Results of Proficiency Test
Jet Fuel A1
September 2016

CONTENTS

Appendices:

1   INTRODUCTION

Since 1995, the Institute for Interlaboratory Studies organises every year proficiency tests (PT) for Jet Fuel A1. The interlaboratory study on Jet Fuel was extended with PTs for the determination of BOCLE, Particle Size Distribution and FAME. In the annual proficiency testing program of 2016/2017, it was decided to continue the 4 PTs on Jet Fuel A1 in accordance with the latest applicable version of the "Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS)", sometimes referred to as the "Joint Fuelling System Check List for Jet A-1". This is Issue 28 from March 2015, because Issue 29 was published after the closing date of the PT). In total 144 laboratories from 66 different countries have registered for participation of the interlaboratory study for Jet Fuel A1. See appendix 5 for the number of participants per country. This means that 134 laboratories in 62 countries registered for the main round (iis16J02), 23 laboratories in 17 countries for BOCLE (iis16J02BOCLE), 57 laboratories in 31 countries for Particle Size Distribution (iis16J02PS) and 58 laboratories in 29 countries for FAME (iis16J03FAME). In this report, the results of the four proficiency tests are presented and discussed. This report is also electronically available through the iis website 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 to an ISO/IEC 17025 accredited laboratory. For the main round Jet Fuel A1, it was decided to send two identical samples (2 x 1 litre bottles, labelled #16170) for the analyses according to the latest version of "Joint Fuelling System Check List for Jet A-1". For the BOCLE determination one sample (100 ml, labelled #16172) was sent, for the Particle Size Distribution determination one sample (0.5 L bottle, labelled #16173) and for the FAME determination two samples (both 100 ml, one labelled #16174 and one labelled #16175).
The participants were requested to report rounded and unrounded test results. The unrounded test 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 falls under the accredited scope. This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentiality of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires.

2.2 PROTOCOL

The protocol followed in the organisation 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 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 A1 (MAIN)

The necessary bulk material, approximately 400 litres, was obtained from a trader and homogenised in a mixing vessel. From this batch, 300 amber glass bottles of one litre were filled, closed with inner and outer caps and labelled #16170. The remainder of the batch was stored. The homogeneity of the subsamples #16170 was checked by the determination of Density in accordance with ASTM D4052 on ten stratified randomly selected samples.

	Density at 15°C in kg/m^3
Sample #16170-1	803.12
Sample #16170-2	803.12
Sample #16170-3	803.12
Sample #16170-4	803.12
Sample #16170-5	803.12
Sample #16170-6	803.12
Sample #16170-7	803.12
Sample #16170-8	803.11
Sample #16170-9	803.12
Sample #16170-10	803.12

Table 1: homogeneity test results of sub samples #16170

From the above test results, the repeatability was calculated and compared with 0.3 times the reproducibility of the reference test 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 test method	ASTM D4052:15
0.3 x R (ref. test method)	0.15

Table 2: evaluation of repeatability of subsamples #16170

The calculated repeatability was in agreement with 0.3 times the corresponding reproducibility of the target method. Therefore, homogeneity of all subsamples #16170 was assumed.

2.4.2 JET FUEL A1 – SAMPLE FOR BOCLE (BALL-ON-CYLINDER LUBRICITY EVALUATOR) DETERMINATION

For this sample, Jet Fuel was used that was obtained from a participating laboratory. Approximately 5 liter was homogenized. From this batch, 25 amber glass bottles of 0.1 liter were filled and labelled #16172. The homogeneity of the subsamples #16172 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 #16172-1	811.76
Sample #16172-2	811.76
Sample #16172-3	811.76
Sample #16172-4	811.76
Sample #16172-5	811.76
Sample #16172-6	811.76
Sample #16172-7	811.76
Sample #16172-8	811.76

Table 3: homogeneity test results of sub samples #16172

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)	0.00
reference method	D4052:15
0.3 x R (ref. method)	0.15

Table 4: evaluation of repeatability of subsamples #16172

The calculated repeatability was in agreement with 0.3 times the corresponding reproducibility of the target method. Therefore, homogeneity of the subsamples #16172 was assumed.

2.4.3 JET FUEL PARTICLE SIZE DISTRIBUTION DETERMINATION (PS)

The bulk material for Particle Size Distribution Determination was obtained from a participating laboratory. Approximately 200 litres bulk material was homogenized. From this material 100 amber glass bottles of 0.5 litres were filled during constant mixing, closed with inner and outer caps and labelled #16173. The homogeneity of the subsamples #16173 was checked by the determination of Particle Size Distribution in accordance with IP565 on seven stratified randomly selected samples.

	≥ 4 µm (c) parts/ml	≥ 6 µm (c) parts/ml	≥ 14 µm (c) parts/ml
Sample #16173-1	256	71	6
Sample #16173-2	288	77	9
Sample #16173-3	305	82	7
Sample #16173-4	274	71	7
Sample #16173-5	290	77	7
Sample #16173-6	301	85	8
Sample #16173-7	286	82	7

Table 5: homogeneity test results of sub samples #16173

From the above test results, the repeatabilities were calculated and compared with 0.3 times the reproducibilities of the reference test method in agreement with the procedure of ISO13528, Annex B2 in the next table:

	≥ 4 µm (c) parts/ml	≥ 6 µm (c) parts/ml	≥ 14 µm (c) parts/ml
r (observed)	46.4	15.4	2.7
reference test method	IP565:13	IP565:13	IP565:13
0.3 x R (ref. test method)	68.3	34.6	6.5

Table 6: evaluation of repeatabilities of subsamples #16173

The calculated repeatabilities for the particle sizes ≥ 4 µm (c), ≥ 6 µm (c) and ≥ 14 µm (c) were in agreement with 0.3 times the target reproducibility of the respective reference test methods. Therefore, homogeneity of the subsamples of #16173 was assumed.

2.4.4 JET FUEL A1 – SAMPLE FOR FATTY ACID METHYL ESTER (FAME) DETERMINATION

It was decided to prepare two samples for FAME determination in Jet fuel with low and high level of FAME. Approximately 15 liter Jet fuel bulk material was spiked with 0.060 gram Biodiesel B100 and homogenised. From this batch 60 amber glass bottles of 0.1 liter were filled and labelled #16175.

Because the spike of sample #16175 was close to the lower limit of test method IP585, it was decided to evaluate the homogeneity after the PT. Looking at the results of the FAME content of this sample (see Appendix 1), it can be concluded that calculated reproducibility of the group of laboratories is almost in agreement with the target reproducibility of the method. Therefore, the homogeneity of the subsamples was assumed sufficient.

The amount left over of the batch used for #16175 (8 liter) was spiked with 0.294 gram Biodiesel B100 and homogenised. From this batch 60 amber glass bottles of 0.1 liter were filled and labelled #16174.

The homogeneity of the subsamples #16174 was checked by the determination of FAME in accordance with method IP585 on 8 stratified randomly selected samples.

	FAME in mg/kg
Sample #16174-1	33
Sample #16174-2	33
Sample #16174-3	32
Sample #161744	35
Sample #16174-5	31
Sample #16174-6	31
Sample #16174-7	35
Sample #16174-8	30

Table 7: homogeneity test results of sub samples #16174

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

	FAME in mg/kg
r (observed)	5.2
reference method	IP585:13
r (ref. method)	5.8

Table 8: evaluation of repeatabilities of subsamples #16174

The calculated repeatability was in agreement with the repeatability of the reference method. Therefore, homogeneity of the subsamples of #15174 was assumed.

Depending on the registration of each individual participant the following samples were dispatched on August 24, 2016: 2 bottles Jet Fuel A1 (2*1 liter, labelled #16170), 1 bottle especially prepared for the BOCLE determination (1*0.1L, labelled #16172), 1 bottle especially prepared for the Particle Size Distribution determination (1*0.5L, labelled #15173) and 2 bottles especially prepared for the FAME determination (1*0.1 L, labelled #15174 + 1*0.1 L, labelled #15175).

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 D4306:15. The material has been found sufficiently stable for the period of the proficiency test.

2.6   ANALYSES

The participants were requested to determine on sample #16170: Total Acidity, 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 and FBP), Existent Gum (unwashed), Flash Point, Freezing Point, JFTOT, Kinematic Viscosity at -20°C, Mercaptan Sulphur, MSEP, Naphthalenes, Smoke Point, Specific Energy (on Sulphur free basis) and Total Sulphur. The participants were requested to determine on sample #16172 BOCLE only, on sample #16173 Particle Size Distribution only and on samples #16174 and #16175 FAME only.

The analyses should be performed according to the "Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS), version March 2015", also referred to as the "Joint Fuelling System Check List" or simply "Check List".

To get comparable test results a detailed report form, on which the units were prescribed as well as the reference test methods and a letter of instructions were prepared and made available on the data entry portal www.kpmd.co.uk/sgs-iis/. The laboratories were also requested to confirm the sample receipt on the same data entry portal together with some details of the test methods used. A SDS of the samples was added to the sample package.

3   RESULTS

During five weeks after sample dispatch, the test results of the individual laboratories were gathered via the data entry portal www.kpmd.co.uk/sgs-iis/. The reported test results are tabulated per determination in appendix 1 of this report. The laboratories are presented by their code numbers.

Directly after the deadline, a reminder was sent to those laboratories that had not reported test results at that moment. Shortly after the deadline, the available test results were screened for suspect data. A test 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 reported test results (no reanalysis). Additional or corrected test results are used for data analysis and original test results are placed under 'Remarks' in the test result tables in appendix 1. Test results that came in after the deadline were not taken into account in this screening for suspect data and thus these participants were not requested for checks.

3.1   STATISTICS

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the 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 test results. Test 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 test results should be used with due care.

According to ISO 5725 the original test results per determination were submitted to Dixon's, Grubbs' and/or Rosner's outlier tests. Outliers are marked by D(0.01) for the Dixon's test, by G(0.01) or DG(0.01) for the Grubbs' test and by R(0.01) for the Rosner's test. Stragglers are marked by D(0.05) for the Dixon's test, by G(0.05) or DG(0.05) for the Grubbs' test and by

R(0.05) for the Rosner's test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

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

Finally, the reproducibilities were calculated from the standard deviations by multiplying 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 test results are plotted. The corresponding laboratory numbers are on 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 reference test method. 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. Also a normal Gauss curve was projected over the Kernel Density Graph for reference.

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 variation 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 according to:

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

The $z_{(target)}$ scores are listed in the test result tables in appendix 1.
Absolute values for z<2 are very common and absolute values for z>3 are very rare.

The usual interpretation of z-scores is 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 interlaboratory study, no major problems with sample dispatch were encountered.
For the main round Jet Fuel A1, four participants reported the test results after the final reporting date and another six participants did not report any test results at all. For the BOCLE round, all reporting participants reported the test results before the final reporting date and four participants did not report any test results at all. For the Particle Size Distribution round, three participants reported the test results after the final reporting date and another nine participants did not report any test results at all. And for the FAME round, three participants reported the test results after the final reporting date and fifteen did not report any results at all.
Finally, 137 participants reported in total 2710 numerical test results. Observed were 49 outlying test results, which is 1.8% of the reported numerical test results. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

4.1   EVALUATION PER TEST

In this section, the reported test results are discussed per sample and per test. The test methods, which were used by the various laboratories, were taken into account for explaining the observed differences where possible and applicable. These test methods are also in the tables together with the reported test results. The abbreviations, used in these tables, are listed in appendix 5.

In the iis PT reports, ASTM test methods are referred to with a number and if appropriate an indication of sub test method (e.g. D1840-B) and an added designation for the year that the test method was adopted or revised (e.g. D1840-B:07). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D1840-B:07(2013)). In the test results tables of Appendix 1 only the test method number and year of adoption or revision e.g. D1840-B:07 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.

Since the Joint Fuelling System Check List for Jet-A1 is continuously updated, the participants are advised to monitor the updates. The latest version at the time of this Round Robin is "DEF STAN 91-91/Issue 7 Amendment 3, dated: February 2015" and ASTM D1655:16a. One must keep in mind that ISO test methods are not mentioned in the "Checklist".

Jet Fuel A1: sample #16170

Acidity, Total: This determination may be problematic for a number of laboratories. Five statistical outliers were observed. Three participants reported a test method (ASTM D664 and ASTM D974) other than ASTM D3242 or IP354 mentioned in the check list for Jet Fuel A1. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D3242:11.

Aromatics by FIA: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with ASTM D1319:15.

Aromatics by HPLC: The determination in %M/M was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with ASTM D6379:11.
The determination in %V/V may be problematic. No statistical outliers were observed. Regretfully, no precision data for the determination in %V/V is mentioned in ASTM D6379:11. However, the calculated reproducibility was larger than the calculated reproducibility in %V/V of the proficiency tests iis16J01 and iis15J02..

Colour Saybolt: The determination was problematic for the automatic test method ASTM D6045. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D6045:12. Some of the variation may be caused by the fact that the majority of the laboratories reported to have used a different cell than the suggested 100 mm cell in ASTM D6045. The calculated reproducibility over the reported results of thirteen participants who have indeed used a 100 mm cell is closer to the requirements of ASTM D6045:12. 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 D156:15.

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 D4052:15.

Distillation: This determination was not problematic. In total, six statistical outliers were observed. Eighty percent of the reported test results were obtained with an automated method. The calculated reproducibilities after rejection of the statistical outliers are all in agreement with the automated mode requirements of ASTM D86:16a.
When compared to the manual mode requirements of ASTM D86:16a only the calculated reproducibility for IBP is not in agreement.

Existent Gum: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in good agreement with ASTM D381:12.

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 IP170/ISO13736 and ASTM D56 or ASTM D3828 are mentioned as test methods. Still some participants (nine in total) reported test methods, which are not equivalent to D93 or ISO2719.

Freezing Point: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D2386:15e1.

JFTOT: The test results for tube rating are reported mostly as <1 or 1 and by some as <2. No statistical analysis can be done on this parameter as this is a qualitative parameter.
For Delta P the majority of the participants reported a value ≤3 mmHg. No statistical outliers were observed. Regretfully, no precision data for the Delta P is mentioned in ASTM D3241:16a. The value of ≤3 mmHg is well within the maximum limit stated in the Checklist.

Kin. Viscosity at -20°C: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D445:15a.

Mercaptan Sulphur: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D3227:13.

MSEP: 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 D3948:14.

Naphthalenes: This determination was problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D1840:07(2013) procedure A or B. When the test results from the reported procedures A and B are evaluated separately, the calculated reproducibility after rejection of the statistical outliers of procedure B test results is in agreement and that of procedure A test results is not in agreement with the respective requirements of ASTM D1840:07(2013).

Smoke Point: This determination was not problematic. No statistical outliers were observed. Seventy percent of the reported test results were obtained with a manual

method. The calculated reproducibility is in agreement with the requirements of ASTM D1322:15e1-Manual.

When the test results from the reported manual and automated modes are evaluated separately, only the calculated reproducibility of the manual method is in agreement with the respective requirements of ASTM D1322:15e1.

Specific Energy: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D3338:09e2(2014).

Sulphur, Total: This determination was problematic for a number of laboratories. Five statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D5453:16e1.

For Jet Fuel BOCLE sample #16172

BOCLE: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of the ASTM D5001:10(2014) semi-automatic nor with the full-automatic method. When the test results from the reported semi-automatic and full-automatic mehods were evaluated separately, still the calculated reproducibility of the semi-automatic is not in agreement with the requirements of ASTM D5001:10(2014) semi-automatic. For the full-automatic method, the target reproducibility is much smaller. The calculated reproducibility for the full-automatic method only is closer, but not in agreement with the requirements of ASTM D5001:10(2014) full-automatic.

Jet Fuel PS sample #16173:

Particle Size Distribution Determination:
The Joint Fuelling System Check List for Jet-A1 lists test methods IP564, IP565 and IP577 as the reference test methods to determine the Particle Size Distribution in Jet Fuel A1. Over the last few years, iis has observed and concluded that these methods are biased and not as interchangeable as it appears from the checklist. Although no equipment suppliers are mentioned in the methods, the description of the equipment in the method defines the equipment than should be used. Therefore, the automatic particle counter (APC) in method IP564 is Parker Hannifin, in method IP565 it is Stanhope-Seta and in method IP IP577 it is Pamas.

This year the participants were requested to specify the brand of the particle counter, along with the method for calibration, the actual test method performed and the test method used for determining ISO code scaling. All participants mentioned the equipment used, thirteen participants used performed IP564, thirty-three used IP565 and two participants used IP 577. All reported (some after a correction) to have used the method that corresponds with the equipment used. Most participants used ISO11171 for the calibration, but also two participants used the equipment supplier (see appendix 4). All laboratories used ISO 4406 for calculating the scale numbers from the parts per ml. Some laboratories reported the test method for this (IP564/565/577), which in fact also is ISO4406, because these methods refer to ISO 4406 for assigning scale numbers. Only one participant (lab 1631) reported results in ISO scale numbers

that did not correspond to the measured parts/ml. However, this participant had corrected the parts/ml results, but did not correct the ISO scale number results. These results in ISO scale numbers were excluded.

Also in this PT, it was found that the test results of IP564 were significantly lower than those of IP565. This is generally the case, the same is also documented in an article found on internet (see literature reference 4). Therefore, it was decided to evaluate both methods separately. The results of the participants performing IP577 were evaluated in the group of IP565, because the results were more compatible with the results of IP565 than those of IP564 at the particle size distribution found in this PT sample.

Four laboratories (lab 230, 1026, 1776 and 6075) had three or more outliers for the six different particle sizes in parts/ml. The other test results for these laboratories, which were not an outlier, were excluded, as well as the results in ISO scale numbers.

IP564:   The determination according to IP564 was not problematic. In total, eight statistical outliers were observed for the six particle size categories and four test results were excluded. The calculated reproducibilities after rejection of the suspect data are all in agreement with the requirements of IP564:13. The determination expressed in ISO scale numbers may be problematic. No statistical outliers were observed and six test results were excluded. The calculated reproducibilities after rejection of the suspect data for ≥4 µm (c) and ≥6 µm (c) are not in agreement and for ≥14 µm (c) is in agreement with the indicative requirements of IP564:13 Annex C.

IP565:   The determination according to IP565 was only problematic for ≥4µm (c). In total, eight statistical outliers were observed for the six particle size categories and three test results were excluded. The calculated reproducibilities after rejection of the suspect data are in agreement with the requirements of IP565:13 for ≥6µm (c), ≥14µm (c), ≥21µm (c), ≥25µm (c) and≥30µm (c). The calculated reproducibility for ≥4µm (c) was not in agreement. The determination expressed in ISO scale numbers was problematic. Four statistical outliers were observed and eight test results were excluded. The calculated reproducibilities after rejection of the suspect data are not in agreement with the indicative requirements of IP565:13 Annex C.

For Jet Fuel FAME sample #16174 and #16175

FAME (#16174):   This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of IP585:10. The average recovery of FAME (theoretical increment of 50.4 mg FAME/kg) is good: "less than 84%" (the actual blank FAME content is unknown). When IP585, IP583 and IP590 were evaluated separately, only the calculated reproducibility of IP583 was in agreement with the requirements of the respective test method.

FAME (#16175):   This sample was spiked with approximately 5 mg FAME per kg. This is just above the lower limit of IP585 (range: 4.5-150 mg/kg) and IP590 (range: 3-140 mg/kg) and well below the lower limit of IP583 (range: 10-150 mg/kg). All laboratories that performed IP583 and D7797 reported a test result as "<", except one. This laboratory reported a test result of 10, which was the only outlier. The laboratories that reported another method all reported a value higher than 4.19 with a normal distribution above the lower limit of IP585. Therefore, a statistical evaluation was done on this sample.
This determination may be problematic. One statistical outlier was observed and the test result of one laboratory was excluded, for they reported a zero (which is not a real value). The calculated reproducibility after rejection of the statistical outlier is almost in agreement with the requirements of IP585:10. When the results of IP585 and IP590 were evaluated separately, the calculated reproducibilities are not in agreement with the respective requirements. The average recovery of FAME (theoretical increment of 5.1 mg FAME/kg) is satisfactory: "less than 126%" (the actual blank FAME content is unknown).

4.2   PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the relevant reference test method and the reproducibility as found for the group of laboratories that participated. The reproducibilities derived from literature reference test methods (in casu ASTM test methods) and the calculated reproducibilities of samples #16170, #16171, #16172, #16173 and #16174 are compared in the next tables.

Parameter	unit	n	average	2.8 * sd	R (lit)
Acidity, Total	mg KOH/g	79	0.0098	0.0038	0.0040
Aromatics by FIA	%V/V	73	17.9	2.1	3.0
Aromatics by HPLC	%M/M	24	20.9	2.1	2.1
Aromatics by HPLC	%V/V	29	18.6	2.3	n.a.
Colour Saybolt (automated)		52	25.3	1.7	1.2
Colour Saybolt (manual)		72	25.0	4.5	2.0
Density at 15°C	kg/m^3	124	803.1	0.3	0.5
Initial Boiling Point	°C	120	150.7	5.0	8.3
Temp at 10% recovered	°C	120	165.4	2.3	3.6
Temp at 50% recovered	°C	119	191.1	2.3	3.0
Temp at 90% recovered	°C	120	234.5	3.4	3.5
Final Boiling Point	°C	119	255.4	4.3	7.1
Existent Gum (unwashed)	mg/100mL	75	0.61	1.09	3.11
Flash Point	°C	120	42.1	2.7	3.2
Freezing Point	°C	107	-55.6	2.5	2.5
JFTOT – Tube Rating		73	<2	n.a.	n.a.
JFTOT – Delta P	mmHg	75	<3	n.a.	n.a.
Kinematic Viscosity at -20°C	mm^2/s	81	3.570	0.082	0.068
Mercaptan Sulphur as S	%M/M	77	0.0004	0.0003	0.0003
MSEP	rating	95	91.2	12.1	11.0

Table 9: comparison of the observed and target reproducibilities of sample #16170

Parameter	unit	n	average	2.8 * sd	R (lit)
Naphthalenes	%V/V	69	1.73	0.16	0.13
Smoke Point	mm	97	23.0	2.9	3.7
Specific Energy (Net)	MJ/kg	72	43.203	0.043	0.046
Sulphur, Total	mg/kg	107	385.7	51.9	50.5
BOCLE (#16172)	mm	19	0.67	0.09	0.06

Table 10: comparison of the observed and target reproducibilities of sample #16170 (continued) and #16172

Parameter - IP564	unit	n	average	2.8 * sd	R (lit)
Particle Size ≥4 µm (c)	parts/ml	11	175	144	210
Particle Size ≥6 µm (c)	parts/ml	11	52	56	101
Particle Size ≥14 µm (c)	parts/ml	11	3.6	3.4	12.9
Particle Size ≥21 µm (c)	parts/ml	11	1.0	1.3	1.3
Particle Size ≥25 µm (c)	parts/ml	11	0.6	0.8	0.8
Particle Size ≥30 µm (c)	parts/ml	11	0.3	0.4	0.4
Particle Size ≥4 µm (c)	ISO scale number	10	14.6	1.5	1.0
Particle Size ≥6 µm (c)	ISO scale number	10	12.8	1.8	1.4
Particle Size ≥14 µm (c)	ISO scale number	10	8.8	1.8	2.2

Table 11: comparison of the observed and target reproducibilities of sample #16173 according to IP564

Parameter - IP565	unit	n	average	2.8 * sd	R (lit)
Particle Size ≥4 µm (c)	parts/ml	33	281	277	227
Particle Size ≥6 µm (c)	parts/ml	33	74	69	114
Particle Size ≥14 µm (c)	parts/ml	33	5.8	5.9	20.9
Particle Size ≥21 µm (c)	parts/ml	33	1.7	2.6	4.9
Particle Size ≥25 µm (c)	parts/ml	32	0.9	1.5	2.6
Particle Size ≥30 µm (c)	parts/ml	32	0.4	1.0	1.1
Particle Size ≥4 µm (c)	ISO scale number	23	15.2	1.4	1.0
Particle Size ≥6 µm (c)	ISO scale number	23	13.4	1.7	1.0
Particle Size ≥14 µm (c)	ISO scale number	22	9.7	1.6	1.4

Table 12: comparison of the observed and target reproducibilities of sample #16173 according to IP565

Parameter	unit	n	average	2.8 * sd	R (lit)
FAME (#16174)	mg/kg	39	42.5	17.1	11.7
FAME (#16175)	mg/kg	29	6.4	2.7	2.4

Table 13: comparison of the observed and target reproducibilities of sample #16174 and #16175

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 reference test methods. The tests that are problematic have been discussed in paragraph 4.1.

4.3 COMPARISON OF THE PROFICIENCY TEST OF SEPTEMBER 2016 WITH PREVIOUS PTS

	September 2016	March 2016	September 2015	March 2015	September 2014	March 2014
Number of reporting labs	137	103	129	102	132	100
Number of test results reported	2710	1809	2695	1803	2729	1741
Statistical outliers	49	40	74	44	62	29
Percentage outliers	1.8%	2.2%	2.7%	2.4%	2.3%	1.6%

Table 14: 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 reference test methods. The conclusions are given the following table:

Parameter	September 2016	March 2016	September 2015	March 2015	September 2014	March 2014
Acidity, Total	+/-	-	--	-	--	--
Aromatics by FIA	+	+/-	++	+	++	+
Aromatics by HPLC	+/-	-	+	+/-	-	-
Colour Saybolt (automated)	-	--	-	--	-	-
Colour Saybolt (manual)	--	--	-	-	--	--
Density at 15°C	+	+	++	++	++	++
Distillation	+	+	+	+	+	+
Existent Gum	++	++	++	++	++	++
Flash Point	+	+/-	+	+	+	+
Freezing Point	+/-	+	+	+	+	-
Kinematic Viscosity at -20°C	-	+	+/-	-	+/-	-
Mercaptan Sulphur	+/-	+/-	+	+/-	++	+
MSEP	+/-	+/-	+/-	+	+	+
Naphthalenes	-	+/-	-	+/-	+	+
Smoke Point	+	+	+/-	+	+	+/-
Specific Energy (Net)	+/-	+/-	-	-	-	-
Sulphur, Total	+/-	+/-	++	++	+	+/-
BOCLE	-	n.e.	-	n.e.	+	n.e.
Particle Size Distribution IP564						
- Cumulative parts/ml	+	--	--	--	-	-
- ISO scale numbers	-	-	n.e.	n.e.	n.e.	n.e.
Particle Size Distribution IP565						
- Cumulative parts/ml	+	-	-	-	--	--
- ISO scale numbers	-	-	n.e.	n.e.	n.e.	n.e.
FAME	--	n.e.	-	n.e.	--	n.e.

Table 15: comparison determinations against the requirements of the reference test methods

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

++:   group performed much better than the reference test method
+ :   group performed better than the reference test method
+/-:   group performance equals the reference test method
- :   group performed worse than the reference test method
-- :   group performed much worse than the reference test method

APPENDIX 1

Determination of Acidity, Total on sample #16170; results in mg KOH/g

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3242	0.009		-0.55	974		-----		-----
62	D3242	0.009		-0.55	994		-----		-----
120	D3242	0.0098		0.00	995		-----		-----
131		-----		-----	996		-----		-----
132	D3242	0.009		-0.55	997	D3242	0.00847	C	-0.92
140	D3242	0.013		2.23	1011	D3242	0.009		-0.55
150	D3242	0.009		-0.55	1016	D3242	0.0086		-0.83
158		-----		-----	1023		-----		-----
159	D3242	0.011		0.84	1026	D3242	0.009		-0.55
169		-----		-----	1039	D3242	0.011		0.84
171	D3242	0.007		-1.95	1049	D3242	0.0108	C	0.70
175	D3242	0.0096		-0.14	1059	D3242	0.010		0.14
177	D3242	0.007		-1.95	1062	D3242	0.0090		-0.55
194		-----		-----	1064	D3242	0.0092		-0.42
216		-----		-----	1065		-----		-----
221		-----		-----	1079	D3242	0.01088		0.76
224	D974	0.0017	C,R(0.01)	-5.64	1081	D3242	0.0104		0.42
225	D3242	0.010		0.14	1082		-----		-----
228		-----		-----	1097	D3242	0.0111		0.91
230	D3242	0.0091		-0.49	1109	D3242	0.0117		1.33
237		-----		-----	1121		-----		-----
238		-----		-----	1134		-----		-----
252		-----		-----	1135	D3242	0.009		-0.55
253		-----		-----	1146		-----		-----
254		-----		-----	1150		-----		-----
256		-----		-----	1161	D664	0.001	C,R(0.01)	-6.13
258		-----		-----	1182		-----		-----
273	D974	0.0129		2.16	1191	D3242	0.0089		-0.62
311		-----		-----	1205		-----		-----
317		-----		-----	1264	D3242	0.010	C	0.14
323	D3242	0.009		-0.55	1279	D3242	0.008877		-0.64
333	D3242	0.009		-0.55	1297		-----		-----
334	D3242	0.008		-1.25	1299	D3242	0.009		-0.55
335	D3242	0.008		-1.25	1316	D3242	0.00919		-0.42
336		-----		-----	1318	D3242	0.010		0.14
340	D3242	0.0094		-0.28	1347	D3242	0.0103		0.35
353		-----		-----	1348	D3242	0.023	R(0.01)	9.20
369		-----		-----	1397	D3242	0.009		-0.55
370	D3242	0.014	C	2.93	1412		-----		-----
371	D3242	0.00995		0.11	1417		-----		-----
372	D3242	0.009		-0.55	1441		-----		-----
440	D3242	0.012		1.54	1496	D3242	0.0103		0.35
445	D3242	0.012		1.54	1538	D3242	0.0087		-0.76
447	D3242	0.011		0.84	1585	D3242	0.0085		-0.90
448	D3242	0.011		0.84	1587	D3242	0.0087		-0.76
453	IP354	0.01035		0.39	1610	D3242	0.01315		2.34
468		-----		-----	1613	D3242	0.00935		-0.31
473		-----		-----	1631	D3242	0.0102		0.28
485		-----		-----	1634	D3242	0.00925		-0.38
496	D3242	0.0086		-0.83	1636	D3242	0.00983		0.02
601		-----		-----	1715		-----		-----
606		-----		-----	1720	D3242	0.011		0.84
608		-----		-----	1724	D3242	0.0096		-0.14
631		-----		-----	1741	D3242	0.0089		-0.62
657	D3242	0.0103		0.35	1776	D3242	0.0092		-0.42
663	D3242	0.0103		0.35	1782	D3242	0.010		0.14
671		-----		-----	1811	D3242	0.00021	C,R(0.01)	-6.68
704	D3242	0.0098		0.00	1813	D3242	0.012		1.54
732		-----		-----	1833	D3242	0.012		1.54
840	D3242	0.0086		-0.83	1881		-----		-----
851	D3242	0.009		-0.55	1883		-----		-----
854	D3242	0.0107		0.63	1913	D3242	0.00975		-0.03
862	D3242	0.0117		1.33	1914	D3242	0.010		0.14
869	D3242	0.0100		0.14	1944	D3242	0.0077		-1.46
922		-----		-----	2129	D3242	0.0082		-1.11
962	D3242	0.0015	C,R(0.01)	-5.78	2130	D3242	0.008		-1.25
963		-----		-----	6054	D3242	0.00905		-0.52

normality	OK
n	79
outliers	5
mean (n)	0.00980
st.dev. (n)	0.001369
R(calc.)	0.00383
R(D3242:11)	0.00402

Lab 224 first reported: 0.0023
Lab 370 first reported: 0.0014
Lab 962 first reported: 0.015
Lab 997 first reported: 0.00247
Lab 1049 first reported: 0.0180
Lab 1161 first reported:0.0021
Lab 1264 first reported: 0.0034
Lab 1811 first reported: 0.00276
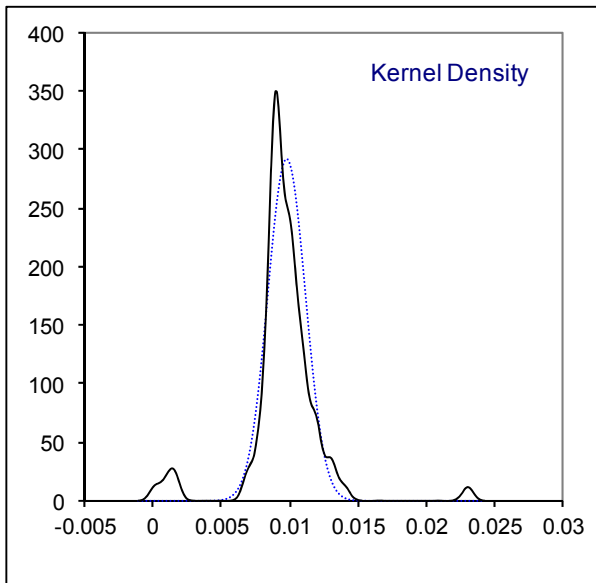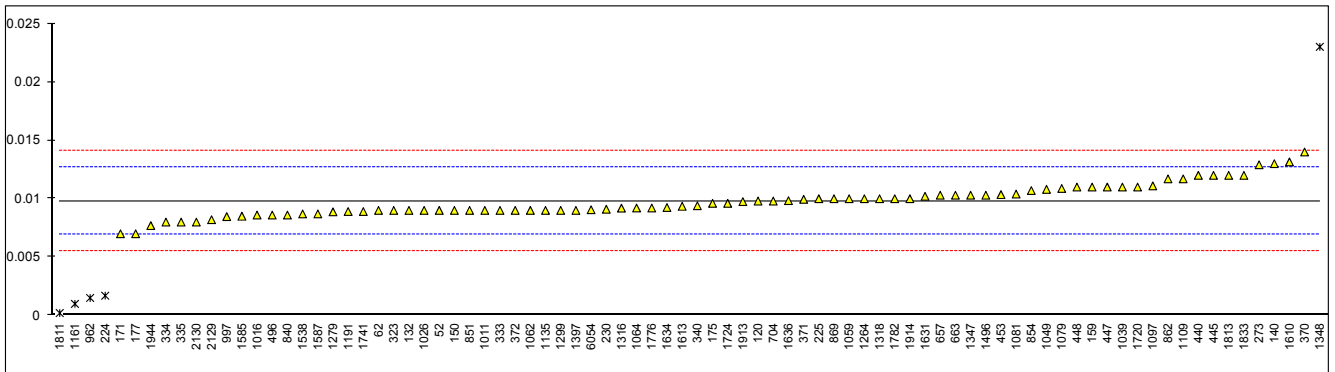
Determination of Aromatics by FIA (without oxygenate correction) on sample #16170; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D1319	17.8		-0.08	974	D1319	17.4		-0.45
62	D1319	16.7		-1.11	994		-----		-----
120	D1319	17.8		-0.08	995		-----		-----
131		-----		-----	996		-----		-----
132	D1319	18.2		0.30	997		-----		-----
140	D1319	18.8		0.86	1011	D1319	17.8		-0.08
150	D1319	16.4		-1.39	1016		-----		-----
158		-----		-----	1023		-----		-----
159	D1319	20.1		2.08	1026		-----		-----
169	D1319	18.67		0.74	1039		-----		-----
171	D1319	17.4		-0.45	1049		-----		-----
175	D1319	18.8		0.86	1059	D1319	17.6		-0.27
177	D1319	17.2		-0.64	1062	D1319	18.0		0.11
194		-----		-----	1064	D1319	18.06		0.17
216		-----		-----	1065		-----		-----
221		-----		-----	1079	D1319	18.50		0.58
224		-----		-----	1081	D1319	17.99		0.10
225	D1319	16.7		-1.11	1082		-----		-----
228		-----		-----	1097	D1319	18.1		0.20
230	D1319	18.16		0.26	1109	D1319	18.216		0.31
237	D1319	18.4		0.49	1121		-----		-----
238		-----		-----	1134		-----		-----
252	D1319	18.32		0.41	1135		-----		-----
253	D1319	18.10		0.20	1146		-----		-----
254	D1319	18.4		0.49	1150		-----		-----
256	D1319	17.9		0.02	1161		-----		-----
258		-----		-----	1182		-----		-----
273		-----		-----	1191		-----		-----
311	D1319	18.4		0.49	1205		-----		-----
317		-----		-----	1264	D1319	19.3		1.33
323	D1319	16.3		-1.49	1279	D1319	16.8	C	-1.02
333		-----		-----	1297		-----		-----
334	D1319	17.5		-0.36	1299	D1319	18.1		0.20
335	D1319	17.3		-0.55	1316		-----		-----
336		-----		-----	1318		-----		-----
340	D1319	18.6		0.67	1347	D1319	19.07		1.12
353		-----		-----	1348	D1319	18.4		0.49
369	D1319	17.9		0.02	1397		-----		-----
370	D1319	17.67		-0.20	1412		-----		-----
371		-----		-----	1417		-----		-----
372	D1319	17.8		-0.08	1441	D1319	18.28		0.37
440	D1319	18.31094		0.40	1496	D1319	18.2		0.30
445	D1319	18.0		0.11	1538	D1319	17.8		-0.08
447	D1319	17.9		0.02	1585		-----		-----
448	D1319	17.88		0.00	1587		-----		-----
453	IP156	18.815		0.88	1610	D1319	17.1		-0.74
468		-----		-----	1613	D1319	18.380		0.47
473		-----		-----	1631	D1319	16.69		-1.12
485		-----		-----	1634		-----		-----
496	D1319	18.80		0.86	1636	D1319	17.41		-0.44
601		-----		-----	1715		-----		-----
606		-----		-----	1720		-----		-----
608		-----		-----	1724	D1319	18.3		0.39
631	D1319	17.18		-0.66	1741	D1319	18.800		0.86
657	D1319	16.69		-1.12	1776		-----		-----
663	D1319	17.188		-0.65	1782		-----		-----
671		-----		-----	1811	D1319	17.94		0.05
704		-----		-----	1813	D1319	17.9		0.02
732		-----		-----	1833	D1319	17.79		-0.09
840	D1319	18.75		0.81	1881		-----		-----
851		-----		-----	1883		-----		-----
854	D1319	17.34		-0.51	1913	D1319	17.64		-0.23
862	D1319	18.7		0.77	1914	D1319	16.9		-0.92
869	D1319	17.70		-0.17	1944	D1319	17.73		-0.14
922	D1319	17.0		-0.83	2129	D1319	17.73		-0.14
962		-----		-----	2130	D1319	15.8		-1.96
963	D1319	18.8		0.86	6054	D1319	17.3523		-0.50

normality	OK
n	73
outliers	0
mean (n)	17.883
st.dev. (n)	0.7518
R(calc.)	2.105
R(D1319:15)	2.980

Lab 1279 first reported test result as Aromatics by HPLC (V/V%)
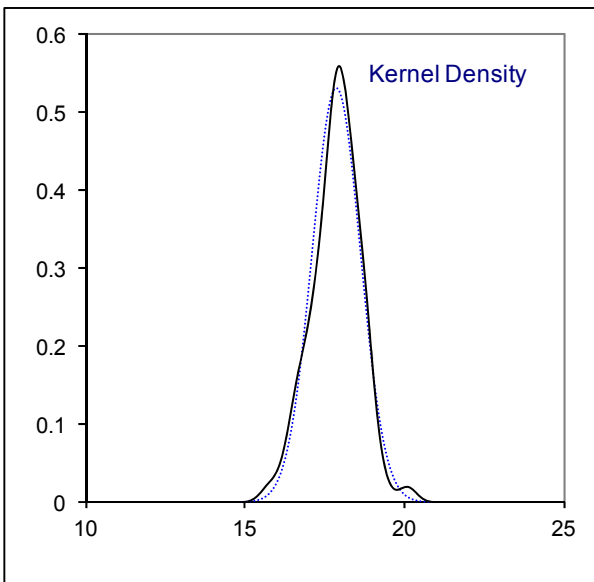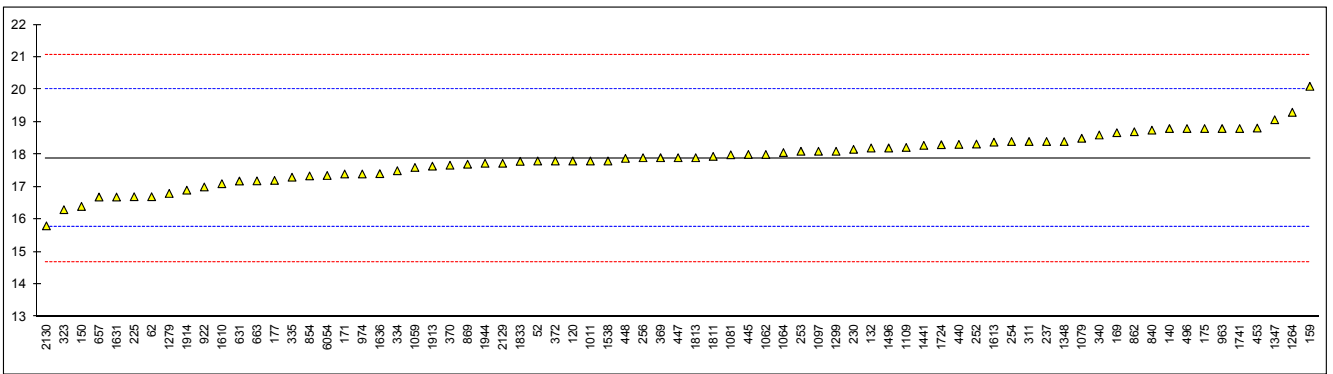
Determination of Aromatics by HPLC on sample #16170; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	974	IP391	21.9		1.30
62		-----		-----	994		-----		-----
120		-----		-----	995		-----		-----
131		-----		-----	996		-----		-----
132		-----		-----	997		-----		-----
140	D6379	21.0		0.11	1011		-----		-----
150		-----		-----	1016		-----		-----
158		-----		-----	1023		-----		-----
159		-----		-----	1026		-----		-----
169		-----		-----	1039		-----		-----
171		-----		-----	1049	D6379	20.663		-0.34
175		-----		-----	1059		-----		-----
177		-----		-----	1062		-----		-----
194		-----		-----	1064		-----		-----
216		-----		-----	1065		-----		-----
221		-----		-----	1079	D6379	21.64		0.95
224		-----		-----	1081		-----		-----
225		-----		-----	1082		-----		-----
228		-----		-----	1097		-----		-----
230		-----		-----	1109	D6591	21.88		1.27
237		-----		-----	1121		-----		-----
238		-----		-----	1134		-----		-----
252		-----		-----	1135	D6379	20.668		-0.33
253		-----		-----	1146		-----		-----
254		-----		-----	1150		-----		-----
256		-----		-----	1161	EN12916	20.2		-0.95
258		-----		-----	1182		-----		-----
273		-----		-----	1191		-----		-----
311		-----		-----	1205		-----		-----
317		-----		-----	1264		-----		-----
323		-----		-----	1279		-----		-----
333		-----		-----	1297	D6379	21.05		0.17
334		-----		-----	1299	IP436	21.4		0.64
335		-----		-----	1316		-----		-----
336		-----		-----	1318	D6379	20.380		-0.72
340		-----		-----	1347		-----		-----
353		-----		-----	1348		-----		-----
369	D6379	21.1		0.24	1397		-----		-----
370	D6379	21.13		0.28	1412		-----		-----
371		-----		-----	1417		-----		-----
372	D6379	21.0		0.11	1441		-----		-----
440		-----		-----	1496		-----		-----
445		-----		-----	1538		-----		-----
447		-----		-----	1585	D6379	20.17		-0.99
448		-----		-----	1587		-----		-----
453		-----		-----	1610		-----		-----
468		-----		-----	1613		-----		-----
473		-----		-----	1631		-----		-----
485		-----		-----	1634		-----		-----
496	D6379	22.06		1.51	1636		-----		-----
601		-----		-----	1715		-----		-----
606		-----		-----	1720		-----		-----
608		-----		-----	1724		-----		-----
631		-----		-----	1741	D6379	20.60		-0.42
657	IP436	20.56		-0.48	1776		-----		-----
663		-----		-----	1782		-----		-----
671		-----		-----	1811	D6379	21.98		1.41
704	D6379	21.51		0.78	1813		-----		-----
732		-----		-----	1833		-----		-----
840		-----		-----	1881		-----		-----
851	D6379	19.89		-1.36	1883		-----		-----
854		-----		-----	1913		-----		-----
862	IP391	20.87		-0.07	1914	IP391	18.9		-2.68
869		-----		-----	1944		-----		-----
922		-----		-----	2129	D6379	20.62		-0.40
962		-----		-----	2130		-----		-----
963	D6379	20.90		-0.03	6054		-----		-----

normality	suspect
n	24
outliers	0
mean (n)	20.920
st.dev. (n)	0.7365
R(calc.)	2.062
R(D6379:11)	2.113
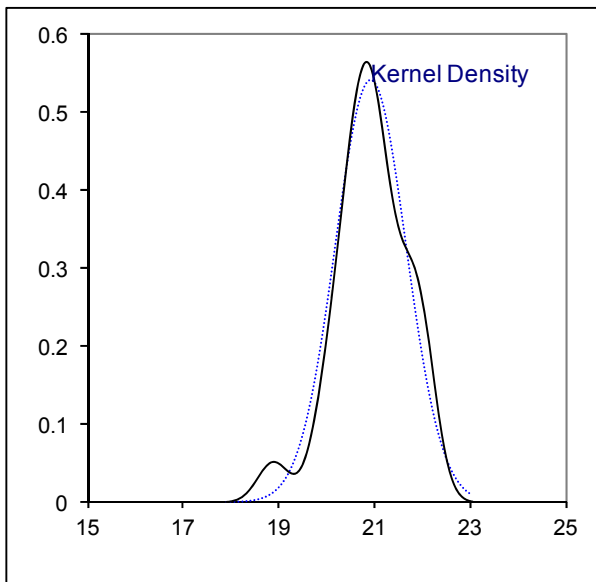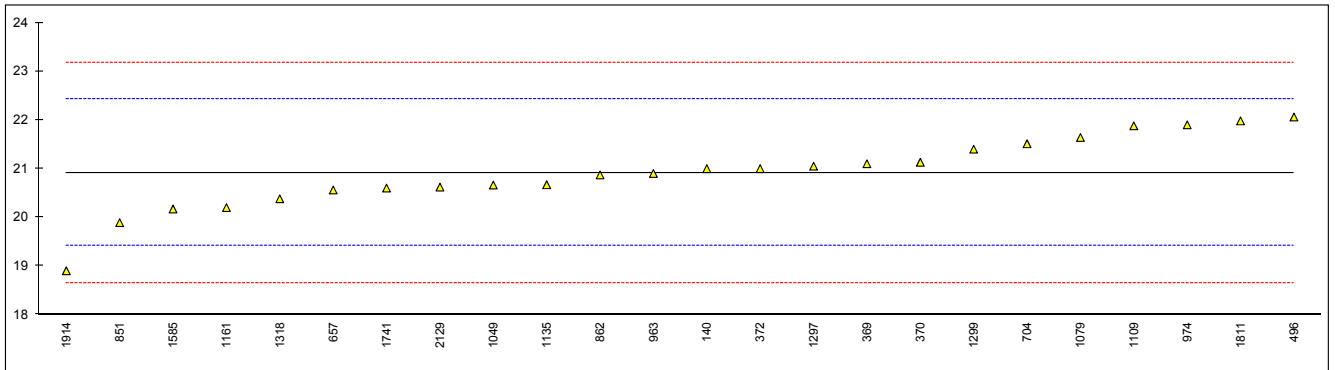
Determination of Aromatics by HPLC on sample #16170; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	974		-----		-----
62		-----		-----	994		-----		-----
120		-----		-----	995		-----		-----
131		-----		-----	996		-----		-----
132		-----		-----	997		-----		-----
140		-----		-----	1011		-----		-----
150		-----		-----	1016	IP436	18.3		-----
158		-----		-----	1023		-----		-----
159		-----		-----	1026	IP436	21.2		-----
169		-----		-----	1039	D6379	19.2		-----
171		-----		-----	1049	D6379	18.68838		-----
175		-----		-----	1059		-----		-----
177		-----		-----	1062		-----		-----
194		-----		-----	1064		-----		-----
216		-----		-----	1065		-----		-----
221		-----		-----	1079	D6379	19.40		-----
224		-----		-----	1081		-----		-----
225		-----		-----	1082		-----		-----
228		-----		-----	1097		-----		-----
230		-----		-----	1109		-----		-----
237		-----		-----	1121		-----		-----
238		-----		-----	1134		-----		-----
252		-----		-----	1135	D6379	19.301		-----
253		-----		-----	1146		-----		-----
254		-----		-----	1150		-----		-----
256		-----		-----	1161	EN12916	18.0		-----
258		-----		-----	1182		-----		-----
273		-----		-----	1191	D6379	17.89		-----
311		-----		-----	1205		-----		-----
317		-----		-----	1264		-----		-----
323		-----		-----	1279		-----		-----
333	D6379	18.7		-----	1297	EN12916	18.46		-----
334		-----		-----	1299	IP436	19.0		-----
335		-----		-----	1316	IP391	18.3		-----
336		-----		-----	1318	D6379	18.340		-----
340		-----		-----	1347		-----		-----
353		-----		-----	1348		-----		-----
369	D6379	19.1		-----	1397	D6379	18.8	C	-----
370	D6379	19.21		-----	1412		-----		-----
371		-----		-----	1417		-----		-----
372	D6379	18.8		-----	1441		-----		-----
440		-----		-----	1496		-----		-----
445		-----		-----	1538		-----		-----
447		-----		-----	1585	D6379	18.15		-----
448		-----		-----	1587		-----		-----
453		-----		-----	1610		-----		-----
468		-----		-----	1613		-----		-----
473		-----		-----	1631		-----		-----
485		-----		-----	1634		-----		-----
496	D6379	19.85		-----	1636		-----		-----
601		-----		-----	1715		-----		-----
606		-----		-----	1720	D6379	18.3		-----
608		-----		-----	1724	D6379	18.19		-----
631		-----		-----	1741	D6379	18.40		-----
657	IP436	18.45		-----	1776	D6379	18.75		-----
663		-----		-----	1782		-----		-----
671		-----		-----	1811		-----		-----
704	D6379	19.22		-----	1813		-----		-----
732		-----		-----	1833	D6379	17.68		-----
840		-----		-----	1881		-----		-----
851	D6379	17.83		-----	1883		-----		-----
854		-----		-----	1913		-----		-----
862		-----		-----	1914		-----		-----
869		-----		-----	1944	D6379	16.97		-----
922		-----		-----	2129	D6379	16.99		-----
962		-----		-----	2130		-----		-----
963		-----		-----	6054		-----		-----

normality	not OK
n	29
outliers	0
mean (n)	18.602
st.dev. (n)	0.8333
R(calc.)	2.333
R(D6379:11)	n.a

Compare to R(calc) of iis16J01 = 1.443 or R(calc) of iis15J02 = 1.6

Lab 1397 first reported: 27.9

Kernel Density
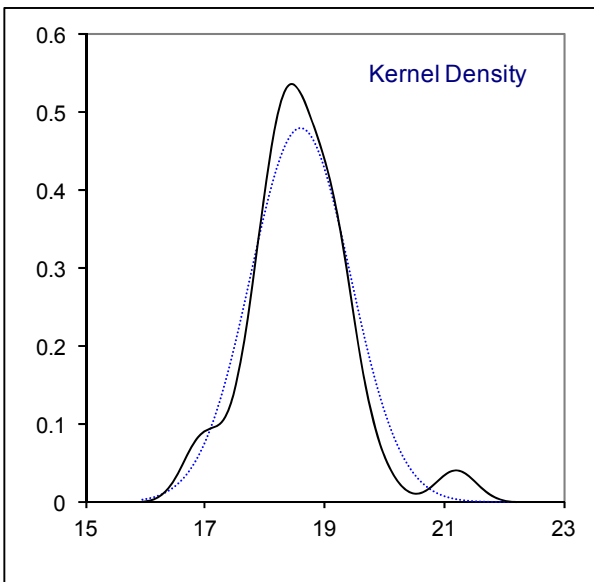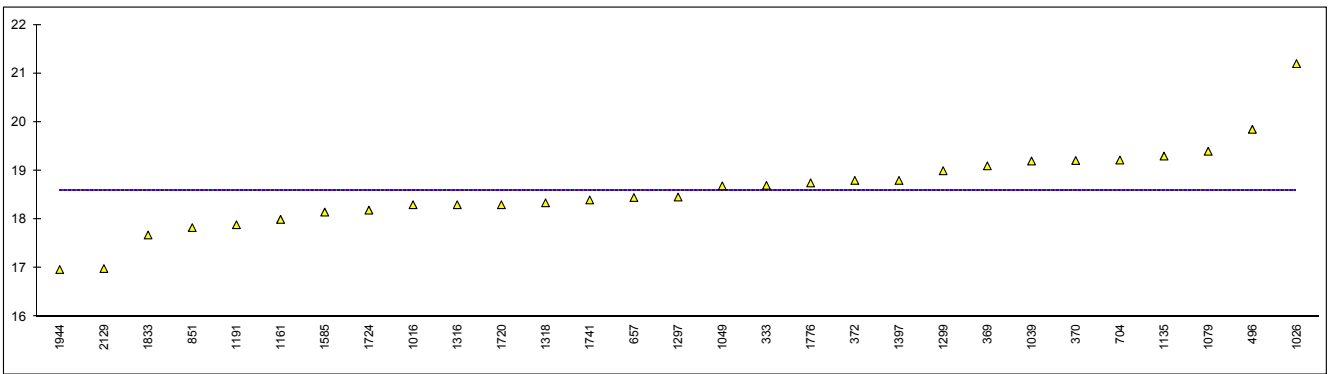
Determination of Colour Saybolt (Automated) on sample #16170; cell size in mm;

lab	method	cell mm	value	mark	z(targ)	lab	method	cell mm	value	mark	z(targ)
52	D6045	100	26		1.56	974		-----	-----		-----
62		-----	-----		-----	994		-----	-----		-----
120	D6045	50	27		3.82	995		-----	-----		-----
131		-----	-----		-----	996		-----	-----		-----
132		-----	-----		-----	997		-----	-----		-----
140	D6045	-----	24		-2.96	1011		-----	-----		-----
150	D6045	-----	26		1.56	1016	D6045	100	26		1.56
158		-----	-----		-----	1023		-----	-----		-----
159	D6045	100	25		-0.70	1026		-----	-----		-----
169	D6045	50	25	C	-0.70	1039		-----	-----		-----
171	D6045	-----	25		-0.70	1049	D6045	50	25		-0.70
175		-----	-----		-----	1059		-----	-----		-----
177		-----	-----		-----	1062	D6045	100	25		-0.70
194		-----	-----		-----	1064	D6045	50	25		-0.70
216		-----	-----		-----	1065		-----	-----		-----
221		-----	-----		-----	1079	D6045	100	25		-0.70
224		-----	-----		-----	1081	D6045	100	25		-0.70
225	D6045	-----	25		-0.70	1082	D6045	100	25		-0.70
228		-----	-----		-----	1097		-----	-----		-----
230		-----	-----		-----	1109	D6045	100	25		-0.70
237		-----	-----		-----	1121		-----	-----		-----
238		-----	-----		-----	1134		-----	-----		-----
252		-----	-----		-----	1135	D6045	100	25		-0.70
253		-----	-----		-----	1146		-----	-----		-----
254		-----	-----		-----	1150		-----	-----		-----
256		-----	-----		-----	1161	D6045	-----	26	C	1.56
258		-----	-----		-----	1182	D6045	50	25		-0.70
273		-----	-----		-----	1191	D6045	100	24		-2.96
311	D6045	-----	25		-0.70	1205		-----	-----		-----
317		-----	-----		-----	1264	D6045	-----	26		1.56
323	D6045	50	26		1.56	1279	D6045	-----	25		-0.70
333	D6045	50	25		-0.70	1297		-----	-----		-----
334		-----	-----		-----	1299	D6045	50	25		-0.70
335		-----	-----		-----	1316		-----	-----		-----
336		-----	-----		-----	1318	D6045	100	25		-0.70
340		-----	-----		-----	1347		-----	-----		-----
353	D6045	50	25		-0.70	1348		-----	-----		-----
369	D6045	50	26		1.56	1397		-----	-----		-----
370	D6045	50	26		1.56	1412		-----	-----		-----
371	D6045	-----	25		-0.70	1417	D6045	-----	25		-0.70
372	D6045	50	26		1.56	1441		-----	-----		-----
440		-----	-----		-----	1496		-----	-----		-----
445	D6045	50	24		-2.96	1538		-----	-----		-----
447		-----	-----		-----	1585		-----	-----		-----
448		-----	-----		-----	1587	D6045	50	26		1.56
453	D6045	50	25		-0.70	1610		-----	-----		-----
468		-----	-----		-----	1613		-----	-----		-----
473	D6045	-----	25		-0.70	1631	D6045	50	26		1.56
485		-----	-----		-----	1634		-----	-----		-----
496	D6045	-----	25		-0.70	1636		-----	-----		-----
601		-----	-----		-----	1715	D6045	100	26.1		1.78
606		-----	-----		-----	1720		-----	-----		-----
608		-----	-----		-----	1724		-----	-----		-----
631	D6045	50	26		1.56	1741		-----	-----		-----
657		-----	-----		-----	1776	D6045	-----	22	R(0.01)	-7.47
663		-----	-----		-----	1782	D6045	50	26		1.56
671		-----	-----		-----	1811	D6045	50	25.0		-0.70
704		-----	-----		-----	1813	D6045	100	25		-0.70
732		-----	-----		-----	1833		-----	-----		-----
840		-----	-----		-----	1881	D6045	50	26		1.56
851		-----	-----		-----	1883		-----	-----		-----
854		-----	-----		-----	1913	D6045	50	25		-0.70
862	D6045	-----	25		-0.70	1914		-----	-----		-----
869		-----	-----		-----	1944	D6045	50	26.0		1.56
922		-----	-----		-----	2129	D6045	50.00	25.0		-0.70
962	D6045	-----	25		-0.70	2130	D6045	50	25		-0.70
963		-----	-----		-----	6054	D6045	-----	26		1.56

		Test results of cell 50 mm only	Test results of cell 100 mm only
normality	OK	OK	OK
n	52	24	13
outliers	1	0	0
mean (n)	25.31	25.46	25.16
st.dev. (n)	0.614	0.658	0.578
R(calc.)	1.72	1.84	1.59
R(D6045:12)	1.24	1.24	1.24

Lab 169 first reported: 23
Lab 1161 first reported: 29
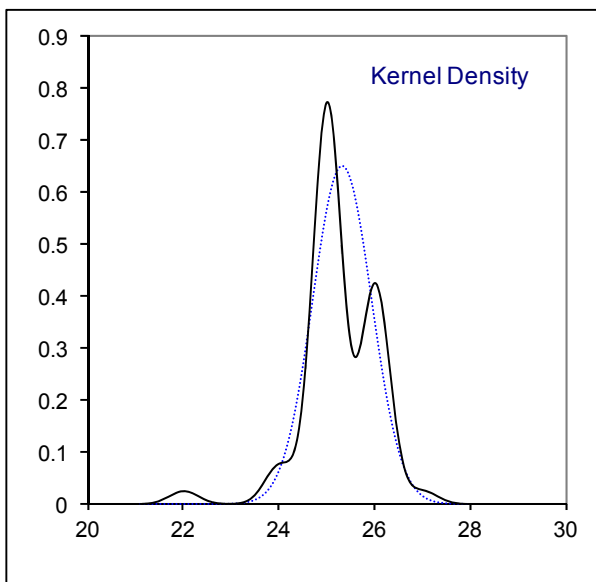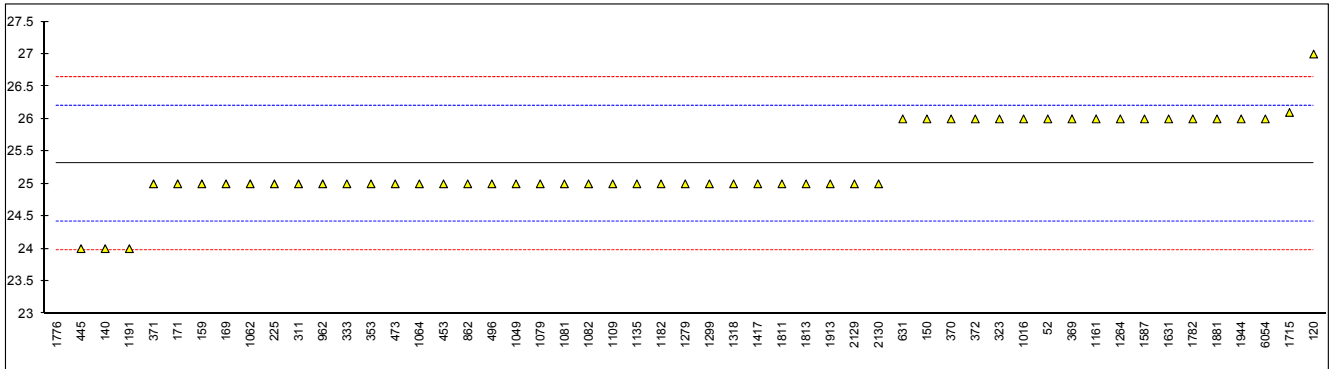
Determination of Colour Saybolt (Manual) on sample #16170;

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	974	D156	23		-2.79
62	D156	23		-2.79	994	D156	25		0.01
120	D156	26		1.41	995	D156	25		0.01
131	D156	25		0.01	996		-----		-----
132	D156	27		2.81	997	D156	24.5		-0.69
140	D156	25		0.01	1011	D156	22		-4.19
150		-----		-----	1016		-----		-----
158		-----		-----	1023		-----		-----
159		-----		-----	1026	D156	27		2.81
169		-----		-----	1039	D156	26		1.41
171	D156	25		0.01	1049		-----		-----
175		-----		-----	1059	D156	26		1.41
177	D156	24	C	-1.39	1062		-----		-----
194		-----		-----	1064	D156	25		0.01
216		-----		-----	1065		-----		-----
221		-----		-----	1079		-----		-----
224		-----		-----	1081		-----		-----
225		-----		-----	1082		-----		-----
228		-----		-----	1097	INH-003	26		1.41
230	D156	24		-1.39	1109	D156	24		-1.39
237	D156	23		-2.79	1121	D156	23		-2.79
238	D156	25		0.01	1134		-----		-----
252	D156	26		1.41	1135	D156	21		-5.59
253	D156	22		-4.19	1146		-----		-----
254	D156	26		1.41	1150		-----		-----
256	D156	26		1.41	1161		-----		-----
258	D156	27		2.81	1182		-----		-----
273	D156	26		1.41	1191		-----		-----
311		-----		-----	1205		-----		-----
317	D156	24		-1.39	1264		-----		-----
323	D156	26		1.41	1279	D156	24		-1.39
333		-----		-----	1297		-----		-----
334	D156	24		-1.39	1299		-----		-----
335	D156	25		0.01	1316		-----		-----
336	D156	26		1.41	1318		-----		-----
340	D156	26		1.41	1347		-----		-----
353		-----		-----	1348	D156	26		1.41
369	D156	25		0.01	1397		-----		-----
370		-----		-----	1412		-----		-----
371		-----		-----	1417		-----		-----
372	D156	25		0.01	1441	D156	24		-1.39
440	D156	25		0.01	1496	D156	27		2.81
445		-----		-----	1538	D156	28		4.21
447	D156	25		0.01	1585	D156	24		-1.39
448	D156	26		1.41	1587		-----		-----
453		-----		-----	1610	D156	29		5.61
468	D156	23		-2.79	1613	D156	26		1.41
473		-----		-----	1631		-----		-----
485		-----		-----	1634	D156	26		1.41
496		-----		-----	1636	D156	28		4.21
601		-----		-----	1715		-----		-----
606		-----		-----	1720		-----		-----
608	D156	26		1.41	1724	D156	26		1.41
631		-----		-----	1741	D156	24		-1.39
657	D156	28		4.21	1776		-----		-----
663	D156	27		2.81	1782		-----		-----
671	D156	24		-1.39	1811		-----		-----
704	D156	24		-1.39	1813		-----		-----
732		-----		-----	1833	D156	26		1.41
840	D156	23		-2.79	1881		-----		-----
851	D156	25		0.01	1883	D156	22	C	-4.19
854	D156	25		0.01	1913	D156	26		1.41
862	D156	23		-2.79	1914	D156	22		-4.19
869	D156	25		0.01	1944	D156	26		1.41
922	D156	26	C	1.41	2129	D156	23.0		-2.79
962	D156	25		0.01	2130		-----		-----
963	D156	24		-1.39	6054		-----		-----

normality	OK
n	72
outliers	0
mean (n)	24.99
st.dev. (n)	1.593
R(calc.)	4.46
R(D156:15)	2.00

Lab 177 first reported: 18
Lab 922 first reported: 29
Lab 1883 first reported: 29
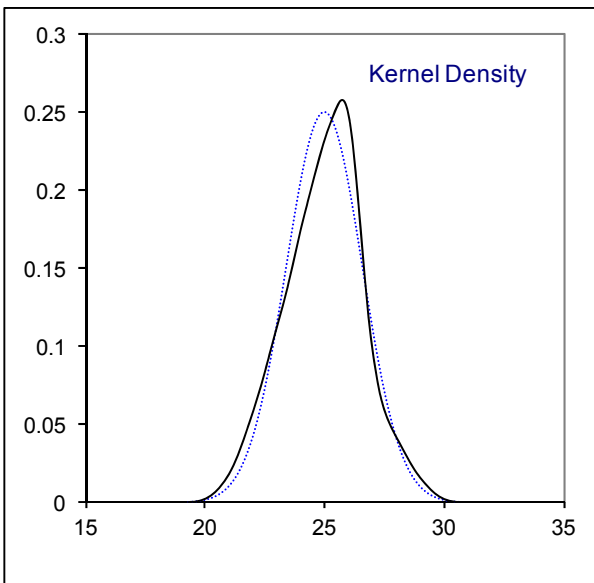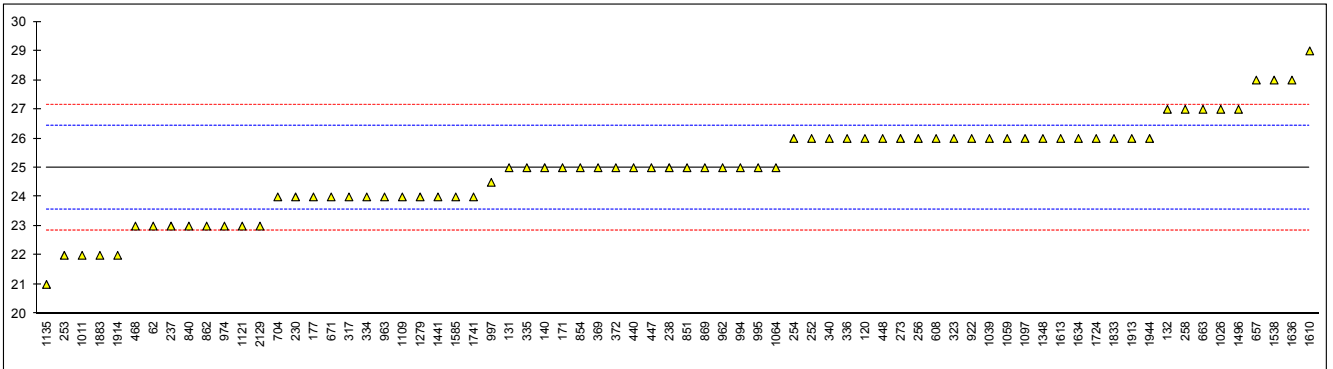
Determination of Density at 15°C on sample #16170; results in kg/m^3

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4052	803.2		0.36	974	D4052	803.2		0.36
62	D4052	803.15		0.08	994	D4052	803.1		-0.20
120	D4052	803.2		0.36	995	D4052	803.1		-0.20
131	D4052	803.2		0.36	996		-----		-----
132	D4052	803.1		-0.20	997	D4052	803.1		-0.20
140	D4052	803.2		0.36	1011	D4052	803.0		-0.76
150	D4052	803.3		0.92	1016		-----		-----
158		-----		-----	1023	D4052	803.7	R(0.01)	3.16
159	D4052	803.3		0.92	1026	D4052	803.2		0.36
169	D4052	803.1		-0.20	1039	D4052	803.2		0.36
171	D4052	803.2		0.36	1049	D4052	803.05		-0.48
175	D4052	803.1		-0.20	1059	D4052	803.1		-0.20
177	D4052	803.3	C	0.92	1062	D4052	803.2		0.36
194		-----		-----	1064	D4052	803.00		-0.76
216		-----		-----	1065		-----		-----
221	D4052	803.3		0.92	1079	D4052	803.15		0.08
224	D1298	803.2		0.36	1081	D4052	803.10		-0.20
225	D4052	803.1		-0.20	1082	D4052	803.1		-0.20
228	D4052	803.2		0.36	1097	ISO12185	803.1		-0.20
230	D4052	803.19		0.31	1109	D4052	803.10		-0.20
237	D4052	803.19		0.31	1121	D4052	803.1	C	-0.20
238	D4052	802.8		-1.88	1134		-----		-----
252	D1298	803.2		0.36	1135	D4052	803.1		-0.20
253	D4052	803.0		-0.76	1146	ISO12185	803.14		0.03
254	D4052	803.5	R(0.05)	2.04	1150	ISO12185	803.13		-0.03
256	D4052	803.2		0.36	1161	ISO12185	803.13		-0.03
258	D1298	803.2		0.36	1182	ISO12185	803.167		0.18
273	D4052	802.8		-1.88	1191	D4052	803.2		0.36
311	D4052	803.1		-0.20	1205	ISO12185	803.13		-0.03
317	D4052	803.2		0.36	1264	D4052	803.6	R(0.01)	2.60
323	D4052	803.1		-0.20	1279	D4052	803.10		-0.20
333	D4052	803.1		-0.20	1297	D4052	803.09		-0.25
334	D4052	803.2		0.36	1299	D4052	803.1		-0.20
335	D4052	803.2		0.36	1316	D4052	803.1		-0.20
336	D4052	803.0		-0.76	1318	D4052	803.14		0.03
340	D4052	803.09		-0.25	1347	D4052	803.18		0.25
353	IP365	803.2		0.36	1348	D4052	803.2		0.36
369	D4052	803.2		0.36	1397	ISO12185	803.2		0.36
370	D4052	803.1		-0.20	1412	D4052	803.15		0.08
371	D4052	803.1		-0.20	1417	IP365	803.1		-0.20
372	D4052	803.1		-0.20	1441	D4052	803.18		0.25
440	D4052	803.3		0.92	1496	D1298	803.2		0.36
445	D4052	803.2		0.36	1538	D4052	803.14		0.03
447	D4052	803.3		0.92	1585	D4052	802.98		-0.87
448	D4052	803.1		-0.20	1587	D4052	803.07		-0.37
453	IP365	803.3		0.92	1610	IP365	803.1		-0.20
468	D4052	803.16		0.14	1613	D4052	803.16		0.14
473	D4052	803.0		-0.76	1631	D4052	803.1		-0.20
485	D4052	803.1		-0.20	1634	D4052	803.143		0.04
496	D4052	803.15		0.08	1636	D4052	803.1		-0.20
601	D1298	803.0		-0.76	1715	ISO12185	803.2		0.36
606	D4052	803.1		-0.20	1720	D4052	802.8		-1.88
608	D4052	803.1		-0.20	1724	D4052	803.1		-0.20
631	D4052	803.26		0.70	1741	D4052	803.00		-0.76
657	D4052	803.2		0.36	1776	ISO12185	803.19		0.31
663	D4052	803.17		0.19	1782	D4052	803.2		0.36
671	D4052	803.1		-0.20	1811	D4052	803.1		-0.20
704	D4052	803.15		0.08	1813	D4052	803.2		0.36
732	D4052	803.1		-0.20	1833	D4052	803.2		0.36
840	D4052	803.12		-0.09	1881	D4052	803.2		0.36
851	D4052	803.1		-0.20	1883	D1298	802.9		-1.32
854	D4052	803.16		0.14	1913	D4052	802.9		-1.32
862	D4052	803.19		0.31	1914	D4052	803.2		0.36
869	D4052	803.24		0.59	1944	D4052	803.14		0.03
922	D4052	803.1		-0.20	2129	D4052	803.3		0.92
962	D4052	803.1		-0.20	2130	D4052	803.2		0.36
963	D4052	803.1		-0.20	6054	D4052	803.0923		-0.24

normality	not OK
n	124
outliers	3
mean (n)	803.135
st.dev. (n)	0.0931
R(calc.)	0.261
R(D4052:15)	0.500

Lab 177 first reported: 0.8003 (no unit selected)
Lab 1121 first reported: 799.5

Kernel Density
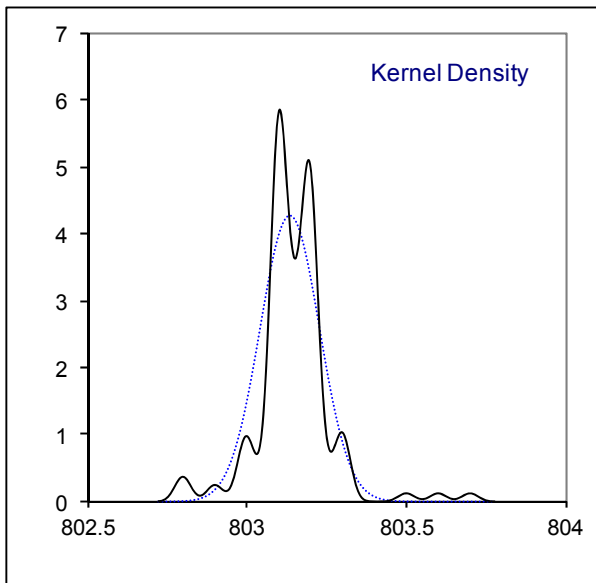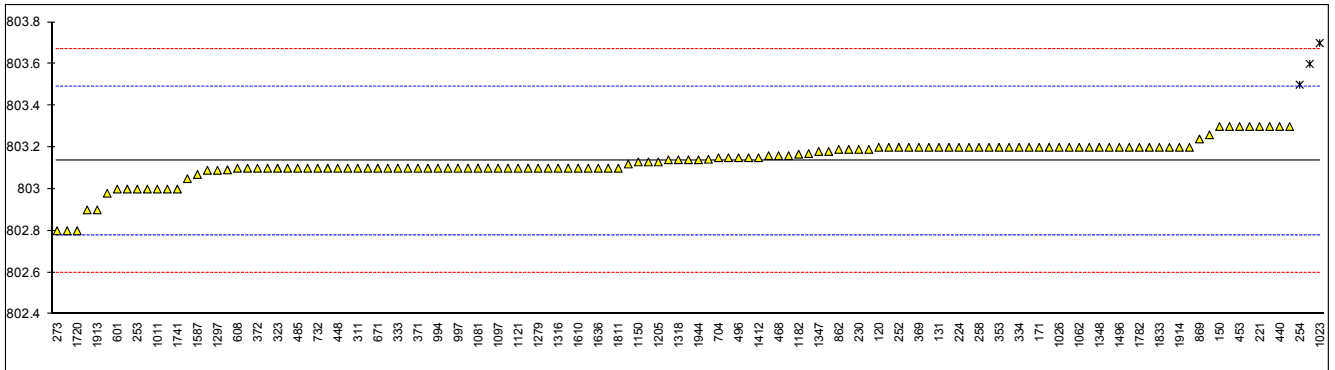
Determination of Distillation ASTM D86 on sample #16170; results in °C

lab	method	Mode	IBP	mark	10% rec	mark	50% rec	mark	90% rec	mark	FBP	mark
52	D86	Automated	151.4		165.2		191.8		236.0		258.9	
62		Manual	-----		-----		-----		-----		-----	
120	D86	Automated	151.3		164.6		190.4		234.6		254.3	
131	D86	Automated	153.4		166.0		191.6		235.5	C	256.1	
132	D86	Automated	150.8		166.2		192.1		235.3		255.0	
140	D86	Automated	149.3		165.4		190.8		234.0		254.8	
150	D86	Automated	145.1		164.8		190.5		234.0		254.5	
158			-----		-----		-----		-----		-----	
159	D86	Automated	145.7		164.8		190.2		233.6		254.3	
169	D86	Automated	149.8		166.6		194.4	R(5)	249.2	R(1)	259.6	
171	D86	Automated	151.3		164.8		190.0		234.1		253.8	
175	D86		150.6		164.8		191.4		235.2		257.0	
177	D86	Automated	146.7		163.7		190.0		232.7		252.5	
194			-----		-----		-----		-----		-----	
216			-----		-----		-----		-----		-----	
221	D86	Manual	151.0		167.0		192.0		234.0		256.0	
224	D86	Manual	152.01		166.18		191.19		234.19		255.02	
225	D86		150.5		166.0		191.5		234.0		257.0	
228	D86	Manual	147.0		163.0		188.0	R(5)	231.0		263.0	R(1)
230	D86	Automated	152.7		165.1		190.6		234.7		254.9	
237	D86	Manual	151.0		166.0		191.0		236.0		256.0	
238	D86	Manual	151.0		162.0	R(1)	190.0		234.0		252.0	
252	D86	Manual	151.0		165.0		192.0		234.0		258.0	
253	D86	Manual	149.0		165.0		189.5		233.0		252.0	
254	D86	Manual	151.0		166.0		192.0		235.0		256.0	
256	D86	Manual	151.0		164.0		191.0		234.0		255.0	
258	D86	Automated	155.0		166.0		192.1		236.4		256.2	
273	D86	Automated	151.4		164.9		190.8		234.9		257.8	
311	D86	Automated	149.3		164.7		190.3		234.3		254.8	
317	D86	Automated	150.8		165.5		191.3		234.2		256.1	
323	D86	Automated	150.8		165.0		190.8		234.0		253.5	
333	D86	Automated	147.1		165.4		190.6		233.6		253.6	
334	D86	Automated	151.0		165.9		190.2		234.6		254.9	
335	D86	Automated	153.4		165.2		191.8		236.4		254.0	
336	D86	Automated	151.6		165.2		191.5		235.5		254.8	
340	D86		150.0		165.5		191.5		235.9		253.5	
353	IP123	Automated	152.1		165		191.7		235.8		258.6	
369	D86	Automated	150.7		165.2		190.4		235.0		256.5	
370	D86	Automated	151.3		164.3		191.1		233.6		254.8	
371	D86	Manual	151.0		164.0		189.0		232.0		253.0	
372	D86	Automated	150.5		165.0		191.0		234.9		255.6	
440	IP123	Automated	153.0		165.9		191.3		234.8		256.6	
445	D86	Automated	148.0		164.7		190.4		234.2		254.1	
447	D86	Automated	150.5		165.5		192.3		236.8		255.9	
448	D86	Automated	149.8		165.8		191.8		236.6		256.7	
453	IP123	Automated	150.8		165.5		191.4		234.6		255.7	
468			-----		-----		-----		-----		-----	
473	D86	Automated	150.6		165.2		191.6		235.4		256.5	
485	D86	Automated	149.50		165.35		191.05		234.30		254.75	
496	D86	Automated	148.6		164.3		190.8		233.7		256	
601			-----		-----		-----		-----		-----	
606	D86	Automated	152.0		166.5		192.2		235.0		256.7	
608	D86	Automated	153.9		167.2		192.3		235.2		257.0	
631	D86	Automated	153.4		165.0		190.4		234.4		254.2	
657	D86	Automated	150.4		165.8		192.4		235.9		256.1	
663	D86	Automated	152.80		166.80		191.25		235.50		258.15	
671			-----		-----		-----		-----		-----	
704	D86	Manual	153.1		165.3		191.2		233.8		255.0	
732	D86	Manual	150.0		165.0		190.5		233.0		254.5	
840	D86	Automated	149.11		166.04		190.81		234.50		254.99	
851	D86	Automated	153.3		166.5		191.2		235.2		255.8	
854	D86	Automated	151.4		166.2		192.2		235.2		256.9	
862	D86	Automated	149.9		164.8		189.9		233.5		257.2	
869	D86	Manual	151.5		165.0		191.0		234.0		255.0	
922	D86	Automated	150.7		164.1		189.9		232.5		254.1	
962	D86	Automated	148.4		165.2		191.5		234.0		253.7	
963	D86	Automated	149.2		165.3		191.1		233.4		254.1	
974	D86	Automated	150.6		165.9		190.6		233.3		252.2	
994	D86	Manual	151.0		165.0		191.0		234.0		256.0	
995	D86	Manual	151.5		165.5		191.5		234.0		255.5	
996			-----		-----		-----		-----		-----	
997	D86	Manual	151.5		165.5		191.5		234.0		255.5	
1011	D86	Automated	152.2		165.9		191.4		235.3		255.9	
1016			-----		-----		-----		-----		-----	
1023			-----		-----		-----		-----		-----	

lab	method	Mode	IBP	mark	10% rec	mark	50% rec	mark	90% rec	mark	FBP	mark
1026	ISO3405	Automated	150.4		165.8		191.2		233.9		255.5	
1039			-----		-----		-----		-----		-----	
1049		Automated	150.6		166.2		191.9		235.2		256.2	
1059	D86	Automated	150.7		164.5		190.7		233.9		255.9	
1062	D86	Automated	150.0		165.3		191.2		234.0		255.0	
1064	D86	Automated	153.5		166.1		193.2		236.3		257.1	
1065			-----		-----		-----		-----		-----	
1079	D86	Automated	151.9		165.9		192.0		236.2		256.5	
1081	D86	Automated	148.4		164.9		190.7		234.8		255.1	
1082	D86	Automated	152		165.5		192.2		236.0		255.5	
1097	ISO3405	Automated	151.1		165.6		191.7		236.4		255.9	
1109	D86	Automated	150.5		165.4		191.3		234.7		254.5	
1121	D86	Manual	149.5		166	C	189.0		231.5		252.0	
1134			-----		-----		-----		-----		-----	
1135	D86	Automated	150.3		166.0		191.5		235.9		255.9	
1146	ISO3405	Automated	150.6		165.7		190.9		233.0		256.0	
1150	ISO3405	Automated	152.10		166.75		191.69		236.81		256.34	
1161	ISO3405	Automated	148.8		163.2		189.5		233.2		255.7	
1182	D86	Automated	151.5		164.8		191.0		236.3		255.5	
1191	D86	Automated	149.8		165.1		191.8		235.3		255.8	
1205	D86	Automated	152.7		166.3		192.1		234.9		257.7	
1264	D86	Automated	150.0		166.4		191.3		234.4		254.6	
1279	D86	Automated	153.7		167.0		191.7		235.0		254.1	
1297	D86	Automated	147.8		165.5		190.3		232.2		254.7	
1299	D86	Automated	151.6		165.0		191.3		235.4		255.8	
1316		Automated	147.6		165.1		191.1		234.2		254.1	
1318	D86	Automated	147.8		165.3		190.7		234.6		254.5	
1347	D86	Manual	155.0		167.0		192.0		234.0		254.0	
1348	D86	Automated	153.8		163.7		189.2		233.6		253.9	
1397	D86		150.1		164.7		190.9		233.0		255.6	
1412	D86	Manual	151.0		165.5		192.0		234.5		-----	
1417	IP123	Automated	151.5		165.7		192.8		237.2		257.3	
1441	D86	Automated	149.0		163.7		188.9		233.5		252.9	
1496	D86	Automated	149.9		166.8		191.6		234.9		255.7	
1538	D86	Automated	152.1		165.6		191.3		233.8		255.1	
1585	D86	Automated	149.5		165.3		191.5		234.8		254.6	
1587	D86	Manual	149.4		165.7		191.0		234.0		255.6	
1610	D86	Automated	150.8		164.7		190.4		234.0		255.1	
1613	D86	Automated	153.0		166.1		192.1		235.1		257.0	
1631	D86	Automated	148.5		164.3		190.8		234.4		256.3	
1634	D86	Automated	149.6		165.9		192.9		237.9		257.8	
1636	D86	Automated	149.8		165.5		191.0		234.0		254.0	
1715	D86	Automated	150.0		165.7		190.9		234.3		255.3	
1720	D86	Automated	142.5	R(1)	165.4		191.4		234.5		254.3	
1724	D86	Automated	149.1		165.7		191.3		234.5		256.3	
1741	D86	Automated	149.3		164.3		190.2		234.5		253.3	
1776	ISO3405	Automated	149.1		165.2		191.2		236.1		256.2	
1782	D86	Automated	154.3		165.4		191.1		235.8		254.1	
1811	D86	Automated	151.5		165.4		190.2		232.8		255.4	
1813	D86	Automated	149.2		165.4		192.0		236.2		255.4	
1833	D86	Automated	151		165.3		190.9		232.9		256.5	
1881	D86	Manual	152.0		165.0		190.0		233.5		254.0	
1883	D86	Manual	152		166		190		232		260	
1913	D86	Automated	151.75		167.25		192.0		236.4		253.75	
1914		Manual	151.0		163.0		190.0		233.0		253.0	
1944	D86	Automated	150.7		165.1		190.6		235.3		254.9	
2129	D86	Automated	147.3		165.1		191.2		235.0		256.1	
2130	D86	Automated	149.1		165.6		192.0		235.6		257.3	
6054	D86	Automated	151.4		166.3		191.0		233.5		252.9	
	normality		OK		OK		OK		OK		OK	
	n		120		120		119		120		119	
	outliers		1		1		2		1		1	
	mean (n)		150.67		165.39		191.11		234.54		255.37	
	st.dev. (n)		1.792		0.820		0.820		1.211		1.522	
	R(calc.)		5.02		2.30		2.30		3.39		4.26	
	R(D86:16a-Auto)		8.29		3.64		3.00		3.52		7.10	
comp	R(D86:16a-Man)		4.17		2.88		2.95		3.51		3.97	

R(1) = R(0.01)
R(5) = R(0.05)

Lab 131 first reported for the temperature at 90% recovered: 221.8°C
Lab 1121 first reported for the temperature at 10% recovered: 160.0°C
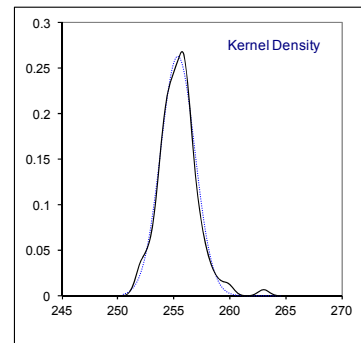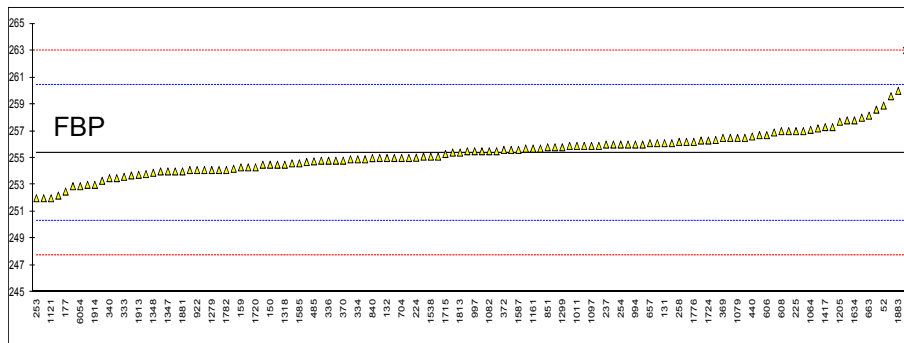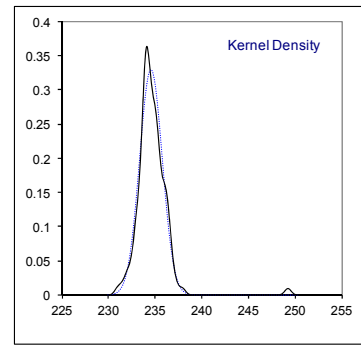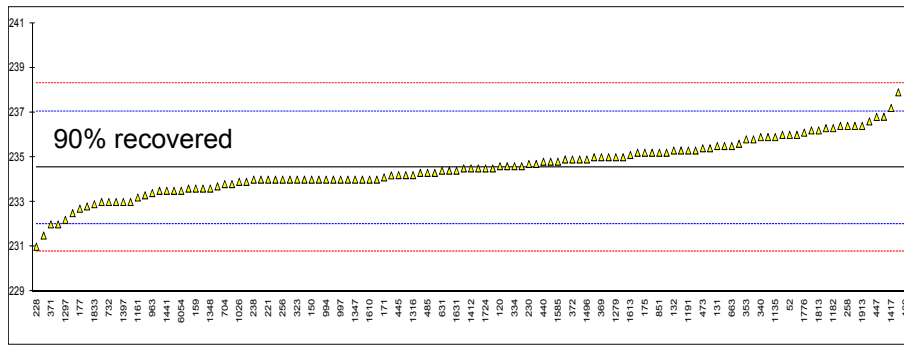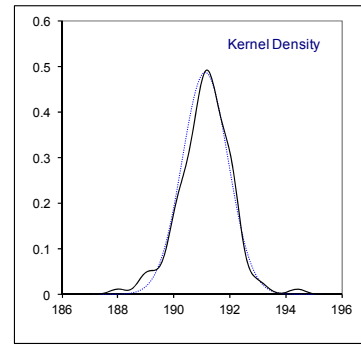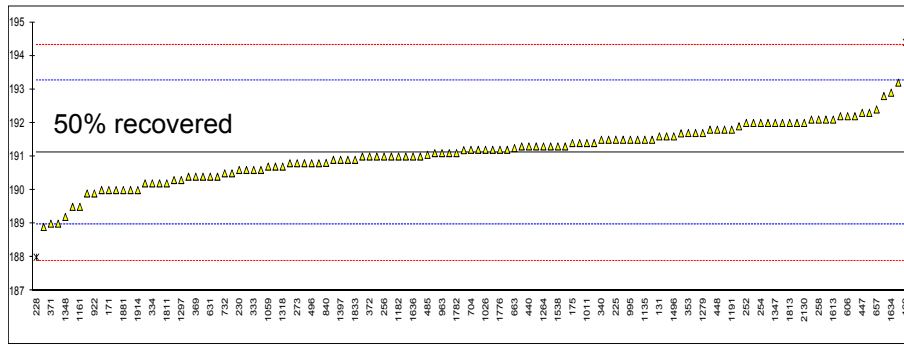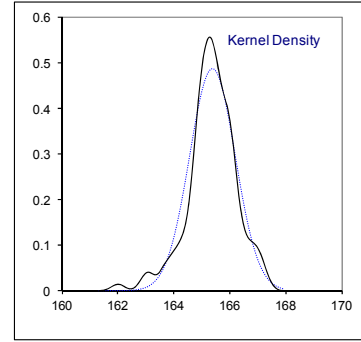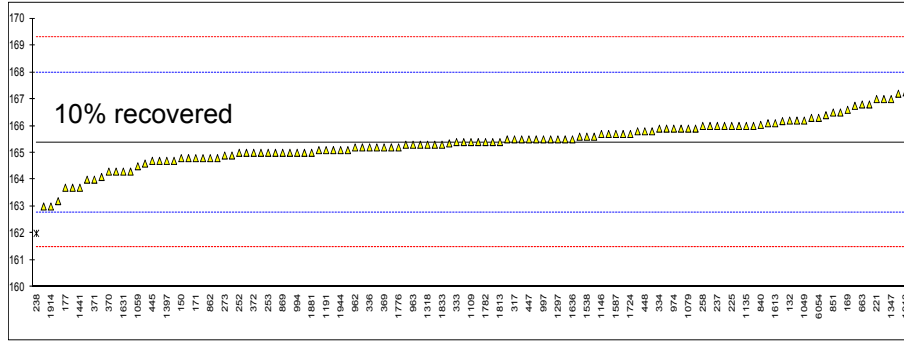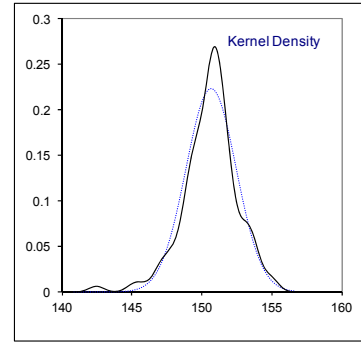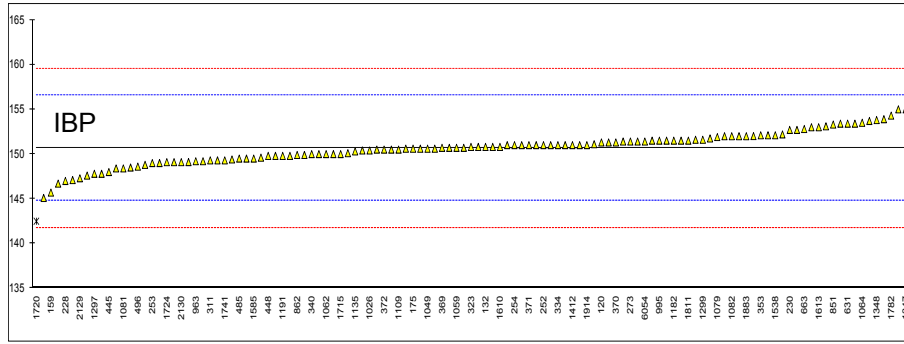
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Determination of Existent Gum (unwashed) on sample #16170; results in mg/100mL

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D381	1		0.35	974	D381	1		0.35
62	D381	<1		-----	994	D381	0.6		-0.01
120	IP540	0.5		-0.10	995		-----		-----
131		-----		-----	996		-----		-----
132	D381	<1		-----	997		-----		-----
140	D381	<1.0		-----	1011	D381	1		0.35
150	D381	<1		-----	1016		-----		-----
158		-----		-----	1023		-----		-----
159	D381	1		0.35	1026	ISO6246	< 1		-----
169	D381	0.0		-0.55	1039	IP540	1		0.35
171	D381	1		0.35	1049	D381	0.4		-0.19
175	D381	<1		-----	1059	D381	0.4		-0.19
177	D381	<1		-----	1062	D381	0		-0.55
194		-----		-----	1064	D381	0.2		-0.37
216		-----		-----	1065		-----		-----
221		-----		-----	1079	D381	0		-0.55
224		-----		-----	1081	D381	0.2		-0.37
225	D381	0.4		-0.19	1082	IP540	0.32		-0.26
228		-----		-----	1097	IP540	0.2		-0.37
230	IP540	0.8		0.17	1109	D381	0.0		-0.55
237	D381	<1		-----	1121		-----		-----
238		-----		-----	1134		-----		-----
252	D381	0.6		-0.01	1135	D381	0.3		-0.28
253	IP540	1.0		0.35	1146		-----		-----
254		-----		-----	1150	ISO6246	1.0		0.35
256	D381	0.4		-0.19	1161		-----		-----
258	D381	1.0		0.35	1182		-----		-----
273	D381	<1		-----	1191	D381	0.1		-0.46
311	D381	<1		-----	1205		-----		-----
317	D381	<1		-----	1264	D381	0.5		-0.10
323	D381	1		0.35	1279	D381	<1		-----
333		-----		-----	1297		-----		-----
334	D381	1.0		0.35	1299	D381	0.2		-0.37
335	IP540	1		0.35	1316	D381	0.1		-0.46
336	D381	1		0.35	1318	IP540	0.2		-0.37
340	D381	<0.5		-----	1347	D381	1.4		0.71
353	IP540	0.1		-0.46	1348	D381	1.0		0.35
369	IP540	0.5		-0.10	1397		-----		-----
370	IP540	0.8		0.17	1412		-----		-----
371		-----		-----	1417	IP540	0.0		-0.55
372	IP540	0.8		0.17	1441		-----		-----
440	IP540	1		0.35	1496	D381	0.4		-0.19
445	IP540	<1		-----	1538	D381	0.6		-0.01
447		-----		-----	1585		-----		-----
448	IP540	1		0.35	1587	IP540	1.0		0.35
453	IP540	<1		-----	1610	IP540	0.4		-0.19
468	IP540	1.0		0.35	1613	D381	0.4		-0.19
473	D381	<1		-----	1631	IP540	0.8		0.17
485		-----		-----	1634	D381	0.5		-0.10
496	D381	0.3		-0.28	1636	IP540	0.8		0.17
601		-----		-----	1715		-----		-----
606	IP540	0.4		-0.19	1720		-----		-----
608	D381	<1		-----	1724	IP540	1.0		0.35
631	IP540	0.4		-0.19	1741	D381	0.7		0.08
657	D381	0.8		0.17	1776	IP540	1.8		1.07
663		-----		-----	1782	D381	0.80		0.17
671	D381	0.2		-0.37	1811	D381	0.2		-0.37
704	GOST-1567	0.2		-0.37	1813	D381	<1		-----
732		-----		-----	1833	IP540	0.8		0.17
840		-----		-----	1881		-----		-----
851	IP540	1.0		0.35	1883	D381	0.6		-0.01
854	IP540	1		0.35	1913	D381	1		0.35
862	D381	0.2		-0.37	1914	IP540	< 1.0		-----
869	D381	0.6		-0.01	1944		-----		-----
922	D381	0.7		0.08	2129	D381	0.0		-0.55
962		-----		-----	2130	D381	0.2		-0.37
963	D381	0.8		0.17	6054		-----		-----

normality	OK
n	75
outliers	0
mean (n)	0.608
st.dev. (n)	0.3881
R(calc.)	1.087
R(D381:12)	3.111
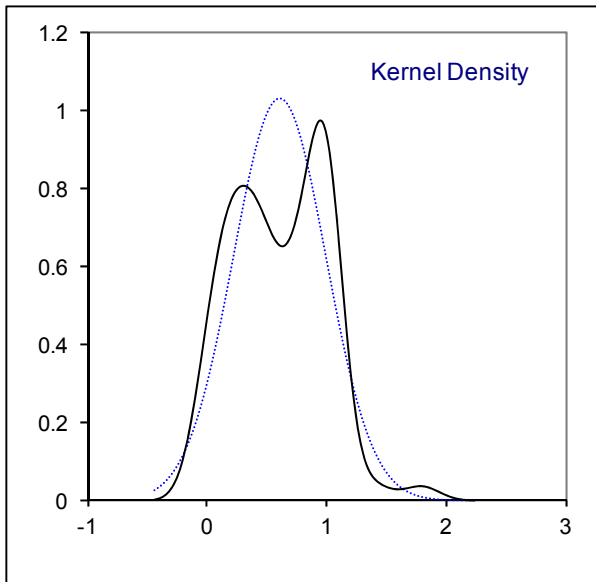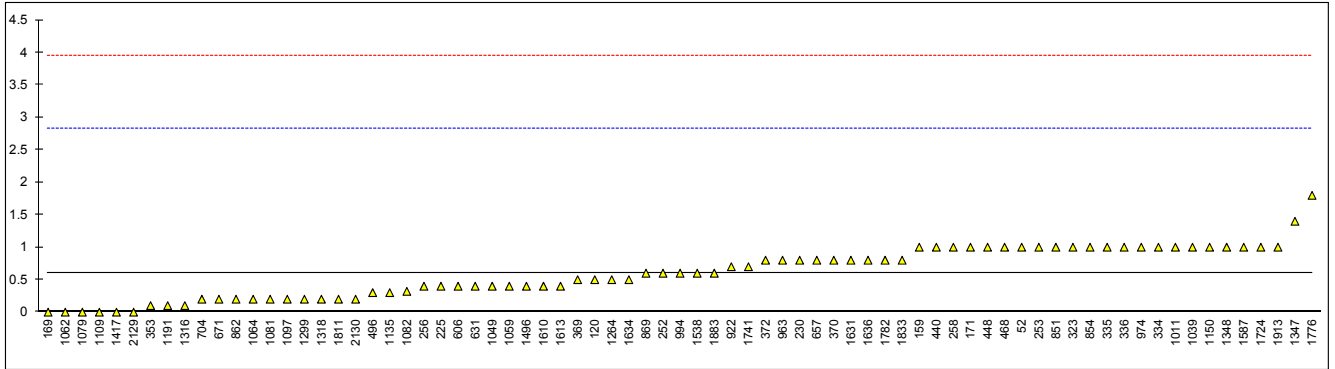
Determination of Flash Point on sample #16170; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	974	IP170	42.0		-0.10
62	D56	41.0		-0.97	994	D93	43.0		0.78
120	D56	43.5		1.21	995	IP170	42.0		-0.10
131	D56	43.0		0.78	996		-----		-----
132	D56	42.5		0.34	997	IP170	42.0		-0.10
140	D56	42.0		-0.10	1011	IP170	42		-0.10
150	D56	42.0		-0.10	1016	IP170	41.5		-0.54
158		-----		-----	1023	ISO13736	40.7		-1.24
159	D56	43		0.78	1026	IP170	42.0		-0.10
169	D56	40.0		-1.85	1039	IP170	43.5		1.21
171	D56	44.5		2.09	1049	ISO13736	42.0		-0.10
175		-----		-----	1059	IP170	42.5		0.34
177	D56	42.0		-0.10	1062	IP170	42.0		-0.10
194		-----		-----	1064	IP170	42.5		0.34
216		-----		-----	1065		-----		-----
221	D3828	40.0		-1.85	1079	IP170	42.0		-0.10
224	IP170	41.75		-0.32	1081	IP170	43.5		1.21
225	IP170	42.5		0.34	1082	D56	41.5		-0.54
228	IP523	40.0		-1.85	1097	ISO13736	42.6		0.43
230	IP170	42.5		0.34	1109	IP170	42.0		-0.10
237	IP170	41.5		-0.54	1121	IP170	40.0		-1.85
238	IP170	41.8		-0.27	1134		-----		-----
252	IP170	41.5		-0.54	1135	IP170	41.5		-0.54
253	IP170	41.5		-0.54	1146		-----		-----
254	IP170	43.0		0.78	1150	D56	42.0		-0.10
256	IP170	43.0		0.78	1161		-----		-----
258	IP170	42.5		0.34	1182	D93	44	C	1.65
273	IP170	41		-0.97	1191	IP170	43.5		1.21
311	IP170	42.5		0.34	1205	D93	45.0		2.53
317	IP170	44.5		2.09	1264	IP170	41.0		-0.97
323	IP170	41.5		-0.54	1279	D56	45.0		2.53
333	IP170	41.0		-0.97	1297	D56	42		-0.10
334	IP170	41.0		-0.97	1299	IP170	43.0		0.78
335	IP170	41.1		-0.89	1316	IP170	42.5		0.34
336		-----		-----	1318	IP170	42.5		0.34
340	IP170	41.5		-0.54	1347	IP170	42.5		0.34
353	IP170	41.0		-0.97	1348	IP170	43.0		0.78
369	IP170	41.0		-0.97	1397	D56	42.0		-0.10
370	IP170	41.35		-0.67	1412	D93	42.5		0.34
371	IP170	41.0		-0.97	1417		-----		-----
372	IP170	42.0		-0.10	1441	D93	43.0		0.78
440	IP170	41.6		-0.45	1496	IP170	41.7		-0.36
445	IP170	44.0		1.65	1538	D56	43.0		0.78
447	IP170	41.5		-0.54	1585	IP170	40.5		-1.41
448	IP170	41.8		-0.27	1587	IP170	41.5		-0.54
453	IP170	41.0		-0.97	1610	IP170	42.5		0.34
468	IP170	42.5		0.34	1613	D56	43.0		0.78
473	IP170	42.5		0.34	1631	IP170	42.5		0.34
485	D56	40.5		-1.41	1634	IP170	41.2		-0.80
496	IP170	43.3		1.04	1636	IP170	42.5		0.34
601		-----		-----	1715	D56	42.0		-0.10
606	IP170	42.5		0.34	1720	D3828	42.1		-0.01
608	IP170	43.0		0.78	1724	IP170	41.5		-0.54
631	D56	41.0		-0.97	1741	IP170	42.5		0.34
657	IP170	42.0		-0.10	1776	IP170	42.5		0.34
663		-----		-----	1782	IP170	42.0		-0.10
671	IP170	42.5		0.34	1811	D56	42.3		0.16
704	GOST-6356	42.5		0.34	1813	IP170	41.5		-0.54
732	ISO2719	43.5		1.21	1833	IP170	43		0.78
840	D93	43.5		1.21	1881	IP170	42.0		-0.10
851	IP170	41.6		-0.45	1883	D93	42		-0.10
854	IP170	42.0		-0.10	1913	IP170	42.45		0.29
862	IP170	42.0		-0.10	1914	IP170	41.5		-0.54
869	IP170	41.0		-0.97	1944	ISO13736	41.5		-0.54
922	IP170	43.0		0.78	2129	IP170	42.0		-0.10
962	D56	42.0		-0.10	2130	IP170	41.5		-0.54
963	IP170	41.5		-0.54	6054	IP170	40.8625		-1.10

normality	OK
n	120
outliers	0
mean (n)	42.11
st.dev. (n)	0.970
R(calc.)	2.72
R(IP170:14)	3.20

Lab 1182 first reported: 47

Kernel Density
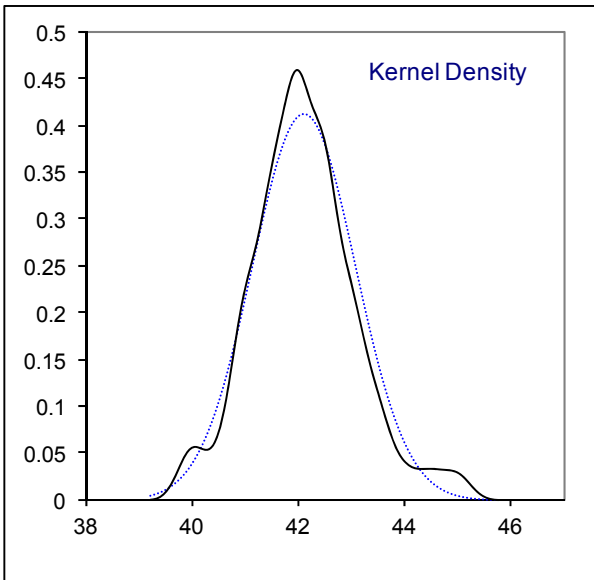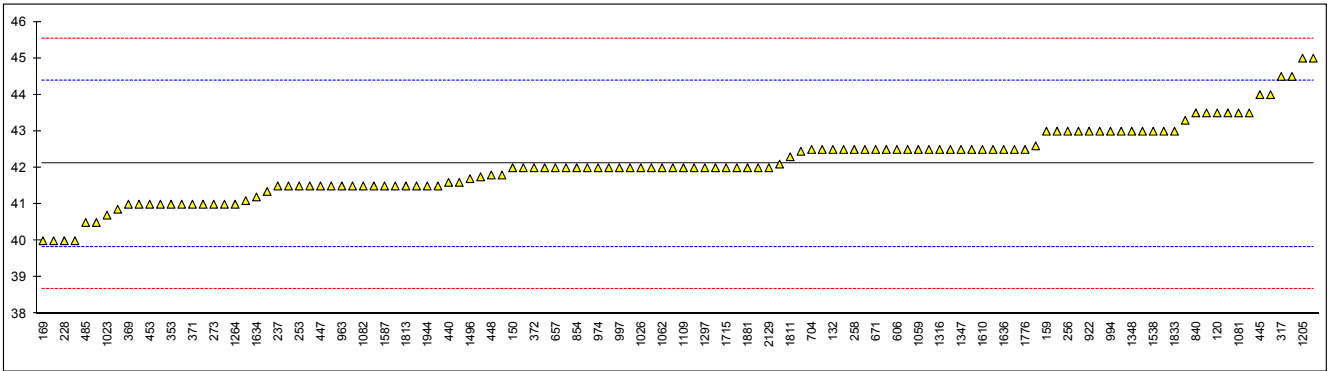
Determination of Freezing Point on sample #16170; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5972	-57.5		-2.14	974	D2386	-56.0		-0.46
62	D5972	-56.7		-1.25	994	D2386	-55.0		0.66
120	D2386	-56		-0.46	995	D2386	-54.5		1.22
131		-----		-----	996		-----		-----
132	D2386	-56.5		-1.02	997	D2386	-54.5		1.22
140	D5972	-56.3		-0.80	1011	D2386	-56.0		-0.46
150	D7153	-55.7		-0.13	1016	D5972	-56.6		-1.13
158		-----		-----	1023		-----		-----
159	D2386	-56.4		-0.91	1026	D5972	-56.5		-1.02
169	D2386	-56.0		-0.46	1039	IP529	-55.5		0.10
171	D2386	-58.0		-2.70	1049	D7153	-55.4		0.21
175	D2386	-54.5	C	1.22	1059	D2386	-53.5		2.34
177	D2386	-55.0		0.66	1062	D2386	-54.7		0.99
194		-----		-----	1064	D7153	-53.3		2.56
216		-----		-----	1065		-----		-----
221	D2386	-57		-1.58	1079	D5972	-56.4		-0.91
224		-----		-----	1081	D7153	-55.0		0.66
225	D2386	-57.5		-2.14	1082	IP529	-55.5		0.10
228		-----		-----	1097	IP529	-54.9		0.77
230	D2386	-53.78		2.02	1109	D5972	-57.6		-2.25
237	D2386	-55.0		0.66	1121	IP16	-55.5		0.10
238		-----		-----	1134		-----		-----
252	D2386	-55.5		0.10	1135	D7153	-55.0		0.66
253	D2386	-56.0		-0.46	1146		-----		-----
254		-----		-----	1150	D2386	-55.0		0.66
256	D2386	-55.0		0.66	1161	ISO3016	-56		-0.46
258	D2386	-54.0		1.78	1182	D5972	-55		0.66
273		-----		-----	1191	IP529	-55.6		-0.01
311	D2386	-56.5		-1.02	1205		-----		-----
317	D5972	-55.5		0.10	1264	D2386	-55.0		0.66
323	D2386	-56.0		-0.46	1279	D2386	-55.5		0.10
333		-----		-----	1297	D5972	-56.0		-0.46
334	D7153	-55.1		0.55	1299	D2386	-56.5		-1.02
335	IP529	-55.3		0.32	1316	D7153	-55.5		0.10
336		-----		-----	1318	D7153	-55.1		0.55
340	D2386	-55.3		0.32	1347	D2386	-56.0		-0.46
353	IP16	-54.5		1.22	1348	D2386	-55.0		0.66
369	D2386	-55.0		0.66	1397	D7153	-55.5		0.10
370	D2386	-54.5		1.22	1412		-----		-----
371	D2386	-56.0		-0.46	1417		-----		-----
372	D2386	-55.5		0.10	1441	D5972	-57.0	C	-1.58
440	IP16	-54.8		0.88	1496	D5972	-55.2		0.43
445	D2386	-55.0		0.66	1538	D2386	-57.0		-1.58
447	IP529	-55.0		0.66	1585	D2386	-55.5		0.10
448	IP529	-54.7		0.99	1587	IP529	-55.3		0.32
453	D5972	-56.5		-1.02	1610	IP453	-56.8		-1.36
468	D2386	-55.5		0.10	1613	D7153	-55.6		-0.01
473	D2386	-55.0		0.66	1631	D7153	-55.5		0.10
485		-----		-----	1634	D2386	-56.0		-0.46
496		-----		-----	1636	D2386	-56.5		-1.02
601		-----		-----	1715	D5972	-55.5		0.10
606	D2386	-54.0		1.78	1720	D5972	-55.7		-0.13
608	D2386	-54.5		1.22	1724	D2386	-55		0.66
631	D2386	-57.0		-1.58	1741	D2386	-56		-0.46
657	D7153	-55.6		-0.01	1776	IP529	-55.3		0.32
663	D2386	-54.5		1.22	1782	D2386	-57.0		-1.58
671	D2386	-55.0		0.66	1811	D2386	-55.5		0.10
704		-----		-----	1813	D5972	-56.7		-1.25
732		-----		-----	1833	D5972	-54.9		0.77
840		-----		-----	1881	D2386	-55.0	C	0.66
851	D2386	-56.5		-1.02	1883	D2386	-56		-0.46
854	D2386	-57.5		-2.14	1913	D5972	-55.8		-0.24
862	D2386	-56.2		-0.69	1914	D2386	-55.5		0.10
869	D2386	-56.5		-1.02	1944		-----		-----
922	D2386	-56.0		-0.46	2129	D2386	-54.50		1.22
962		-----		-----	2130	D7153	-54.2		1.55
963	D2386	-55.5		0.10	6054	D7153	-54.8		0.88

normality	OK
n	107
outliers	0
mean (n)	-55.59
st.dev. (n)	0.907
R(calc.)	2.54
R(D2386:15e1)	2.50

Lab 175 first reported: -45.5
Lab 1441first reported: 57.0
Lab 1881 first reported: 55.0
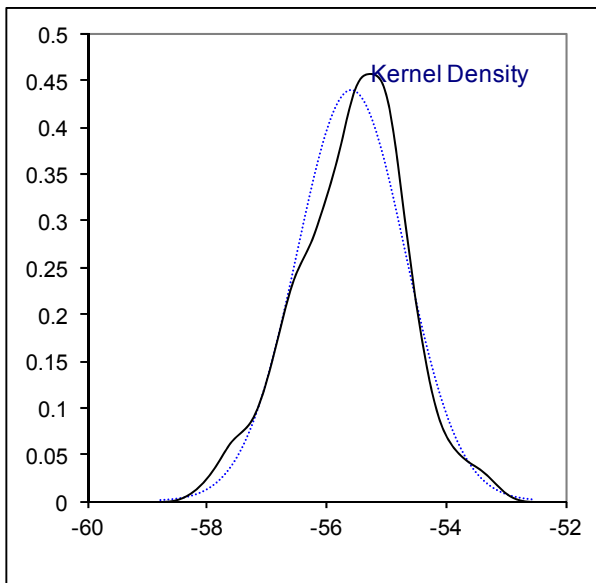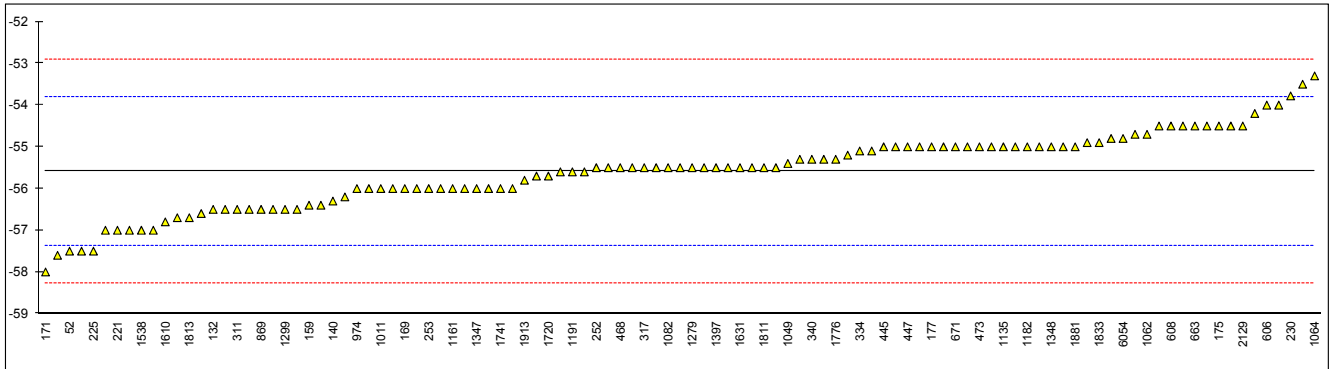
Determination of JFTOT at 260 °C; Tube Rating, Delta P in mmHg, Pumped Vol. in mL, Temp. in °C

lab	method	Tube rating	mark	Delta P	mark	Volume	mark	Temp	mark	remarks
52	D3241	<1		1		450		260		
62		-----		-----		-----		-----		
120	D3241	1		0		475		260		
131		-----		-----		-----		-----		
132	D3241	<1		0		450		260		
140	D3241	<1		1		450		260		
150	D3241	1		1		450		260		
158		-----		-----		-----		-----		
159	D3241	1		0.0		510		260		
169	D3241	1		3		450		260		
171	D3241	<1		0		450		260		
175	D3241	<1		0		440		260		
177	D3241	1		0		450		260		
194		-----		-----		-----		-----		
216		-----		-----		-----		-----		
221	D3241	<1		0.3		-----		260		
224		-----		-----		-----		-----		
225	D3241	<1		0.0		-----		260		
228		-----		-----		-----		-----		
230	D3241	<1		0.3		450		260		
237	D3241	1		0		460		260		
238		-----		-----		-----		-----		
252		-----		-----		-----		-----		
253	D3241	less than 1		0		450		260		
254	D3241	<1		0		465		260		
256	D3241	<1		0		411		260		
258	D3241	<1.0		0.4		450		260		
273		-----		-----		-----		-----		
311	D3241	1		1		460		260		
317		-----		-----		-----		-----		
323		-----		-----		-----		-----		
333		-----		-----		-----		-----		
334	D3241	<1		0		>495		260		
335	D3241	1		0		510		260		
336		-----		-----		-----		-----		
340	D3241	1		0		450		260		
353		-----		-----		-----		-----		
369	D3241	1		<1		450		260		
370	D3241	1		less than 3		510		260		
371		-----		-----		-----		-----		
372	D3241	1		0		450		260		
440	IP323	1		0		455		260		
445	D3241	1		<1		460		260		
447	D3241	1		<1		450		260		
448	D3241	1		<1		460		260		
453	IP323	1		<1		460		-----		
468		-----		-----		-----		-----		
473		-----		-----		-----		-----		
485		-----		-----		-----		-----		
496	D3241	1		0.10		510.0		260.0		
601		-----		-----		-----		-----		
606		-----		-----		-----		-----		
608		-----		-----		-----		-----		
631	D3241	<1		<1.0		480		260		
657	D3241	<1		1		455		260		
663		-----		-----		-----		-----		
671	D3241	1		0.1		450		260		
704		-----		-----		-----		-----		
732		-----		-----		-----		-----		
840		-----		-----		-----		-----		
851	D3241	<1		0		510		260		
854	D3241	<1		0		510		260		
862	D3241	<1		0		-----		260		
869	D3241	<1		0		-----		260		
922		-----		-----		-----		-----		
962		-----		-----		-----		-----		
963	D3241	<1		0.0		460		260		
974	D3241	<1		0		475		260		
994		-----		-----		-----		-----		
995		-----		-----		-----		-----		
996		-----		-----		-----		-----		
997		-----		-----		-----		-----		
1011		-----		-----		-----		-----		
1016	D3241	<1		0.0		510		260		
1023		-----		-----		-----		-----		
1026		-----		-----		-----		-----		

lab	method	Tube rating	mark	Delta P	mark	Volume	mark	Temp	mark	remarks
1039		-----		-----		-----		-----		
1049	D3241	1		0.0		450		260		
1059		-----		-----		-----		-----		
1062	D3241	0		<3		500		260		
1064	D3241	1		0.1		430.1		260		
1065		-----		-----		-----		-----		
1079	D3241	<1		0		450		260		
1081	D3241	<1		2		465		275		
1082		-----		-----		-----		-----		
1097	D3241	1		0		455		260		
1109	D3241	<1		0.0		450		260		
1121	D3241	<2		1		460		260		
1134		-----		-----		-----		-----		
1135		-----		-----		-----		-----		
1146	D3241	1		0.0		424		260		
1150		-----		-----		-----		-----		
1161		-----		-----		-----		-----		
1182		-----		-----		-----		-----		
1191	D3241	1		0		-----		-----		
1205		-----		-----		-----		-----		
1264	D3241	<1		0		600		260		
1279	D3241	1		0.0		510		260		
1297		-----		-----		-----		-----		
1299	D3241	1		0		450		260		
1316	D3241	1		0		448		-----		
1318	D3241	<1		0.1		450		260		
1347	D3241	1		0		450		260		
1348	D3241	1		0		500		260		
1397		-----		-----		-----		-----		
1412		-----		-----		-----		-----		
1417	IP323	<2		0		450		260		
1441	D3241	0		0.0		800		260.0		
1496	D3241	0		0.1		450		260		
1538	D3241	<1		<0,1		450		260		
1585		-----		-----		-----		-----		
1587	D3241	<1		0.1		460		260		
1610	IP323	<1		<1		450		260		
1613	D3241	<1		0.0		450		260		
1631	D3241	<1.0		0.0		-----		260		
1634	D3241	1		0		600		260		
1636		-----		-----		-----		-----		
1715		-----		-----		-----		-----		
1720		-----		-----		-----		-----		
1724	D3241	1		0		450		260		
1741	D3241	1		1		480		260		
1776		-----		-----		-----		-----		
1782		-----		-----		-----		-----		
1811		-----		-----		-----		-----		
1813	D3241	1		1.0		450		260		
1833	D3241	<1		0		-----		260		
1881		-----		-----		-----		-----		
1883		-----		-----		-----		-----		
1913	D3241	<1		0.0		450		260		
1914	D3241	< 1		1		460		260		
1944		-----		-----		-----		-----		
2129	D3241	1		0		450		260.0		
2130	IP323	1		<1		440		260		
6054		-----		-----		-----		-----		
	normality	n.a.		n.a.						
	n	73		75						
	outliers	n.a.		n.a.						
	mean (n)	<2		<3						
	st.dev. (n)	n.a.		n.a.						
	R(calc.)	n.a.		n.a.						
	R(D3241:16a)	unknown		unknown						

Determination of Kinematic Viscosity at -20°C on sample #16170; results in mm^2/s

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D445	3.558		-0.48	974	D445	3.582		0.51
62	D445	3.581		0.47	994		-----		-----
120	D445	3.601		1.30	995	D445	3.5651		-0.19
131		-----		-----	996		-----		-----
132	D445	3.536		-1.39	997		-----		-----
140	D445	3.625		2.29	1011	D445	3.598		1.17
150	D445	3.552		-0.73	1016	D445	3.5944		1.02
158		-----		-----	1023		-----		-----
159	D445	3.520	C	-2.05	1026	ISO3104	3.565		-0.19
169	D445	3.5178		-2.14	1039	ISO3104	3.596		1.09
171	D445	3.572		0.10	1049	D445	3.572		0.10
175		-----		-----	1059	D445	3.564		-0.23
177	D445	3.528		-1.72	1062	D445	3.554		-0.64
194		-----		-----	1064	D445	3.5675		-0.09
216		-----		-----	1065		-----		-----
221	D445	3.611		1.71	1079	D445	3.57304		0.14
224		-----		-----	1081	D445	3.593		0.97
225	D445	3.592		0.93	1082	D445	3.6152		1.88
228		-----		-----	1097	ISO3104	3.588		0.76
230	D445	3.5882		0.77	1109	D445	3.5958		1.08
237	D445	3.5811		0.48	1121		-----		-----
238		-----		-----	1134		-----		-----
252		-----		-----	1135		-----		-----
253	D445	3.604		1.42	1146		-----		-----
254		-----		-----	1150	ISO3104	3.8446	C,R(0.01)	11.35
256	D445	3.566		-0.15	1161		-----		-----
258		-----		-----	1182		-----		-----
273		-----		-----	1191	D445	3.5691		-0.02
311	D445	3.572		0.10	1205		-----		-----
317		-----		-----	1264	D445	3.518		-2.13
323	D445	3.537		-1.35	1279	D445	3.513		-2.34
333	D445	3.610		1.67	1297		-----		-----
334	D445	3.615		1.88	1299	D445	3.575		0.22
335	D445	3.594		1.01	1316	D445	3.558		-0.48
336		-----		-----	1318	D7042	3.5465		-0.95
340	D445	3.5727		0.13	1347	D445	3.607		1.54
353		-----		-----	1348	D445	3.496		-3.04
369	D445	3.556		-0.56	1397	D7042	3.588		0.76
370	D445	3.5597		-0.41	1412		-----		-----
371		-----		-----	1417	IP71	3.571		0.06
372	D445	3.570		0.02	1441		-----		-----
440	D445	3.57893		0.39	1496	D445	3.527		-1.76
445	D445	3.577		0.31	1538		-----		-----
447	D445	3.585		0.64	1585	D445	3.5455		-0.99
448	D445	3.585	C	0.64	1587	D445	3.56617		-0.14
453	IP71	3.56089		-0.36	1610	D445	3.5985		1.19
468		-----		-----	1613	D445	3.5013		-2.82
473		-----		-----	1631	D445	3.566		-0.15
485		-----		-----	1634		-----		-----
496	D445	3.5748		0.22	1636		-----		-----
601		-----		-----	1715		-----		-----
606		-----		-----	1720		-----		-----
608		-----		-----	1724	D445	3.562		-0.31
631	D445	3.6119		1.75	1741	D445	3.5362		-1.38
657	D445	3.525		-1.84	1776		-----		-----
663	D445	3.5772		0.31	1782	D7042	3.529		-1.68
671		-----		-----	1811	D445	3.5850		0.64
704		-----		-----	1813	D445	3.621		2.12
732		-----		-----	1833	D445	3.556		-0.56
840		-----		-----	1881		-----		-----
851	D445	3.564		-0.23	1883		-----		-----
854	D445	3.5624		-0.30	1913	D445	3.5115		-2.40
862	D445	3.556		-0.56	1914	D341	3.632		2.58
869	D445	3.5750		0.22	1944		-----		-----
922		-----		-----	2129	D445	3.5785		0.37
962		-----		-----	2130	D445	3.548	C	-0.89
963	D445	3.564		-0.23	6054	D445	3.59123		0.89

normality	OK
n	81
outliers	1
mean (n)	3.5696
st.dev. (n)	0.02940
R(calc.)	0.0823
R(D445:15a)	0.0678

Lab 159 first reported: 3.801
Lab 448 first reported: 3.659
Lab 1150 first reported:3.4446
Lab 2130 first reported: 3.683

Kernel Density
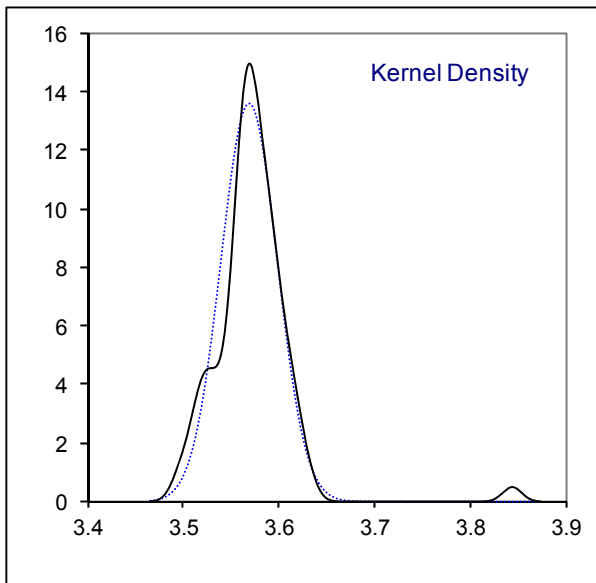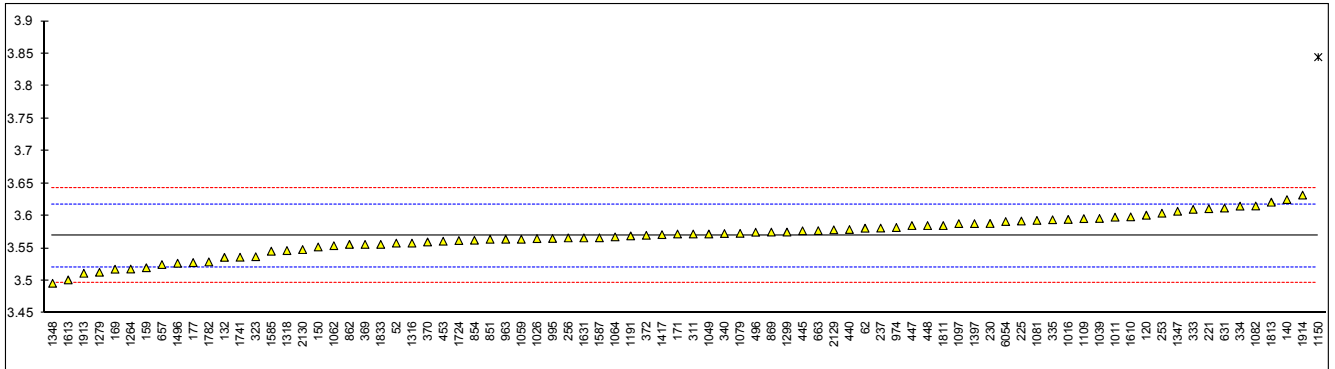
Determination of Mercaptan Sulphur as S on sample #16170; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3227	0.00045		0.09	974	D3227	0.0004		-0.34
62	D3227	0.0006		1.37	994	D3227	0.00044		0.00
120	D3227	0.0003		-1.19	995	D3227	0.00045		0.09
131		-----		-----	996		-----		-----
132	D3227	0.0005		0.52	997		-----		-----
140	D3227	<0.01		-----	1011	D3227	0.0003		-1.19
150	D3227	0.0005		0.52	1016	D3227	0.0004		-0.34
158		-----		-----	1023		-----		-----
159	D3227	0.0003		-1.19	1026	D3227	0.0005		0.52
169	D3227	0.0005		0.52	1039	UOP163	0.0005		0.52
171	D3227	0.0004		-0.34	1049	D3227	0.000391		-0.41
175	D3227	0.0004		-0.34	1059	D3227	0.0008	R(0.05)	3.07
177	D3227	0.0004		-0.34	1062	D3227	0.0004		-0.34
194		-----		-----	1064	D3227	0.00038		-0.51
216		-----		-----	1065		-----		-----
221		-----		-----	1079	D3227	0.000596		1.33
224		-----		-----	1081		-----		-----
225		-----		-----	1082		-----		-----
228		-----		-----	1097	ISO3012	0.00034		-0.85
230	D3227	0.00052		0.69	1109	D3227	0.00044		0.00
237	D3227	0.00068		2.05	1121		-----		-----
238		-----		-----	1134		-----		-----
252		-----		-----	1135		-----		-----
253		-----		-----	1146		-----		-----
254		-----		-----	1150		-----		-----
256		-----		-----	1161	ISO3012	0.00045		0.09
258		-----		-----	1182		-----		-----
273	D3227	0.0005		0.52	1191		-----		-----
311	D3227	0.0007		2.22	1205		-----		-----
317		-----		-----	1264	D3227	0.000409		-0.26
323	D3227	0.0003		-1.19	1279	D3227	0.00060		1.37
333		-----		-----	1297	D3227	0.00041		-0.25
334	D3227	0.0004		-0.34	1299	D3227	0.0002		-2.04
335	D3227	0.0005		0.52	1316		-----		-----
336		-----		-----	1318		-----		-----
340		-----		-----	1347	D3227	0.00071		2.31
353		-----		-----	1348	D3227	0.00045		0.09
369	D3227	0.0003		-1.19	1397	D3227	0.0004		-0.34
370	D3227	0.00032		-1.02	1412		-----		-----
371	D3227	0.00036		-0.68	1417		-----		-----
372	D3227	0.00047		0.26	1441		-----		-----
440	D3227	0.0004		-0.34	1496	D3227	0.00042		-0.17
445	D3227	0.0003		-1.19	1538	D3227	0.0004	C	-0.34
447	D3227	0.0005		0.52	1585	D3227	0.0003		-1.19
448	D3227	0.0004	C	-0.34	1587		-----		-----
453	IP342	0.0003		-1.19	1610	IP342	0.000427		-0.11
468		-----		-----	1613		-----		-----
473		-----		-----	1631	D3227	0.000465		0.22
485		-----		-----	1634		-----		-----
496	D3227	0.00042		-0.17	1636	D3227	0.000391		-0.41
601		-----		-----	1715		-----		-----
606		-----		-----	1720		-----		-----
608		-----		-----	1724	D3227	0.00038		-0.51
631		-----		-----	1741	D3227	0.00041		-0.25
657	D3227	0.0005		0.52	1776		-----		-----
663		-----		-----	1782	D3227	0.00044		0.00
671		-----		-----	1811	D3227	0.00051		0.60
704	D3227	0.00037		-0.59	1813	D3227	0.0005		0.52
732	D3227	0.000503		0.54	1833	D3227	0.0004		-0.34
840	D3227	0.00061		1.45	1881	D3227	0.00038		-0.51
851	D3227	0.0004		-0.34	1883		-----		-----
854	D3227	0.00052		0.69	1913	D3227	0.00043		-0.08
862	D3227	0.00048		0.35	1914	D3227	0.0005		0.52
869	D3227	0.00049		0.43	1944	D3227	0.00039		-0.42
922	D3227	0.00049		0.43	2129	D3227	0.00050		0.52
962	D3227	0.00048		0.35	2130	D3227	0.0004		-0.34
963	D3227	0.00047		0.26	6054		-----		-----

normality	suspect
n	77
outliers	1
mean (n)	0.000440
st.dev. (n)	0.0000941
R(calc.)	0.000263
R(D3227:13)	0.000328

Lab 448 first reported: 0.0385
Lab 1538 first reported: 0.00091

Kernel Density
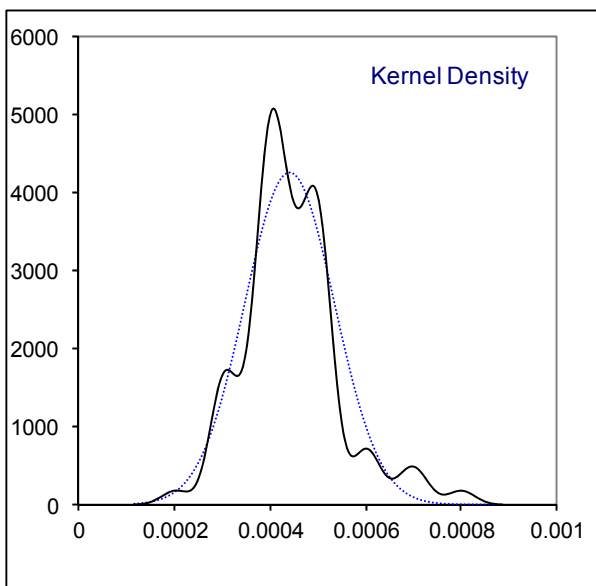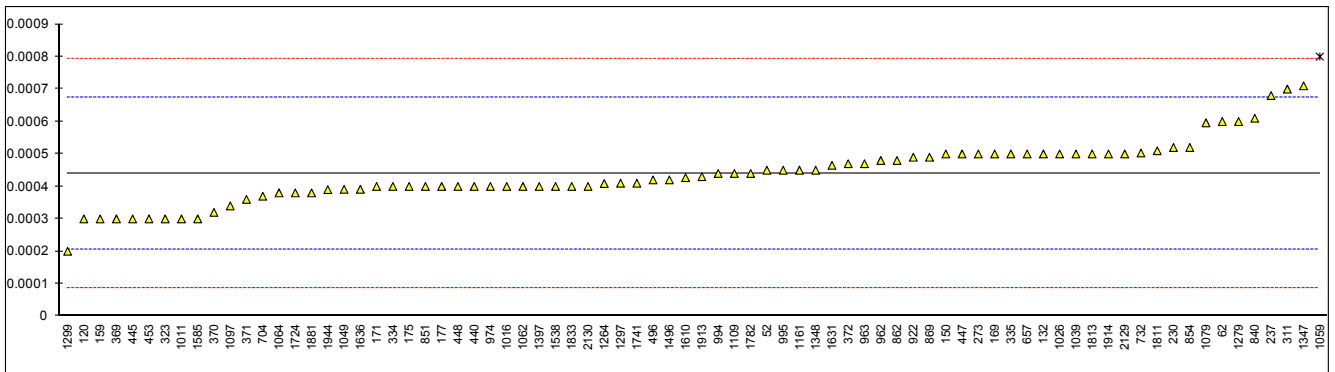
Determination of MSEP on sample #16170;

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3948	86		-1.32	974	D3948	96		1.22
62		-----		-----	994		-----		-----
120	D3948	90		-0.31	995		-----		-----
131		-----		-----	996		-----		-----
132	D3948	89		-0.56	997		-----		-----
140	D3948	89		-0.56	1011	D3948	94		0.71
150	D3948	88		-0.81	1016	D3948	90		-0.31
158		-----		-----	1023	D3948	90		-0.31
159	D3948	84		-1.83	1026		-----		-----
169	D3948	88		-0.81	1039	D3948	88		-0.81
171	D3948	92		0.20	1049	D3948	94		0.71
175	D3948	87		-1.07	1059	D3948	92		0.20
177	D3948	94		0.71	1062	D3948	91		-0.05
194		-----		-----	1064	D3948	87		-1.07
216		-----		-----	1065		-----		-----
221	D3948	93		0.46	1079	D3948	94		0.71
224		-----		-----	1081		-----		-----
225	D3948	88		-0.81	1082	D3948	94		0.71
228		-----		-----	1097	D3948	82	C	-2.34
230	D3948	90		-0.31	1109	D3948	93		0.46
237	D3948	95		0.97	1121	D3948	90		-0.31
238		-----		-----	1134		-----		-----
252	D3948	95		0.97	1135	D3948	93		0.46
253	D3948	94		0.71	1146		-----		-----
254	D3948	94		0.71	1150	D3948	92	C	0.20
256	D3948	90		-0.31	1161		-----		-----
258	D3948	90		-0.31	1182		-----		-----
273		-----		-----	1191	D3948	67	R(0.01)	-6.15
311	D3948	80		-2.85	1205		-----		-----
317	D3948	87		-1.07	1264	D3948	99		1.98
323	D3948	90		-0.31	1279	D3948	88		-0.81
333	D3948	97		1.47	1297		-----		-----
334	D3948	90		-0.31	1299	D3948	89		-0.56
335	D3948	91		-0.05	1316	D7224	87		-1.07
336	D3948	90		-0.31	1318	D3948	95		0.97
340	D3948	93		0.46	1347	D3948	96		1.22
353	D3948	91		-0.05	1348	D3948	98		1.73
369	D3948	92		0.20	1397	D3948	90		-0.31
370	D3948	96		1.22	1412		-----		-----
371		-----		-----	1417		-----		-----
372	D3948	94		0.71	1441	D3948	94		0.71
440	D3948	86		-1.32	1496	D3948	97		1.47
445	D3948	92		0.20	1538	D3948	95		0.97
447	D3948	94		0.71	1585	D3948	85.5		-1.45
448	D3948	86		-1.32	1587	D3948	90		-0.31
453	D3948	91		-0.05	1610	D3948	69	R(0.01)	-5.64
468		-----		-----	1613	D3948	96		1.22
473	D3948	87		-1.07	1631	D3948	90		-0.31
485		-----		-----	1634		-----		-----
496	D3948	84.5		-1.70	1636		-----		-----
601		-----		-----	1715		-----		-----
606	D3948	92		0.20	1720	D3948	98		1.73
608	D3948	99		1.98	1724	D3948	82		-2.34
631	D3948	91		-0.05	1741	D3948	91		-0.05
657	D3948	97		1.47	1776	D3948	80		-2.85
663		-----		-----	1782	D3948	91		-0.05
671	D3948	97		1.47	1811	D3948	96		1.22
704		-----		-----	1813	D3948	89		-0.56
732		-----		-----	1833	D3948	91		-0.05
840		-----		-----	1881		-----		-----
851	D3948	94		0.71	1883	D3948	98		1.73
854	D3948	97		1.47	1913	D3948	98		1.73
862	D3948	92		0.20	1914	D3948	81		-2.59
869	D3948	95		0.97	1944	D3948	89		-0.56
922		-----		-----	2129	D3948	86.0		-1.32
962	D3948	93		0.46	2130	D3948	85		-1.58
963	D3948	92		0.20	6054	D3948	93		0.46

normality	OK
n	95
outliers	2
mean (n)	91.20
st.dev. (n)	4.322
R(calc.)	12.10
R(D3948:14)	11.01

Lab 1097 first reported: 66
Lab 1150 first reported: 148

Kernel Density
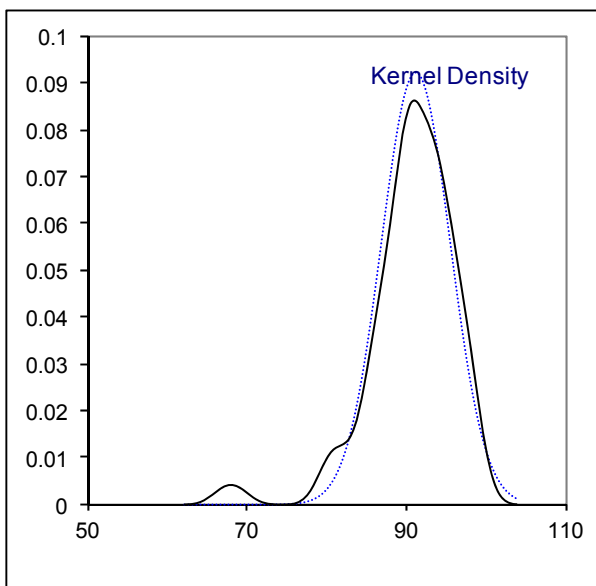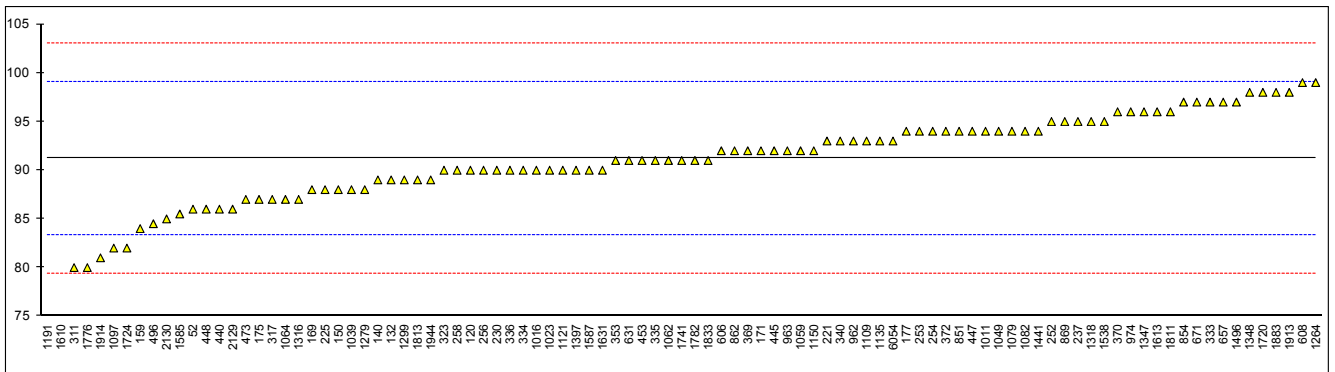
Determination of Naphthalenes on sample #16170; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D1840 - meth.B	1.73		0.05	974	D1840 - meth.A	1.66		-1.46
62	D1840 - meth.A	1.7		-0.60	994		-----		-----
120	D1840 - meth.B	1.80		1.55	995		-----		-----
131		-----		-----	996		-----		-----
132	D1840 - meth.B	1.73		0.05	997		-----		-----
140	D1840 - meth.B	1.69		-0.81	1011	D1840 - meth.A	1.72		-0.17
150	D1840 - meth.A	1.84		2.41	1016	D1840 - meth.B	1.70		-0.60
158		-----		-----	1023		-----		-----
159	D1840 - meth.B	1.79		1.33	1026		-----		-----
169	D1840 - meth.B	1.71	C	-0.38	1039	D1840 - meth.B	1.73		0.05
171	D1840 - meth.B	1.70		-0.60	1049	D1840 - meth.A	1.747		0.41
175		-----		-----	1059	D1840 - meth.B	1.67		-1.24
177	D1840 - meth.A	1.85		2.62	1062	D1840 - meth.A	1.73		0.05
194		-----		-----	1064	D1840 - meth.A	1.730		0.05
216		-----		-----	1065		-----		-----
221		-----		-----	1079	D1840 - meth.A	1.723		-0.10
224		-----		-----	1081	D1840 - meth.A	1.70		-0.60
225		-----		-----	1082		-----		-----
228		-----		-----	1097	D1840 - meth.A	1.730		0.05
230		-----		-----	1109	D1840 - meth.B	1.717		-0.23
237	D1840 - meth.A	1.71		-0.38	1121		-----		-----
238		-----		-----	1134		-----		-----
252		-----		-----	1135	D1840 - meth.A	1.75		0.47
253	D1840 - meth.B	1.67		-1.24	1146		-----		-----
254		-----		-----	1150		-----		-----
256		-----		-----	1161		-----		-----
258		-----		-----	1182		-----		-----
273		-----		-----	1191	D1840 - meth.A	1.901	C	3.71
311	D1840 - meth.B	1.63		-2.10	1205		-----		-----
317		-----		-----	1264	D1840 - meth.A	1.72	C	-0.17
323	D1840 - meth.A	1.78		1.12	1279	D1840 - meth.B	1.7181		-0.21
333	D1840 - meth.B	1.61	C	-2.53	1297		-----		-----
334	D1840 - meth.A	1.61		-2.53	1299	D1840 - meth.B	1.67		-1.24
335	D1840 - meth.A	1.68		-1.03	1316	D1840 - meth.B	1.70		-0.60
336		-----		-----	1318	D1840 - meth.B	1.69		-0.81
340	D1840 - meth.A	1.59		-2.96	1347	D1840 - meth.B	1.78	C	1.12
353		-----		-----	1348	D1840 - meth.B	1.5	R(0.05)	-4.89
369	D1840 - meth.B	1.80		1.55	1397	D6379	1.7		-0.60
370	D1840 - meth.A	1.714		-0.30	1412		-----		-----
371	D1840 - meth.B	1.66		-1.46	1417		-----		-----
372	D1840 - meth.B	1.74		0.26	1441		-----		-----
440	D1840 - meth.B	1.2	R(0.01)	-11.33	1496	D1840 - meth.B	1.707		-0.45
445	D1840 - meth.B	1.768		0.86	1538	D1840 - meth.B	1.76		0.69
447	D1840 - meth.B	1.17	R(0.01)	-11.97	1585		-----		-----
448		-----		-----	1587		-----		-----
453	D1840 - meth.B	1.74	C	0.26	1610	D1840-meth.B	1.6598		-1.46
468		-----		-----	1613		-----		-----
473		-----		-----	1631		-----		-----
485		-----		-----	1634	D1840 - meth.B	1.71		-0.38
496	D1840 - meth.B	1.757		0.62	1636		-----		-----
601		-----		-----	1715		-----		-----
606		-----		-----	1720	D1840 - meth.B	1.73		0.05
608		-----		-----	1724		-----		-----
631	D1840 -meth.A	1.718		-0.21	1741	D1840 - meth.A	1.726		-0.04
657	D1840 - meth.A	1.86		2.83	1776	D1840 - meth.B	1.84		2.41
663	D1840 - meth.A	1.702		-0.56	1782		-----		-----
671		-----		-----	1811	D1840 - meth.A	1.7512		0.50
704	D1840 - meth.A	1.725		-0.06	1813	D1840 - meth.A	1.83		2.19
732		-----		-----	1833		-----		-----
840	D1840 - meth.B	1.778		1.08	1881		-----		-----
851	D1840 - meth.A	1.79		1.33	1883		-----		-----
854	D1840 - meth.A	1.73		0.05	1913	D1840 - meth.B	1.80		1.55
862	D1840 - meth.B	1.702		-0.56	1914	D1840 - meth.A	1.71		-0.38
869	D1840 - meth.A	1.688		-0.86	1944		-----		-----
922		-----		-----	2129	D1840 - meth.B	1.713		-0.32
962		-----		-----	2130	D1840 - meth.B	1.70		-0.60
963	D1840 - meth.B	1.709		-0.41	6054		-----		-----

			D1840 Method A only	D1840 Method B only
	normality	OK	OK	OK
	n	69	31	37
	outliers	3	0	3
	mean (n)	1.7279	1.7360	1.7219
	st.dev. (n)	0.05831	0.06733	0.05028
	R(calc.)	0.1633	0.1885	0.1408
	R(D1840:07-B)	0.1304	-	0.1302
comp	R(D1840:07-A)	0.0816	0.0818	-

Lab 169 first reported: 1.37
Lab 333 first reported: 1.41
Lab 453 first reported: 1.06
Lab 1191 first reported: 2.367
Lab 1264 first reported: 0.64
Lab 1347 first reported: 1.5
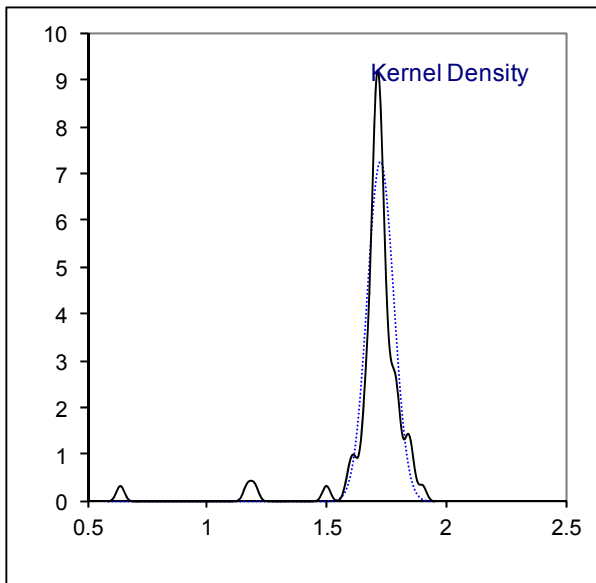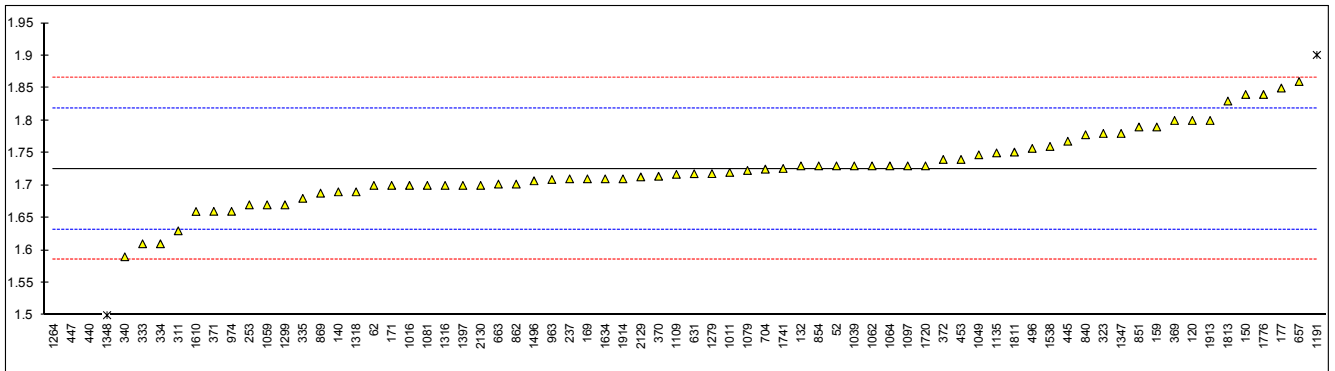
Determination of Smoke Point on sample #16170; results in mm

lab	method	mode	value	mark	z(targ)	lab	method	mode	value	mark	z(targ)
52	D1322	Manual	21.0		-1.50	974	D1322	Manual	22		-0.74
62	D1322	Manual	21.5		-1.12	994	D1322	Manual	22.5		-0.35
120	D1322	Automated	22.3		-0.51	995	D1322		22.5		-0.35
131	D1322	Manual	21		-1.50	996			-----		-----
132	D1322	Manual	24.0		0.80	997			-----		-----
140	D1322	Automated	22.2		-0.58	1011	D1322	Automated	22.4		-0.43
150	D1322	Automated	22.0		-0.74	1016	IP598		22.4		-0.43
158			-----		-----	1023			-----		-----
159	D1322	Automated	22.2		-0.58	1026	D1322	Manual	24.0		0.80
169	D1322	Automated	22.7		-0.20	1039	D1322	Manual	24.5		1.18
171	D1322	Automated	22.6		-0.27	1049	D1322	Automated	22.8		-0.12
175			-----		-----	1059	D1322	Manual	23.8		0.65
177	D1322	Automated	22.5		-0.35	1062	D1322	Manual	22		-0.74
194			-----		-----	1064	D1322	Automated	22.3		-0.51
216			-----		-----	1065			-----		-----
221			-----		-----	1079	D1322	Automated	22.9		-0.04
224			-----		-----	1081	D1322	Manual	22.2		-0.58
225			-----		-----	1082	D1322	Manual	22.1		-0.66
228			-----		-----	1097	D1322	Manual	22.0		-0.74
230	D1322	Manual	22.9		-0.04	1109	D1322	Manual	21.97		-0.76
237	D1322	Automated	21.6		-1.04	1121	D1322	Manual	22.5		-0.35
238			-----		-----	1134			-----		-----
252	D1322	Manual	23.0		0.03	1135	D1322	Manual	22.0		-0.74
253	D1322	Manual	22		-0.74	1146			-----		-----
254	D1322	Manual	24.0		0.80	1150			-----		-----
256	D1322	Manual	23.76		0.62	1161	ISO3014	Manual	24.2		0.95
258	D1322	Manual	24		0.80	1182			-----		-----
273	D1322	Manual	23		0.03	1191	D1322	Automated	22.3		-0.51
311	D1322	Manual	23.0		0.03	1205			-----		-----
317			-----		-----	1264	D1322	Manual	25		1.57
323	D1322	Manual	25.0		1.57	1279	D1322	Automated	21.9		-0.81
333	D1322		22.6		-0.27	1297	D1322	Manual	23.5		0.42
334			-----		-----	1299	D1322	Automated	22.0		-0.74
335	D1322	Manual	24.1		0.88	1316	D1322	Automated	22.4		-0.43
336			-----		-----	1318	D1322	Automated	22.6		-0.27
340	D1322	Manual	22.0		-0.74	1347	D1322	Manual	23		0.03
353	IP57	Manual	24.0		0.80	1348	D1322	Manual	24		0.80
369	D1322	Manual	24.75		1.38	1397	D1322		25		1.57
370	D1322	Manual	23.5		0.42	1412			-----		-----
371			-----		-----	1417			-----		-----
372	D1322	Manual	22.0		-0.74	1441			-----		-----
440	D1322	Manual	23		0.03	1496	D1322	Automated	22.5		-0.35
445	IP598	Manual	23.0		0.03	1538	D1322	Automated	22.8		-0.12
447	D1322	Manual	23.0		0.03	1585	D1322	Manual	22.74		-0.17
448	D1322	Manual	23.5		0.42	1587	D1322	Automated	22.5		-0.35
453	D1322	Automated	22.6		-0.27	1610	IP598	Manual	21.56		-1.07
468	D1322	Manual	25.0		1.57	1613	D1322	Automated	23.1		0.11
473			-----		-----	1631	D1322	Manual	25		1.57
485			-----		-----	1634			-----		-----
496	D1322	Manual	23.30		0.26	1636	D1322	Manual	22.4		-0.43
601			-----		-----	1715	D1322	Manual	24		0.80
606			-----		-----	1720			-----		-----
608			-----		-----	1724	D1322	Manual	24		0.80
631	D1322	Automated	22.3		-0.51	1741	D1322	Manual	21.914		-0.80
657	D1322	Manual	22.8		-0.12	1776	D1322	Automated	22.2		-0.58
663			-----		-----	1782	D1322	Manual	23.0		0.03
671			-----		-----	1811	D1322	Automated	22.20		-0.58
704	D1322	Manual	22.75		-0.16	1813	D1322	Manual	24.0		0.80
732			-----		-----	1833	D1322	Manual	26		2.33
840	D1322	Manual	22.1		-0.66	1881	D1322	Manual	21.5		-1.12
851	D1322	Manual	23.0		0.03	1883			-----		-----
854	D1322	Manual	23.0		0.03	1913	D1322	Automated	22.2		-0.58
862	D1322	Automated	24.0		0.80	1914	D1322	Manual	23.0		0.03
869	D1322	Manual	23.5		0.42	1944	D1322		24.5		1.18
922	D1322	Manual	25		1.57	2129	D1322	Manual	22.00		-0.74
962	D1322	Manual	25		1.57	2130	D1322	Automated	22.0		-0.74
963	D1322	Manual	23		0.03	6054			-----		-----

|			D1322 Manual only	D1322 Automated only
	normality	OK	OK	not OK
	n	97	64	28
	outliers	0	0	0
	mean (n)	22.96	23.13	22.43
	st.dev. (n)	1.029	1.124	0.449
	R(calc.)	2.88	3.15	1.26
	R(D1322:15e1-M)	3.65	3.66	-
comp	R(D1322:15e1-A)	0.87	-	0.87
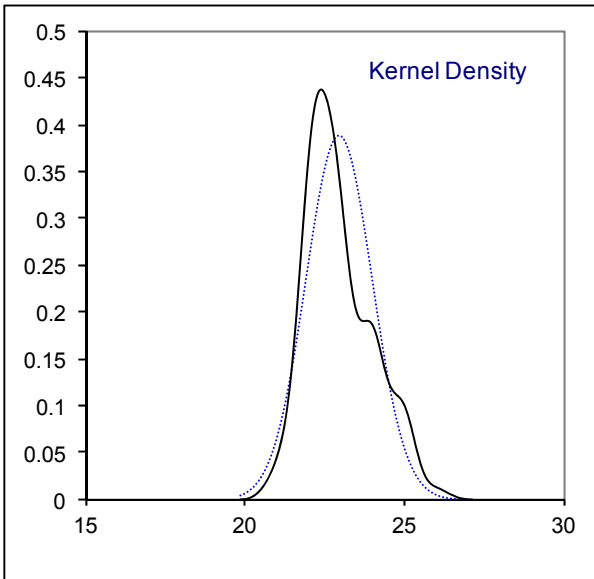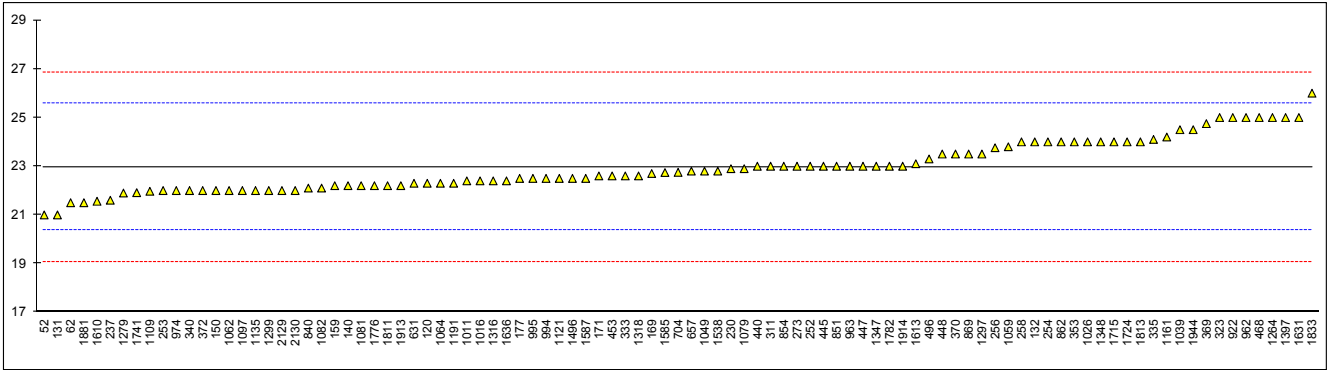
Determination of Specific Energy (Net, on Sulphur free basis) on sample #16170; results in MJ/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3338	43.201		-0.14	974	D3338	43.215		0.71
62	D3338	43.228		1.51	994		-----		-----
120	D3338	43.209		0.35	995		-----		-----
131		-----		-----	996		-----		-----
132	D3338	43.210		0.41	997		-----		-----
140	D3338	43.181		-1.35	1011	D3338	43.203		-0.02
150	D3338	43.230		1.63	1016		-----		-----
158		-----		-----	1023		-----		-----
159		-----		-----	1026		-----		-----
169		-----		-----	1039		-----		-----
171	D3338	43.214		0.65	1049	D3338	43.2012		-0.13
175		-----		-----	1059	D3338	43.197		-0.38
177	D3338	43.20		-0.20	1062	D3338	43.193		-0.62
194		-----		-----	1064	D3338	43.216		0.78
216		-----		-----	1065		-----		-----
221		-----		-----	1079	D3338	43.207		0.23
224		-----		-----	1081	D3338	43.194		-0.56
225		-----		-----	1082		-----		-----
228		-----		-----	1097	D3338	43.199		-0.26
230	D3338	43.203		-0.02	1109	D3338	43.19		-0.81
237	D3338	43.191		-0.75	1121		-----		-----
238		-----		-----	1134		-----		-----
252		-----		-----	1135		-----		-----
253	D3338	43.1885		-0.90	1146		-----		-----
254	D3338	43.19		-0.81	1150		-----		-----
256		-----		-----	1161	D3338	43.199		-0.26
258		-----		-----	1182		-----		-----
273		-----		-----	1191	D3338	43.19246		-0.66
311	D3338	43.185		-1.11	1205		-----		-----
317		-----		-----	1264	D3338	43.183		-1.23
323	D3338	43.235		1.93	1279	D3338	43.22	C	1.02
333		-----		-----	1297		-----		-----
334		-----		-----	1299	D3338	43.20		-0.20
335	D3338	43.247		2.66	1316	D3338	43.189		-0.87
336		-----		-----	1318	D3338	43.207		0.23
340	D3338	43.188		-0.93	1347	D3338	43.179		-1.48
353		-----		-----	1348	D3338	43.183		-1.23
369		-----		-----	1397	D3338	43.21	C	0.41
370	D3338	43.2100		0.41	1412		-----		-----
371		-----		-----	1417		-----		-----
372	D3338	43.212		0.53	1441	D3338	43.182		-1.29
440		-----		-----	1496	D3338	43.209		0.35
445	D3338	43.191		-0.75	1538	D3338	43.199		-0.26
447	D3338	43.214		0.65	1585	D3338	43.220		1.02
448	D3338	43.215		0.71	1587		-----		-----
453	D3338	43.181		-1.35	1610	D3338	43.220		1.02
468		-----		-----	1613	D3338	43.204538		0.08
473		-----		-----	1631	D3338	43.227		1.45
485		-----		-----	1634		-----		-----
496	D3338	43.191		-0.75	1636	D3338	43.2040		0.05
601		-----		-----	1715		-----		-----
606		-----		-----	1720		-----		-----
608		-----		-----	1724	D3338	43.198		-0.32
631	D3338	43.2183		0.92	1741	D3338	43.193		-0.62
657	D3338	43.222		1.14	1776	D3338	43.18		-1.42
663	D3338	43.2254		1.35	1782		-----		-----
671		-----		-----	1811	D3338	43.2050		0.11
704	D3338	43.1859		-1.06	1813	D3338	43.20		-0.20
732		-----		-----	1833	D3338	43.195		-0.50
840	D3338	43.1829		-1.24	1881		-----		-----
851	D3338	43.218		0.90	1883		-----		-----
854	D3338	43.2229		1.20	1913	D3338	43.21		0.41
862	D3338	43.179		-1.48	1914	D3338	43.20		-0.20
869	D3338	43.2101		0.42	1944		-----		-----
922	D3338	43.218		0.90	2129	D3338	43.202		-0.08
962		-----		-----	2130	D3338	43.23		1.63
963	D3338	43.181		-1.35	6054		-----		-----

normality	OK
n	72
outliers	0
mean (n)	43.2033
st.dev. (n)	0.01546
R(calc.)	0.0433
R(D3338:09e2)	0.0460

Lab 1279 first reported: 43.308
Lab 1397 first reported: 43.06

Kernel Density
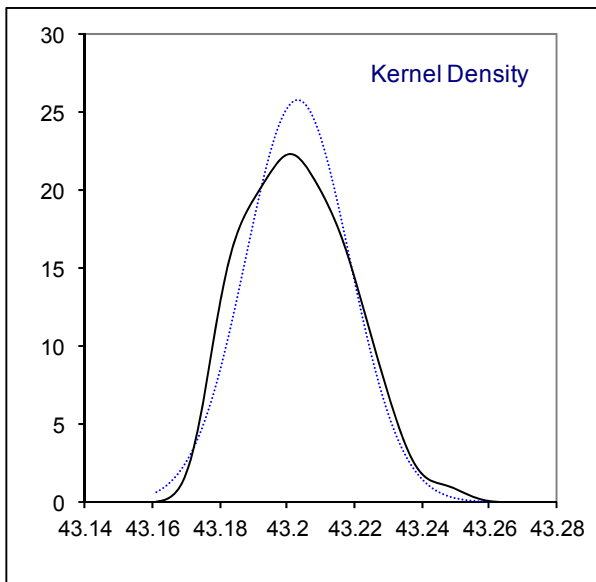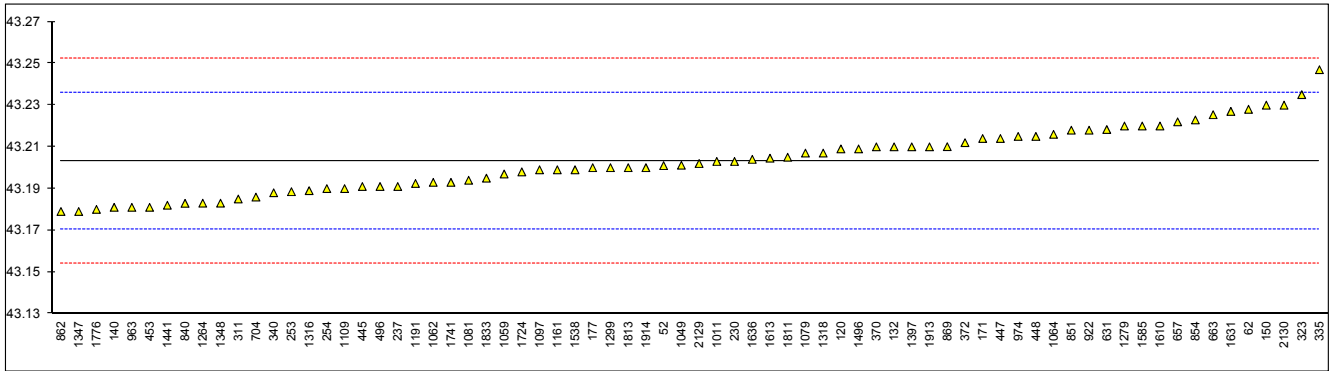
Determination of Sulphur, Total on sample #16170; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5453	378		-0.43	974	D4294	390		0.24
62	D5453	376		-0.54	994	D4294	409		1.29
120	D4294	352		-1.87	995	D5453	405		1.07
131	D5453	356.2		-1.64	996		-----		-----
132	D2622	395		0.51	997	D4294	398		0.68
140	D5453	335.3		-2.80	1011	D4294	380		-0.32
150	D5453	391		0.29	1016		-----		-----
158		-----		-----	1023	ISO14596	340		-2.54
159	D4294	401		0.85	1026	ISO20884	403		0.96
169	D5453	438	C,R(0.05)	2.90	1039	D2622	365	C	-1.15
171	D5453	377.7		-0.45	1049	D5453	374.3		-0.63
175	D4294	389		0.18	1059	ISO14596	360		-1.43
177	D4294	450	C,R(0.05)	3.57	1062	D5453	401		0.85
194		-----		-----	1064	D5453	365.0		-1.15
216		-----		-----	1065		-----		-----
221		-----		-----	1079	ISO20846	360		-1.43
224	D4294	403.33		0.98	1081	D5453	402.7		0.94
225		-----		-----	1082	D4294	387		0.07
228		-----		-----	1097	D5453	365.62		-1.12
230	D4294	398		0.68	1109	D2622	393.4		0.43
237	D4294	400		0.79	1121	IP336	400.65		0.83
238	D4294	389.0		0.18	1134		-----		-----
252		-----		-----	1135	D5453	442	R(0.05)	3.12
253	D4294	403		0.96	1146		-----		-----
254	D4294	370		-0.87	1150		-----		-----
256	D4294	357		-1.59	1161	ISO20846	401		0.85
258	D5453	406		1.12	1182	D4294	388		0.13
273	D5453	396		0.57	1191	D4294	416		1.68
311	D2622	370		-0.87	1205	ISO14596	391.6		0.33
317		-----		-----	1264	D5453	445	R(0.05)	3.29
323	D5453	360		-1.43	1279	D4294	382.2	C	-0.20
333	D4294	400		0.79	1297	D4294	390.5	C	0.26
334	D5453	420		1.90	1299	D2622	380	C	-0.32
335	D4294	395		0.51	1316	D4294	390.6		0.27
336		-----		-----	1318	D5453	372.8		-0.72
340	D5453	407		1.18	1347	D4294	419		1.85
353	IP336	409		1.29	1348	D4294	404		1.01
369	D5453	394		0.46	1397	ISO20884	394		0.46
370	IP336	404		1.01	1412		-----		-----
371	D4294	391.25		0.31	1417	IP336	295	R(0.01)	-5.04
372	D5453	387		0.07	1441	D7039	358.0		-1.54
440	D5453	387.86		0.12	1496	D4294	405.6		1.10
445	D5453	419		1.85	1538	D4294	350.7		-1.94
447	IP336	380		-0.32	1585	D4294	391.2		0.30
448	IP336	387	C	0.07	1587	D4294	354.4		-1.74
453	IP336	397		0.63	1610	IP336	389		0.18
468		-----		-----	1613	D4294	383.0		-0.15
473		-----		-----	1631	D5453	357.2		-1.58
485	D4294	378.8		-0.38	1634	D5453	379		-0.37
496	D2622	380.05		-0.32	1636	D5453	401.5		0.87
601		-----		-----	1715		-----		-----
606		-----		-----	1720	D5453	383.0		-0.15
608	D5453	384	C	-0.10	1724	D5453	362		-1.32
631	D4294	386.8		0.06	1741	D5453	370.4		-0.85
657	D5453	408.2		1.25	1776	ISO20846	378		-0.43
663	D5453	399.8		0.78	1782	D5453	409		1.29
671	D5453	393.3		0.42	1811	D5453	396.22		0.58
704	D5453	357.2		-1.58	1813	D2622	380		-0.32
732	D4294	420		1.90	1833	ISO8754	370		-0.87
840	D4294	401.1		0.85	1881	D5453	372		-0.76
851	D2622	398.5		0.71	1883		-----		-----
854	D4294	386		0.01	1913	D4294	378.65		-0.39
862	D2622	387		0.07	1914	D5453	398		0.68
869	D4294	389.0		0.18	1944	D5453	359.73		-1.44
922	D5453	384		-0.10	2129	D5453	345.3		-2.24
962	D4294	358		-1.54	2130	D5453	409		1.29
963	D5453	380		-0.32	6054	D4294	390		0.24

normality	OK
n	107
outliers	5
mean (n)	385.74
st.dev. (n)	18.527
R(calc.)	51.88
R(D5453:16e1)	50.46

Lab 169 first reported: 474
Lab 177 first reported: 0.0449
Lab 448 first reported: 0.0385
Lab 608 first reported: 306
Lab 1039 first reported: 0.0365
Lab 1279 first reported: 0.03988
Lab 1297 first reported: 295.1
Lab 1299 first reported: 0.038
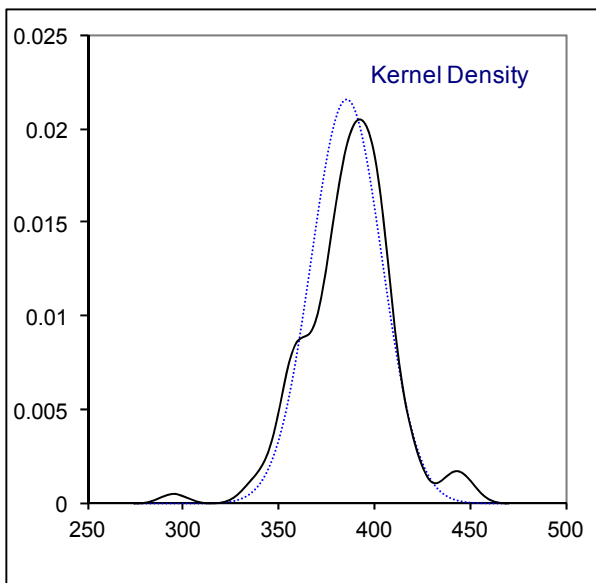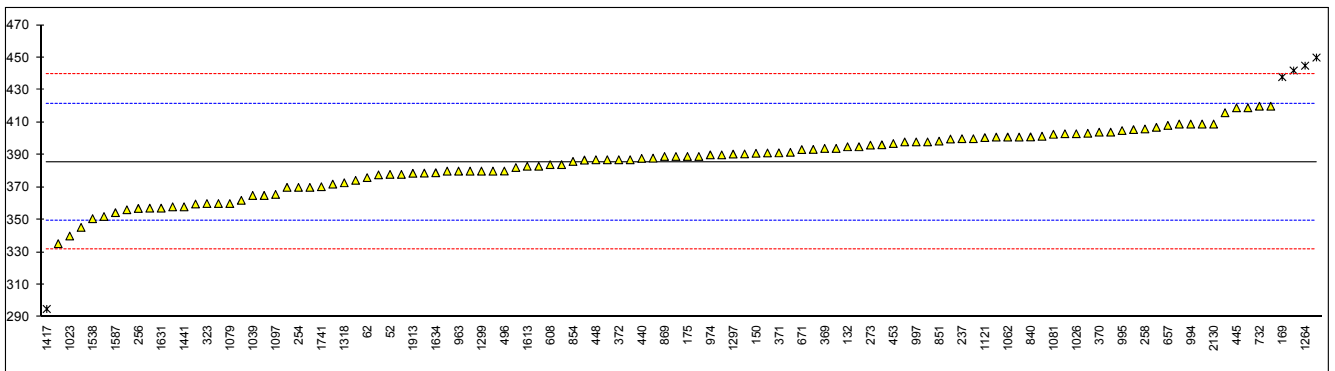
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Determination of BOCLE on sample #16172; results in mm

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171	D5001-semi-automatic	0.64		-1.15	
237	D5001-semi-automatic	0.65		-0.69	
334	D5001-semi-automatic	0.63		-1.60	
496	D5001-full-automatic	0.6784		0.59	
963		-----		-----	
1016	D5001-semi-automatic	0.636		-1.33	
1064	D5001-full-automatic	0.681		0.71	
1065		-----		-----	
1081	D5001-semi-automatic	0.659		-0.29	
1082	D5001-semi-automatic	0.709		1.98	
1134		-----		-----	
1264	D5001-semi-automatic	0.68		0.67	
1279	D5001-semi-automatic	0.636		-1.33	
1316	D5001-semi-automatic	0.695		1.35	
1318	D5001-semi-automatic	0.6485		-0.76	
1538	D5001-full-automatic	0.69		1.12	
1631	D5001-semi-automatic	0.61		-2.51	
1724	D5001-semi-automatic	0.70		1.57	
1741	D5001-full-automatic	0.709		1.98	
1833	D5001-semi-automatic	0.70		1.57	
1913	D5001-semi-automatic	0.625		-1.83	
9090	D5001-full-automatic	0.664		-0.06	

			Only semi-automatic	Only full-automatic
normality	OK		OK	OK
n	19		14	5
outliers	0		0	0
mean (n)	0.6653		0.6585	0.6845
st.dev. (n)	0.03091		0.03235	0.01658
R(calc.)	0.0865		0.0906	0.0464
R(D5001:10 (semi-automatic))	0.0618		0.0608	-
comp	R(D5001:10 (full-automatic))	0.0355		-	0.0381
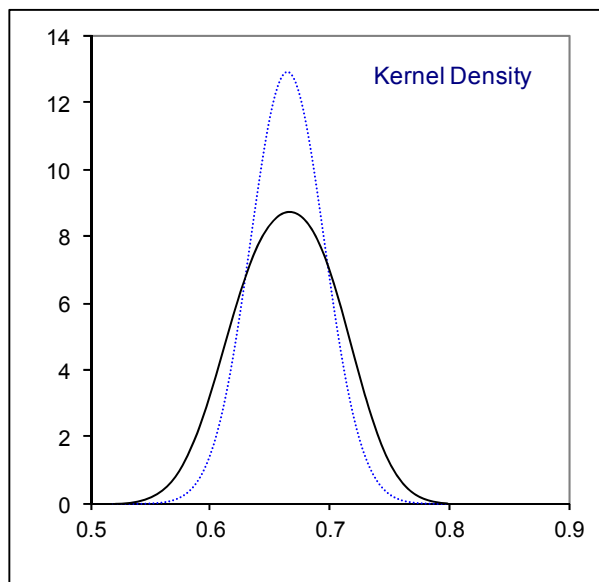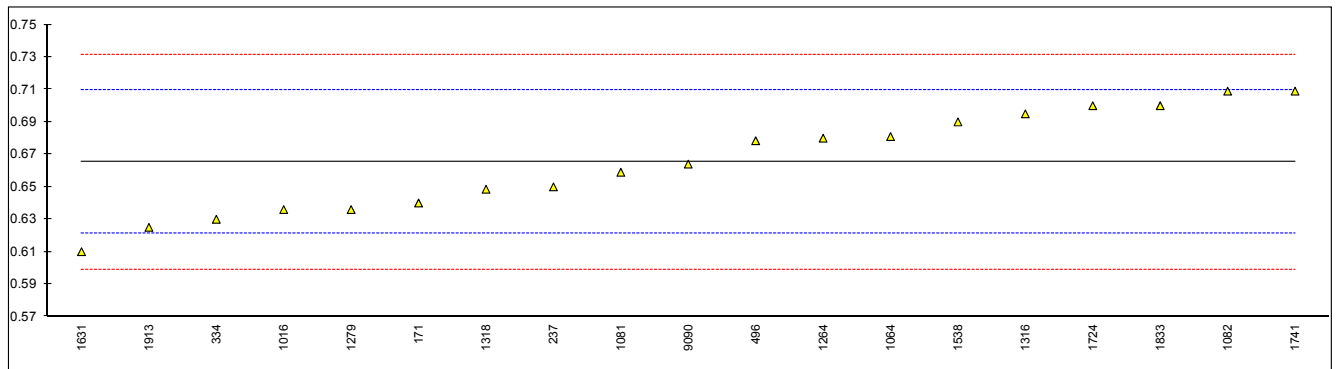
Determination of Particle Size Distribution on sample #16173 acc. to IP564, in (cumulative) parts/ml

lab	method	≥4 µm	m	≥6 µm	m	≥14 µm	m	≥21 µm	m	≥25 µm	m	≥30 µm	m
140		-----		-----		-----		-----		-----		-----	
150		-----		-----		-----		-----		-----		-----	
171		-----		-----		-----		-----		-----		-----	
230	IP564	352.2	ex	101.2	ex	12	DG(1)	5.4	G(1)	4	G(1)	2.8	G(1)
237		-----		-----		-----		-----		-----		-----	
253	IP564	140.4		51.4		4.2		1.8		1.0		0.4	
311		-----		-----		-----		-----		-----		-----	
333		-----		-----		-----		-----		-----		-----	
334		-----		-----		-----		-----		-----		-----	
335		-----		-----		-----		-----		-----		-----	
372	IP564	250.4		77.2		3.74		0.91		0.52		0.26	
447	IP564	184.7		50.9		3.2		0.4		0.3		0.1	
453	IP564	98.6		22.9		1.7		0.6		0.5		0.4	
496		-----		-----		-----		-----		-----		-----	
657		-----		-----		-----		-----		-----		-----	
840		-----		-----		-----		-----		-----		-----	
854		-----		-----		-----		-----		-----		-----	
922		-----		-----		-----		-----		-----		-----	
963		-----		-----		-----		-----		-----		-----	
974	IP564	175.0		49.0		3.9		1.6		0.6		0.1	
1011		-----		-----		-----		-----		-----		-----	
1016		-----		-----		-----		-----		-----		-----	
1026		-----		-----		-----		-----		-----		-----	
1039		-----		-----		-----		-----		-----		-----	
1062		-----		-----		-----		-----		-----		-----	
1064		-----		-----		-----		-----		-----		-----	
1065		-----		-----		-----		-----		-----		-----	
1081	IP564	235.0		86.7		5.9		1.3		0.7		0.4	
1095		-----		-----		-----		-----		-----		-----	
1097		-----		-----		-----		-----		-----		-----	
1109		-----		-----		-----		-----		-----		-----	
1134		-----		-----		-----		-----		-----		-----	
1191	IP564	95		26		3		1.0		0.5		0.2	
1200		-----		-----		-----		-----		-----		-----	
1264		-----		-----		-----		-----		-----		-----	
1279		-----		-----		-----		-----		-----		-----	
1299		-----		-----		-----		-----		-----		-----	
1316		-----		-----		-----		-----		-----		-----	
1402		-----		-----		-----		-----		-----		-----	
1538		-----		-----		-----		-----		-----		-----	
1585		-----		-----		-----		-----		-----		-----	
1587	IP564	186.7		45.9		1.8		0.5		0.3		0.1	
1610		-----		-----		-----		-----		-----		-----	
1613		-----		-----		-----		-----		-----		-----	
1631		-----		-----		-----		-----		-----		-----	
1634		-----		-----		-----		-----		-----		-----	
1724		-----		-----		-----		-----		-----		-----	
1741		-----		-----		-----		-----		-----		-----	
1776	IP564	248.4	ex	87.7	ex	12.8	DG(1)	8.1	G(1)	6.0	G(1)	4.3	G(1)
1811		-----		-----		-----		-----		-----		-----	
1813		-----		-----		-----		-----		-----		-----	
1833		-----		-----		-----		-----		-----		-----	
1913	IP564	220.3		69.6		3.4		0.6		0.3		0.2	
1914	IP564	197.4		58.1		4.7		1.5		1.1		0.4	
2130	IP564	146.3		38.8		3.6		1.2		0.4		0.2	
6075		-----		-----		-----		-----		-----		-----	
9090		-----		-----		-----		-----		-----		-----	
	normality	OK		OK		OK		OK		suspect		OK	
	n	11		11		11		11		11		11	
	outliers	0 (+2ex)		0 (+2ex)		2		2		2		2	
	mean (n)	175.44		52.41		3.56		1.04		0.57		0.25	
	st.dev. (n)	51.309		19.822		1.198		0.480		0.273		0.128	
	R(calc.)	143.66		55.50		3.36		1.34		0.76		0.36	
	R(IP564:13)	210.17		101.39		12.87		1.32		0.76		0.42	

m = mark
G(1) = G(0.01)
DG(1) = DG(0.01)

Test results of lab 230 and 1776, which were not an outlier, were excluded.
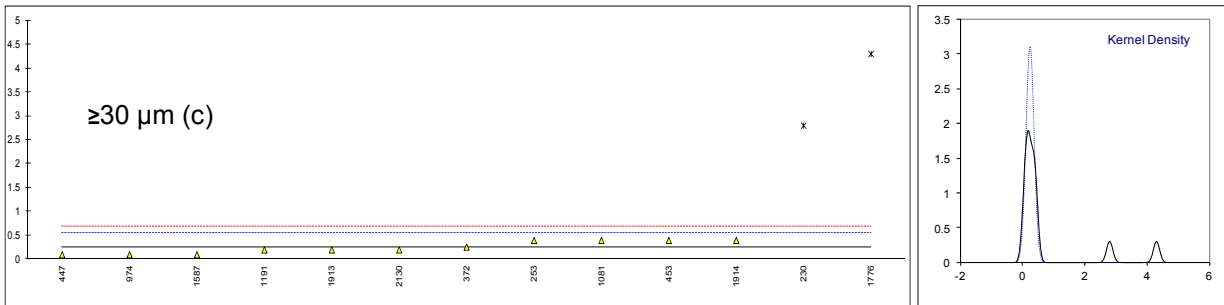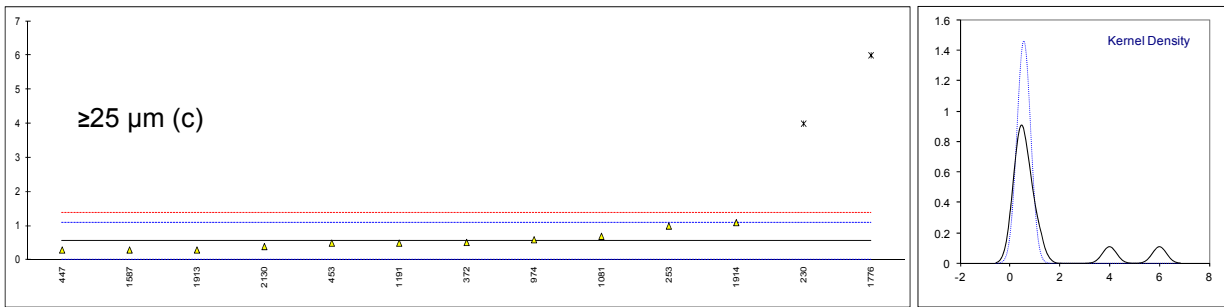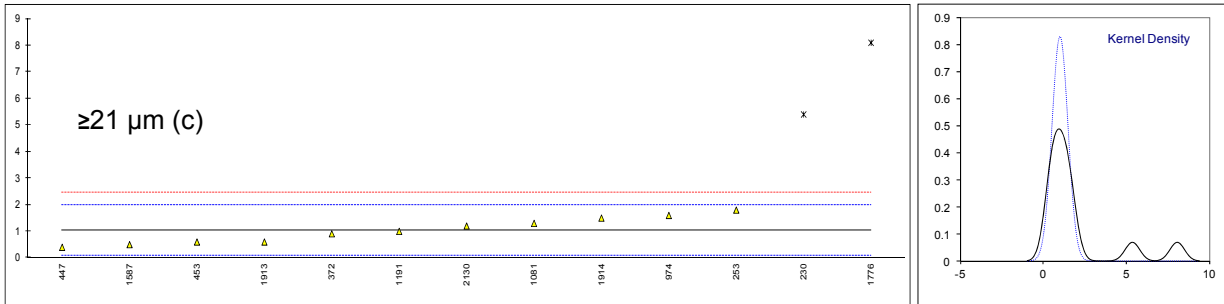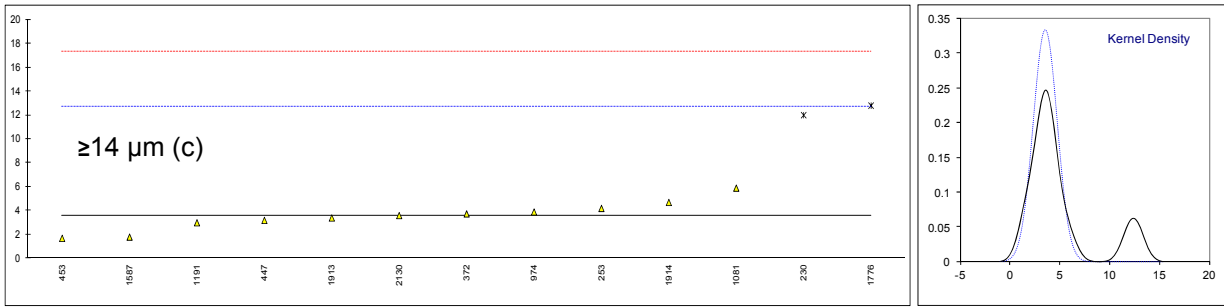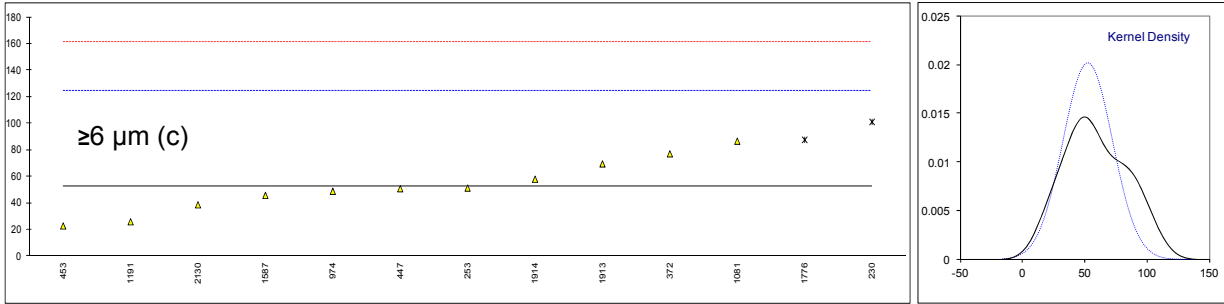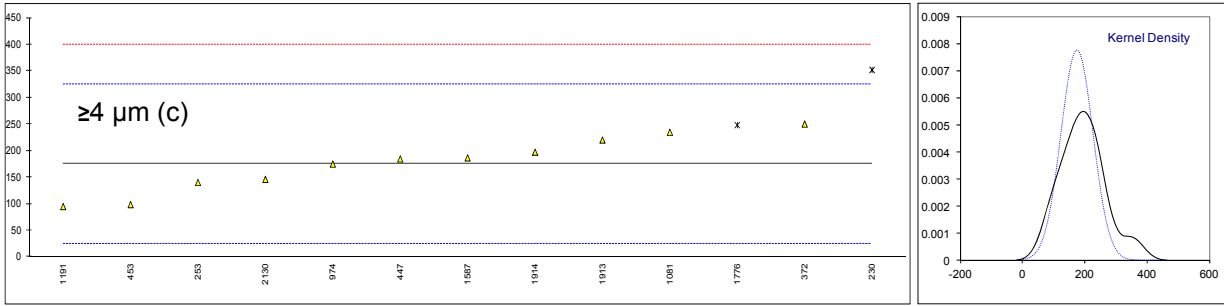
Determination of Particle Size Distribution on sample #16173 acc. to IP564, in ISO scale numbers

lab	method	≥4 µm	mark	z(targ)	≥6 µm	mark	z(targ)	≥14 µm	mark	z(targ)
140		-----		-----	-----		-----	-----		-----
150		-----		-----	-----		-----	-----		-----
171		-----		-----	-----		-----	-----		-----
230	IP564	16	ex	3.84	14	ex	2.35	11	ex	2.77
237		-----		-----	-----		-----	-----		-----
253		14		-1.64	13		0.39	9		0.25
311		-----		-----	-----		-----	-----		-----
333		-----		-----	-----		-----	-----		-----
334		-----		-----	-----		-----	-----		-----
335		-----		-----	-----		-----	-----		-----
372	ISO4406	15		1.10	13		0.39	9		0.25
447	ISO4406	15		1.10	13		0.39	9		0.25
453	ISO4406	14		-1.64	12		-1.57	8		-1.01
496		-----		-----	-----		-----	-----		-----
657		-----		-----	-----		-----	-----		-----
840		-----		-----	-----		-----	-----		-----
854		-----		-----	-----		-----	-----		-----
922		-----		-----	-----		-----	-----		-----
963		-----		-----	-----		-----	-----		-----
974		-----		-----	-----		-----	-----		-----
1011		-----		-----	-----		-----	-----		-----
1016		-----		-----	-----		-----	-----		-----
1026		-----		-----	-----		-----	-----		-----
1039		-----		-----	-----		-----	-----		-----
1062		-----		-----	-----		-----	-----		-----
1064		-----		-----	-----		-----	-----		-----
1065		-----		-----	-----		-----	-----		-----
1081	ISO4406	15		1.10	14		2.35	10		1.51
1095		-----		-----	-----		-----	-----		-----
1097		-----		-----	-----		-----	-----		-----
1109		-----		-----	-----		-----	-----		-----
1134		-----		-----	-----		-----	-----		-----
1191	ISO4406	14		-1.64	12		-1.57	8		-1.01
1200		-----		-----	-----		-----	-----		-----
1264		-----		-----	-----		-----	-----		-----
1279		-----		-----	-----		-----	-----		-----
1299		-----		-----	-----		-----	-----		-----
1316		-----		-----	-----		-----	-----		-----
1402		-----		-----	-----		-----	-----		-----
1538		-----		-----	-----		-----	-----		-----
1585		-----		-----	-----		-----	-----		-----
1587	IP564	15		1.10	13		0.39	8		-1.01
1610		-----		-----	-----		-----	-----		-----
1613		-----		-----	-----		-----	-----		-----
1631		-----		-----	-----		-----	-----		-----
1634		-----		-----	-----		-----	-----		-----
1724		-----		-----	-----		-----	-----		-----
1741		-----		-----	-----		-----	-----		-----
1776	ISO4406	15	ex	1.10	14	ex	2.35	11	ex	2.77
1811		-----		-----	-----		-----	-----		-----
1813		-----		-----	-----		-----	-----		-----
1833		-----		-----	-----		-----	-----		-----
1913	ISO4406	15		1.10	13		0.39	9		0.25
1914	ISO4406	15		1.10	13		0.39	9		0.25
2130	ISO4406	14		-1.64	12		-1.57	9		0.25
6075		-----		-----	-----		-----	-----		-----
9090		-----		-----	-----		-----	-----		-----
	normality	OK			OK			OK		
	n	10			10			10		
	outliers	0 (+2ex)			0 (+2ex)			0 (+2ex)		
	mean (n)	14.60			12.80			8.80		
	st.dev. (n)	0.516			0.632			0.632		
	R(calc.)	1.45			1.77			1.77		
	R(IP564:13)	1.02			1.43			2.22		

Test results of lab 230 and 1776 were excluded, for they were excluded or were an outlier in the evalution of the cumulative counts per ml.

≥4 µm (c)

Kernel Density

≥6 µm (c)

Kernel Density

≥14 µm (c)

Kernel Density
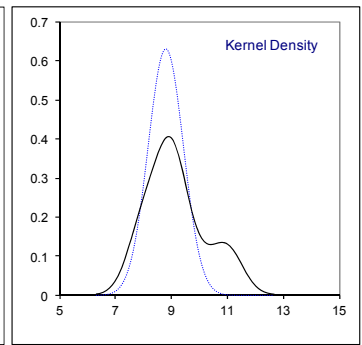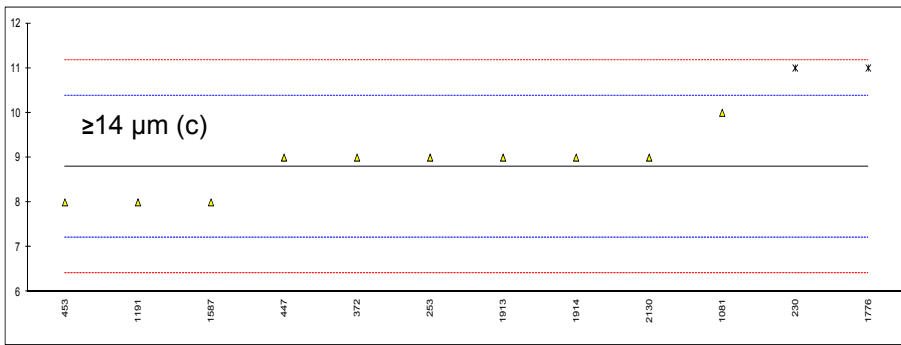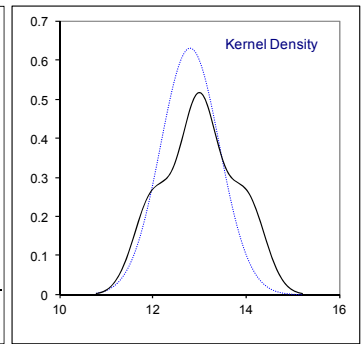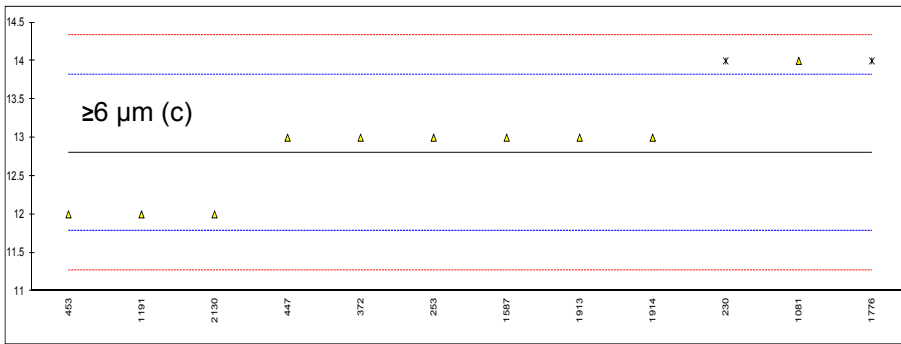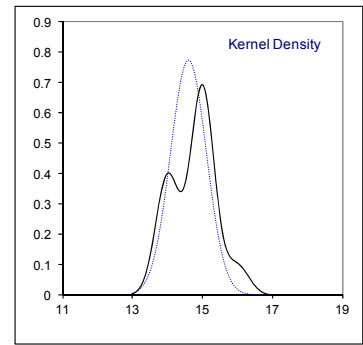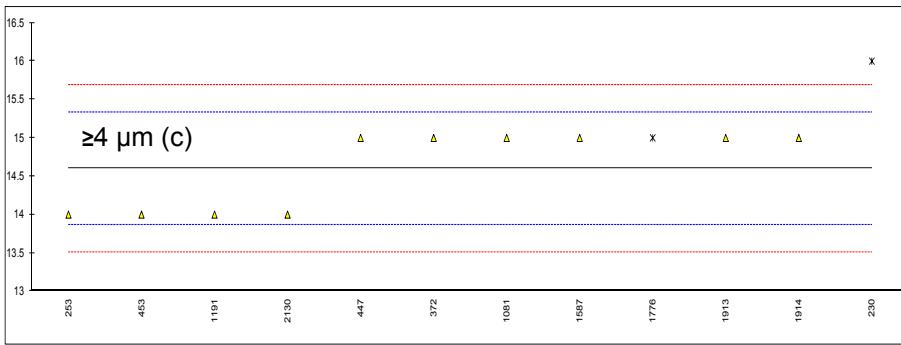
Determination of Particle Size Distribution on sample #16173 acc. to IP565, in (cumulative) parts/ml

| lab	method	≥4 µm	m	≥6 µm	m	≥14 µm	m	≥21 µm	m	≥25 µm	m	≥30 µm	m
140		-----		-----		-----		-----		-----		-----	
150	IP565	316	C	72	C	6	C	2	C	1	C	0	C
171	IP565	180		53		3		1		0		0	
230		-----		-----		-----		-----		-----		-----	
237	IP565	205.0		64.5		2.9		0.6		0.2		0.0	
253		-----		-----		-----		-----		-----		-----	
311	IP565	283		67		4		1		<1		<1	
333	IP565	302		83		5		2		1		1	
334	IP565	397		105		7		1		1		0	
335	IP565	206.0		43.3		4.7		1.5		0.6		0.2	
372		-----		-----		-----		-----		-----		-----	
447		-----		-----		-----		-----		-----		-----	
453		-----		-----		-----		-----		-----		-----	
496		-----		-----		-----		-----		-----		-----	
657	IP565	252.6		68.2		5.2		2.2		1.6		0.4	C
840	IP565	370.7		77.8		7.0		2.3		1.1		0.51	
854	IP565	284.6		92.0		8.9		1.4		0.6		0.2	
922	IP565	270.2		81.0		3.5		0.7		0.4		0.2	
963	IP565	504.6		103.0		7.0		1.4		0.6		0.2	
974		-----		-----		-----		-----		-----		-----	
1011	IP565	270		81		9		1		1		0	
1016	IP565	268.7		85.1		5.1		1.3		0.7		0.2	
1026	IP565	906	R(1)	318	R(1)	61	R(1)	11	R(1)	3	R(5)	< 1	
1039	IP565	288		89		5		3		2		1	
1062	IP565	288.9		65.1		5.6		2.0		0.9		0.4	
1064	IP565	297.90		81.43		4.57		0.87		0.57		0.53	
1065		-----		-----		-----		-----		-----		-----	
1081		-----		-----		-----		-----		-----		-----	
1095	IP565	180		46		4		1		0		0	
1097		-----		-----		-----		-----		-----		-----	
1109	IP565	271.1		104.1		10.1		4.1		1.9		0.9	
1134		-----		-----		-----		-----		-----		-----	
1191		-----		-----		-----		-----		-----		-----	
1200		-----		-----		-----		-----		-----		-----	
1264	IP565	249.4		87.6		8.9		2.9		1.7		0.9	
1279	IP565	158.3	C	37.6	C	2.7	C	0.6	C	0.3	C	0.2	C
1299	IP577	355.6		51.8		4.0		1.7		1.3		0.7	
1316	in house	254		90		6		1.5		0.95		0.51	
1402	IP565	304.3		70.0		5.4		1.3		0.7		0.3	
1538	IP565	314.7		90.3		7.3		1.6		0.6		0.2	
1585	IP565	199.5		48.2		4.4		1.5		0.8		0.5	
1587		-----		-----		-----		-----		-----		-----	
1610	IP565	379.5		89.1		7.7		2.6		1.5		0.7	
1613	IP565	206.5		57.8		6.8		2.4		1.7		1.1	
1631	IP565	402.4	C	104.3	C	9.7	C	4.0		1.3		0.3	
1634		-----		-----		-----		-----		-----		-----	
1724	IP565	390.8		101.1		7.8		2.6		1.4		0.7	
1741	IP565	47.5		17.4		2.5		0.4		0.2		0.1	
1776		-----		-----		-----		-----		-----		-----	
1811	IP565	483.6		124.5		6.3		1.8		0.8		0.0	
1813	IP565	86.0		26.4		3.7		1.0		0.6		0.3	
1833		-----		-----		-----		-----		-----		-----	
1913		-----		-----		-----		-----		-----		-----	
1914		-----		-----		-----		-----		-----		-----	
2130		-----		-----		-----		-----		-----		-----	
6075	IP565	1302.4	R(1)	342.0	R(1)	18.3	R(1)	2.1	ex	0.9	ex	0.1	ex
9090		-----		-----		-----		-----		-----		-----	
	normality	OK		OK		OK		suspect		OK		OK	
	n	33		33		33		33		32		32	
	outliers	2		2		2		1 (+1ex)		1 (+1ex)		0 (+1ex)	
	mean (n)	280.86		74.47		5.78		1.71		0.91		0.38	
	st.dev. (n)	98.898		24.631		2.105		0.911		0.535		0.338	
	R(calc.)	276.91		68.97		5.89		2.55		1.50		0.95	
	R(IP565:13)	227.15		114.49		20.91		4.88		2.64		1.13	

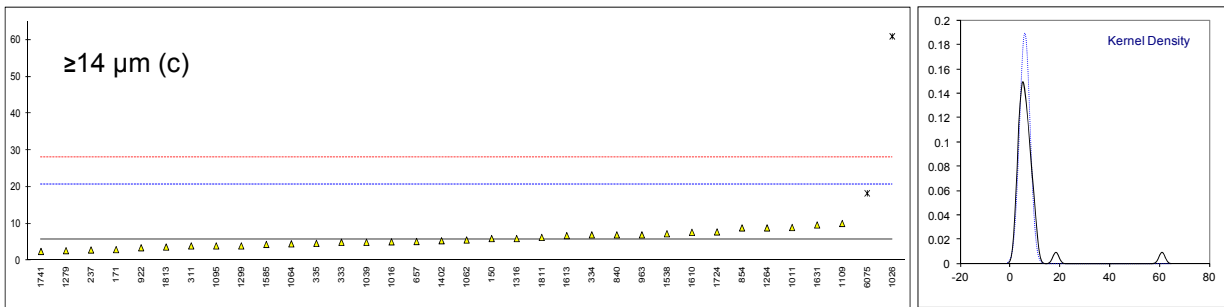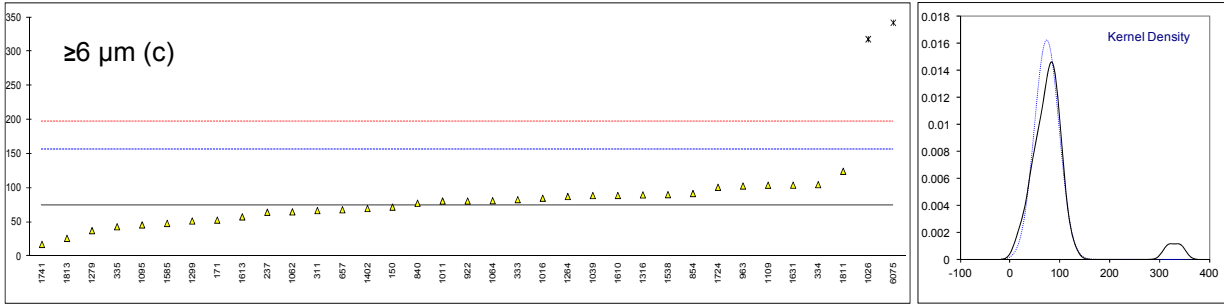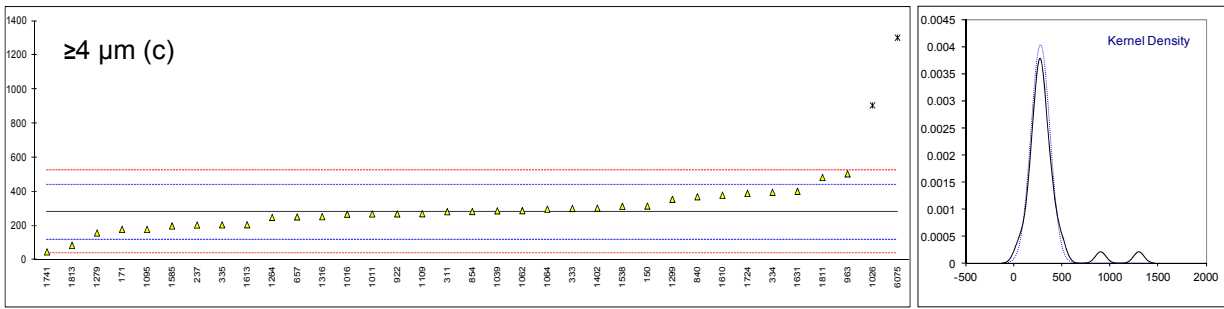m = mark, R(1) = R(0.01) and R(5) = R(0.05)

Lab 150 first reported the test results as IP564
Lab 657 first reported ≥30 µm: 1.2
Lab 1279 first reported for ≥4 µm: 678.7, for ≥6 µm: 182.8, for ≥14 µm: 13.6, for ≥21 µm: 4.1, for ≥25 µm: 2.2 andfor ≥30 µm: 1.2
Lab 1631 first reported for ≥4 µm: 2551.1, for ≥6 µm: 620 and for ≥14 µm: 25.7
Lab 6075 test results, which were not an outlier, were excluded.
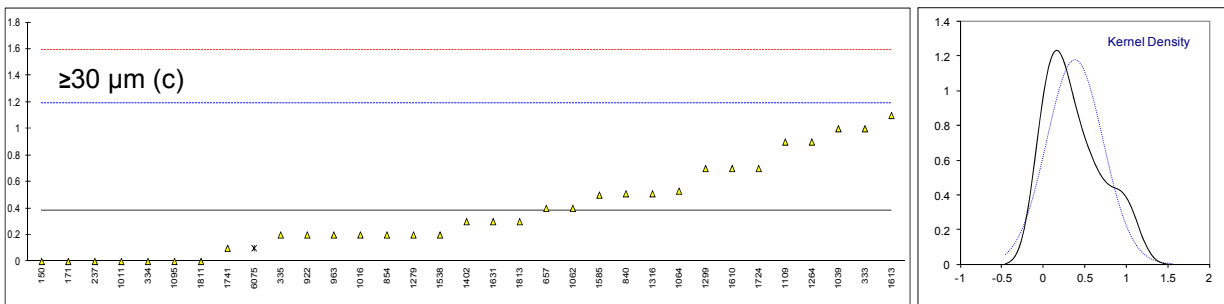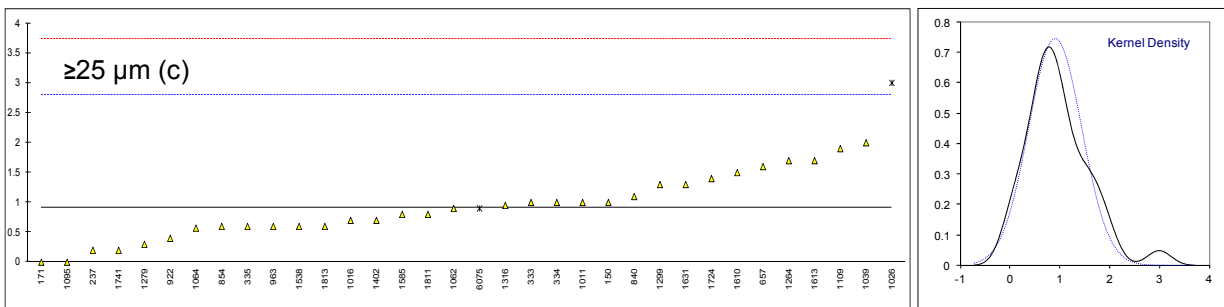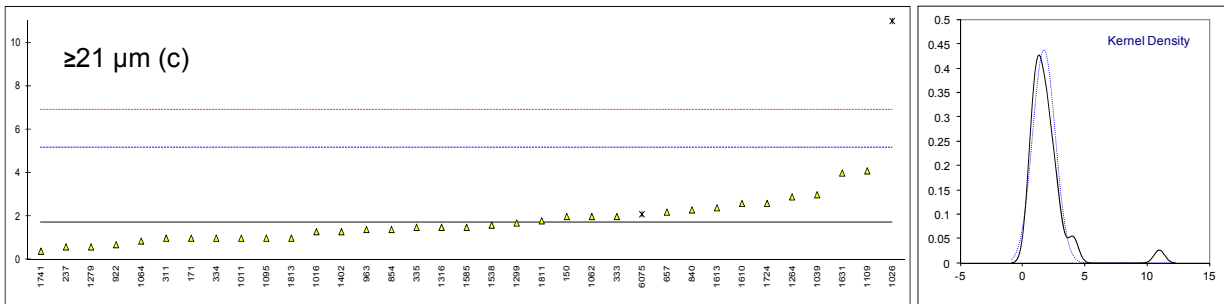
Determination of Particle Size Distribution on sample #16173 acc. to IP565, in ISO scale numbers

lab	method	≥4 µm	mark	z(targ)	≥6 µm	mark	z(targ)	≥14 µm	mark	z(targ)
140		-----		-----	-----		-----	-----		-----
150		-----		-----	-----		-----	-----		-----
171		-----		-----	-----		-----	-----		-----
230		-----		-----	-----		-----	-----		-----
237	ISO4406	15		-0.48	13		-1.19	>or=09		-----
253		-----		-----	-----		-----	-----		-----
311	ISO4406	15		-0.48	13		-1.19	9		-1.39
333	ISO4406	15		-0.48	14		1.54	9		-1.39
334	ISO4406	16		2.26	14		1.54	10		0.65
335	ISO4406	15		-0.48	13		-1.19	9		-1.39
372		-----		-----	-----		-----	-----		-----
447		-----		-----	-----		-----	-----		-----
453		-----		-----	-----		-----	-----		-----
496		-----		-----	-----		-----	-----		-----
657	ISO4406	15		-0.48	13		-1.19	10		0.65
840	ISO4406	16		2.26	13		-1.19	10		0.65
854	ISO4406	15		-0.48	14		1.54	10		0.65
922	ISO4406	15		-0.48	14		1.54	9		-1.39
963		-----		-----	-----		-----	-----		-----
974		-----		-----	-----		-----	-----		-----
1011	IP565	15		-0.48	14		1.54	10		0.65
1016		-----		-----	-----		-----	-----		-----
1026	ISO4406	17	ex	4.99	15	ex	4.28	13	R(0.01)	6.77
1039	IP565	15		-0.48	14		1.54	10		0.65
1062	ISO4406	15		-0.48	13		-1.19	10		0.65
1064		-----		-----	-----		-----	-----		-----
1065		-----		-----	-----		-----	-----		-----
1081		-----		-----	-----		-----	-----		-----
1095	ISO4406	15		-0.48	13		-1.19	9		-1.39
1097		-----		-----	-----		-----	-----		-----
1109	ISO4406	15	C	-0.48	14	C	1.54	11	C	2.69
1134		-----		-----	-----		-----	-----		-----
1191		-----		-----	-----		-----	-----		-----
1200		-----		-----	-----		-----	-----		-----
1264	ISO4406	15		-0.48	14		1.54	10		0.65
1279	IP565	14		-3.21	12		-3.92	9		-1.39
1299	IP577	16		2.26	13		-1.19	9		-1.39
1316	ISO4406	15		-0.48	14		1.54	10		0.65
1402	ISO4406	15		-0.48	13		-1.19	10		0.65
1538		-----		-----	-----		-----	-----		-----
1585	ISO4406	15		-0.48	13		-1.19	9		-1.39
1587		-----		-----	-----		-----	-----		-----
1610	IP565	16		2.26	14		1.54	10		0.65
1613	IP565	15		-0.48	13		-1.19	10		0.65
1631	ISO4406	19	E, ex	10.45	16	E, ex	7.01	12	E, ex	4.73
1634		-----		-----	-----		-----	-----		-----
1724	ISO4406	16		2.26	14		1.54	10		0.65
1741	ISO4406	13	R(0.01)	-5.94	11	R(0.05)	-6.65	8	ex	-3.43
1776		-----		-----	-----		-----	-----		-----
1811		-----		-----	-----		-----	-----		-----
1813		-----		-----	-----		-----	-----		-----
1833		-----		-----	-----		-----	-----		-----
1913		-----		-----	-----		-----	-----		-----
1914		-----		-----	-----		-----	-----		-----
2130		-----		-----	-----		-----	-----		-----
6075	ISO4406	18	R(0.01)	7.72	16	ex	7.01	11	ex	2.69
9090		-----		-----	-----		-----	-----		-----
	normality	OK			OK			OK		
	n	23			23			22		
	outliers	2 (+2ex)			1 (+3ex)			1 (+3ex)		
	mean (n)	15.17			13.43			9.68		
	st.dev. (n)	0.491			0.590			0.568		
	R(calc.)	1.37			1.65			1.59		
	R(IP565:13)	1.03			1.03			1.37		

Lab 1109 first reported for ≥4 µm: 21.3, for ≥6 µm: 11.1 and for ≥14 µm: 2.6
Lab 1631 test results were excluded because the the results in parts/ml were corrected, but they were not corrected in ISO scale numbers
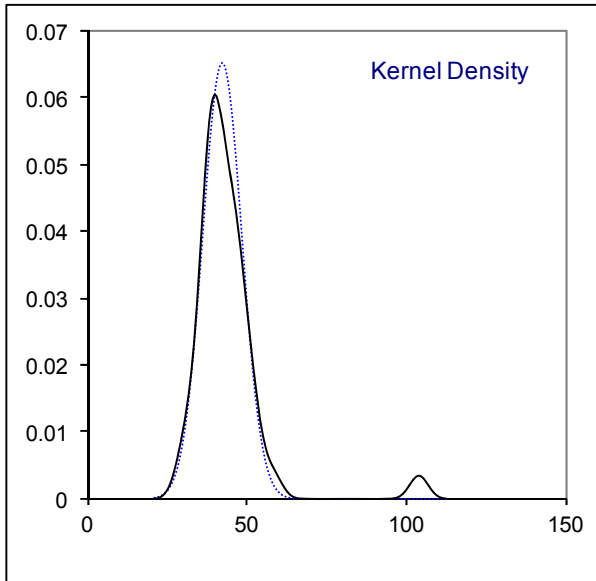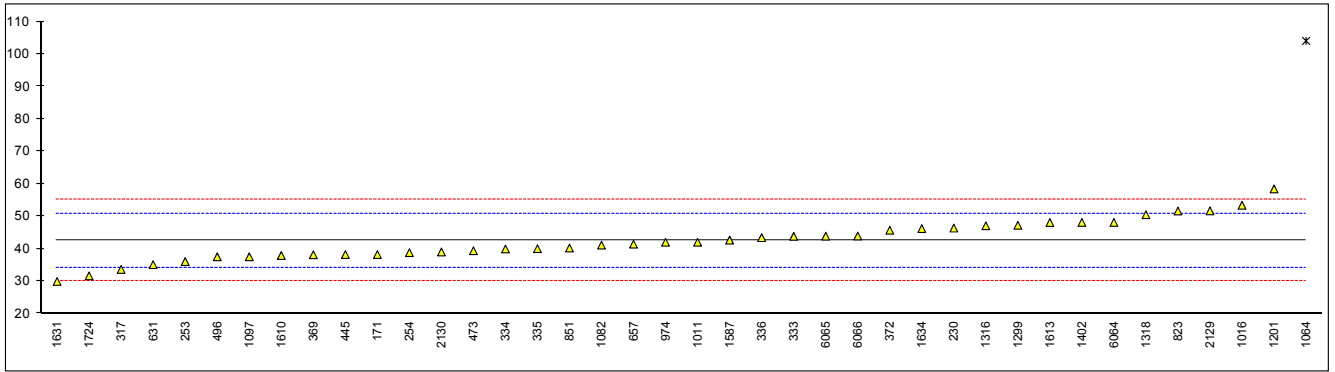
Test results of lab 1026 and 6075 were excluded, for they were excluded or were an outlier in the evalution of the cumulative counts per ml.
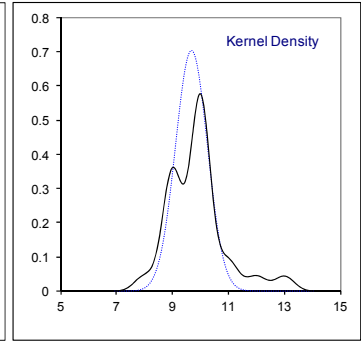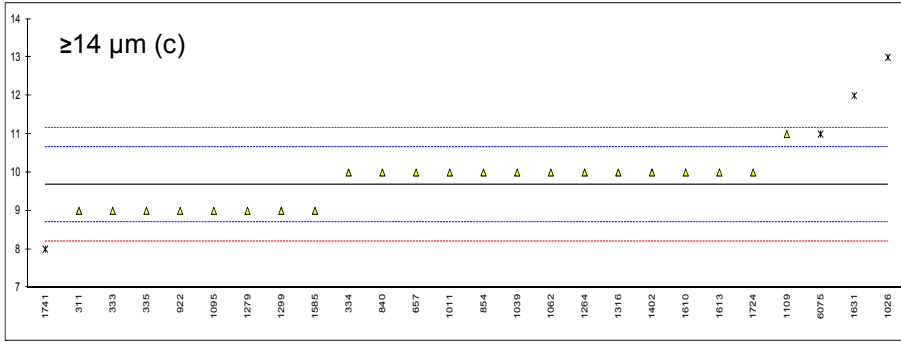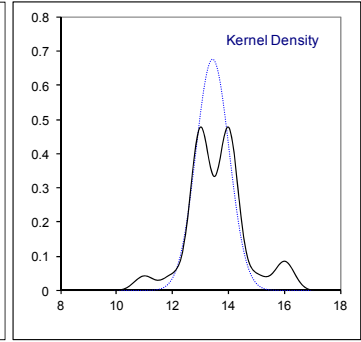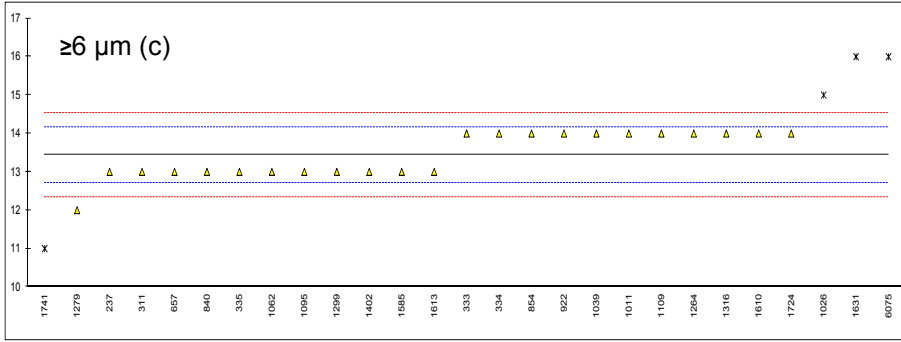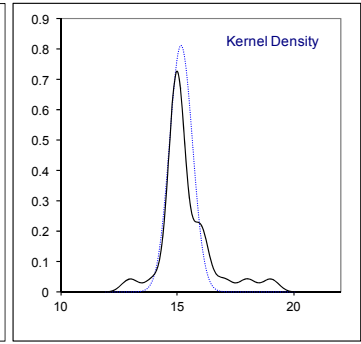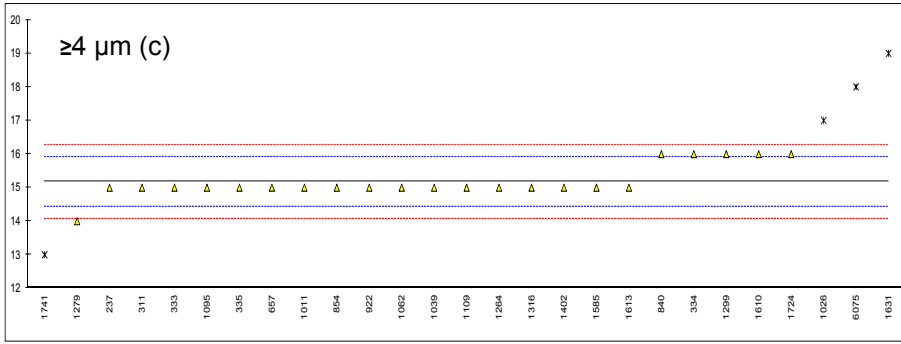
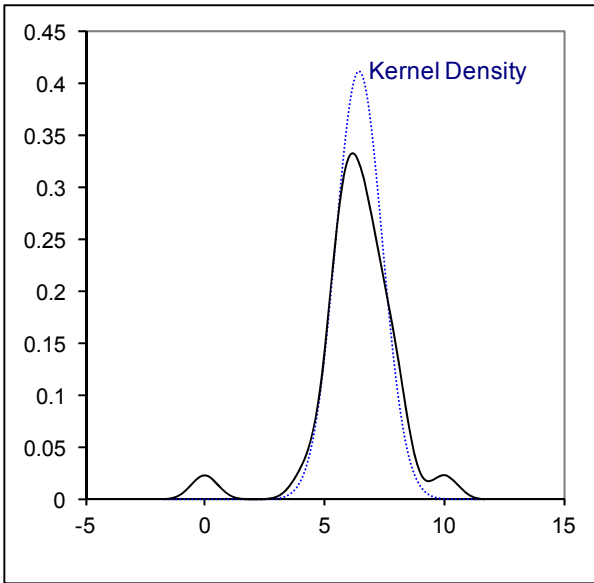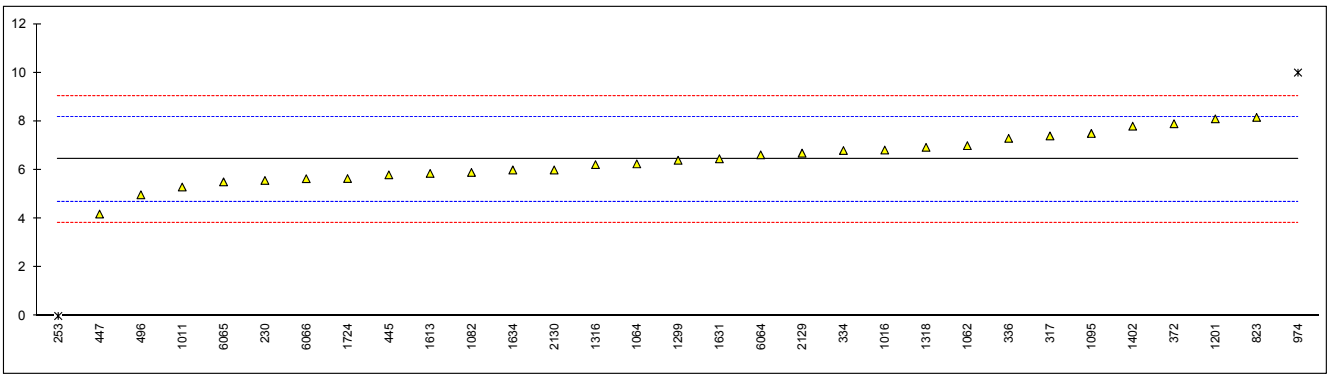## Determination of FAME on sample #16174; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
140		-----		-----	
171	IP585	38.2		-1.03	
230	IP585	46.36		0.92	
237		-----		-----	
253	IP585	36.04		-1.54	
254	D7797	38.77		-0.89	
311		-----		-----	
317	IP585	33.6		-2.12	
323		-----		-----	
333	IP585	43.8		0.31	
334	IP585	39.9		-0.62	
335	IP585	40.0		-0.60	
336	IP585	43.4		0.22	
369	IP583	38.14		-1.04	
372	IP590	45.7		0.76	
445	IP585	38.2		-1.03	
447		-----		-----	
448		-----		-----	
453		-----		-----	
473	D7797	39.39		-0.74	
496	IP585	37.51		-1.19	
631	IP583	35.08	C	-1.77	first reported: <20
657	IP585	41.4		-0.26	
823	IP585	51.59		2.17	
851	D7797	40.21		-0.55	
974	IP583	42		-0.12	
1011	IP585	42.0		-0.12	
1016	IP585	53.37		2.59	
1062		>50		-----	
1064	IP585	104.04	C,R(0.01)	14.69	first reported: 71.08
1065		-----		-----	
1081		-----		-----	
1082	IP585	41.10		-0.33	
1095		-----		-----	
1097	IP583	37.51		-1.19	
1134		-----		-----	
1161		-----		-----	
1201	IP585	58.4		3.79	
1299	IP585	47.2		1.12	
1316	IP585	47.06		1.09	
1318	IP585	50.46		1.90	
1402	IP590	48.1		1.34	
1587	IP583	42.65		0.04	
1610	IP583	37.9	C	-1.10	first reported: <3
1613	IP599	48.07574		1.33	
1631	IP590	29.9		-3.01	
1634	IP585	46.2		0.88	
1724	IP590	31.63		-2.59	
1782		-----		-----	
1833		-----		-----	
1914		-----		-----	
2129	IP590	51.67		2.19	
2130	IP590	39		-0.83	
6064	IP585	48.12		1.34	
6065	IP585	43.86		0.33	
6066	IP585	43.91		0.34	
6075		-----		-----	

					IP585 only:	IP583/D7797 only:	IP590 only:
	normality	OK			OK	OK	OK
	n	39			23	9	6
	outliers	1	Spike:	Recovery:	1	0	0
	mean (n)	42.50	50.4	<84%	43.99	39.07	41.00
	st.dev. (n)	6.115			5.935	2.331	8.959
	R(calc.)	17.12			16.62	6.53	25.09
	R(IP585:10)	11.73			11.73		
comp	R(IP583:16)				-	6.91	-
comp	R(IP590:10)				-	-	9.10
			Range:		4.5-150 mg/kg	10-150 mg/kg	3-140 mg/kg

Kernel Density

Determination of FAME on sample #16175; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
140		-----		-----	
171	IP585	<4.5		-----	
230	IP585	5.57		-1.00	
237		-----		-----	
253	IP585	0	ex	-7.41	test result excluded, for zero is not a real value
254		-----		-----	
311		-----		-----	
317	IP585	7.4		1.10	
323		-----		-----	
333	IP585	<4.5		-----	
334	IP585	6.8		0.41	
335		-----		-----	
336	IP585	7.3		0.99	
369	IP583	<20		-----	
372	IP590	7.9		1.68	
445	IP585	5.8		-0.74	
447	IP585	4.19		-2.59	
448		-----		-----	
453		-----		-----	
473		-----		-----	
496	IP585	4.98		-1.68	
631	IP583	<20	C	-----	first reported: 35.08
657	IP585	<4.5		-----	
823	IP585	8.16		1.98	
851	D7797	<20		-----	
974	IP583	10	C,R(0.05)	4.10	first reported: 0
1011	IP585	5.3		-1.31	
1016	IP585	6.82		0.44	
1062		7		0.64	
1064	IP585	6.25		-0.22	
1065		-----		-----	
1081		-----		-----	
1082	IP585	5.9		-0.62	
1095	IP585	7.5		1.22	
1097	IP583	<10.0		-----	
1134		-----		-----	
1161		-----		-----	
1201	IP585	8.1		1.91	
1299	IP585	6.4		-0.05	
1316	IP585	6.22		-0.25	
1318	IP585	6.93		0.56	
1402	IP590	7.8		1.56	
1587	IP583	<10		-----	
1610	IP583	<3	C	<-3.96	first reported: 37.9, false negative test result?
1613	IP599	5.85848		-0.67	
1631	IP590	6.46		0.02	
1634	IP585	6.0		-0.51	
1724	IP590	5.648		-0.91	
1782		-----		-----	
1833		-----		-----	
1914		-----		-----	
2129	IP590	6.69		0.29	
2130	IP590	6		-0.51	
6064	IP585	6.62		0.21	
6065	IP585	5.51		-1.07	
6066	IP585	5.64		-0.92	
6075		-----		-----	

					IP585 only:	IP590 only:	IP583/D7797 only:
	normality	OK			OK	OK	n.a.
	n	29			23	6	9
	outliers	1 (+1ex)	Spike:	Recovery:	0 (+1ex)	0	n.a.
	mean (n)	6.44	5.1	<126%	6.38	6.75	≤10
	st.dev. (n)	0.969			1.000	0.926	n.a.
	R(calc.)	2.71			2.80	2.59	n.a.
	R(IP585:10)	2.43			2.42	-	-
comp	R(IP590:10)				-	2.17	-
comp	R(IP583:16)				-	-	n.a.
			Range:	4.5-150 mg/kg	3-140 mg/kg	10-150 mg/kg

APPENDIX 2

z-scores distillation ASTM D86.

lab	method	IBP	10% rec.	50% rec.	90%rec.	FBP
52	D86	0.25	-0.14	0.64	1.16	1.39
62		-----	-----	-----	-----	-----
120	D86	0.21	-0.61	-0.67	0.05	-0.42
131	D86	0.92	0.47	0.45	0.76	0.29
132	D86	0.05	0.63	0.92	0.60	-0.15
140	D86	-0.46	0.01	-0.29	-0.43	-0.22
150	D86	-1.88	-0.45	-0.57	-0.43	-0.34
158		-----	-----	-----	-----	-----
159	D86	-1.68	-0.45	-0.85	-0.75	-0.42
169	D86	-0.29	0.93	**3.07**	**11.67**	1.67
171	D86	0.21	-0.45	-1.04	-0.35	-0.62
175	D86	-0.02	-0.45	0.27	0.53	0.64
177	D86	-1.34	-1.30	-1.04	-1.46	-1.13
194		-----	-----	-----	-----	-----
216		-----	-----	-----	-----	-----
221	D86	0.11	1.24	0.83	-0.43	0.25
224	D86	0.45	0.61	0.07	-0.28	-0.14
225	D86	-0.06	0.47	0.36	-0.43	0.64
228	D86	-1.24	-1.84	**-2.91**	-2.82	**3.01**
230	D86	0.69	-0.22	-0.48	0.13	-0.18
237	D86	0.11	0.47	-0.11	1.16	0.25
238	D86	0.11	**-2.61**	-1.04	-0.43	-1.33
252	D86	0.11	-0.30	0.83	-0.43	1.04
253	D86	-0.56	-0.30	-1.51	-1.23	-1.33
254	D86	0.11	0.47	0.83	0.37	0.25
256	D86	0.11	-1.07	-0.11	-0.43	-0.15
258	D86	1.46	0.47	0.92	1.48	0.33
273	D86	0.25	-0.37	-0.29	0.29	0.96
311	D86	-0.46	-0.53	-0.76	-0.19	-0.22
317	D86	0.05	0.09	0.17	-0.27	0.29
323	D86	0.05	-0.30	-0.29	-0.43	-0.74
333	D86	-1.21	0.01	-0.48	-0.75	-0.70
334	D86	0.11	0.39	-0.85	0.05	-0.18
335	D86	0.92	-0.14	0.64	1.48	-0.54
336	D86	0.32	-0.14	0.36	0.76	-0.22
340	D86	-0.23	0.09	0.36	1.08	-0.74
353	IP123	0.48	-0.30	0.55	1.00	1.27
369	D86	0.01	-0.14	-0.67	0.37	0.45
370	D86	0.21	-0.84	-0.01	-0.75	-0.22
371	D86	0.11	-1.07	-1.97	-2.02	-0.93
372	D86	-0.06	-0.30	-0.11	0.29	0.09
440	IP123	0.79	0.39	0.17	0.21	0.49
445	D86	-0.90	-0.53	-0.67	-0.27	-0.50
447	D86	-0.06	0.09	1.11	1.80	0.21
448	D86	-0.29	0.32	0.64	1.64	0.53
453	IP123	0.05	0.09	0.27	0.05	0.13
468		-----	-----	-----	-----	-----
473	D86	-0.02	-0.14	0.45	0.68	0.45
485	D86	-0.39	-0.03	-0.06	-0.19	-0.24
496	D86	-0.70	-0.84	-0.29	-0.67	0.25
601		-----	-----	-----	-----	-----
606	D86	0.45	0.86	1.01	0.37	0.53
608	D86	1.09	1.39	1.11	0.53	0.64
631	D86	0.92	-0.30	-0.67	-0.11	-0.46
657	D86	-0.09	0.32	1.20	1.08	0.29
663	D86	0.72	1.09	0.13	0.76	1.10
671		-----	-----	-----	-----	-----
704	D86	0.82	-0.07	0.08	-0.59	-0.15
732	D86	-0.23	-0.30	-0.57	-1.23	-0.34
840	D86	-0.53	0.50	-0.28	-0.03	-0.15
851	D86	0.89	0.86	0.08	0.53	0.17
854	D86	0.25	0.63	1.01	0.53	0.60
862	D86	-0.26	-0.45	-1.13	-0.83	0.72
869	D86	0.28	-0.30	-0.11	-0.43	-0.15
922	D86	0.01	-0.99	-1.13	-1.62	-0.50
962	D86	-0.77	-0.14	0.36	-0.43	-0.66
963	D86	-0.50	-0.07	-0.01	-0.91	-0.50
974	D86	-0.02	0.39	-0.48	-0.99	-1.25
994	D86	0.11	-0.30	-0.11	-0.43	0.25
995	D86	0.28	0.09	0.36	-0.43	0.05
996		-----	-----	-----	-----	-----
997	D86	0.28	0.09	0.36	-0.43	0.05
1011	D86	0.52	0.39	0.27	0.60	0.21
1016		-----	-----	-----	-----	-----

lab	method	IBP	10% rec.	50% rec.	90%rec.	FBP
1023		-----	-----	-----	-----	-----
1026	ISO3405	-0.09	0.32	0.08	-0.51	0.05
1039		-----	-----	-----	-----	-----
1049		-0.02	0.63	0.73	0.53	0.33
1059	D86	0.01	-0.68	-0.39	-0.51	0.21
1062	D86	-0.23	-0.07	0.08	-0.43	-0.15
1064	D86	0.96	0.55	1.95	1.40	0.68
1065		-----	-----	-----	-----	-----
1079	D86	0.42	0.39	0.83	1.32	0.45
1081	D86	-0.77	-0.37	-0.39	0.21	-0.11
1082	D86	0.45	0.09	1.01	1.16	0.05
1097	ISO3405	0.15	0.16	0.55	1.48	0.21
1109	D86	-0.06	0.01	0.17	0.13	-0.34
1121	D86	-0.39	0.47	-1.97	-2.42	-1.33
1134		-----	-----	-----	-----	-----
1135	D86	-0.12	0.47	0.36	1.08	0.21
1146	ISO3405	-0.02	0.24	-0.20	-1.23	0.25
1150	ISO3405	0.48	1.05	0.54	1.81	0.38
1161	ISO3405	-0.63	-1.68	-1.51	-1.07	0.13
1182	D86	0.28	-0.45	-0.11	1.40	0.05
1191	D86	-0.29	-0.22	0.64	0.60	0.17
1205	D86	0.69	0.70	0.92	0.29	0.92
1264	D86	-0.23	0.78	0.17	-0.11	-0.30
1279	D86	1.03	1.24	0.55	0.37	-0.50
1297	D86	-0.97	0.09	-0.76	-1.86	-0.26
1299	D86	0.32	-0.30	0.17	0.68	0.17
1316		-1.04	-0.22	-0.01	-0.27	-0.50
1318	D86	-0.97	-0.07	-0.39	0.05	-0.34
1347	D86	1.46	1.24	0.83	-0.43	-0.54
1348	D86	1.06	-1.30	-1.79	-0.75	-0.58
1397	D86	-0.19	-0.53	-0.20	-1.23	0.09
1412	D86	0.11	0.09	0.83	-0.03	-----
1417	IP123	0.28	0.24	1.57	2.12	0.76
1441	D86	-0.56	-1.30	-2.07	-0.83	-0.97
1496	D86	-0.26	1.09	0.45	0.29	0.13
1538	D86	0.48	0.16	0.17	-0.59	-0.11
1585	D86	-0.39	-0.07	0.36	0.21	-0.30
1587	D86	-0.43	0.24	-0.11	-0.43	0.09
1610	D86	0.05	-0.53	-0.67	-0.43	-0.11
1613	D86	0.79	0.55	0.92	0.45	0.64
1631	D86	-0.73	-0.84	-0.29	-0.11	0.37
1634	D86	-0.36	0.39	1.67	2.67	0.96
1636	D86	-0.29	0.09	-0.11	-0.43	-0.54
1715	D86	-0.23	0.24	-0.20	-0.19	-0.03
1720	D86	**-2.76**	0.01	0.27	-0.03	-0.42
1724	D86	-0.53	0.24	0.17	-0.03	0.37
1741	D86	-0.46	-0.84	-0.85	-0.03	-0.82
1776	ISO3405	-0.53	-0.14	0.08	1.24	0.33
1782	D86	1.23	0.01	-0.01	1.00	-0.50
1811	D86	0.28	0.01	-0.85	-1.38	0.01
1813	D86	-0.50	0.01	0.83	1.32	0.01
1833	D86	0.11	-0.07	-0.20	-1.31	0.45
1881	D86	0.45	-0.30	-1.04	-0.83	-0.54
1883	D86	0.45	0.47	-1.04	-2.02	1.83
1913	D86	0.37	1.43	0.83	1.48	-0.64
1914		0.11	-1.84	-1.04	-1.23	-0.93
1944	D86	0.01	-0.22	-0.48	0.60	-0.18
2129	D86	-1.14	-0.22	0.08	0.37	0.29
2130	D86	-0.53	0.16	0.83	0.84	0.76
6054	D86	0.25	0.70	-0.11	-0.83	-0.97

Z-scores underlined and bold test results: assigned by the statistical Rosner outlier test.

APPENDIX 3

z-scores Particle Size Distribution on sample #16173 acc. to IP564 and IP565, results in parts/ml

		IP 564						IP565					
lab	method	>4 µm	>6 µm	>14 µm	>21 µm	>25 µm	>30 µm	method	>4 µm	>6 µm	>14 µm	>21 µm	>25 µm	>30 µm
140		-----	-----	-----	-----	-----	-----		-----	-----	-----	-----	-----	-----
150		-----	-----	-----	-----	-----	-----	IP565	0.43	-0.06	0.03	0.17	0.10	-0.95
171		-----	-----	-----	-----	-----	-----	IP565	-1.24	-0.53	-0.37	-0.40	-0.96	-0.95
230	IP564	*2.35*	*1.35*	<u>1.84</u>	<u>9.29</u>	<u>12.70</u>	<u>17.19</u>		-----	-----	-----	-----	-----	-----
237		-----	-----	-----	-----	-----	-----	IP565	-0.94	-0.24	-0.39	-0.63	-0.75	-0.95
253	IP564	-0.47	-0.03	0.14	1.62	1.61	1.01		-----	-----	-----	-----	-----	-----
311		-----	-----	-----	-----	-----	-----	IP565	0.03	-0.18	-0.24	-0.40	-----	-----
333		-----	-----	-----	-----	-----	-----	IP565	0.26	0.21	-0.10	0.17	0.10	1.53
334		-----	-----	-----	-----	-----	-----	IP565	1.43	0.75	0.16	-0.40	0.10	-0.95
335		-----	-----	-----	-----	-----	-----	IP565	-0.92	-0.76	-0.14	-0.12	-0.32	-0.45
372	IP564	1.00	0.68	0.04	-0.27	-0.17	0.06		-----	-----	-----	-----	-----	-----
447	IP564	0.12	-0.04	-0.08	-1.36	-0.98	-1.02		-----	-----	-----	-----	-----	-----
453	IP564	-1.02	-0.81	-0.40	-0.93	-0.24	1.01		-----	-----	-----	-----	-----	-----
496		-----	-----	-----	-----	-----	-----		-----	-----	-----	-----	-----	-----
657		-----	-----	-----	-----	-----	-----	IP565	-0.35	-0.15	-0.08	0.28	0.73	0.04
840		-----	-----	-----	-----	-----	-----	IP565	1.11	0.08	0.16	0.34	0.20	0.32
854		-----	-----	-----	-----	-----	-----	IP565	0.05	0.43	0.42	-0.18	-0.32	-0.45
922		-----	-----	-----	-----	-----	-----	IP565	-0.13	0.16	-0.31	-0.58	-0.54	-0.45
963		-----	-----	-----	-----	-----	-----	IP565	2.76	0.70	0.16	-0.18	-0.32	-0.45
974	IP564	-0.01	-0.09	0.07	1.20	0.13	-1.02		-----	-----	-----	-----	-----	-----
1011		-----	-----	-----	-----	-----	-----	IP565	-0.13	0.16	0.43	-0.40	0.10	-0.95
1016		-----	-----	-----	-----	-----	-----	IP565	-0.15	0.26	-0.09	-0.23	-0.22	-0.45
1026		-----	-----	-----	-----	-----	-----	IP565	<u>7.71</u>	<u>5.96</u>	<u>7.39</u>	<u>5.34</u>	<u>2.22</u>	-----
1039		-----	-----	-----	-----	-----	-----	IP565	0.09	0.36	-0.10	0.74	1.16	1.53
1062		-----	-----	-----	-----	-----	-----	IP565	0.10	-0.23	-0.02	0.17	-0.01	0.04
1064		-----	-----	-----	-----	-----	-----	IP565	0.21	0.17	-0.16	-0.48	-0.36	0.37
1065		-----	-----	-----	-----	-----	-----		-----	-----	-----	-----	-----	-----
1081	IP564	0.79	0.95	0.51	0.56	0.50	1.01		-----	-----	-----	-----	-----	-----
1095		-----	-----	-----	-----	-----	-----	IP565	-1.24	-0.70	-0.24	-0.40	-0.96	-0.95
1097		-----	-----	-----	-----	-----	-----		-----	-----	-----	-----	-----	-----
1109		-----	-----	-----	-----	-----	-----	IP565	-0.12	0.72	0.58	1.38	1.05	1.28
1134		-----	-----	-----	-----	-----	-----		-----	-----	-----	-----	-----	-----
1191	IP564	-1.07	-0.73	-0.12	-0.08	-0.24	-0.34		-----	-----	-----	-----	-----	-----
1200		-----	-----	-----	-----	-----	-----		-----	-----	-----	-----	-----	-----
1264		-----	-----	-----	-----	-----	-----	IP565	-0.39	0.32	0.42	0.69	0.84	1.28
1279		-----	-----	-----	-----	-----	-----	IP565	-1.51	-0.90	-0.41	-0.63	-0.64	-0.45
1299		-----	-----	-----	-----	-----	-----	IP577	0.92	-0.55	-0.24	0.00	0.42	0.79
1316		-----	-----	-----	-----	-----	-----	in house	-0.33	0.38	0.03	-0.12	0.05	0.32
1402		-----	-----	-----	-----	-----	-----	IP565	0.29	-0.11	-0.05	-0.23	-0.22	-0.21
1538		-----	-----	-----	-----	-----	-----	IP565	0.42	0.39	0.20	-0.06	-0.32	-0.45
1585		-----	-----	-----	-----	-----	-----	IP565	-1.00	-0.64	-0.18	-0.12	-0.11	0.29
1587	IP564	0.15	-0.18	-0.38	-1.14	-0.98	-1.02		-----	-----	-----	-----	-----	-----
1610		-----	-----	-----	-----	-----	-----	IP565	1.22	0.36	0.26	0.51	0.63	0.79
1613		-----	-----	-----	-----	-----	-----	IP565	-0.92	-0.41	0.14	0.40	0.84	1.78
1631		-----	-----	-----	-----	-----	-----	IP565	1.50	0.73	0.52	1.32	0.42	-0.21
1634		-----	-----	-----	-----	-----	-----		-----	-----	-----	-----	-----	-----
1724		-----	-----	-----	-----	-----	-----	IP565	1.36	0.65	0.27	0.51	0.52	0.79
1741		-----	-----	-----	-----	-----	-----	IP565	-2.88	-1.40	-0.44	-0.75	-0.75	-0.70
1776	IP564	*0.97*	*0.97*	<u>2.01</u>	<u>15.04</u>	<u>20.10</u>	<u>27.30</u>		-----	-----	-----	-----	-----	-----
1811		-----	-----	-----	-----	-----	-----	IP565	2.50	1.22	0.07	0.05	-0.11	-0.95
1813		-----	-----	-----	-----	-----	-----	IP565	-2.40	-1.18	-0.28	-0.40	-0.32	-0.21
1833		-----	-----	-----	-----	-----	-----		-----	-----	-----	-----	-----	-----
1913	IP564	0.60	0.47	-0.03	-0.93	-0.98	-0.34		-----	-----	-----	-----	-----	-----
1914	IP564	0.29	0.16	0.25	0.99	1.98	1.01		-----	-----	-----	-----	-----	-----
2130	IP564	-0.39	-0.38	0.01	0.35	-0.61	-0.34		-----	-----	-----	-----	-----	-----
6075		-----	-----	-----	-----	-----	-----	IP565	<u>12.59</u>	<u>6.54</u>	<u>1.68</u>	*0.23*	*-0.01*	*-0.70*
9090		-----	-----	-----	-----	-----	-----		-----	-----	-----	-----	-----	-----

Z-score underlined and bold: test result is assigned by the statistical Dixon's or Grubb's outlier tests.

Z-scores bold and Italic test result: excluded

APPENDIX 4

Equipment used in Particle Size distribution

L ab	Equipment	Test method reported	Test method reported for calibration
140			
150	Stanhope-Seta	IP565	ISO11171
171	Stanhope-Seta	IP565	
230	Parker Hannifin	IP564	ISO11171
237	Stanhope-Seta	IP565	ISO11171
253	Parker Hannifin	IP564	
311	Stanhope-Seta	IP565	ISO11171
333	Stanhope-Seta	IP565	ISO11171
334	Stanhope-Seta	IP565	
335	Stanhope-Seta	IP565	ISO11171
372	Parker Hannifin	IP564	ISO11171
447	Parker Hannifin	IP564	ISO11171
453	Parker Hannifin	IP564	
496			
657	Stanhope-Seta	IP565	ISO11171
840	Stanhope-Seta	IP565	ISO11171
854	Stanhope-Seta	IP565	
922	Stanhope-Seta	IP565	ISO11171
963	Stanhope-Seta	IP565	AVTUR (ISO4406)
974	Parker Hannifin	IP564	ISO11171
1011	Stanhope-Seta	IP565	
1016	Stanhope-Seta	IP565	by Stanhope Seta
1026	Stanhope-Seta	IP565	ISO11171
1039	Stanhope-Seta	IP565	ISO11171
1062	Stanhope-Seta	IP565	ISO11171
1064	Stanhope-Seta	IP565	
1065			
1081	Parker Hannifin	IP564	validated with Parker-standard
1095	Stanhope-Seta	IP565	
1097			
1109	Stanhope-Seta	IP565	
1134			
1191	Parker Hannifin	IP564	
1200			
1264	Stanhope-Seta	IP565	
1279	Stanhope-Seta	IP565	ISO11171
1299	Pamas	IP577	
1316	Pamas	in house	ISO11171
1402	Stanhope-Seta	IP565	ISO11171
1538	Stanhope-Seta	IP565	
1585	Stanhope-Seta	IP565	ISO11171
1587	Parker Hannifin	IP564	
1610	Stanhope-Seta	IP565	
1613	Stanhope-Seta	IP565	ISO11171
1631	Stanhope-Seta	IP565	ISO11171
1634			
1724	Stanhope-Seta	IP565	ISO11171
1741	Stanhope-Seta	IP565	ISO11171
1776	Parker Hannifin	IP564	ISO11171
1811	Stanhope-Seta	IP565	ISO11171
1813	Stanhope-Seta	IP565	
1833			
1913	Parker Hannifin	IP564	
1914	Parker Hannifin	IP564	ISO11171
2130	Parker Hannifin	IP564	ISO11171
6075	Stanhope-Seta	IP565	ISO11171
9090			

APPENDIX 5

Number of participants per country

2 labs in AUSTRALIA	1 lab in MARTINIQUE
2 labs in AZERBAIJAN	1 lab in MOZAMBIQUE
6 labs in BELGIUM	9 labs in NETHERLANDS
1 lab in BULGARIA	2 labs in NIGERIA
2 labs in CANADA	3 labs in NORWAY
7 labs in CHINA, People's Republic	1 lab in PAKISTAN
2 labs in COTE D'IVOIRE	1 lab in PHILIPPINES
3 labs in COLOMBIA	2 labs in POLAND
1 lab in CROATIA	3 labs in PORTUGAL
1 lab in CYPRUS	1 lab in QATAR
1 lab in CZECH REPUBLIC	1 lab in ROMANIA
1 lab in DJIBOUTI	1 lab in RUSSIAN FEDERATION
1 lab in ESTONIA	3 labs in SAUDI ARABIA
2 labs in FINLAND	1 lab in SENEGAL
6 labs in FRANCE	1 lab in SERBIA
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	1 lab in SPAIN
1 lab in HONG KONG	1 lab in SUDAN
1 lab in HUNGARY	3 labs in SWEDEN
1 lab in IRELAND	1 lab in TANZANIA
1 lab in ISRAEL	1 lab in THAILAND
1 lab in JORDAN	1 lab in TOGO
1 lab in KAZAKHSTAN	1 lab in TUNISIA
2 labs in KENYA	4 labs in TURKEY
3 labs in LATVIA	1 lab in TURKMENISTAN
3 labs in LEBANON	1 lab in UKRAINE
2 labs in LITHUANIA	2 labs in UNITED ARAB EMIRATES
1 lab in MACEDONIA	12 labs in UNITED KINGDOM
3 labs in MALAYSIA	12 labs in UNITED STATES OF AMERICA
1 lab in MAURITIUS	1 lab in VIETNAM

APPENDIX 6

Abbreviations:

C   = final test result after checking of first reported suspect test result
D(0.01)   = outlier in Dixon's outlier test
D(0.05)   = straggler in Dixon's outlier test
G(0.01)   = outlier in Grubbs' outlier test
G(0.05)   = straggler in Grubbs' outlier test
DG(0.01) = outlier in Double Grubbs' outlier test
DG(0.05) = straggler in Double Grubbs' outlier test
R(0.01)   = outlier in Rosner outlier test
R(0.05)   = straggler in Rosner outlier test
E   = probably an error in calculations
W   = test result withdrawn on request of participant
ex   = test result excluded from calculations
U   = probably reported in wrong unit
fr.   = first reported
n.a.   = not applicable
n.d.   = not detected
SDS   = Safety Data Sheet

Literature:

1   iis Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, April 2014
2   Defence Standard 91-91, Issue 7, Amendment 3, Publication date 02 February 2015.
3   Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS), Issue 28 March 2015, Bulletin No. 76.
4   Joel Schmitigal and Jill Bramer, Field Evaluation of Particle Counter Technology for Aviation Fuel Contamination Detection, US Army TARDEC, Technical Report 23966, (June 2013)
5   ASTM E178-02
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8   ISO 5725, parts 1-6, 1994
9   M. Thompson and R. Wood, J. AOAC Int, 76, 926, (1993)
10   W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)
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16   Bernard Rosner, Percentage Points for a Generalized ESD Many-Outlier Procedure, *Technometrics*, 25(2), pp. 165-172, (1983).