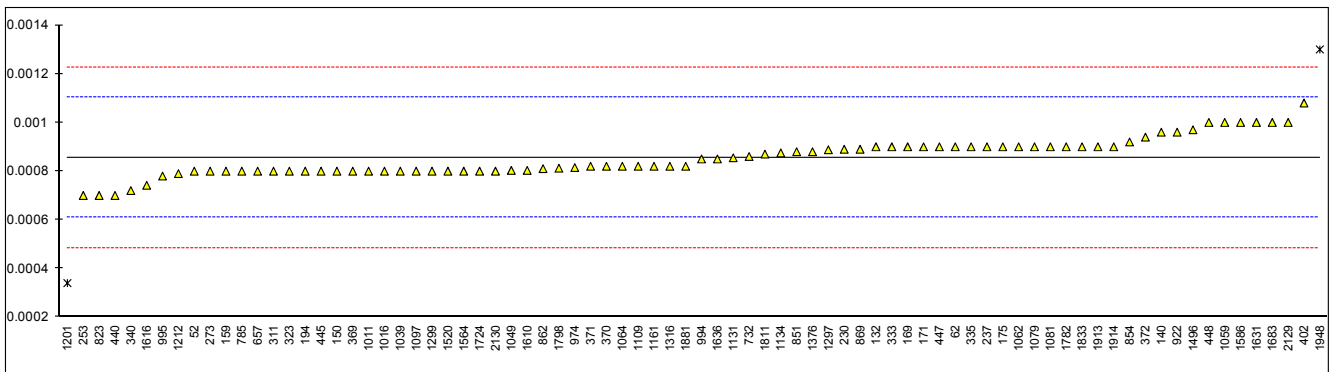
Determination of MSEP on sample #14170; results in MSEP rating

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3948	93		0.59	1011	D3948	95		1.08
62	D3948	89		-0.39	1016	D3948	91		0.10
120	D3948	93		0.59	1021		-----		-----
131		-----		-----	1039	D3948	98		1.82
132	D3948	93		0.59	1049	D3948	87		-0.88
140	D3948	89		-0.39	1059	D3948	91		0.10
150	D3948	92		0.34	1062	D3948	94		0.83
159	D3948	89		-0.39	1064	D3948	82		-2.11
169	D3948	90		-0.15	1065		-----		-----
171	D3948	90		-0.15	1079	D3948	89		-0.39
175	D3948	94		0.83	1081	D3948	88		-0.64
177		91		0.10	1097	D3948	86		-1.13
194	D3948	85		-1.37	1109	D3948	93		0.59
216		-----		-----	1121	D3948	90		-0.15
221		-----		-----	1126		-----		-----
224		-----		-----	1131	D3948	90		-0.15
228		-----		-----	1134		-----		-----
230	D3948	85		-1.37	1146		-----		-----
237	D3948	90		-0.15	1150	D3948	91		0.10
238		-----		-----	1161		-----		-----
252	D3948	90		-0.15	1182		-----		-----
253	D3948	92		0.34	1201	D3948	85		-1.37
254	D3948	83		-1.86	1212	D3948	92		0.34
256	D3948	92		0.34	1231	D3948	89		-0.39
258	D3948	89		-0.39	1279	D3948	88		-0.64
273		-----		-----	1297		-----		-----
311	D3948	92		0.34	1299	D3948	94		0.83
323	D3948	89		-0.39	1316	D3948	87		-0.88
333	D3948	90		-0.15	1318	D3948	83		-1.86
334	D3948	92		0.34	1376	D3948	85		-1.37
335	D3948	89		-0.39	1395		-----		-----
340	D3948	92		0.34	1417		-----		-----
353	D3948	93		0.59	1429		-----		-----
369	D3948	93		0.59	1448		-----		-----
370	D3948	90		-0.15	1491		-----		-----
371		-----		-----	1496	D3948	90		-0.15
372	D3948	93		0.59	1520		-----		-----
399		-----		-----	1538	D3948	95		1.08
402	D3948	88		-0.64	1543		-----		-----
440	D3948	93		0.59	1564	D3948	88		-0.64
445	D3948	89		-0.39	1570		-----		-----
447	D3948	94		0.83	1586	D3948	94		0.83
448	D3948	92		0.34	1587	D3948	86		-1.13
463	D3948	92		0.34	1610	D3948	88		-0.64
473	D3948	48	R(0.01)	-10.45	1616	D3948	90		-0.15
485		-----		-----	1631		-----		-----
496	D3948	85		-1.37	1634	D3948	91		0.10
601	D3948	91		0.10	1636		-----		-----
604		-----		-----	1683	D3948	93		0.59
606	D3948	91		0.10	1694		-----		-----
608	D3948	97		1.57	1715		-----		-----
631	D3948	96		1.33	1720	D3948	85		-1.37
657	D3948	96		1.33	1724	D3948	86		-1.13
663		-----		-----	1776	D3948	91		0.10
671	D3948	96		1.33	1782		-----		-----
732		-----		-----	1787	D3948	71	C,R(0.01)	-4.81
785		-----		-----	1798	D3948	89.5		-0.27
823	D3948	88		-0.64	1811	D3948	94.0		0.83
851	D3948	96		1.33	1833	D3948	94		0.83
854	D3948	93		0.59	1842		-----		-----
862	D3948	95		1.08	1881		-----		-----
869	D3948	92		0.34	1883	D3948	96		1.33
922		-----		-----	1913	D3948	89		-0.39
962		-----		-----	1914	D3948	93		0.59
963		-----		-----	1948		-----		-----
974	D3948	95		1.08	1951	D3948	81		-2.36
994		-----		-----	2129	D3948	88		-0.64
995		-----		-----	2130	D3948	94		0.83
996		-----		-----					
997		-----		-----					
998		-----		-----					

normality   OK
n   91
outliers   2
mean (n)   90.6
st.dev. (n)   3.55
R(calc.)   9.9
R(D3948:13)   11.4

Lab 1787 first reported 74
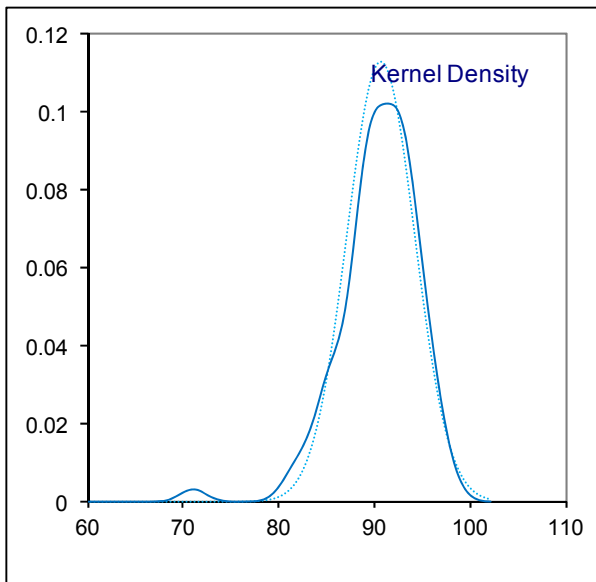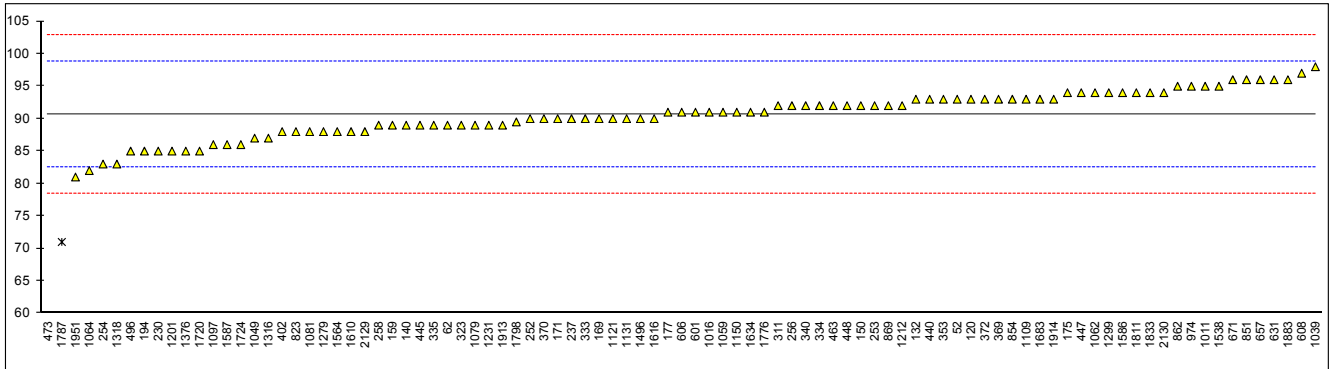
Determination of Naphthalenes on sample #14170; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D1840 - meth.B	1.04		0.37	1011	D1840 - meth.B	1.05		0.66
62	D1840 - meth.A	0.6295	R(0.01)	-11.66	1016	D1840 - meth.B	1.09		1.84
120	D1840 - meth.B	1.04		0.37	1021		-----		-----
131		-----		-----	1039	D1840 - meth.B	1.03		0.08
132	D1840 - meth.B	1.035		0.22	1049	D1840	1.059		0.93
140		-----		-----	1059		-----		-----
150	D1840 - meth.A	0.99		-1.09	1062	D1840 - meth.A	1.01		-0.51
159	D1840 - meth.B	1.023		-0.13	1064	D1840 - meth.A	1.031		0.11
169	D1840 - meth.B	1.33	R(0.01)	8.87	1065		-----		-----
171	D1840 - meth.B	1.01		-0.51	1079	D1840 - meth.A	1.003		-0.71
175	D1840 - meth.B	1.05		0.66	1081	D1840 - meth.A	1.02		-0.22
177		1.11		2.42	1097	D1840 - meth.A	1.006		-0.63
194	D1840 - meth.B	1.81	R(0.01)	22.94	1109	D1840 - meth.A	1.019		-0.25
216		-----		-----	1121		-----		-----
221		-----		-----	1126		-----		-----
224		-----		-----	1131	D1840 - meth.B	1.02		-0.22
228		-----		-----	1134		-----		-----
230	D1840 - meth.B	1.038		0.31	1146		-----		-----
237	D1840 - meth.B	1.03		0.08	1150		-----		-----
238		-----		-----	1161		-----		-----
252		-----		-----	1182		-----		-----
253	D1840 - meth.B	0.96		-1.97	1201	D1840 - meth.A	1.01		-0.51
254		-----		-----	1212	D1840 - meth.B	0.9580		-2.03
256		-----		-----	1231	D1840	0.95		-2.27
258		-----		-----	1279		-----		-----
273	D1840 - meth.B	1.01		-0.51	1297		-----		-----
311	D1840 - meth.B	1.00		-0.80	1299	D1840 - meth.B	1.03		0.08
323	D1840 - meth.A	1.09		1.84	1316	D1840 - meth.B	1.026		-0.04
333	D1840 - meth.B	1.01		-0.51	1318	D1840 - meth.B	1.08		1.54
334		-----		-----	1376	D1840 - meth.A	1.052		0.72
335	D1840 - meth.A	1.01		-0.51	1395		-----		-----
340	D1840 - meth.B	1.037		0.28	1417		-----		-----
353		-----		-----	1429		-----		-----
369	D1840 - meth.B	1.061		0.99	1448		-----		-----
370	D1840 - meth.A	1.027		-0.01	1491		-----		-----
371	D1840 - meth.B	1.012		-0.45	1496	D1840 - meth.A	1.028		0.02
372	D1840 - meth.B	1.02		-0.22	1520	D1840 - meth.B	0.994		-0.98
399		-----		-----	1538	D1840 - meth.B	1.02		-0.22
402	D1840	1.006		-0.63	1543		-----		-----
440	D1840 - meth.B	1.0215		-0.17	1564	D1840 - meth.A	1.01		-0.51
445	D1840 - meth.B	1.05		0.66	1570		-----		-----
447	D1840 - meth.B	0.99		-1.09	1586		-----		-----
448	D1840 - meth.A	1.0200		-0.22	1587		-----		-----
463		-----		-----	1610	D1840 - meth.B	1.0012		-0.77
473		-----		-----	1616	D1840 - meth.B	1.15	R(0.01)	3.59
485		-----		-----	1631		-----		-----
496	D1840 - meth.B	1.026		-0.04	1634		-----		-----
601		-----		-----	1636	D1840 - meth.B	1.032		0.14
604		-----		-----	1683	D1840 - meth.A	1.35	R(0.01)	9.46
606		-----		-----	1694		-----		-----
608		-----		-----	1715		-----		-----
631	D1840 - meth.A	1.02		-0.22	1720	D1840 - meth.B	1.02		-0.22
657	D1840 - meth.A	1.03		0.08	1724		-----		-----
663	D1840	1.053		0.75	1776	D1840 - meth.A	1.11		2.42
671		-----		-----	1782		-----		-----
732		-----		-----	1787		-----		-----
785		-----		-----	1798	D1840 - meth.B	1.00		-0.80
823	D1840 - meth.B	1.24	R(0.01)	6.23	1811	D1840 - meth.A	1.0118		-0.46
851	D1840 - meth.A	1.038		0.31	1833		-----		-----
854	D1840 - meth.A	1.034		0.19	1842	D1840 - meth.A	1.02		-0.22
862	D1840 - meth.B	1.020		-0.22	1881		-----		-----
869	D1840 - meth.A	1.011		-0.48	1883		-----		-----
922		-----		-----	1913	D1840 - meth.B	1.054		0.78
962		-----		-----	1914	D1840 - meth.A	1.05		0.66
963		-----		-----	1948		-----		-----
974	D1840 - meth.A	1.045		0.52	1951	D1840	0.93	R(0.01)	-2.85
994		-----		-----	2129	D1840 - meth.B	1.018		-0.27
995		-----		-----	2130	D1840 - meth.B	1.08		1.54
996		-----		-----					
997		-----		-----					
998		-----		-----					

		D1840 – meth. A	D1840 – meth. B
normality	suspect	not OK	not OK
n	68	26	40
outliers	7	2	3
mean (n)	1.027	1.031	1.031
st.dev. (n)	0.0301	0.0305	0.0359
R(calc.)	0.084	0.086	0.1006
R(D1840:07-A)	0.061	0.061	
R(D1840:07-B)	0.096		0.096

Kernel Density
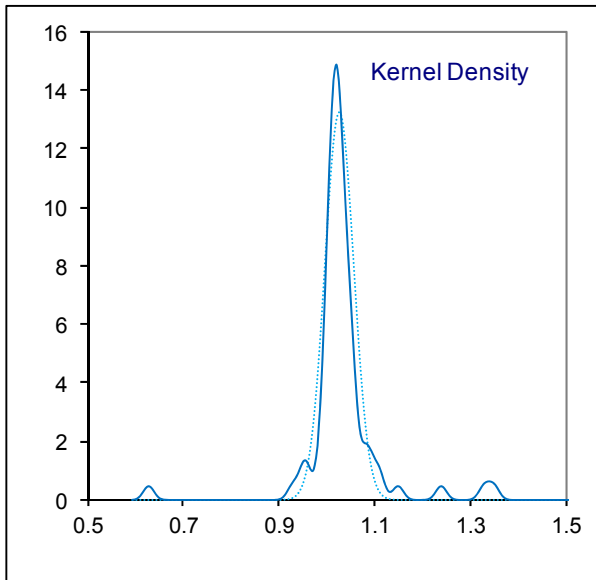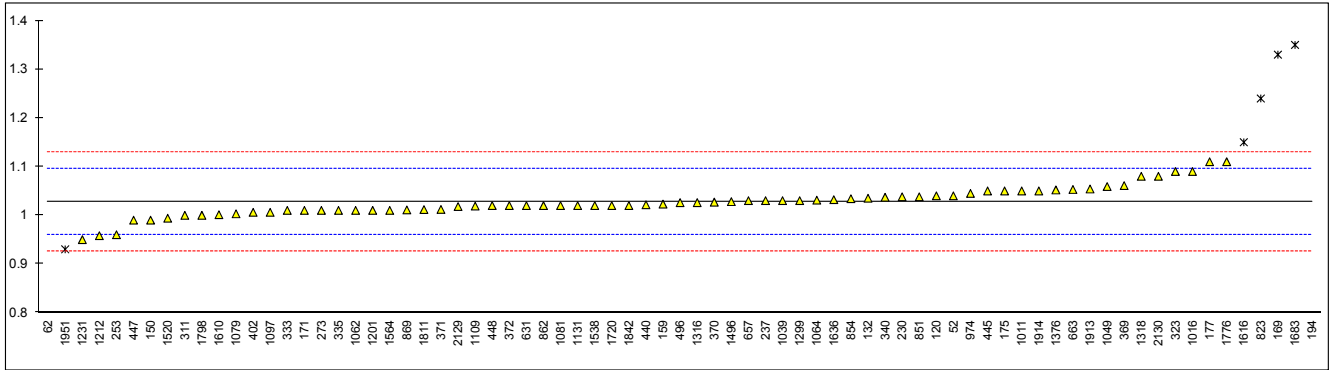
Determination of Smoke Point on sample #14170; results in mm.

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D1322	24		-0.16	1011	D1322	24.1		-0.08
62	D1322	22.5		-1.27	1016	IP598	24.4		0.14
120	D1322	23		-0.90	1021		-----		-----
131		-----		-----	1039	D1322	24.0		-0.16
132	D1322	24		-0.16	1049	D1322	24.5		0.21
140	D1322	26		1.33	1059	D1322	26.0		1.33
150	D1322	25		0.59	1062	D1322	24.0		-0.16
159		-----		-----	1064	D1322	24.2		-0.01
169	D1322	21.0		-2.39	1065		-----		-----
171	D1322	26		1.33	1079	D1322	25.0		0.59
175	D1322	24		-0.16	1081	D1322	26.0		1.33
177		25		0.59	1097	D1322	25.33		0.83
194	D1322	21.0		-2.39	1109	D1322	25.25		0.77
216		-----		-----	1121	IP57	25		0.59
221		-----		-----	1126		-----		-----
224		-----		-----	1131	D1322	23.1		-0.83
228		-----		-----	1134	IP57	24		-0.16
230	D1322	25.9		1.26	1146		-----		-----
237	D1322	24.5		0.21	1150		-----		-----
238		-----		-----	1161	ISO3014	24.0		-0.16
252	D1322	24.0		-0.16	1182		-----		-----
253	D1322	25.0		0.59	1201	D1322	24.5		0.21
254	D1322	24.6		0.29	1212	D1322	25		0.59
256	D1322	24.75		0.40	1231	D1322	23.75		-0.34
258	D1322	25		0.59	1279		-----		-----
273	D1322	24		-0.16	1297	D1322	23		-0.90
311	D1322	25.0		0.59	1299	D1322	24.2		-0.01
323	D1322	24		-0.16	1316	D1322	24.8		0.44
333	D1322	24.2		-0.01	1318	D1322	22.714		-1.11
334	D1322	23.9		-0.23	1376	D1322	24.50		0.21
335	D1322	24.0		-0.16	1395		-----		-----
340	D1322	24.0		-0.16	1417		-----		-----
353	IP57	24.97		0.56	1429		-----		-----
369	D1322	23.0		-0.90	1448		-----		-----
370	D1322	23.47		-0.55	1491		-----		-----
371		-----		-----	1496	D1322	23.2		-0.75
372	D1322	22.5		-1.27	1520	D1322	24.0		-0.16
399		-----		-----	1538	D1322	24.6		0.29
402	D1322	23		-0.90	1543		-----		-----
440	D1322	24		-0.16	1564		-----		-----
445	D1322	23.0		-0.90	1570	D1322	25.2		0.73
447	D1322	23.0		-0.90	1586	D1322	25		0.59
448	D1322	23.5		-0.53	1587	D1322	24.9		0.51
463	D1322	25.15		0.70	1610	IP57	22.8		-1.05
473		-----		-----	1616	D1322	25		0.59
485		-----		-----	1631	D1322	25		0.59
496	D1322	22.4		-1.35	1634		-----		-----
601		-----		-----	1636	D1322	24.54		0.24
604		-----		-----	1683	D1322	22.0		-1.64
606		-----		-----	1694		-----		-----
608	D1322	24.5		0.21	1715	D1322	25.5		0.96
631	D1322	24.5		0.21	1720		-----		-----
657	D1322	24.5		0.21	1724	D1322	25		0.59
663		-----		-----	1776	D1322	24.5		0.21
671		-----		-----	1782	D1322	24.0		-0.16
732		-----		-----	1787	D1322	26		1.33
785		-----		-----	1798	D1322	22.75		-1.09
823	D1322	23.5		-0.53	1811	D1322	24.95		0.55
851	D1322	24.0		-0.16	1833	D1322	25		0.59
854	D1322	22.5		-1.27	1842	D1322	24.5		0.21
862	D1322	25.5		0.96	1881	D1322	26.0		1.33
869	D1322	24.5		0.21	1883		-----		-----
922	D1322	25.0		0.59	1913	D1322	24.1		-0.08
962		-----		-----	1914	D1322	24.0		-0.16
963		-----		-----	1948		-----		-----
974	D1322	25.0		0.59	1951	D1322	24.4		0.14
994	D1322	23.5		-0.53	2129	D1322	24.5		0.21
995	D1322	23.62		-0.44	2130	D1322	24.0		-0.16
996	D1322	23.0		-0.90					
997		-----		-----					
998		-----		-----					

normality	OK
n	98
outliers	0
mean (n)	24.21
st.dev. (n)	1.028
R(calc.)	2.88
R(D1322:12e2-M)	3.77

Compare R(D1322:12e2) Automated: 0.90
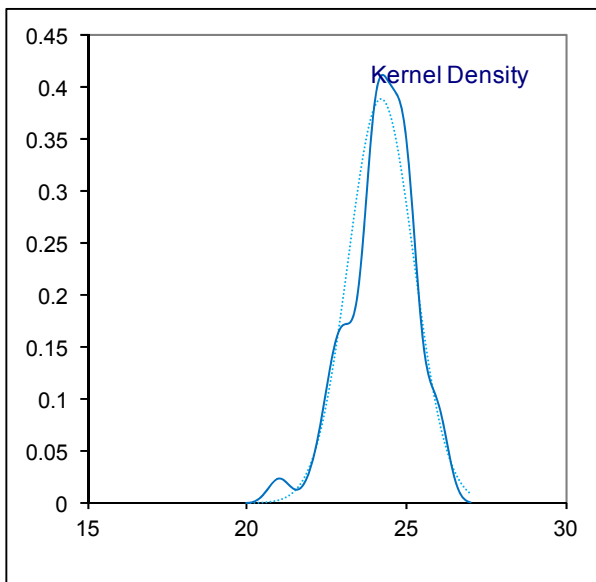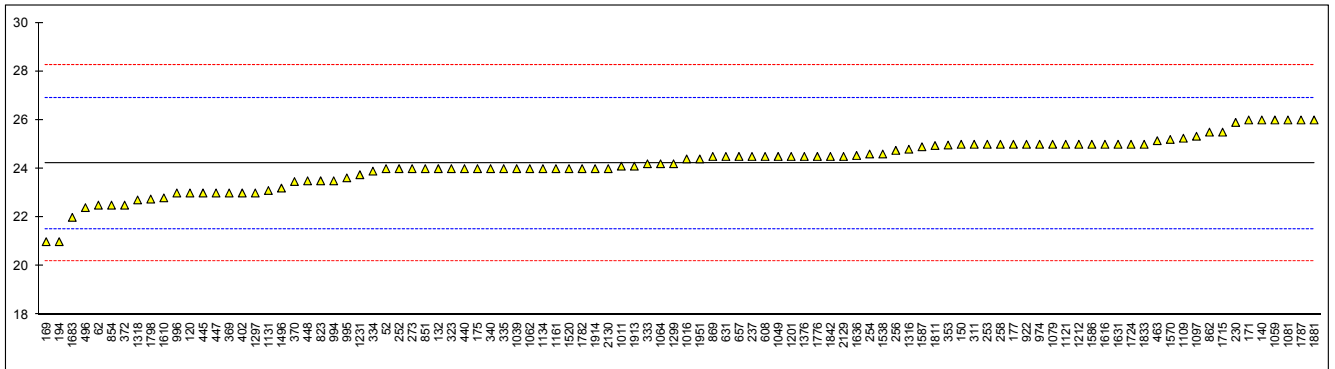
Determination of Specific Energy on sample #14170; results in MJ/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3338	43.290		-0.89	1011	D3338	43.283		-1.31
62	D3338	43.311		0.39	1016		-----		-----
120	D3338	43.322		1.06	1021		-----		-----
131		-----		-----	1039	D3338	43.288		-1.01
132	D3338	43.319		0.88	1049	D3338	43.2421905		-3.80
140		-----		-----	1059	D3338	43.318		0.82
150	D3338	43.314		0.57	1062	D3338	43.296		-0.52
159	D3338	43.304		-0.04	1064	D3338	43.3177		0.80
169	D3338	43.256		-2.96	1065		-----		-----
171	D3338	43.305		0.03	1079	D3338	43.306		0.09
175	D3338	43.323		1.12	1081	D3338	43.290		-0.89
177	D3338	43.30		-0.28	1097	D3338	43.294		-0.64
194	D3338	43.319		0.88	1109	D3338	43.28		-1.50
216		-----		-----	1121		-----		-----
221	D3338	43.37		3.98	1126		-----		-----
224		-----		-----	1131	D4529	43.325		1.24
228		-----		-----	1134	D3338	43.306		0.09
230	D3338	43.285		-1.19	1146		-----		-----
237	D3338	43.316		0.70	1150		-----		-----
238		-----		-----	1161	D3338	43.309		0.27
252		-----		-----	1182		-----		-----
253	D3338	43.3279		1.42	1201		-----		-----
254		-----		-----	1212	D3338	43.296	C	-0.52
256		-----		-----	1231	D3338	43.269		-2.17
258		-----		-----	1279		-----		-----
273		-----		-----	1297		-----		-----
311	D3338	43.31		0.33	1299	D3338	43.3		-0.28
323	D3338	43.36		3.37	1316	D3338	43.298		-0.40
333		-----		-----	1318	D3338	43.277		-1.68
334		-----		-----	1376	D3338	43.2958		-0.53
335		-----		-----	1395		-----		-----
340	D3338	43.278		-1.62	1417		-----		-----
353		-----		-----	1429		-----		-----
369	D3338	43.290		-0.89	1448		-----		-----
370	D3338	43.3224		1.08	1491		-----		-----
371		-----		-----	1496	D3338	43.3203		0.96
372	D3338	43.316		0.70	1520	D3338	43.3089		0.26
399		-----		-----	1538		-----		-----
402		-----		-----	1543		-----		-----
440	D3338	43.3252186		1.26	1564		-----		-----
445	D3338	43.328		1.43	1570		-----		-----
447	D3338	43.343		2.34	1586	D3338	43.31456		0.61
448	D3338	43.319		0.88	1587		-----		-----
463	D3338	43.29		-0.89	1610	D3338	43.304		-0.04
473		-----		-----	1616	D3338	43.316		0.70
485		-----		-----	1631	D3338	43.305		0.03
496	D3338	43.271		-2.04	1634		-----		-----
601		-----		-----	1636	D3338	43.3256		1.28
604		-----		-----	1683	D3338	43.300		-0.28
606		-----		-----	1694		-----		-----
608		-----		-----	1715		-----		-----
631	D3338	43.3202		0.95	1720		-----		-----
657	D3338	43.293		-0.70	1724	D3338	43.311		0.39
663	D3338	43.299		-0.34	1776	D3338	43.29		-0.89
671		-----		-----	1782		-----		-----
732		-----		-----	1787		-----		-----
785		-----		-----	1798	D3338	43.304		-0.04
823	D3338	43.282	C	-1.37	1811	D3338	43.3088		0.26
851	D3338	43.323		1.12	1833	D3338	43.294		-0.64
854	D3338	43.3152		0.65	1842	D3338	43.298		-0.40
862	D3338	43.301		-0.22	1881		-----		-----
869	D3338	43.3020		-0.16	1883		-----		-----
922	D3338	43.317		0.76	1913	D3338	43.30		-0.28
962		-----		-----	1914	D3338	43.270		-2.10
963		-----		-----	1948	D3338	43.323		1.12
974	D3338	43.260		-2.71	1951		-----		-----
994		-----		-----	2129	D3338	43.312		0.45
995		-----		-----	2130	D3338	43.320		0.94
996		-----		-----					
997		-----		-----					
998		-----		-----					

|	
normality	suspect
n	75
outliers	0
mean (n)	43.3046
st.dev. (n)	0.02113
R(calc.)	0.0592
R(D3338:09)	0.0460

Lab 823   first reported: 43.035
Lab 1212 first reported: 43.231
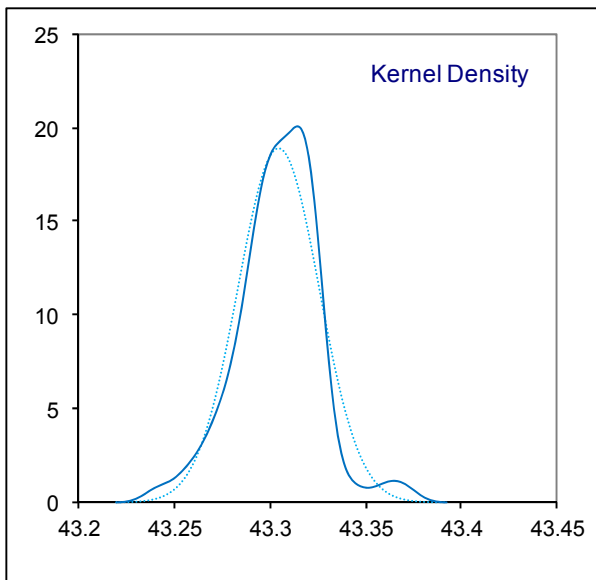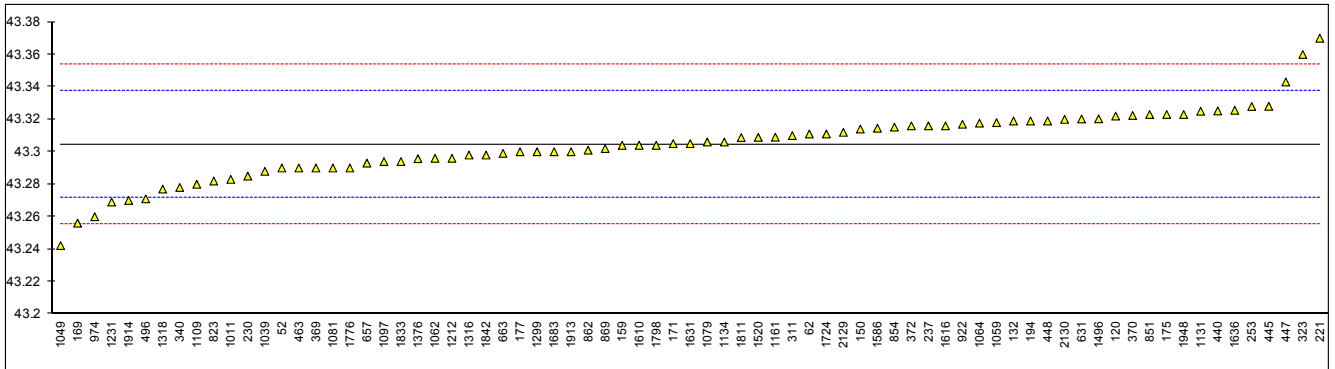
Determination of Total Acidity on sample #14170; results in mg KOH/g

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3242	0.001		-1.66	1011	D3242	0.005		4.35
62	D3242	0.005		4.35	1016	D3242	0.0014		-1.06
120	D3242	0.005		4.35	1021		-----		-----
131		-----		-----	1039	D3242	0.001		-1.66
132	D3242	0.0017		-0.61	1049	D3242	0.00290		1.19
140	D3242	0.003		1.35	1059	D3242	0.001		-1.66
150	D3242	0.001		-1.66	1062	D3242	0.0010		-1.66
159	D3242	0.0017		-0.61	1064	D3242	0.0022		0.14
169	D3242	0.002		-0.16	1065		-----		-----
171	D3242	0.011	R(0.01)	13.37	1079	D3242	0.001		-1.66
175	D3242	0.001		-1.66	1081	D3242	0.002		-0.16
177	D3242	0.0011		-1.51	1097	D3242	0.0029		1.19
194	D3242	0.003		1.35	1109	D3242	0.0009		-1.81
216		-----		-----	1121		-----		-----
221		-----		-----	1126		-----		-----
224		-----		-----	1131	D3242	0.0035		2.10
228		-----		-----	1134		-----		-----
230	D3242	0.0011		-1.51	1146		-----		-----
237	D3242	0.002		-0.16	1150		-----		-----
238		-----		-----	1161	D664	0.002		-0.16
252		-----		-----	1182		-----		-----
253	D3242	0.003		1.35	1201		-----		-----
254		-----		-----	1212	D3242	0.00245		0.52
256		-----		-----	1231	D3242	0.001		-1.66
258		-----		-----	1279	D3242	0.00224		0.20
273		-----		-----	1297		-----		-----
311	D3242	0.001		-1.66	1299	D3242	0.002		-0.16
323	D3242	0.0021		-0.01	1316	D3242	0.002		-0.16
333	D3242	0.004		2.85	1318	D3242	0.0009		-1.81
334	D3242	0.001		-1.66	1376	D3242	0.0017		-0.61
335	D3242	0.001		-1.66	1395		-----		-----
340	D3242	0.0019		-0.31	1417		-----		-----
353		-----		-----	1429		-----		-----
369	D3242	0.001		-1.66	1448		-----		-----
370	D3242	0.0012		-1.36	1491		-----		-----
371	D3242	0.0012		-1.36	1496	D3242	0.0016		-0.76
372	D3242	0.001		-1.66	1520	D3242	0.0020		-0.16
399		-----		-----	1538		-----		-----
402	D3242	0.0022		0.14	1543		-----		-----
440	D3242	0.0030		1.35	1564	D3242	0.002		-0.16
445	D3242	0.001		-1.66	1570		-----		-----
447	D3242	0.005		4.35	1586	D3242	0.001		-1.66
448	D3242	0.0040		2.85	1587	D3242	0.0010		-1.66
463	D3242	0.0034		1.95	1610	IP354	0.0024		0.44
473		-----		-----	1616	D3242	0.0002		-2.86
485		-----		-----	1631	D3242	0.0026		0.74
496		-----		-----	1634		-----		-----
601		-----		-----	1636	D3242	0.0013		-1.21
604		-----		-----	1683	D3242	0.004		2.85
606		-----		-----	1694		-----		-----
608		-----		-----	1715		-----		-----
631	D3242	0.0016		-0.76	1720	D3242	0.001		-1.66
657	D3242	0.002		-0.16	1724	D3242	0.003		1.35
663	D3242	0.00126		-1.27	1776	D3242	0.00158		-0.79
671	D3242	0.006		5.85	1782	D3242	0.0023		0.29
732		-----		-----	1787	D3242	0.0021		-0.01
785		-----		-----	1798	D3242	0.00080		-1.96
823	D3242	0.004		2.85	1811	D3242	0.00227		0.25
851	D3242	0.0012		-1.36	1833	D3242	0.004		2.85
854	D3242	0.0019		-0.31	1842	IP354	0.002		-0.16
862	D3242	0.002		-0.16	1881	D3242	0.0042		3.15
869	D3242	0.0018		-0.46	1883		-----		-----
922		-----		-----	1913	D3242	0.00215		0.07
962		-----		-----	1914	D3242	0.003		1.35
963		-----		-----	1948		-----		-----
974	D3242	0.002		-0.16	1951	D3242	0.0092	R(0.01)	10.66
994	D3242	0.002		-0.16	2129	D3242	0.0012		-1.36
995	D3242	0.0016		-0.76	2130	D3242	0.002		-0.16
996		-----		-----					
997	D3242	0.0014		-1.06					
998		-----		-----					

|	
normality	not OK
n	87
outliers	2
mean (n)	0.00211
st.dev. (n)	0.001180
R(calc.)	0.00330
R(D3242:11)	0.00186

Kernel Density
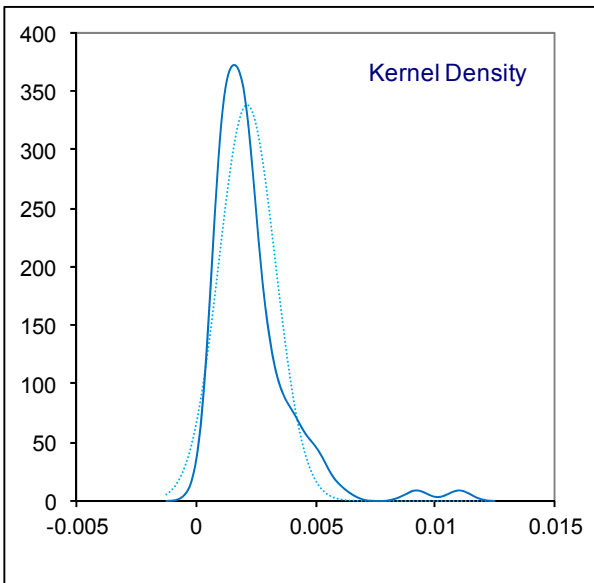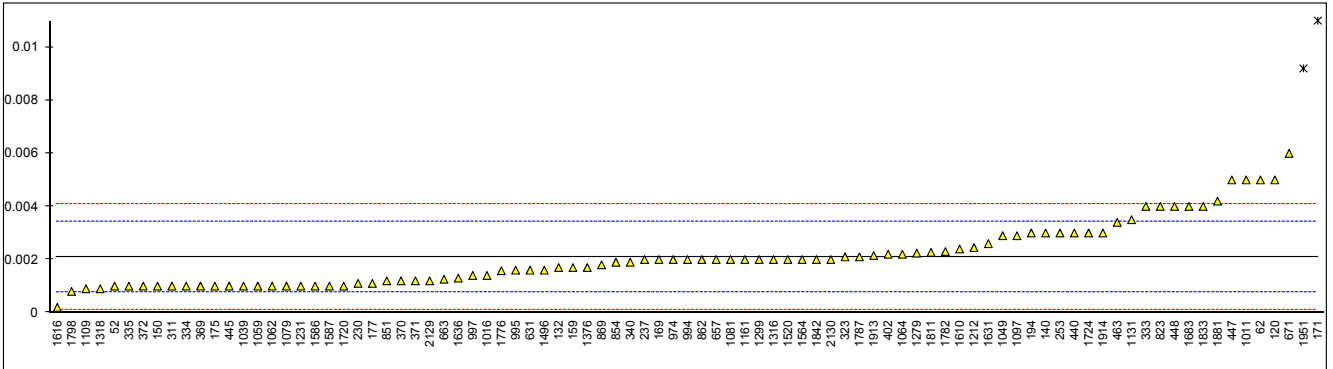
Determination of Total Sulphur on sample #14170; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5453	848.4		-0.71	1011	D4294	949		2.32
62	D5453	1103	C,R(0.01)	6.96	1016		-----		-----
120	D4294	842		-0.90	1021		-----		-----
131		-----		-----	1039	D2622	880	C	0.24
132	D2622	877.1		0.16	1049	D5453	846.9		-0.75
140		-----		-----	1059	ISO14596	830		-1.26
150	D5453	862		-0.30	1062	D5453	872		0.00
159	D4294	910.5		1.16	1064	D5453	891.8		0.60
169	D4294	80.8	R(0.01)	-23.81	1065	D7212	920	C	1.45
171	D5453	965.4		2.82	1079	D5453	880.2		0.25
175		-----		-----	1081	D4294	879		0.21
177	D4294	864	C	-0.24	1097	D5453	824		-1.44
194		-----		-----	1109	D2622	912.0		1.21
216		-----		-----	1121	IP336	877	C	0.15
221		-----		-----	1126	ISO20846	937.36		1.97
224		-----		-----	1131		-----		-----
228		-----		-----	1134	IP336	860	C	-0.36
230	D4294	911.5	C	1.19	1146	D4294	790	C	-2.46
237	D4294	900		0.85	1150		-----		-----
238	D4294	858		-0.42	1161	ISO20846	1080	R(0.01)	6.27
252		-----		-----	1182	D4294	893		0.64
253	D4294	890	C	0.55	1201	D5453	886		0.43
254		-----		-----	1212	D5453	833.01		-1.17
256		-----		-----	1231	D5453	955		2.50
258		-----		-----	1279		-----		-----
273	D5453	879.0		0.21	1297	D4294	876.3		0.13
311	D2622	869		-0.09	1299	D2622	830		-1.26
323	D2622	851		-0.63	1316	D4294	873		0.03
333	D2622	850		-0.66	1318	D4294	889.7		0.54
334	D5453	848		-0.72	1376	D5453	838.0		-1.02
335	ISO8754	885		0.39	1395	D5453	886.2		0.43
340	D4294	879		0.21	1417		-----		-----
353	IP336	898.4		0.80	1429	IP490	821.9		-1.50
369	D2622	871		-0.03	1448		-----		-----
370	D4294	893		0.64	1491	ISO8754	840		-0.96
371	D4294	882		0.30	1496	D4294	830.9	C	-1.23
372	D5453	869		-0.09	1520	D4294	888.7		0.51
399	D5453	887		0.46	1538	D4294	786	C	-2.59
402	D5453	839.6		-0.97	1543		-----		-----
440	D5453	855.17		-0.50	1564	ISO20846	887		0.46
445	D5453	893.8		0.66	1570	D5453	838.4		-1.01
447	IP336	870		-0.06	1586	D5453	863		-0.27
448	D5453	840.09		-0.96	1587	D4294	878		0.18
463	D4294	907.5	C	1.07	1610	IP336	863		-0.27
473		-----		-----	1616	D4294	870		-0.06
485		-----		-----	1631	D5453	910		1.15
496	D5453	878.0		0.18	1634		-----		-----
601		-----		-----	1636	D4294	857.7		-0.43
604		-----		-----	1683	D5453	860		-0.36
606		-----		-----	1694	D5453	1024	R(0.01)	4.58
608		-----		-----	1715		-----		-----
631	D4294	890		0.55	1720	D5453	747.0	R(0.05)	-3.76
657	D5453	837		-1.05	1724	D5453	894		0.67
663	D5453	856.4		-0.47	1776	D5453	901.7		0.90
671	D5453	825		-1.41	1782	D5453	910.5		1.16
732	D4294	850.0		-0.66	1787		-----		-----
785	D4294	905		1.00	1798	D5453	864.0		-0.24
823	D5453	901.9		0.90	1811	D5453	877.72		0.18
851	D2622	875.74		0.12	1833	D5453	904		0.97
854	D5453	884.8		0.39	1842	D5453	880		0.24
862	D2622	848.6		-0.70	1881	D4294	845		-0.81
869	D4294	872		0.00	1883		-----		-----
922	D5453	587.1	C,R(0.01)	-8.57	1913	D4294	856	C	-0.48
962		-----		-----	1914	D5453	835		-1.11
963		-----		-----	1948	D5453	885.8		0.42
974	D4294	898.7		0.81	1951	D5453	819.3		-1.58
994	D4294	858.1		-0.41	2129	D5453	874.2		0.07
995	D5453	860		-0.36	2130	IP336	859		-0.39
996	D4294	876		0.12					
997	D4294	864		-0.24					
998		-----		-----					

normality	suspect
n	100
outliers	6
mean (n)	871.88
st.dev. (n)	30.971
R(calc.)	86.72
R(D5453:09)	93.01

Lab 62   first reported: 773
Lab 177   first reported: 0.0864
Lab 230   first reported: 0.09115
Lab 253   first reported: 980
Lab 463   first reported: 676.7 (D5453)
Lab 922   first reported: 740.2
Lab 1039 first reported: 0.0880
Lab 1065 first reported: 0.092
Lab 1121 first reported: 0.0877
Lab 1134 reported: 0.086 (probably unit error)
Lab 1146 first reported: 79
Lab 1496 first reported: 0.08309
Lab 1538 first reported: 768
Lab 1913 first reported: 0.0856

Kernel Density
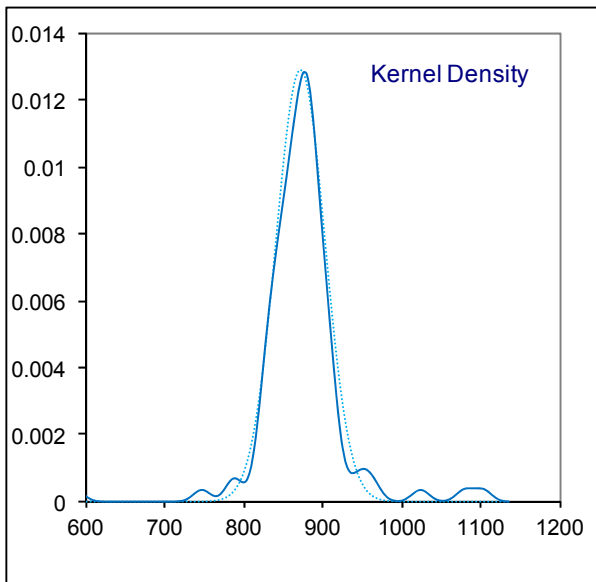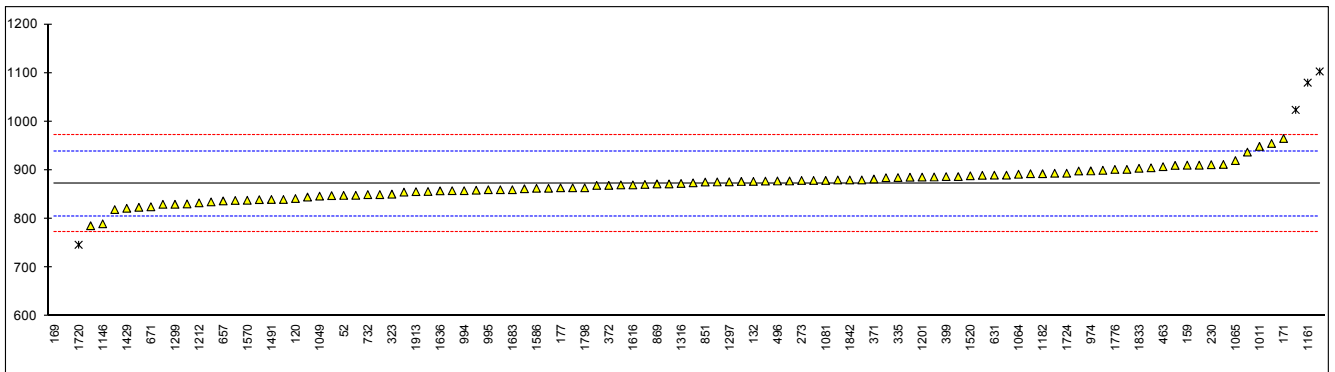
Determination of Copper on sample #14169; results in µg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1011		-----		-----
62		-----		-----	1016		-----		-----
120		-----		-----	1039		-----		-----
131		-----		-----	1049		-----		-----
132		-----		-----	1062		-----		-----
140		-----		-----	1064		-----		-----
150		<100	C	-----	1065		-----		-----
159		-----		-----	1079		110		1.37
169		-----		-----	1081		-----		-----
171	in house	112		1.50	1097		-----		-----
175		-----		-----	1109		-----		-----
177		-----		-----	1121		-----		-----
194		-----		-----	1131		-----		-----
216		-----		-----	1134		-----		-----
221		-----		-----	1146	in house	111		1.44
224		-----		-----	1161		-----		-----
228		-----		-----	1182		-----		-----
230		-----		-----	1201		76.3		-0.84
252		-----		-----	1212	D5185	94		0.32
253		-----		-----	1231		-----		-----
254		-----		-----	1279		-----		-----
256		-----		-----	1297		-----		-----
258		-----		-----	1299		-----		-----
311		-----		-----	1316	in house	107.5		1.21
323		-----		-----	1318	D6732	97.6		0.56
333		-----		-----	1376		-----		-----
334		-----		-----	1429		-----		-----
335		-----		-----	1448		-----		-----
340		-----		-----	1491	D130	1B	ex	-----
353		-----		-----	1496	D130	1A	ex	-----
369		-----		-----	1520		-----		-----
370		-----		-----	1538		-----		-----
371		-----		-----	1543		-----		-----
372		-----		-----	1564		-----		-----
402		-----		-----	1570		-----		-----
440		-----		-----	1586		-----		-----
445		-----		-----	1587		-----		-----
447		-----		-----	1610		-----		-----
448		1A	ex	-----	1616		-----		-----
463		-----		-----	1631		-----		-----
473		-----		-----	1634		-----		-----
485		-----		-----	1636		-----		-----
496		-----		-----	1683	D130	1A	ex	-----
601		-----		-----	1694		-----		-----
604		-----		-----	1715		-----		-----
606		-----		-----	1720		-----		-----
608		-----		-----	1724		-----		-----
631		-----		-----	1776		-----		-----
657		-----		-----	1782		-----		-----
663		-----		-----	1787		-----		-----
671		-----		-----	1798		-----		-----
732		-----		-----	1811		-----		-----
785		-----		-----	1833		-----		-----
823		-----		-----	1842	INH-15	90.7		0.11
851		-----		-----	1881		-----		-----
854		-----		-----	1883		-----		-----
862	GB/T 15337	45.8		-2.84	1913		-----		-----
869		-----		-----	1914		-----		-----
963		-----		-----	1948		-----		-----
974		-----		-----	1951		-----		-----
994		-----		-----	2129	IP225	46		-2.82
995		-----		-----	2130		-----		-----
996		-----		-----					
998		-----		-----					

```
normality        OK
n                10
outliers         0 (+4 ex)
mean (n)         89.09
st.dev. (n)      25.330
R(calc.)         70.92
R(D6732:04)      42.71
```

Lab 150 first reported 733

Kernel Density
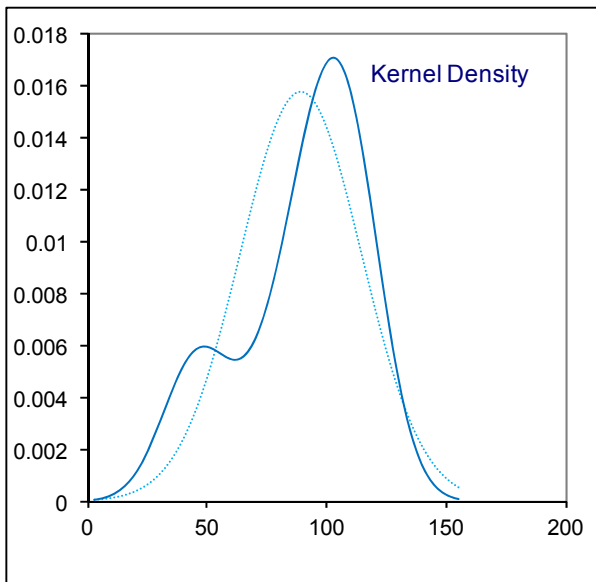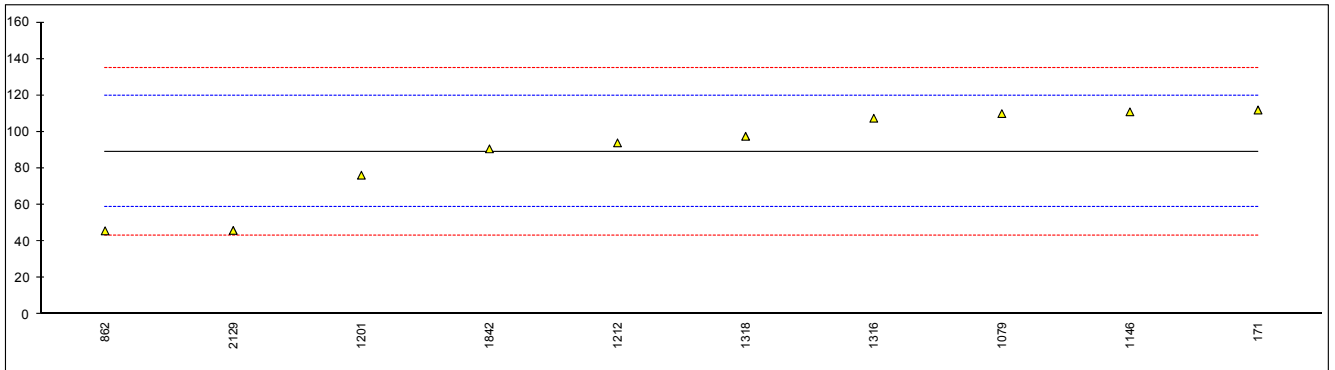
Determination of Density at 15°C on sample #14169; results in kg/m^3

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1011		-----		-----
62		-----		-----	1016		-----		-----
120	D4052	815.6		-1.15	1039	D4052	794.4	R(0.01)	-119.87
131		-----		-----	1049	D4052	815.8		-0.03
132		-----		-----	1062	D4052	815.9		0.53
140		-----		-----	1064	D4052	814.6	R(0.01)	-6.75
150	D4052	815.9		0.53	1065		-----		-----
159		-----		-----	1079	D4052	815.9		0.53
169	D4052	818.6	R(0.01)	15.65	1081	D4052	816.0		1.09
171	D4052	815.4		-2.27	1097	ISO12185	815.8		-0.03
175	D4052	815.8		-0.03	1109	D4052	815.7		-0.59
177		-----		-----	1121	IP365	815.8		-0.03
194	D4052	815.4		-2.27	1131	D4052	815.8		-0.03
216		-----		-----	1134		-----		-----
221		-----		-----	1146	D4052	815.83		0.14
224		-----		-----	1161		-----		-----
228		-----		-----	1182	ISO12185	815.876		0.39
230	D1298	816.0		1.09	1201	D4052	815.9		0.53
252		-----		-----	1212	D4052	815.9		0.53
253	D4052	815.8		-0.03	1231		-----		-----
254		-----		-----	1279	D4052	815.81		0.02
256		-----		-----	1297		-----		-----
258		-----		-----	1299	D4052	815.8		-0.03
311	D4052	815.8		-0.03	1316	D4052	815.8		-0.03
323	D4052	815.6		-1.15	1318	D4052	815.82		0.08
333		-----		-----	1376	D4052	815.80		-0.03
334		-----		-----	1429		-----		-----
335	D4052	815.8		-0.03	1448		-----		-----
340	D4052	815.91		0.58	1491	D4052	815.82		0.08
353		-----		-----	1496	D1298	815.7		-0.59
369	D4052	815.8		-0.03	1520	D4052	815.80		-0.03
370		-----		-----	1538	D4052	815.8		-0.03
371		-----		-----	1543		-----		-----
372	D4052	815.8		-0.03	1564		-----		-----
402		-----		-----	1570		-----		-----
440	D4052	815.8		-0.03	1586		-----		-----
445	D4052	815.9		0.53	1587		-----		-----
447		-----		-----	1610		-----		-----
448	D4052	815.5	C	-1.71	1616	D4052	815.8		-0.03
463		-----		-----	1631		-----		-----
473		-----		-----	1634		-----		-----
485		-----		-----	1636		-----		-----
496	D4052	815.81		0.02	1683	D4052	815.8		-0.03
601		-----		-----	1694		-----		-----
604		-----		-----	1715		-----		-----
606		-----		-----	1720		-----		-----
608		-----		-----	1724	D4052	815.95	C	0.81
631	D4052	815.98		0.98	1776		-----		-----
657	D4052	815.8		-0.03	1782		-----		-----
663		-----		-----	1787		-----		-----
671	D4052	815.9		0.53	1798		-----		-----
732	D4052	815.9		0.53	1811		-----		-----
785		-----		-----	1833		-----		-----
823		-----		-----	1842	D4052	815.7		-0.59
851		-----		-----	1881		-----		-----
854	D4052	815.84		0.19	1883		-----		-----
862	D4052	815.78		-0.14	1913		-----		-----
869		-----		-----	1914		-----		-----
963		-----		-----	1948	D4052	815.9		0.53
974	D4052	815.9		0.53	1951	D4052	815.88	C	0.42
994		-----		-----	2129	D4052	815.8		-0.03
995		-----		-----	2130	D4052	815.8		-0.03
996		-----		-----					
998		-----		-----					

normality	not OK
n	53
outliers	3
mean (n)	815.81
st.dev. (n)	0.123
R(calc.)	0.34
R(D4052:11)	0.50

Lab 448 first reported: 794.3
Lab 1724 reported: 0.81595 (probably unit error)
Lab 1951 reported: 0.81588 (probably unit error)
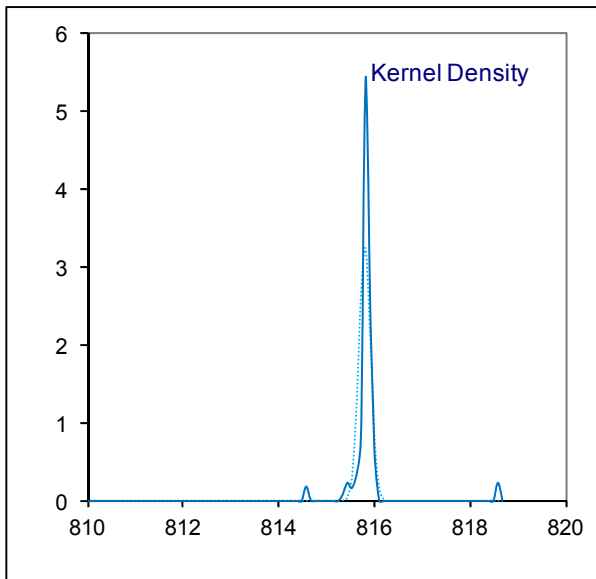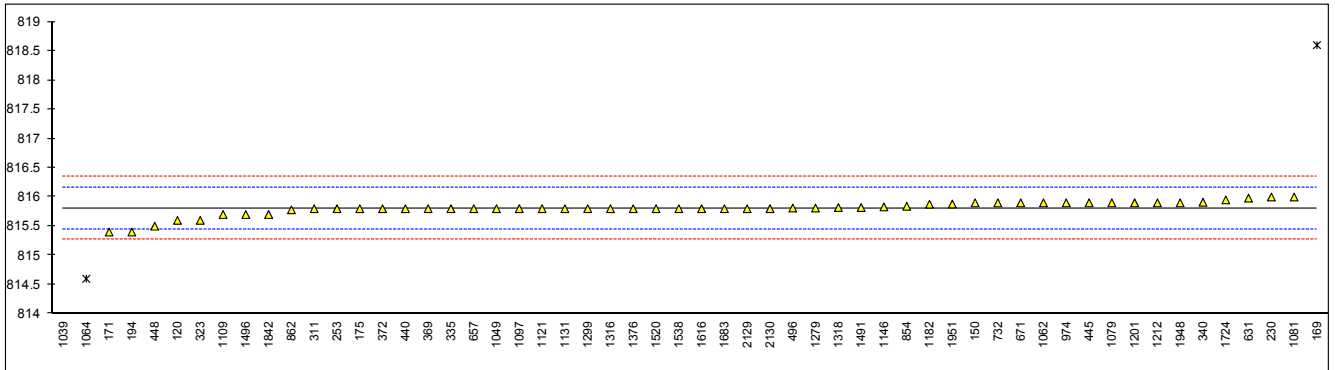
Determination of JFTOT; Tube Rating, Delta P in mmHg, Pass/Fail on sample #14169;

lab	method	tube rating	Delta P	iis: Pass/Fail	lab	method	tube rating	Delta P	iis: Pass/Fail
52		-----	-----	-----	1011		-----	-----	-----
62		-----	-----	-----	1016	D3241	<1	1.8	Pass
120	D3241	1	5	Pass	1039	D3241	<1	274.3	Fail
131		-----	-----	-----	1049	D3241	1	280	Fail
132	D3241	<1	10.2	Pass	1062	D3241	>4	14.8	Fail
140		-----	-----	-----	1064	D3241	2	>280	Fail
150	D3241	1	250	Fail	1065	D3241	1	1	Pass
159	D3241	1	>280	Fail	1079	D3241	1	0.1	Pass
169	D3241	2	251	Fail	1081	D3241	<1	251	Fail
171		-----	-----	-----	1097	D3241	<2	11.8	Pass
175	D3241	<1	>250	Fail	1109	D3241	<1	>250	Fail
177	D3241	1	250	Fail	1121		-----	-----	-----
194	D3241	<1	28	Fail	1131	D3241	>4P	1	Fail
216		-----	-----	-----	1134		-----	-----	-----
221		-----	-----	-----	1146	D3241	4P	>250	Fail
224		-----	-----	-----	1161		-----	-----	-----
228		-----	-----	-----	1182	D3241	1	2.9	Pass
230	D3241	<1	2.1	Pass	1201	D3241	1	251	Fail
252	D3241	1	20	Pass	1212	D3241	<1	280	Fail
253	D3241	1	15	Pass	1231		-----	-----	-----
254		-----	-----	-----	1279	D3241	<2	4.0	Pass
256		-----	-----	-----	1297		-----	-----	-----
258		-----	-----	-----	1299	D3241	1	280	Fail
311	D3241	1	126	Fail	1316	D3241	1	>25	Fail
323	D3241	<1	1.3	Pass	1318	D3241	<1	280.1	Fail
333		-----	-----	-----	1376	D3241	<4P	46	Fail
334	D3241	1	280	Fail	1429		-----	-----	-----
335	D3241	1	9.9	Pass	1448		-----	-----	-----
340	D3241	1	280	Fail	1491		-----	-----	-----
353		-----	-----	-----	1496	D3241	3P	3.8	Fail
369	D3241	1	250	Fail	1520	D3241	<2	>250	Fail
370	D3241	3	80.1	Fail	1538		-----	1.7	-----
371		-----	-----	-----	1543		-----	-----	-----
372	D3241	<2	250	Fail	1564	D3241	1	249	Fail
402		-----	-----	-----	1570	D3241	3	280	Fail
440	IP323	1	59	Fail	1586		-----	-----	-----
445	D3241	1	2.9	Pass	1587	D3241	<1	25.0	Pass
447		-----	-----	-----	1610	IP323	<1	>25	Fail
448	D3241	1	10.3	Pass	1616	D3241	1	3	Pass
463		-----	-----	-----	1631		-----	-----	-----
473		-----	-----	-----	1634		-----	-----	-----
485		-----	-----	-----	1636		-----	-----	-----
496		-----	-----	-----	1683	D3241	<4	0	Fail
601		-----	-----	-----	1694		-----	-----	-----
604		-----	-----	-----	1715		-----	-----	-----
606	D3241	1	0.0	Pass	1720	D3241	1	0.0	Pass
608		-----	-----	-----	1724	D3241	1.0	0	Pass
631		-----	-----	-----	1776		-----	-----	-----
657		-----	-----	-----	1782		-----	-----	-----
663		-----	-----	-----	1787		-----	-----	-----
671	D3241	1	3.0	Pass	1798		-----	-----	-----
732		-----	-----	-----	1811	D3241	1	280	Fail
785		-----	-----	-----	1833		-----	-----	-----
823		-----	-----	-----	1842	IP323	1	>25	Fail
851	D3241	<1	48.8	Fail	1881		-----	-----	-----
854	D3241	4	0.3	Fail	1883		-----	-----	-----
862	D3241	<1	22.9	Pass	1913	D3241	<1	4.0	Pass
869		-----	-----	-----	1914	D3241	1	25-108 min	Fail
963		-----	-----	-----	1948		-----	-----	-----
974	D3241	<1	70	Fail	1951	D3241	1	2.9	Pass
994		-----	-----	-----	2129	D3241	1	25@98min	Fail
995		-----	-----	-----	2130	D3241	1	5	Pass
996		-----	-----	-----					
998		-----	-----	-----					

normality	not OK	OK		
n	65	66		

range of results:

				For the graphical display non-numeric values were calculated
min.	<1	0		as follows: tube rating:< x as (x-0.5) and > x as (x+0.5)
max.	>4	>280		delta P: max. x as x, > x as (x+1)

|				
Pass		25		Pass according to specification D1655 is
Fail		40		when tube rating is 3 or less and Delta P is maximum 25

Lab 171 reported: insufficient sample
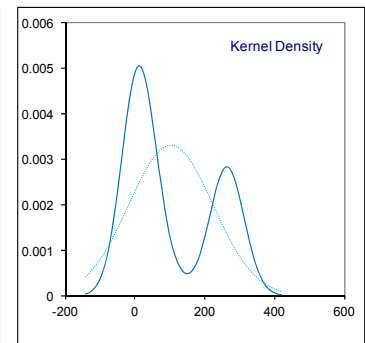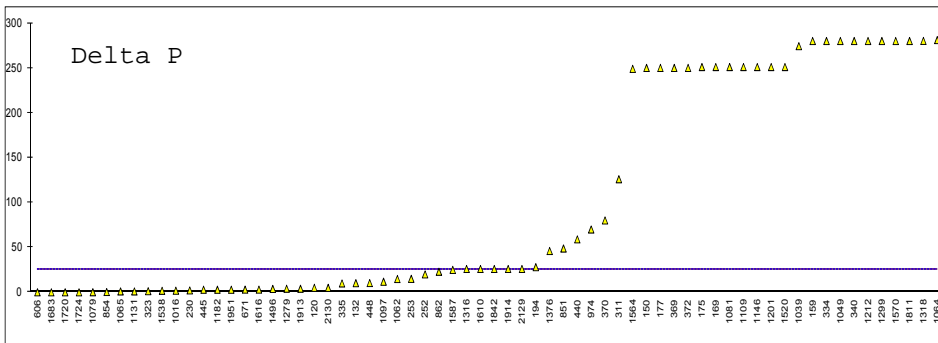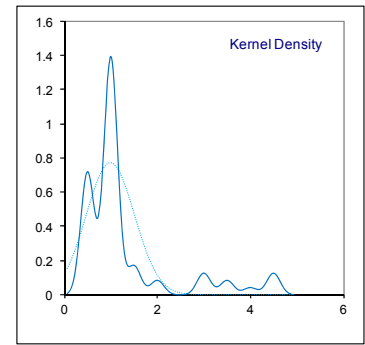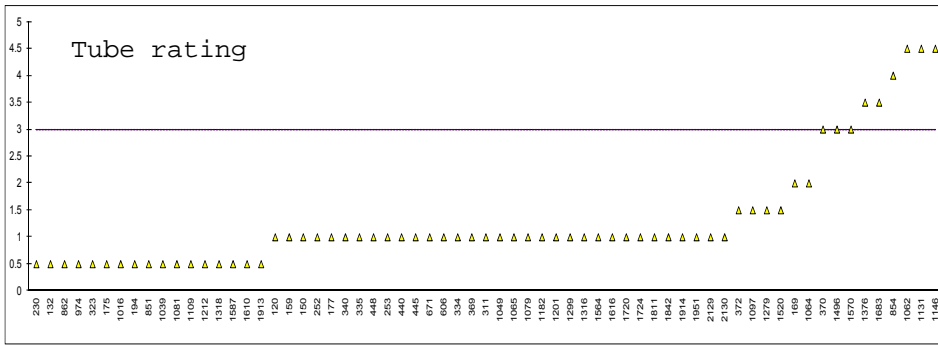
Determination of BOCLE on sample #14171; results in mm

lab	method	value	mark	z(targ)	remarks
150	D5001	0.68		-0.19	
171	D5001	0.725		1.76	
237	D5001	0.66		-1.05	
334	D5001	0.67		-0.62	
496	D5001	0.666		-0.79	
1016	D5001	0.665		-0.84	
1064	D5001	0.712		1.20	
1081	D5001	0.69		0.25	
1131	D5001	0.70		0.68	
1316	D5001	0.725		1.76	
1318	D5001	0.70		0.68	
1395		-----	W	-----	First reported: 0.00
1538	D5001	0.68		-0.19	
1610		-----		-----	
1616	D5001	0.675		-0.40	
1631	D5001	0.66		-1.05	
1724	D5001	0.67		-0.62	
1833	D5001	0.68		-0.19	
1913	D5001	0.675		-0.40	

|	
normality	OK
n	17
outliers	0
mean (n)	0.6843
st.dev. (n)	0.02111
R(calc.)	0.0591
R(D5001:10)	0.0646

Kernel Density
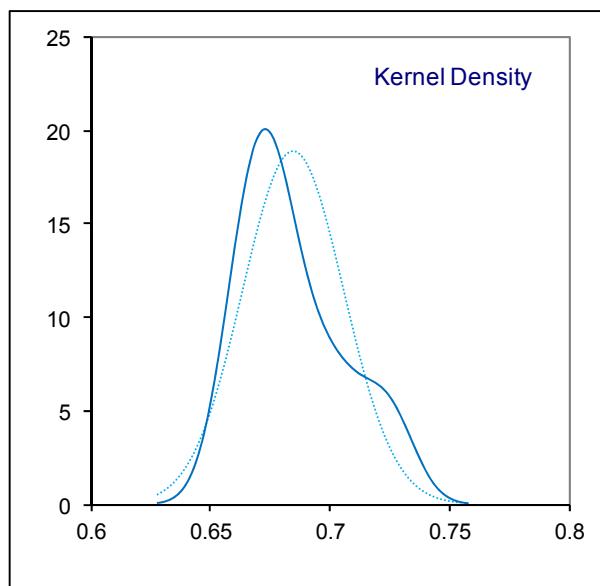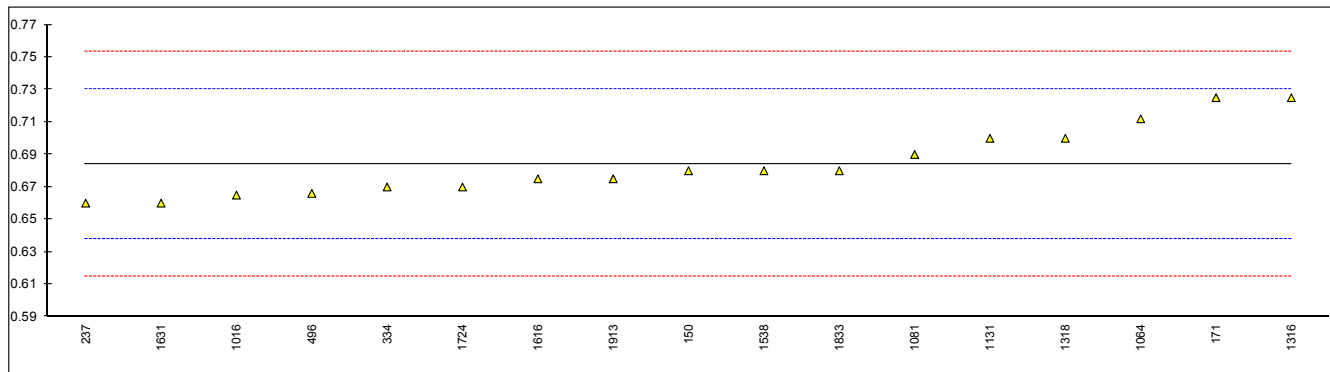
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Determination of Particle Size Distribution on sample #14172 acc. to IP564; results in mL^{-1}

lab	method	≥4 µm		≥6 µm		≥14 µm		≥21 µm		≥25 µm		≥30 µm	
150	IP564	**44724.6**	ex	**4342.7**	ex	**13.9**	ex	**1.7**	ex	**0.5**	ex	**0.1**	ex
171		-----		-----		-----		-----		-----		-----	
230		-----		-----		-----		-----		-----		-----	
237		-----		-----		-----		-----		-----		-----	
253	IP564	28776.2		7117.4		12.1		2.0		0.9		0.3	
311	IP564	3292		142		19		7		5		3	
323	IP564	20826		2634		34		9		4		2	
333		-----		-----		-----		-----		-----		-----	
334		-----		-----		-----		-----		-----		-----	
335		-----		-----		-----		-----		-----		-----	
369	IP564	15635		2688		6.6		-----		-----		-----	
372	IP564	15508		2782		8.5		1.8		0.9		0.4	
445		-----		-----		-----		-----		-----		-----	
447	IP564	16352		2463		7		1		0		0	
657		-----		-----		-----		-----		-----		-----	
671		-----		-----		-----		-----		-----		-----	
823		-----		-----		-----		-----		-----		-----	
851	IP564	12795.2		1095.2		12.4		**8.2**	ex	**6.6**	ex	<u>5.3</u>	
869		-----		-----		-----		-----		-----		-----	
922		-----		-----		-----		-----		-----		-----	
963		-----		-----		-----		-----		-----		-----	
974	IP564	3404		283		1.7		0.6		0.5		0.2	
1016		-----		-----		-----		-----		-----		-----	
1039		-----		-----		-----		-----		-----		-----	
1064	IP564	23378.7		3719.3		19.4		2.1		0.9		0.3	
1065	IP564	28884.5		4100.9		6.3		1.1		0.5		0.2	
1079		-----		-----		-----		-----		-----		-----	
1081	IP564	20494		2584		7		1		1		0	
1097	IP564	23468.0		4027.5		8.7		1.7		1.0		0.6	
1109		-----		-----		-----		-----		-----		-----	
1131		-----		-----		-----		-----		-----		-----	
1146	ISO11500	<u>1371153</u>		<u>45527</u>		<u>2287</u>		<u>527</u>		<u>200</u>		<u>33</u>	
1200		-----		-----		-----		-----		-----		-----	
1201		-----		-----		-----		-----		-----		-----	
1299	IP577	23267		4108		26.3		4.1		1.6		0.7	
1316	IP564	37100		6390		27		5		2		1	
1372		-----		-----		-----		-----		-----		-----	
1395	IP564	29285		6281		16		4		1		0	
1402		-----		-----		-----		-----		-----		-----	
1538		-----		-----		-----		-----		-----		-----	
1587	IP564	31747.7		<u>11765.1</u>		<u>133.4</u>		6.0		1.2		0.3	
1610		-----		-----		-----		-----		-----		-----	
1616	IP564	21300.2		2678.6		10.8		6.6		6.0		4.1	C
1631		-----		-----		-----		-----		-----		-----	
1724		-----		-----		-----		-----		-----		-----	
1776	IP564	19665.0		2897.3		6.1		1.0		0.4		0.1	
1782		-----		-----		-----		-----		-----		-----	
1811		-----		-----		-----		-----		-----		-----	
1833		-----		-----		-----		-----		-----		-----	
1913	IP564	20117.3		2187.9		6.4		1.3		0.9		0.4	
1914	IP564	19871.0		5781.3		<u>128.9</u>		<u>16.5</u>		4.7		1.1	
1951		-----		-----		-----		-----		-----		-----	
2130	IP564	19459		3365		8		1		1		<1	
	normality	OK		OK		suspect		OK		suspect		not OK	
	n	21		20		19		18		19		18	
	outliers	1 (+1 ex)		2 (+1ex)		3 (+1ex)		2 (+2ex)		1 (+2x)		2 (+1ex)	
	mean (n)	20696.46		3366.27		12.81		3.13		1.76		0.82	
	st.dev. (n)	8241.967		1907.061		8.646		2.579		1.763		1.126	
	R(calc.)	23077.51		5339.77		24.21		7.22		4.94		3.15	
	R(IP564:13)	(3879.33)		(1054.79)		(17.03)		(3.97)		(2.36)		(1.35)	

Bold and underlined test results: statistical outliers acc. to Grubbs/Dixon/Rosner outlier test.
Bold test results belong to excluded values

Lab 1616 first reported for ≥30 µm: 5.1
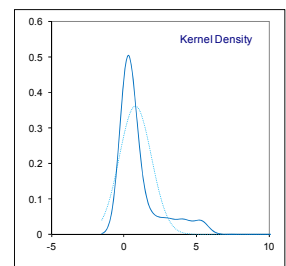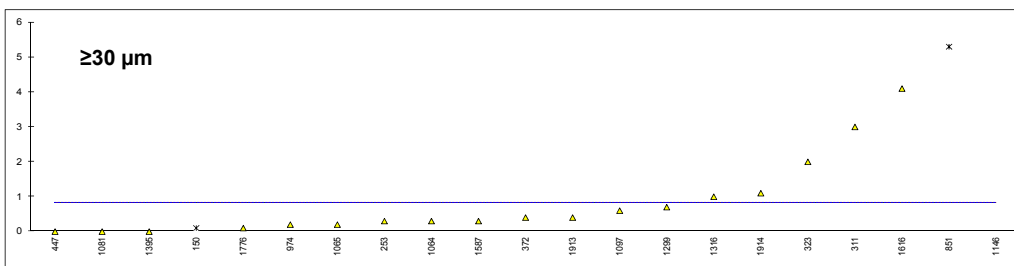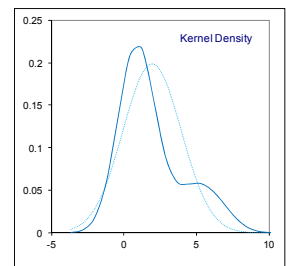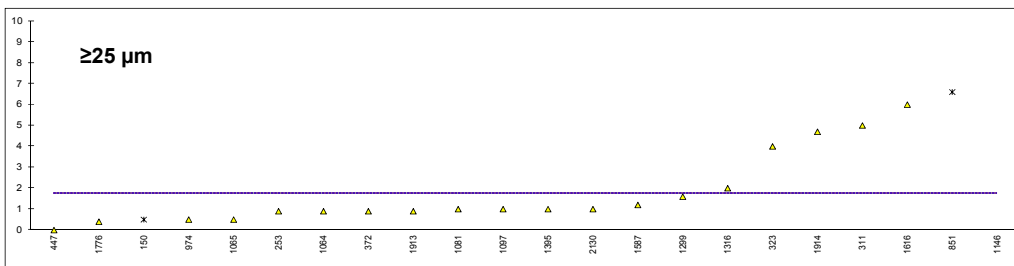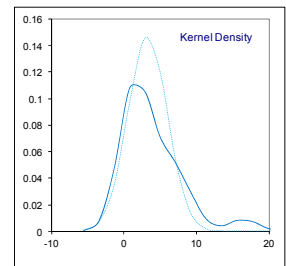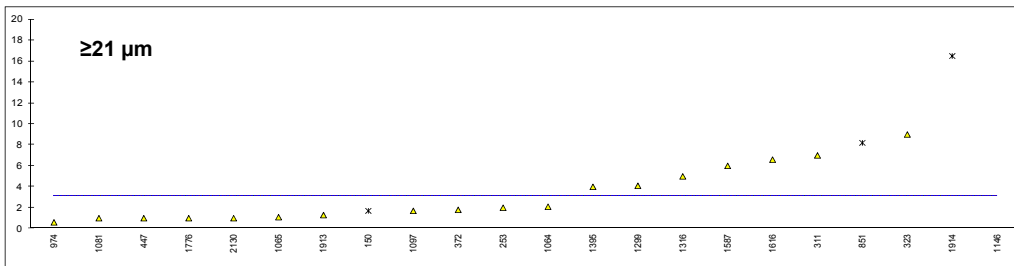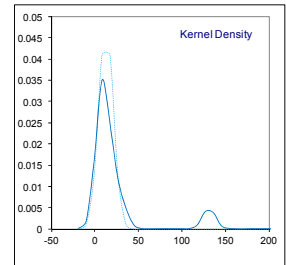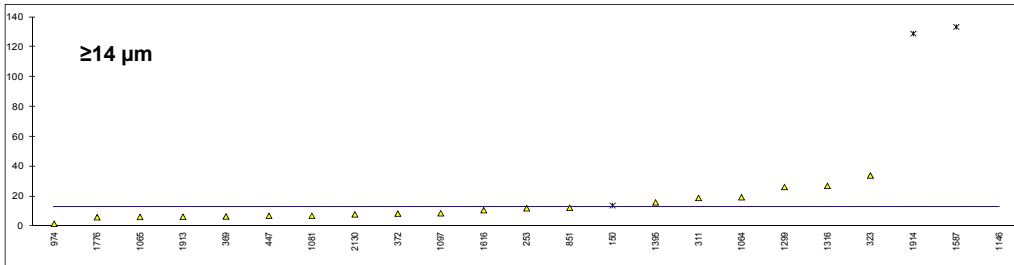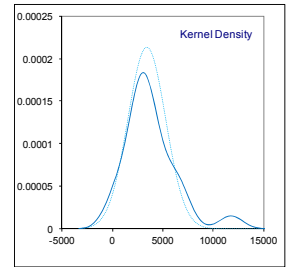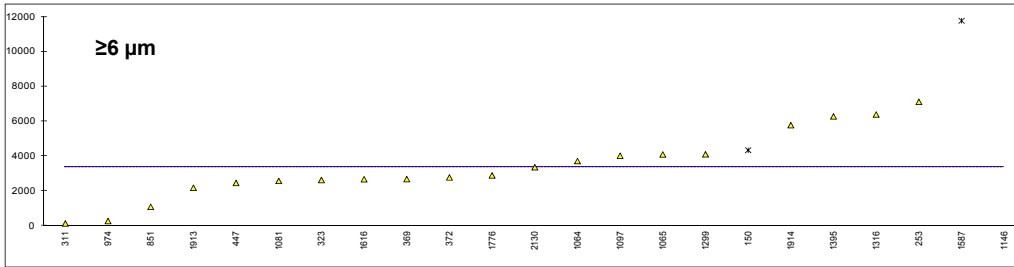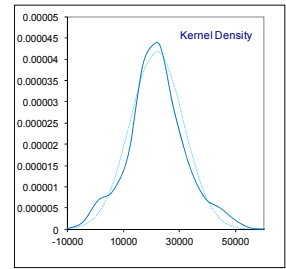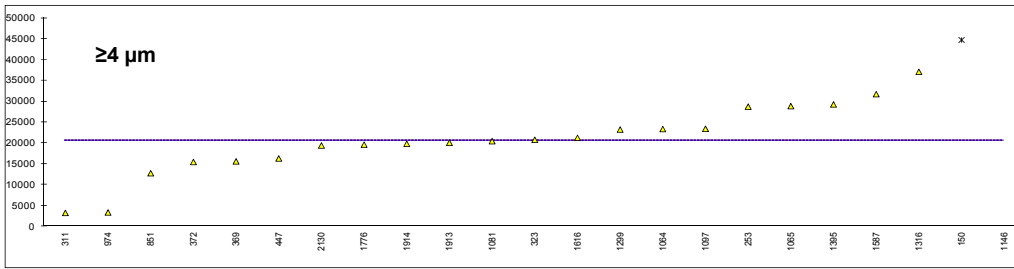
Determination of Particle Size Distribution on sample #14172 acc. to IP565; results in mL^{-1}

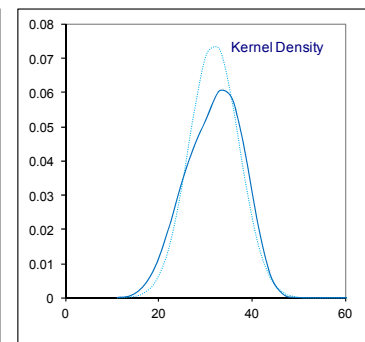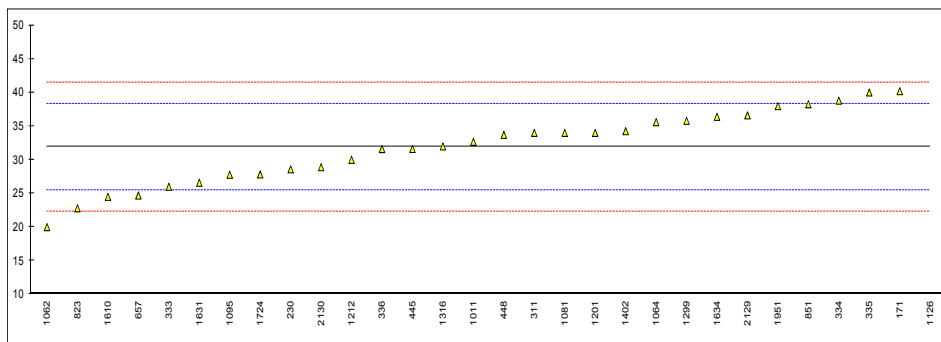| lab	method	≥4 µm	≥6 µm	≥14 µm	≥21 µm	≥25 µm	≥30 µm
150	IP565	44783.5	4355.3	14.6	1.6	0.4	0.2
171	IP565	33878	8060	24	<2	<1	<1
230		-----	-----	-----	-----	-----	-----
237		-----	-----	-----	-----	-----	-----
253		-----	-----	-----	-----	-----	-----
311		-----	-----	-----	-----	-----	-----
323		-----	-----	-----	-----	-----	-----
333	IP565	50708	6906	19	3	2	1
334	IP565	41161	8755	18	2	2	1
335	IP565	41360	7502	17	2	1	1
369		-----	-----	-----	-----	-----	-----
372		-----	-----	-----	-----	-----	-----
445	IP565	6976.1	1372.6	8.2	1.8	0.8	0.4
447		-----	-----	-----	-----	-----	-----
657	IP565	3837.9	28.6	2.5	0.9	0.4	0.2
671		-----	-----	-----	-----	-----	-----
823		-----	-----	-----	-----	-----	-----
851		-----	-----	-----	-----	-----	-----
869	IP565	16251.2	673.4	9.3	1.8	0.8	0.4
922	IP565	45055.9	7233.2	9.9	1.5	0.5	0.2
963		-----	-----	-----	-----	-----	-----
974		-----	-----	-----	-----	-----	-----
1016	IP565	38386.0	6169.8	11.5	1.7	0.4	0.3
1039	IP565	33789	6162	25	3	1	1
1064		-----	-----	-----	-----	-----	-----
1065		-----	-----	-----	-----	-----	-----
1079	IP565	29731.7	1524.2	13.6	3.5	1.5	0.6
1081		-----	-----	-----	-----	-----	-----
1097		-----	-----	-----	-----	-----	-----
1109	IP565	45359.8	8862.4	19.2	2.6	1.0	0.2
1131	IP565	30511.8	2941.6	**139.8** C	**72.0** C	**28.0** C	1.0
1146		-----	-----	-----	-----	-----	-----
1200		-----	-----	-----	-----	-----	-----
1201	IP565	26847	1045	8	1	0.6	0.2
1299		-----	-----	-----	-----	-----	-----
1316		-----	-----	-----	-----	-----	-----
1372	IP565	24630.6	854.6	9.1	1.1	0.6	0.3
1395		-----	-----	-----	-----	-----	-----
1402	IP565	40968.7	12190.0	**38.3**	3.3	1.3	0.5
1538	IP565	8446.6	221.0	5.5	1.3	0.7	0.5
1587		-----	-----	-----	-----	-----	-----
1610	IP565	18815.3	593.9	6.8	1.2	0.5	0.2
1616		-----	-----	-----	-----	-----	-----
1631	IP565	36562	4940	13.7	2.5	1.1	0.6
1724	IP565	20927.8	1058.8	7.9	1.5	0.5	0.1
1776		-----	-----	-----	-----	-----	-----
1782		-----	-----	-----	-----	-----	-----
1811	IP565	14073	561.8	6.7	1.9	0.7	0.3
1833	IP565	32431	3941.1	13.1	2.8	1.2	0.6
1913		-----	-----	-----	-----	-----	-----
1914		-----	-----	-----	-----	-----	-----
1951	IP565	18640.4	2017.5	5.4	0.7	0.3	0.1
2130		-----	-----	-----	-----	-----	-----
	normality	OK	OK	OK	OK	suspect	OK
	n	24	24	22	22	22	23
	outliers	0	0	2	1	1	0
	mean (n)	29338.84	4082.07	12.18	1.94	0.88	0.47
	st.dev. (n)	13383.081	3496.025	6.119	0.810	0.486	0.321
	R(calc.)	37472.63	9788.87	17.13	2.27	1.36	0.90
	R(IP565:13)	(3121.04)	(913.21)	(23.83)	(5.05)	(2.62)	(1.24)

Bold and underlined test results: statistical outliers acc. to Grubbs/Dixon/Rosner outlier test.

Lab 1131 first reported for ≥14 µm: 39.8, ≥21 µm: 7.2 and ≥25 µm: 2.8

≥4 µm

≥6 µm

≥14 µm

≥21 µm

≥25 µm

≥30 µm
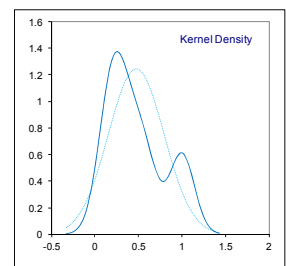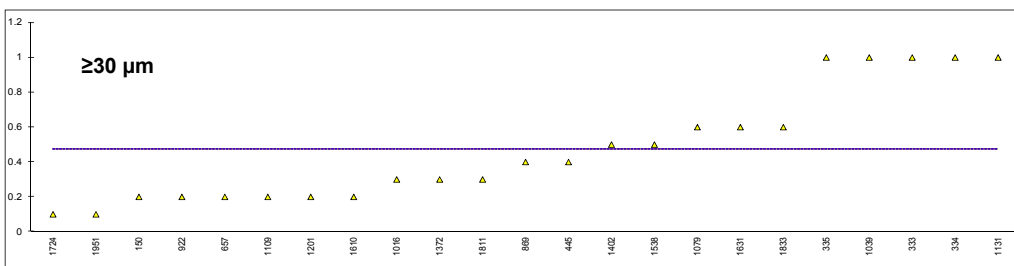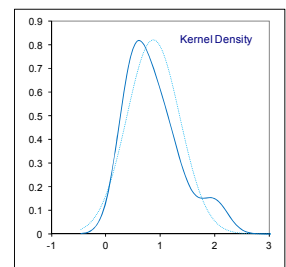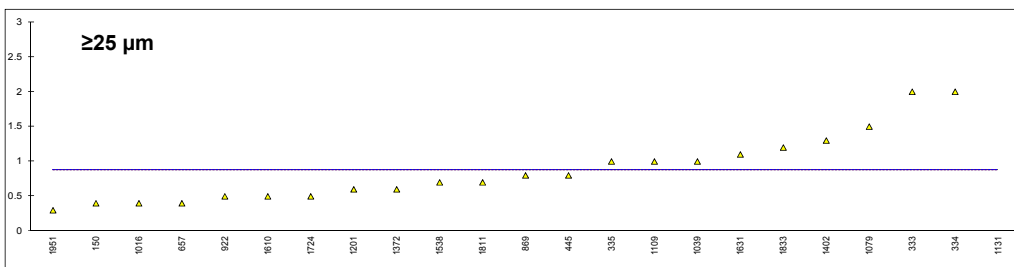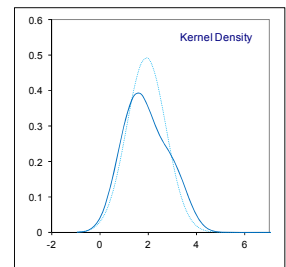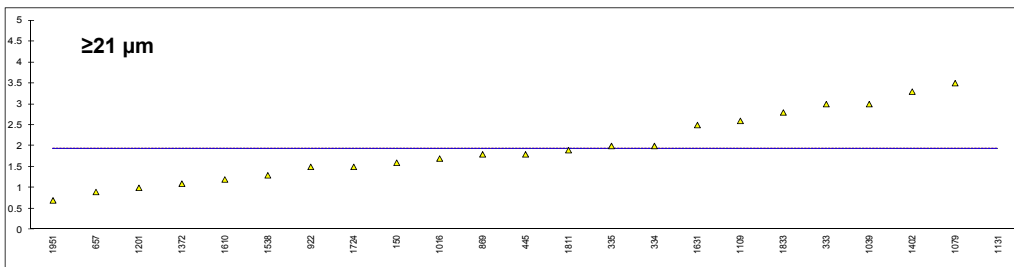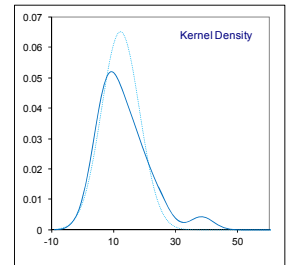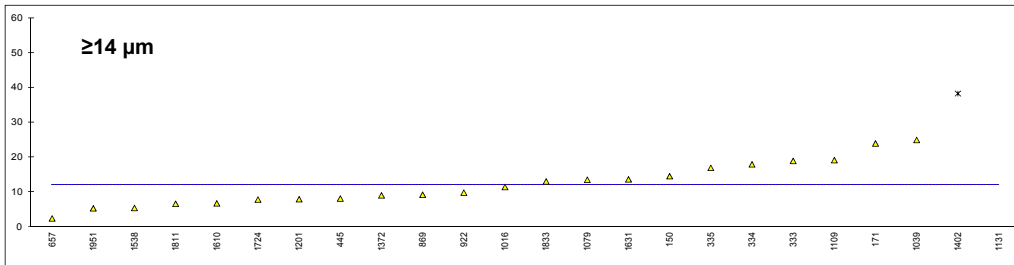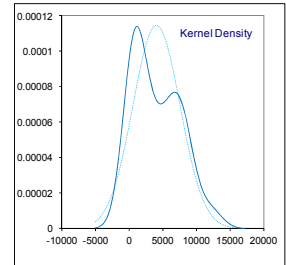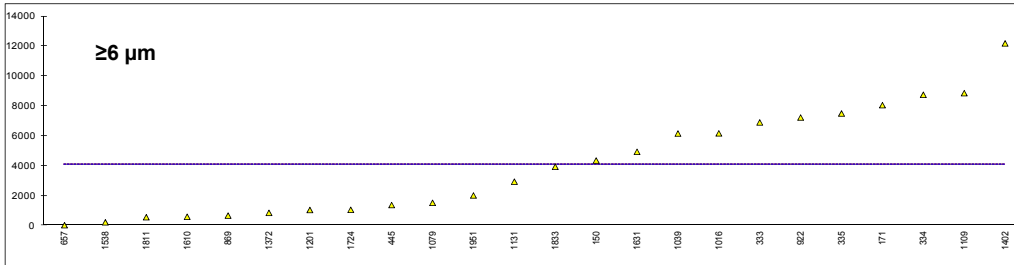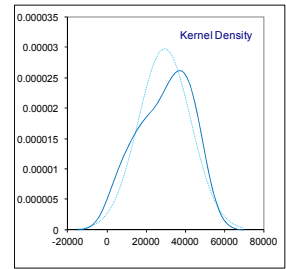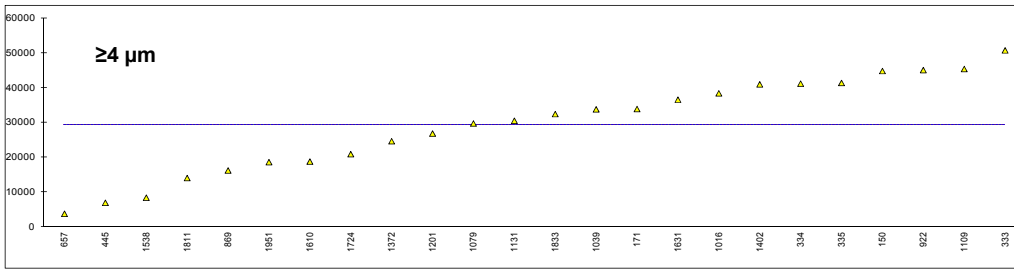
Determination of FAME on sample #14173; results in mg/kg

lab	method	value	mark	z(targ)	remarks
171	IP585	40.2		2.58	
230	IP585	28.59		-1.03	
311	IP585	34		0.65	
323		-----		-----	
333	IP585	26.0		-1.84	
334	IP585	38.8		2.15	
335	IP585	40		2.52	
336	IP585	31.6		-0.09	
445	IP585	31.61		-0.09	
447		-----		-----	
448	IP585	33.7		0.56	
496		-----		-----	
657	IP585	24.7		-2.24	
823	IP585	22.8		-2.83	
851	IP PM-DY/09	38.26		1.98	
862		-----		-----	
1011	IP585	32.67		0.24	
1062	in house	20		-3.70	
1064	PM IP DY-09	35.6		1.15	
1081	IP585	34		0.65	
1095	IP585	27.78		-1.28	
1126	EN14078	700	C,R(0.01)	207.82	First reported: 0.07% V/V, corrected to 0.07% M/M (probably unit error)
1161		-----		-----	
1201		34		0.65	
1212	IP585	30		-0.59	
1299	IP585	35.8		1.21	
1316	IP585	32.0		0.03	
1402	IP585	34.26		0.73	
1610	IP590	24.5		-2.30	
1631	IP590	26.59		-1.65	
1634	IP585	36.4		1.40	
1724	IP590	27.83		-1.27	
1782		-----		-----	
1833		-----		-----	
1842		-----		-----	
1951	IP585	37.98		1.89	
2129	IP590	36.6		1.46	
2130	IP590	28.9		-0.93	

	normality	OK
	n	29
	outliers	1
	mean (n)	31.902
	st.dev. (n)	5.3609
	R(calc.)	15.011
	R(IP585:10)	9.001

APPENDIX 2

Lab 177 first reported:	Temp. at 50% recovery 168.4	Lab 1787 first reported:	Temp. at 10% recovery 162.80
Lab 631 first reported:	Temp. at 10% recovery 165.0	Lab 1811 first reported:	FBP 239.9
Lab 785 first reported:	Temp. at 50% recovery 185.9	Lab 1881 first reported:	Temp. at 10% recovery 165.0
Lab 1121 first reported:	FBP 257.5		Temp. at 50% recovery 186.0
Lab 1182 first reported:	IBP 146.3		Temp. at 90% recovery 220.0

z-scores distillation ASTM D86.

lab	method	IBP	10% rec.	50% rec.	90%rec.	FBP
52	D86	0.75	0.19	0.00	0.65	0.36
62	D86	0.49	1.33	1.41	-0.43	1.03
120	D86	0.15	-0.26	0.28	0.57	-0.31
131		-----	-----	-----	-----	-----
132	D86	-1.04	0.34	0.57	1.07	-0.08
140	D86	0.95	0.49	-0.66	-1.27	-1.14
150	D86	-1.27	-0.49	-0.38	-0.35	-0.31
159	D86	-0.31	0.12	0.75	0.23	0.04
169	D86	-0.51	0.42	0.28	-0.27	0.20
171	D86	-1.14	-0.79	0.10	-0.18	-0.55
175	D86	0.19	-0.19	0.94	1.40	1.03
177	D86	-0.14	-0.26	-0.66	-1.60	-1.54
194	D86	-1.54	-0.34	-0.38	-0.93	0.08
216		-----	-----	-----	-----	-----
221	D86	0.49	-0.26	0.85	0.23	0.32
224	D86	0.64	0.28	0.34	1.03	0.01
228	D86	0.15	-1.02	-1.04	-1.85	**2.68**
230	D86	0.29	-1.09	-1.51	-0.35	0.08
237	D86	-0.18	-0.64	0.85	0.65	0.32
238		-----	-----	-----	-----	-----
252	D86	0.15	0.49	-0.09	-0.18	0.32
253	D86	0.49	0.49	1.32	0.65	0.12
254	D86	0.15	1.25	0.85	0.65	0.71
256	D86	0.15	0.49	-0.09	-0.18	0.32
258	D86	1.08	0.57	0.57	0.73	0.16
273	D86	-1.37	-0.41	-0.19	0.07	0.28
311	D86	0.42	-0.56	-0.09	0.15	0.32
323	D86	-0.08	-0.64	0.10	-0.35	0.00
333	D86	-0.81	0.12	-0.56	-1.10	-0.12
334	D86	0.39	-0.11	0.47	-0.35	1.66
335	D86	-0.08	-0.04	0.57	0.98	-0.08
340	D86	0.88	-0.19	-0.09	0.40	-0.87
353	D86	0.09	0.72	0.28	1.57	0.59
369	D86	0.02	-1.09	-0.09	2.15	0.95
370	D86	0.98	0.57	1.32	1.32	0.20
371	D86	0.88	0.19	0.75	0.40	0.04
372	D86	-0.18	-0.19	0.10	0.15	0.08
399	D86	1.98	1.55	0.85	-0.10	0.12
402	D86	0.52	-0.64	-1.51	-1.43	-1.18
440	IP123	0.65	0.87	1.13	0.82	1.07
445	D86	-0.11	0.19	0.66	1.32	0.44
447	D86	-0.61	0.95	0.94	1.65	0.20
448	D86	0.35	-0.49	-0.75	-0.18	0.28
463	D86	0.22	-0.11	0.19	0.73	0.36
473	D86	0.09	0.72	0.94	1.48	0.36
485	D86	-0.21	0.38	0.43	-0.10	0.24
496	D86	-0.38	0.04	0.10	-0.60	0.12
601		-----	-----	-----	-----	-----
604	D86	-0.48	-1.02	-2.26	-0.27	-1.46
606	D86	0.39	0.64	0.85	0.15	-0.08
608	D86	-0.58	0.04	-0.28	-0.77	-0.83
631	D86	-0.18	-0.26	-1.51	-1.02	-0.67
657	D86	-0.08	0.49	1.04	1.32	0.59
663	D86	0.42	0.27	0.28	0.69	0.32
671	D86	-0.41	-0.34	0.57	-0.85	-0.59
732	D86	-0.18	-2.15	-1.51	-1.02	-0.87
785	ISO3405	-0.21	0.49	0.38	0.23	0.51
823	D86	-0.31	0.80	0.10	-0.60	0.87
851	D86	0.49	0.72	0.75	1.32	0.40
854	D86	-0.64	0.95	0.66	0.15	-0.23
862	D86	-0.41	0.34	-0.09	-0.35	-0.31
869	D86	-0.51	-1.02	-1.04	-0.18	-0.47
922	D86	-0.44	-0.87	-0.75	-1.60	0.12
962		-----	-----	-----	-----	-----
963		-----	-----	-----	-----	-----
974	D86	-0.01	-0.34	-0.47	0.07	-0.71

994	D86	0.15	-1.40	-1.04	-0.18	-0.47
995	D86	0.05	-0.87	-0.09	0.23	-0.08
996	D86	-0.18	-0.64	-0.56	-0.60	-0.08
997	D86	-0.01	-0.26	-0.09	0.23	-0.08
998		-----	-----	-----	-----	-----
1011	D86	0.12	0.04	0.10	0.40	0.83
1016		-----	-----	-----	-----	-----
1021		-----	-----	-----	-----	-----
1039	D2887	-1.17	-0.49	1.04	-0.68	1.22
1049	D86	-0.24	1.02	0.57	0.57	0.12
1059	D86	-0.44	0.57	0.85	0.23	0.51
1062	D86	-0.28	0.95	1.23	0.98	0.20
1064	D86	0.29	0.19	0.47	1.23	0.16
1065	D86	0.88	-0.19	-0.56	-0.35	0.04
1079	D86	0.02	0.19	1.13	1.07	0.44
1081	D86	0.35	-0.64	-1.13	-1.68	-0.59
1097	ISO3405	0.92	1.10	0.94	1.23	-0.51
1109	D86	0.35	-0.72	-0.47	-0.43	0.79
1121	IP123	-1.01	0.87	-0.56	-0.60	**6.23**
1126	in house	0.05	1.55	**3.68**	0.98	1.70
1131		-----	-----	-----	-----	-----
1134	D86	-0.48	-0.49	-0.19	0.90	-0.08
1146	ISO3405	-0.44	-0.49	-1.13	-1.68	-0.27
1150	ISO3405	0.92	-0.77	-1.70	-2.21	-1.46
1161	ISO3405	-0.28	-2.38	-1.32	0.15	0.32
1182	D86	-1.01	-0.72	-0.94	0.40	-0.43
1201		-----	-----	-----	-----	-----
1212	D86	-0.44	0.42	0.28	-0.18	0.40
1231	D86	-0.74	0.04	0.28	0.69	-0.35
1279	D86	-0.54	0.64	0.57	0.82	-0.51
1297	D86	-0.28	-0.72	-0.94	-1.93	-1.54
1299	D86	-0.38	0.19	0.38	0.98	-0.08
1316	D86	-0.67	-0.11	0.28	0.40	-0.27
1318	D86	-0.71	0.34	-0.09	-0.27	-0.23
1376	D86	-0.24	-0.64	0.57	0.32	0.71
1395	D86	0.75	-0.19	-0.66	-0.43	-1.65
1417	IP123	0.22	-0.19	1.23	2.40	0.48
1429	D86	-0.48	-0.72	-1.13	-1.52	-1.06
1448	D86	-0.41	0.64	0.57	0.90	0.04
1491	D86	1.08	0.72	0.75	0.82	1.46
1496	D86	0.39	0.12	0.28	0.65	0.24
1520	D86	-0.41	-0.79	-1.70	-3.26	-1.50
1538	D86	0.68	0.42	-0.19	-0.18	-0.98
1543		-----	-----	-----	-----	-----
1564	D86	0.98	1.25	0.10	0.07	0.87
1570	D86	-0.41	0.04	-0.28	-1.35	-0.12
1586	D86	0.02	-0.04	0.28	1.23	-0.16
1587	D86	0.49	0.19	-0.09	-0.77	-0.20
1610	D86	0.55	-0.19	-0.38	-0.10	-0.39
1616	D86	-0.87	0.12	0.10	-0.27	-0.71
1631	D86	0.49	0.19	-0.09	-0.02	0.44
1634	D86	-0.34	0.42	0.38	1.40	0.44
1636	D86	1.02	0.64	0.85	0.40	-0.35
1683	D86	-0.24	-0.34	-0.47	-0.10	-0.75
1694		-----	-----	-----	-----	-----
1715	D86	0.39	0.42	0.28	0.65	0.16
1720	D86	-0.41	0.42	0.47	0.32	1.18
1724	D86	0.12	0.19	-0.19	-0.43	0.00
1776	D86	-1.40	-0.41	-0.19	0.73	-0.27
1782	D86	-0.28	-0.19	-0.19	-0.52	-0.59
1787	D86	-0.58	-1.93	-2.18	-2.04	-1.35
1798	D86	1.20	0.98	0.75	0.94	-0.10
1811	D86	-0.38	-1.25	-1.70	-2.43	-1.54
1833	D86	0.09	1.25	0.47	-0.02	0.83
1842	D86	-0.48	-0.41	0.57	0.82	0.48
1881	D86	-0.34	-1.02	-1.04	-1.43	-0.87
1883	D86	0.49	1.25	-1.98	-3.51	1.11
1913	D86	1.08	0.95	1.89	1.81	0.75
1914	D86	-0.51	-1.77	-1.51	-2.26	-1.26
1948	D86	0.55	-0.34	0.10	-0.60	0.40
1951	D86	0.15	1.02	1.04	1.07	0.48
2129	D86	0.95	-0.41	-0.85	-0.85	0.20
2130	D86	0.75	0.64	0.28	0.40	1.11

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

APPENDIX 3: Number of participants per country

1 lab in AFGHANISTAN	1 lab in MAURITIUS
1 lab in ALGERIA	1 lab in MOZAMBIQUE
1 lab in AUSTRALIA	8 labs in NETHERLANDS
1 lab in AZERBAIJAN	2 labs in NIGERIA
5 labs in BELGIUM	2 labs in NORWAY
1 lab in BULGARIA	1 lab in PAKISTAN
2 labs in CANADA	1 lab in PHILIPPINES
6 labs in CHINA, People's Republic	2 labs in POLAND
1 lab in CYPRUS	3 labs in PORTUGAL
1 lab in CZECH REPUBLIC	1 lab in QATAR
1 lab in DJIBOUTI	1 lab in ROMANIA
1 lab in EGYPT	2 labs in RUSSIAN FEDERATION
2 labs in ESTONIA	2 labs in SAUDI ARABIA
5 labs in FRANCE	1 lab in SENEGAL
2 labs in GEORGIA	1 lab in SINGAPORE
2 labs in GERMANY	1 lab in SLOVENIA
2 labs in GREECE	1 lab in SOUTH AFRICA
1 lab in GUAM	1 lab in SOUTH KOREA
1 lab in GUINEA REPUBLIC	4 labs in SPAIN
1 lab in HONG KONG	2 labs in SUDAN
1 lab in HUNGARY	6 labs in SWEDEN
1 lab in IRELAND	1 lab in TANZANIA
1 lab in ISRAEL	2 labs in THAILAND
1 lab in ITALY	1 lab in TOGO
1 lab in KAZAKHSTAN	2 labs in TUNISIA
2 labs in KENYA	5 labs in TURKEY
3 labs in LATVIA	1 lab in TURKMENISTAN
1 lab in LEBANON	1 lab in UNITED ARAB EMIRATES
3 labs in LITHUANIA	13 labs in UNITED KINGDOM
1 lab in MACEDONIA	11 labs in UNITED STATES OF AMERICA
5 labs in MALAYSIA	1 lab in URUGUAY
1 lab in MALTA	

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
R(0.01)   = outlier in Rosner outlier test
R(0.05)   = straggler in Rosner 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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