Results of Proficiency Test
Jet Fuel A1
September 2018

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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Report: iis18J02 -- REVISED --

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SUMMARY OF CHANGES

This revised report replaces the original report iis18J02 of December 2018.

It was discovered by a number of participants that the JFTOT test results (page 78 and 79) were copied incorrectly due to a change in a labcode during the evaluation of the PT results.
After investigation, it turns out that no futher recalculations or other changes were needed.

The following pages in this report have been revised only:

- Appendix 1: page 78-79: Order in labcodes only

CONTENTS

Appendices:

1 INTRODUCTION

Since 1995, the Institute for Interlaboratory Studies organises proficiency tests (PT) for Jet Fuel A1 twice a year. The interlaboratory study on Jet Fuel was extended with PTs for the determination of Particle Size Distribution, BOCLE, FAME and JFTOT. The latter three once a year. In the annual proficiency testing program of 2018/2019, it was decided to continue the PT 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 29 from October 2016.
The number of participants per Jet Fuel PT: 139 laboratories in 64 countries for the main round (iis18J02), 28 laboratories in 18 countries for BOCLE (iis18J02BOCLE), 60 laboratories in 32 countries for Particle Size Distribution (iis18J02PS), 69 laboratories in 35 countries for FAME (iis18J02FAME) and 88 laboratories in 42 countries for JFTOT (iis18J02JF) registered.
In total 157 laboratories in 67 different countries registered for participation. See appendix 2 for the number of participants per country. In this report, the results of the Jet Fuel 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 Jet Fuel A1 round it was decided to send two identical samples (2 x 1 litre bottles, labelled #18160) for the analyses according to the latest version of "Joint Fuelling System Check List for Jet A-1". For the BOCLE determination to send one sample (100 ml, labelled #18161), for the Particle Size Distribution determination one sample (0.5 L bottle, labelled #18162), for the FAME determination two different samples (both 100 ml, one labelled #18163 and one labelled #18164) and for the JFTOT one sample (1 L bottle, labelled #18165).
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 June 2018 (iis-protocol, version 3.5). This protocol can be downloaded from the iis website www.iisnl.com, from the FAQ page.

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 ROUND)

The necessary bulk material of Jet Fuel A1, approximately 400 litres, was obtained from a trader and homogenised in a mixing vessel. From this batch, 320 amber glass bottles of one litre were filled, closed with inner and outer caps and labelled #18160. The homogeneity of the subsamples #18160 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 #18160-1	792.36
Sample #18160-2	792.35
Sample #18160-3	792.35
Sample #18160-4	792.35
Sample #18160-5	792.36
Sample #18160-6	792.35
Sample #18160-7	792.35
Sample #18160-8	792.35
Sample #18160-9	792.35
Sample #18160-10	792.35

Table 1: homogeneity test results of subsamples #18160

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 D4052:18
0.3 x R (ref. test method)	0.15

Table 2: evaluation of repeatability of subsamples #18160

The calculated repeatability was in agreement with 0.3 times the corresponding reproducibility of the target method. Therefore, homogeneity of the subsamples #18160 was assumed.

2.4.2 BOCLE (BALL-ON-CYLINDER LUBRICITY EVALUATOR) DETERMINATION

For the BOCLE sample Jet Fuel A1 material was used that was obtained from a participating laboratory. Approximately 15 litre was homogenized and 40 amber glass bottles of 0.1 liter were filled and labelled #18161. The homogeneity of the subsamples #18161 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 #18161-1	811.52
Sample #18161-2	811.51
Sample #18161-3	811.51
Sample #18161-4	811.51
Sample #18161-5	811.51
Sample #18161-6	811.51
Sample #18161-7	811.51
Sample #18161-8	811.51

Table 3: homogeneity test results of subsamples #18161

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

	Density at 15°C in kg/m^3
r (observed)	0.01
reference test method	D4052:18
0.3 x R (ref. test method)	0.15

Table 4: evaluation of repeatability of subsamples #18161

The calculated repeatability was in agreement with 0.3 times the corresponding reproducibility of the target method. Therefore, homogeneity of the subsamples #18161 was assumed.

2.4.3 PARTICLE SIZE DISTRIBUTION DETERMINATION (PS)

The remainder of the batch Jet Fuel A1 from the main round was used for Particle Size Distribution Determination. Approximately 80 litres bulk material was homogenized and 80 amber glass bottles of 0.5 litres were filled under constant mixing. The botlles were spiked with Arizona Dust and labelled #18162. The homogeneity of the subsamples #18162 was checked by the determination of Particle Size Distribution in accordance with IP565 on five stratified randomly selected samples.

	≥ 4 µm (c) counts/ml	≥ 6 µm (c) counts/ml	≥ 14 µm (c) counts/ml
Sample #18162-1	36757	13304	260
Sample #18162-2	36538	13518	354
Sample #18162-3	37080	13555	280
Sample #18162-4	36466	13262	288
Sample #18162-5	37714	14062	359

Table 5: homogeneity test results of subsamples #18162

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

	≥ 4 µm (c) counts/ml	≥ 6 µm (c) counts/ml	≥ 14 µm (c) counts/ml
r (observed)	1424	892	127
reference test method	IP565:13	IP565:13	IP565:13
r (ref. test method)	3059	2169	121

Table 6: evaluation of repeatabilities of subsamples #18162

The calculated repeatabilities for the particle sizes ≥ 4 µm (c), ≥ 6 µm (c) and ≥ 14 µm (c) were in agreement with the target repeatability of the reference test method. Therefore, homogeneity of the subsamples of #18162 was assumed.

2.4.4 FATTY ACID METHYL ESTER (FAME) DETERMINATION

It was decided to prepare two different samples for FAME determination in Jet Fuel with low and high level of FAME. A Jet Fuel batch of 9.8 litres was spiked with 0.12 gram Biodiesel B100 and homogenised. From this batch 80 amber glass bottles of 0.1 liter were filled and labelled #18163. Another Jet Fuel batch of 9.8 litres was spiked with 0.43 gram Biodiesel B100 and homogenized. From this batch 80 amber glas bottles of 0.1 liter were filled and labelled #18164.

The homogeneity of the subsamples #18163 and #18164 was checked by the determination of FAME in accordance with method IP585 on 8 stratified randomly selected samples.

	FAME in mg/kg #18163	FAME in mg/kg #18164
Sample 1	15.1	46.3
Sample 2	15.6	47.0
Sample 3	14.9	47.7
Sample 4	14.8	46.7
Sample 5	14.8	46.8
Sample 6	14.4	44.6
Sample 7	14.7	45.0
Sample 8	15.0	44.9

Table 7: homogeneity test results of subsamples #18163 and #18164

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

	FAME in mg/kg #18163	FAME in mg/kg #18164
r (observed)	1.0	3.2
reference test method	IP585:10	IP585:10
0.3 x R (ref. test method)	1.4	3.8

Table 8: evaluation of repeatabilities of subsamples #18163 and #18164

The calculated repeatability was in agreement with 0.3 times the corresponding reproducibility of the target method. Therefore, homogeneity of the subsamples of #18163 and #18164 was assumed.

2.4.5 JFTOT DETERMINATION

A sample of off-spec Jet Fuel was prepared by soaking a copper bar in a batch of Jet Fuel for a while. This material was tested for JFTOT and a clear “Fail” according to ASTM D3241 was obtained. The material was diluted with a batch of Jet Fuel which was obtained by a third party laboratory. A batch of 75 liter of bulk material was homogenized and 100 amber glass bottles of 1 liter were filled with approximately 0.7 liter Jet Fuel and labelled #18165. The homogeneity of the subsamples #18165 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 #18165-1	808.69
Sample #18165-2	808.69
Sample #18165-3	808.68
Sample #18165-4	808.69
Sample #18165-5	808.68
Sample #18165-6	808.68
Sample #18165-7	808.67
Sample #18165-8	808.67

Table 9: homogeneity test results of subsamples #18165

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)	0.02
reference test method	ASTM D4052:18
0.3 x R (ref. test method)	0.15

Table 10: evaluation of repeatability of subsamples #18165

The calculated repeatability was in agreement with 0.3 times the corresponding reproducibility of the target method. Therefore, homogeneity of the subsamples #18165 was assumed.

Depending on the registration of each individual participant the following samples were dispatched on August 22, 2018: 2 samples Jet Fuel A1 (2*1 liter, labelled #18160), 1 sample especially prepared for the BOCLE determination (1*0.1L, labelled #18161), 1 sample especially prepared for the Particle Size Distribution determination (1*0.5L, labelled #18162), 2 samples especially prepared for the FAME determination (1*0.1 L, labelled #18163 + 1*0.1 L, labelled #18164) and 1 sample especially prepared for the JFTOT determination (1*1 L, labelled #18165). An SDS of the samples was added to the sample package.

2.5 STABILITY OF THE SAMPLES

The stability of Jet Fuel A1, packed in the amber 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 #18160: Total Acidity, Aromatics by FIA, Aromatics by HPLC (in %M/M and %V/V), Color Saybolt (automated and manual), Copper Corrosion 2 hrs at 100°C, Density at 15°C, Distillation (IBP, temperature at 10%, 50%, 90% recovered and FBP), Existent Gum (unwashed), Flash Point, Freezing Point, Kinematic Viscosity at -20°C, Mercaptan Sulphur, MSEP, Naphthalenes, Smoke Point, Specific Energy (Net, on Sulphur free basis) and Total Sulphur. The participants were requested to determine on sample #18161 BOCLE only, on sample #18162 Particle Size Distribution only, on samples #18163 and #18164 FAME only and on #18165 Copper and JFTOT only.
The analyses should be performed according to the "Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS), version October 2016", also referred to as the "Joint Fuelling System Check List” or simply “Check List”.

It was explicitly requested to treat the samples as if they were routine samples and to report the test results using the indicated units on the report form and not to round the test results, but report as much significant figures as possible. It was also requested not to report ‘less than’ test results, which are above the detection limit, because such test results cannot be used for meaningful statistical evaluations.

To get comparable test results a detailed report form and a letter of instructions are prepared. On the report form the reporting units are given as well as the appropriate reference test methods that will be used during the evaluation. The detailed report form and the letter of instructions are both made available on the data entry portal www.kpmd.co.uk/sgs-iis/. The participating laboratories are also requested to confirm the sample receipt on this data entry portal. The letter of instructions can also be downloaded from the iis website www.iisnl.com.

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 June 2018 (iis-protocol, version 3.5).
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. If a data set does not have a normal distribution, the (results of the) statistical evaluation 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. In this PT, the criterion of ISO13528, paragraph 9.2.1. was met for all evaluated tests, therefore the uncertainty of all assigned values may be negligible and need not be included in the PT report.

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. In case no literature reproducibility was available, other target values were used. In some cases, a reproducibility based on former iis proficiency tests could be used.

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:

$\lvert z \rvert < 1$	good
$1 < \lvert z \rvert < 2$	satisfactory
$2 < \lvert z \rvert < 3$	questionable
$3 < \lvert z \rvert$	unsatisfactory

4 EVALUATION

In this interlaboratory study no severe problems were encountered with sample dispatch or analytical reporting of the test results.
For the main round Jet Fuel A1, seven participants reported the test results after the final reporting date and three other participants did not report any test results at all. For the BOCLE round, three participants reported the test results after the final reporting date and five 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 twelve (!) participants did not report any test results at all. For the FAME round, two participants reported the test results after the final reporting date and eleven (!) did not report any results at all. And for the JFTOT round, four participants reported the test results after the final reporting date and eleven (!) did not report any test results at all.
Finally, in total 2678 numerical test results were reported. Observed were 57 outlying test results, which is 2.1% of the reported numerical test results. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

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

4.1 EVALUATION PER SAMPLE AND 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 3.

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. D3242) and an added designation for the year that the test method was adopted or revised (e.g. D3242:11). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D3242:11(2017)). In the test results tables of Appendix 1 only the test method number and year of adoption or revision e.g. D3242:11 will be used.

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 91-091/Issue 9, dated: October 2016” and ASTM D1655:17. One must keep in mind that ISO test methods are not mentioned in the “Checklist”.

Sample #18160

Acidity, Total: 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 D3242:11(2017).

Aromatics by FIA: 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 ASTM D1319:15 (see also § 5)

Aromatics by HPLC: The determination in %M/M was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with ASTM D6379:11.
The determination in %V/V may not be problematic. One statistical outlier was observed. Regretfully, no precision data for the determination in %V/V is mentioned in ASTM D6379:11. However, the calculated reproducibility was smaller than the calculated reproducibility in %V/V of the previous proficiency tests iis17J02 and iis18J01.

Color Saybolt: The determination was problematic for the automatic test method. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D6045:12(2017).
The determination for the manual test method was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D156:15.

Copper corrosion: This determination was not problematic. One-hundred and three participants reported a test result and agreed on a result of 1 (1a/1b).

Density: This determination was not problematic. Five statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ASTM D4052:18.

Distillation: This determination was not problematic. In total three statistical outliers were observed over five parameters. However, the calculated reproducibilities after rejection of the statistical outliers are all in agreement with the automated mode requirements of ASTM D86:17, except for 90% recovered.
When compared to the manual mode requirements of ASTM D86:17 only the calculated reproducibilities for IBP and FBP are not in agreement.

Existent Gum: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in good agreement with ASTM D381:12(2017).

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

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.

Kin. Viscosity at -20°C: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D445:17a.

Mercaptan Sulphur: This determination was not problematic. No statistical outliers were observed, but one test result was excluded. The calculated reproducibility after rejection of the suspect data is in agreement with the requirements of ASTM D3227:16.

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 for a number of laboratories. Six statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D1840:07(2013) procedure B and procedure A.

Smoke Point: This determination was problematic depending on the test method used. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D1322:18 Manual mode, but not with the requirements of ASTM D1322:18 Automated mode.
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 D1322:18.

Specific Energy: This determination was problematic for a number of laboratories. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ASTM D3338:09e2(2014). No calculation errors were observed.

Sulphur, Total: This determination was problematic. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5453:16e1.

Sample #18161

BOCLE: This determination was problematic depending on the test method used. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of the ASTM D5001:10(2014) semi-automatic, but not with the requirements of the full-automatic method.
When the test results from the reported semi-automatic and full-automatic methods were evaluated separately, the calculated reproducibility of the semi-automatic is again in agreement with the requirements of ASTM D5001:10(2014) and the calculated reproducibility is not at all in agreement with the respective requirements of ASTM D5001:10(2014).

Sample #18162:

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 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 that 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.

The participants were requested to specify the brand of the particle counter, the actual test method performed and the test method used for determining ISO code scaling. All participants mentioned the equipment used, fifteen participants used IP564, thirty used IP565 and one participant used IP577. All reporting laboratories (some after a correction) have used the method that corresponds with the equipment used, except for labs 140, 171 and 862. All laboratories used ISO4406 for calculating the scale numbers from the counts per ml. All participants calculated the ISO code from the test results in counts/ml correctly.

Also in this PT, it was found that the test results of IP564 were significantly lower than those of IP565. Therefore, it was again decided to evaluate both methods separately. The results of the participants performing IP577 were evaluated in the group of IP565.

Four laboratories had two or more outliers for the six different particle sizes in counts/ml. The other test results in counts/ml for these seven laboratories were excluded. Two laboratories reported IP564 with Stanhope-Seta and one laboratory reported IP564 with Pamas as test equipment. Therefore, the test results of these three laboratories were put in the results table for IP565.

IP564: The determination according to IP564 was problematic. In total, six statistical outliers were observed for the six particle size categories and nine other test results were excluded. The calculated reproducibilities after rejection of the suspect data are not in agreement with the requirements of IP564:13.
The determination expressed in ISO scale numbers may be problematic. Two statistical outliers were observed and four test results were excluded from statistical evaluations. The calculated reproducibility for ≥14 µm (c) is in agreement with the indicative requirements of IP564:13 Annex C.

IP565: The determination according to IP565 was problematic. In total five statistical outliers were observed for the six particle size categories and nine other test results were excluded. The calculated reproducibilities after rejection of the suspect data is in agreement with the requirements of IP565:13 for ≥30µm (c).
The determination expressed in ISO scale numbers may not be problematic. One statistical outlier and two test results were excluded were observed. The calculated reproducibilities for ≥6 µm (c) and ≥14 µm (c) are in agreement with the indicative requirements of IP565:13 Annex C.

Samples #18163 and #18164

FAME (#18163): This sample was spiked with approximately 16 mg FAME per kg. This is well above the lower limit of IP585 and IP590 and just above the lower limit of IP583. 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 or IP583:15.
The average recovery of FAME (theoretical increment of 15.5 mg FAME/kg) is satisfactory: “less than 125%” (the actual blank FAME content is unknown).
When the test results of IP583 and IP585 were evaluated separately, only the calculated reproducibility of IP583 is in agreement with the requirements of the respective test method.

FAME (#18164): This sample was spiked with approximately 55 mg FAME per kg. 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 IP585:10 and IP583:15.
The average recovery of FAME (theoretical increment of 55.4 mg FAME/kg) is good: “less than 102%” (the actual blank FAME content is unknown).
When the test results of IP583 and IP585 were evaluated separately, both calculated reproducibilities of IP583 and IP585 are not in agreement with the respective method requirements.

Sample #18165

Copper: This determination was problematic. One statistical outlier was observed. The calculated reproducibility is not in agreement with the requirements of ASTM D6732:04(2015). With this determination, the presence of Copper in this sample has been proven with high certainty.

JFTOT: The reported test results for tube rating vary over a range from <1 to >4 (visual), 49.5 to 412.2 (interferometric) and 176-363 (ellipsometric).
The reported Delta P test results vary from 0 to 412. Visual rating is described in ASTM D3241:16 Annex A1, interferometric rating in ASTM D3241:16 Annex A2 and ellipsometric in ASTM D3241:16 Annex A3.
The JFTOT test can be rated as a pass according to specification AFQRJOS when the visual tube rating (VTR) is less than 3, interferometric (ITR) or ellipsometric (ETR) rating is less than 85 nm and Delta P is 25 or less after 2.5 hrs at 260°C.
Using the criteria from AFQRJOS on all test results (including the laboratories that did not report a pass or fail), almost all the reporting laboratories would rate the sample as a fail, while 4 reporting laboratories would rate it a pass.

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 are compared in the next tables.

Parameter	unit	n	average	2.8 * sd	R (lit)
Acidity, Total	mg KOH/g	86	0.0019	0.0032	0.0018
Aromatics by FIA	%V/V	73	15.8	1.8	2.6
Aromatics by HPLC	%M/M	24	18.8	1.1	2.0
Aromatics by HPLC	%V/V	24	16.7	1.0	n.a.
Color Saybolt (automated)		64	21.7	2.9	1.2
Color Saybolt (manual)		75	20.8	3.7	2
Copper Corrosion 2hr at 100°C		103	1	n.a.	n.a.
Density at 15°C	kg/m^3	129	792.4	0.3	0.5
Initial Boiling Point	°C	129	148.7	6.1	8.2
Temp at 10% recovered	°C	127	167.8	2.7	3.7
Temp at 50% recovered	°C	128	195.7	2.4	3
Temp at 90% recovered	°C	129	243.9	4.2	3.7
Final Boiling Point	°C	129	275.6	5.6	7.1
Existent Gum (unwashed)	mg/100mL	76	0.74	1.15	3.15
Flash Point	°C	123	41.6	3.3	3.2
Freezing Point	°C	114	-51.3	2.3	2.5
Kinematic Viscosity at -20°C	mm^2/s	86	3.808	0.074	0.072
Mercaptan Sulphur as S	%M/M	76	0.0002	0.0002	0.0003
MSEP	rating	93	92.8	8.1	9.8
Naphthalenes	%V/V	68	0.34	0.04	0.05
Smoke Point	mm	98	25.4	2.3	3.9
Specific Energy (Net)	MJ/kg	71	43.389	0.034	0.046
Sulphur, Total	mg/kg	111	221	45	33
BOCLE (#18161)	mm	23	0.66	0.06	0.06

Table 11: reproducibilities of tests on sample #18160 and #18161

Parameter - IP564	unit	n	average	2.8 * sd	R (lit)
Particle Size ≥4 µm (c)	counts/ml	10	23447	8029	4371
Particle Size ≥6 µm (c)	counts/ml	12	7541	6618	2256
Particle Size ≥14 µm (c)	counts/ml	11	211	234	106
Particle Size ≥21 µm (c)	counts/ml	11	27.3	54.0	34.6
Particle Size ≥25 µm (c)	counts/ml	11	10.2	20.0	13.7
Particle Size ≥30 µm (c)	counts/ml	11	3.3	6.7	5.5
Particle Size ≥4 µm (c)	ISO scale	10	21.8	1.2	1.0
Particle Size ≥6 µm (c)	ISO scale	12	19.8	1.6	1.4
Particle Size ≥14 µm (c)	ISO scale	11	14.9	2.3	2.2

Table 12: reproducibilities of tests on sample #18162 according to IP564

Parameter - IP565	unit	n	average	2.8 * sd	R (lit)
Particle Size ≥4 µm (c)	counts/ml	29	39915	10082	4174
Particle Size ≥6 µm (c)	counts/ml	30	13803	5804	2851
Particle Size ≥14 µm (c)	counts/ml	29	544	381	267
Particle Size ≥21 µm (c)	counts/ml	29	62.6	72.9	49.2
Particle Size ≥25 µm (c)	counts/ml	29	21.0	29.8	20.9
Particle Size ≥30 µm (c)	counts/ml	29	6.4	9.6	8.8
Particle Size ≥4 µm (c)	ISO scale	23	22.6	1.4	1.0
Particle Size ≥6 µm (c)	ISO scale	25	20.8	1.0	1.0
Particle Size ≥14 µm (c)	ISO scale	24	16.2	1.2	1.4

Table 13: reproducibilities of tests on sample #18162 according to IP565

Parameter	unit	n	average	2.8 * sd	R (lit)
FAME (#18163)	mg/kg	55	19.4	7.8	5.8
FAME (#18164)	mg/kg	48	56.5	20.0	15.4

Table 14: reproducibilities of tests on sample #18163 and #18164

Parameter	unit	n	average	2.8 * sd	R (lit)
Copper as Cu	µg/kg	4	510	227	102
VTR (visual)		73	<1 – >4	n.a.	n.a
ITR (interferometric)	nm	12	49.5 – 412.2	n.a.	n.a
ETR (elliptometric)	nm	5	176 – 363	n.a.	n.a
Delta P	mmHg	61	0 – 412	n.a.	n.a
JFTOT Evaluation by iis		61	Fail	n.a.	n.a

Table 15: reproducibilities of tests on sample #18165

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 2018 WITH PREVIOUS PTS

	September 2018	March 2018	September 2017	March 2017	September 2016	March 2016
Number of reporting labs	152	99	144	108	137	103
Number of test results reported	2678	1671	2706	2091	2710	1809
Statistical outliers	57	46	83	63	49	40
Percentage outliers	2.1%	2.8%	3.1%	3.0%	1.8%	2.2%

Table 16: 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 2018	March 2018	September 2017	March 2017	September 2016	March 2016
Acidity, Total	-	-	-	-	+/-	-
Aromatics by FIA	+	+	+	+	+	+/-
Aromatics by HPLC	+	+	+/-	+	+/-	-
Color Saybolt (automated)	--	--	--	-	-	--
Color Saybolt (manual)	--	--	-	-	--	--
Density at 15°C	+	+	+	+	+	+
Distillation	+	+	+	+	+	+
Existent Gum	++	++	++	++	++	++
Flash Point	+/-	+/-	+	+	+	+/-
Freezing Point	+/-	+/-	+	+	+/-	+
Kinematic Viscosity at -20°C	+/-	-	+/-	+/-	-	+
Mercaptan Sulphur	+	-	+	+/-	+/-	+/-
MSEP	+	+	+	+/-	+/-	+/-

Parameter	September 2018	March 2018	September 2017	March 2017	September 2016	March 2016
Naphthalenes	+/-	+/-	-	+/-	-	+/-
Smoke Point	++	+	+	+	+	+
Specific Energy (Net)	+	+	+/-	+/-	+/-	+/-
Sulphur, Total	-	+	-	+/-	+/-	+/-
BOCLE	+/-	n.e.	-	n.e.	-	n.e.
- IP 564 Cumulative counts/ml	--	--	-	--	+	--
- IP 564 ISO scale numbers	-	+	+/-	+	-	-
- IP565 Cumulative counts/ml	--	--	-	-	+	-
- IP565 ISO scale numbers	+/-	-	+/-	+	-	-
FAME	-	n.e.	+/-	n.e.	--	n.e.
JFTOT finding correct Pass/Fail	+	n.e.	-	n.e.	n.e.	n.e.

Table 17: 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

5 DISCUSSION

At November 30, 2018 a new JIG Bulletin No.117 / issue 30 November 2018 was published. One of the topics of this bulletin concerns the determination of Hydrocarbons by FIA according ASTM D1319 with a new batch of Fluorescent indicator dyed gel. ASTM D 1319 is a very widely used test that has been around for decades. It is simple, robust and relatively inexpensive. At the heart of the test is a dyed silica gel. The gel has only ever been manufactured by one company. For various technical HSE and commercial reasons the gel can no longer be manufactured using the same components. Several alternative formulations have been tried, but none yield the same results as the original formulation. In use, the revised gels give misleading results. This is also acknowlegded in the letter to “CEN/TC 19/WG21 – FIA Dye issue” of 22 November 2018. Fortunately, this issue was not visible in the aromatics determination by FIA in the 2018 proficiency test of Jet Fuel. However, it is advised that each participant evaluate this determination and check the dyed gel used.

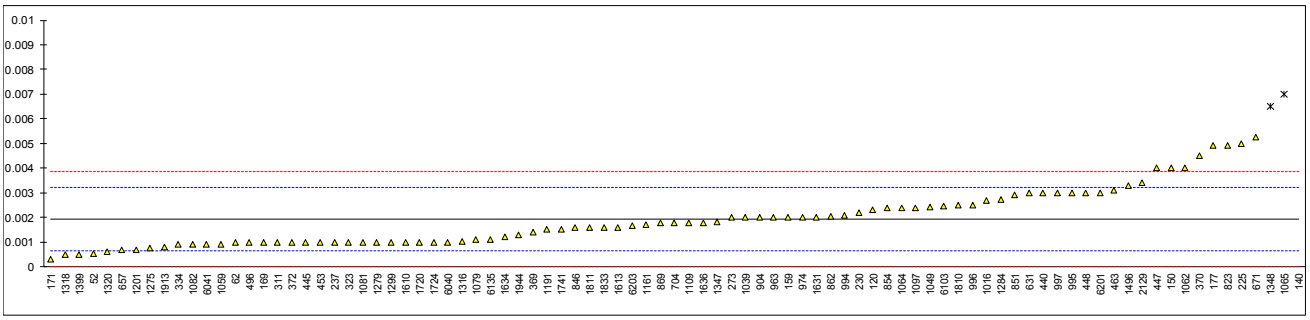
APPENDIX 1

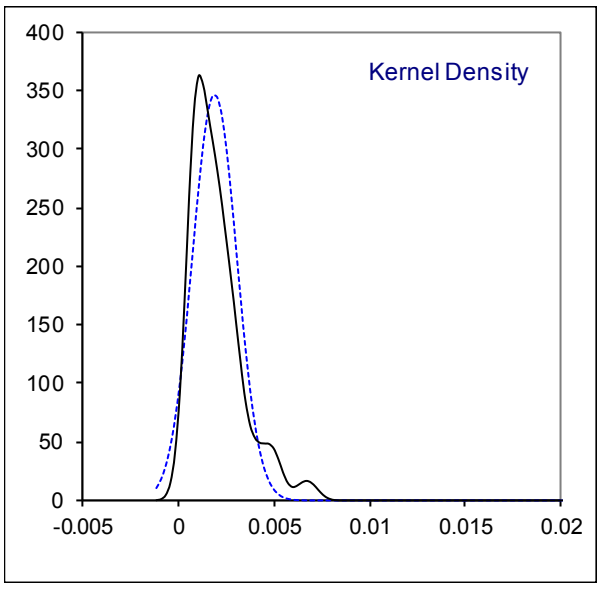
Determination of Acidity, Total on sample #18160; results in mg KOH/g

lab	method	value	Mark	z(targ)	lab	method	value	mark	z(targ)
52	D3242	0.00054		-2.19	1062	D3242	0.0040		3.24
62	D3242	0.001		-1.47	1064	D3242	0.0024		0.73
120	D3242	0.0023		0.57	1065	D3242	0.007	R(0.05)	7.94
131		-----		-----	1079	D3242	0.0011		-1.31
140	D3242	0.06	R(0.01)	91.04	1081	D3242	0.001		-1.47
150	D3242	0.004	C	3.24	1082	D3242	0.0009		-1.62
159	D3242	0.002		0.10	1097	D3242	0.0024		0.73
169	D3242	0.001		-1.47	1109	D3242	0.0018		-0.21
171	D3242	0.0003		-2.56	1121		-----		-----
175		-----		-----	1126		-----		-----
177	D3242	0.0049	C	4.65	1143		-----		-----
194		-----		-----	1150		-----		-----
221		-----		-----	1161	D664-A	0.0017		-0.37
224		-----		-----	1182		-----		-----
225	D3242	0.005		4.81	1191	D3242	0.0015		-0.68
228		-----		-----	1201	D3242	0.00070		-1.94
230	D3242	0.0022		0.42	1275	IP354	0.00074573		-1.86
237	D3242	0.001		-1.47	1279	D3242	0.0010		-1.47
238		-----		-----	1284	D664	0.00273		1.25
254		-----		-----	1299	D3242	0.001	C	-1.47
256		-----		-----	1316	D3242	0.00102		-1.43
258		-----		-----	1318	D3242	0.0005		-2.25
273	D3242	0.002	C	0.10	1320	D3242	0.0006		-2.09
311	D3242	0.001		-1.47	1347	D3242	0.00182		-0.18
317		-----		-----	1348	D3242	0.0065	R(0.05)	7.16
323	D3242	0.001		-1.47	1399	D3242	0.00050		-2.25
334	D3242	0.0009		-1.62	1412		-----		-----
335		-----		-----	1417		-----		-----
336		-----		-----	1441		-----		-----
353		-----		-----	1448		-----		-----
369	D3242	0.0014		-0.84	1496	D3242	0.0033		2.14
370	D3242	0.0045		4.02	1520		-----		-----
372	D3242	0.001		-1.47	1538		-----		-----
391		-----		-----	1586		-----		-----
399		-----		-----	1587		-----		-----
440	D3242	0.003		1.67	1610	IP354	0.001		-1.47
445	IP354	0.001		-1.47	1613	D3242	0.001613		-0.50
447	D3242	0.004		3.24	1631	D3242	0.002		0.10
448	D3242	0.003		1.67	1634	D3242	0.0012		-1.15
453	IP354	0.001		-1.47	1636	D3242	0.0018		-0.21
463	D3242	0.0031		1.83	1694		-----		-----
468		-----		-----	1715		-----		-----
485		-----		-----	1720	D3242	0.001		-1.47
496	D3242	0.001		-1.47	1724	D3242	0.001		-1.47
603		-----		-----	1741	D3242	0.0015		-0.68
631	D3242	0.003	C	1.67	1776		-----		-----
633		-----		-----	1810	D3242	0.0025		0.89
657	D3242	0.00068		-1.97	1811	D3242	0.0016		-0.53
671	D3242	0.005265		5.22	1833	D3242	0.0016		-0.53
704	D3242	0.0018		-0.21	1881		-----		-----
732		-----		-----	1883		-----		-----
798		-----		-----	1913	D3242	0.0008		-1.78
823	D3242	0.0049		4.65	1944	D3242	0.0013		-1.00
846	GB/T12574	0.0016		-0.53	1961		-----		-----
851	D3242	0.0029		1.51	2129	D3242	0.0034		2.30
854	D3242	0.0024		0.73	2130	IP354	<0.001		-----
862	D3242	0.00205		0.18	6040	D3242	0.001		-1.47
869	D3242	0.0018		-0.21	6041	D3242	0.00091	C	-1.61
873		-----		-----	6103	D3242	0.00246		0.82
875		-----		-----	6135	D3242	0.00112		-1.28
904	D3242	0.002		0.10	6147		-----		-----
962		-----		-----	6201	D3242	0.003	C	1.67
963	D3242	0.002		0.10	6203	D3242	0.00168		-0.40
970		-----		-----	9090		-----		-----
974	D3242	0.002		0.10					
994	D3242	0.0021		0.26					
995	D3242	0.003		1.67					
996	D3242	0.00251		0.90					
997	D3242	0.003		1.67					
1011	D3242	< 0.002		-----					
1016	D3242	0.0027		1.20					
1026		-----		-----					
1039	D3242	0.002		0.10					
1049	D3242	0.00243		0.78					
1059	D3242	0.00093		-1.58					

normality	suspect
n	86
outliers	3
mean (n)	0.00193
st.dev. (n)	0.001152
R(calc.)	0.00323
st.dev.(D3242:11)	0.000638
R(D3242:11)	0.00179

Lab 150: First reported 0.006
Lab 177: First reported 0.006
Lab 273: First reported 0.0084
Lab 631: First reported 0.03
Lab 1299: First reported 0.007
Lab 6041: First reported 0.0091
Lab 6201: First reported 0.007



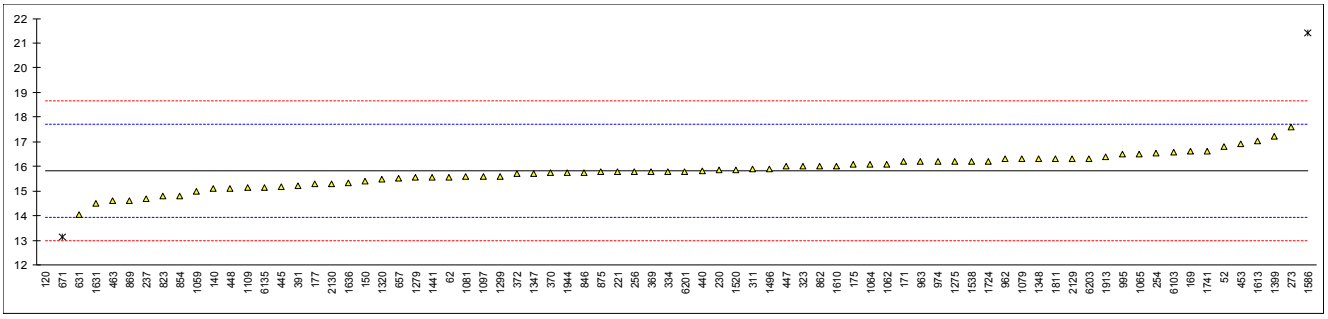


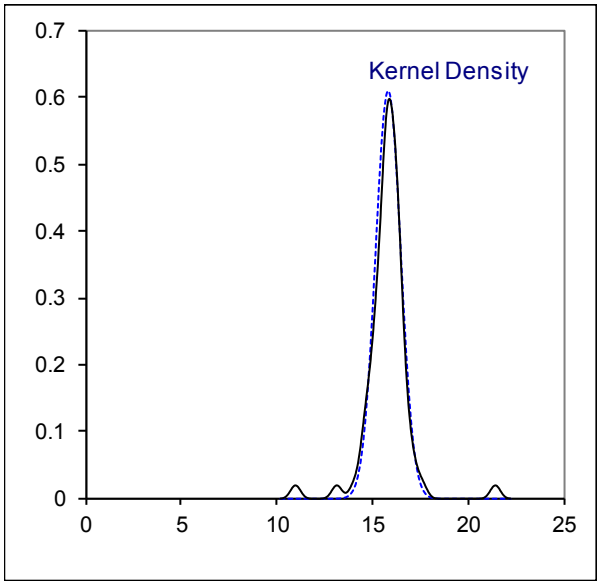
Determination of Aromatics by FIA (without oxygenate correction) on sample #18160; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D1319	16.8		1.04	1062	D1319	16.1		0.29
62	D1319	15.55		-0.29	1064	D1319	16.09		0.28
120	D1319	11.0	C,R(0.01)	-5.12	1065	D1319	16.5		0.72
131		-----		-----	1079	D1319	16.3		0.51
140	D1319	15.1		-0.77	1081	D1319	15.6	C	-0.24
150	D1319	15.4		-0.45	1082		-----		-----
159		-----		-----	1097	D1319	15.6		-0.24
169	D1319	16.6		0.83	1109	D1319	15.14		-0.72
171	D1319	16.2		0.40	1121		-----		-----
175	D1319	16.09		0.28	1126		-----		-----
177	D1319	15.3		-0.56	1143		-----		-----
194		-----		-----	1150		-----		-----
221	D1319	15.8		-0.02	1161		-----		-----
224		-----		-----	1182		-----		-----
225		-----		-----	1191		-----		-----
228		-----		-----	1201		-----		-----
230	D1319	15.85		0.03	1275	IP156	16.2		0.40
237	D1319	14.7		-1.19	1279	D1319	15.54		-0.30
238		-----		-----	1284		-----		-----
254	D1319	16.54		0.76	1299	D1319	15.6		-0.24
256	D1319	15.8		-0.02	1316		-----		-----
258		-----		-----	1318		-----		-----
273	D1319	17.6		1.89	1320	D1319	15.5		-0.34
311	D1319	15.9		0.08	1347	D1319	15.71		-0.12
317		-----		-----	1348	D1319	16.3		0.51
323	D1319	16.0		0.19	1399	D1319	17.21		1.47
334	D1319	15.8		-0.02	1412		-----		-----
335		-----		-----	1417		-----		-----
336		-----		-----	1441	D1319	15.54		-0.30
353		-----		-----	1448		-----		-----
369	D1319	15.8		-0.02	1496	D1319	15.9		0.08
370	D1319	15.73		-0.10	1520	D1319	15.86		0.04
372	D1319	15.7		-0.13	1538	D1319	16.2		0.40
391	D1319	15.2		-0.66	1586	D1319	21.4	R(0.01)	5.92
399		-----		-----	1587		-----		-----
440	D1319	15.84		0.02	1610	IP156	16.0		0.19
445	D1319	15.18		-0.68	1613	D1319	17.024		1.28
447	D1319	16.0		0.19	1631	D1319	14.5		-1.40
448	D1319	15.10		-0.77	1634		-----		-----
453	IP156	16.9		1.14	1636	D1319	15.33		-0.52
463	D1319	14.60		-1.30	1694		-----		-----
468		-----		-----	1715		-----		-----
485		-----		-----	1720		-----		-----
496		-----		-----	1724	D1319	16.2		0.40
603		-----		-----	1741	D1319	16.6		0.83
631	D1319	14.06		-1.87	1776		-----		-----
633		-----		-----	1810		-----		-----
657	D1319	15.53		-0.31	1811	D1319	16.30		0.51
671	D1319	13.15	R(0.01)	-2.84	1833		-----		-----
704		-----		-----	1881		-----		-----
732		-----		-----	1883		-----		-----
798		-----		-----	1913	D1319	16.39		0.60
823	D1319	14.8		-1.09	1944	D1319	15.74		-0.09
846	GB/T11132	15.76		-0.07	1961		-----		-----
851		-----		-----	2129	D1319	16.3		0.51
854	D1319	14.82		-1.06	2130	IP156	15.3		-0.56
862	D1319	16.0		0.19	6040		-----		-----
869	D1319	14.62		-1.28	6041		-----		-----
873		-----		-----	6103	D1319	16.59		0.81
875	D1319	15.77		-0.06	6135	D1319	15.16		-0.70
904		-----		-----	6147		-----		-----
962	D1319	16.3		0.51	6201	D1319	15.8		-0.02
963	D1319	16.2		0.40	6203	D1319	16.30		0.51
970		-----		-----	9090		-----		-----
974	D1319	16.2		0.40					
994		-----		-----					
995	D1319	16.5		0.72					
996		-----		-----					
997		-----		-----					
1011		-----		-----					
1016		-----		-----					
1026		-----		-----					
1039		-----		-----					
1049		-----		-----					
1059	D1319	15.0		-0.87					

normality	OK
n	73
outliers	3
mean (n)	15.823
st.dev. (n)	0.6552
R(calc.)	1.834
st.dev.(D1319:15)	0.9418
R(D1319:15)	2.637

Lab 120: First reported 11.2
Lab 1081: First reported 156



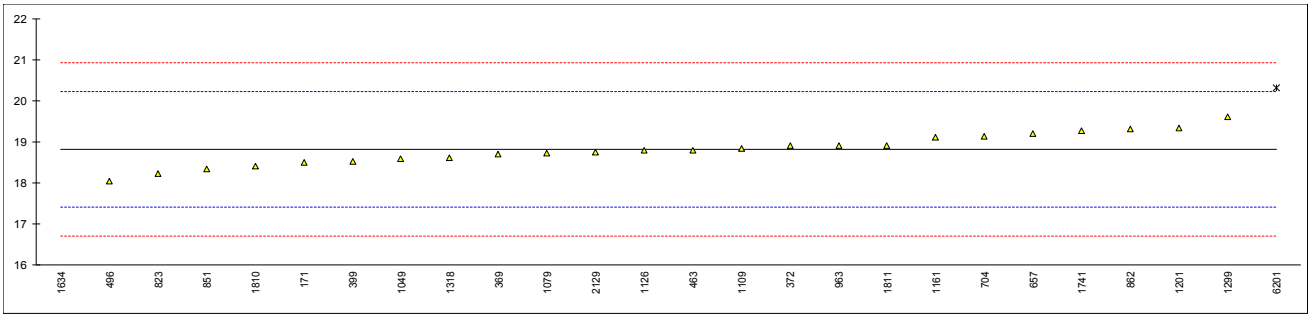


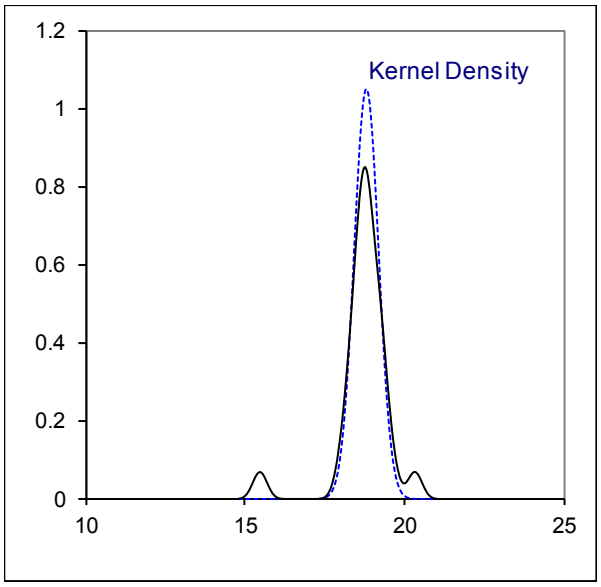
Determination of Aromatics by HPLC on sample #18160; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1062		-----		-----
62		-----		-----	1064		-----		-----
120		-----		-----	1065		-----		-----
131		-----		-----	1079	D6379	18.73		-0.11
140		-----		-----	1081		-----		-----
150		-----		-----	1082		-----		-----
159		-----		-----	1097		-----		-----
169		-----		-----	1109	IP391	18.83		0.03
171	D6379	18.5	C	-0.44	1121		-----		-----
175		-----		-----	1126	EN12916	18.79		-0.03
177		-----		-----	1143		-----		-----
194		-----		-----	1150		-----		-----
221		-----		-----	1161	EN12916	19.1		0.41
224		-----		-----	1182		-----		-----
225		-----		-----	1191		-----		-----
228		-----		-----	1201	D6379	19.33		0.74
230		-----		-----	1275		-----		-----
237		-----		-----	1279		-----		-----
238		-----		-----	1284		-----		-----
254		-----		-----	1299	IP436	19.6		1.12
256		-----		-----	1316		-----		-----
258		-----		-----	1318	D6379	18.62		-0.27
273		-----		-----	1320		-----		-----
311		-----		-----	1347		-----		-----
317		-----		-----	1348		-----		-----
323		-----		-----	1399		-----		-----
334		-----		-----	1412		-----		-----
335		-----		-----	1417		-----		-----
336		-----		-----	1441		-----		-----
353		-----		-----	1448		-----		-----
369	D6379	18.7		-0.16	1496		-----		-----
370		-----		-----	1520		-----		-----
372	D6379	18.9		0.13	1538		-----		-----
391		-----		-----	1586		-----		-----
399	EN12916	18.510	C	-0.43	1587		-----		-----
440		-----		-----	1610		-----		-----
445		-----		-----	1613		-----		-----
447		-----		-----	1631		-----		-----
448		-----		-----	1634	D6379	15.5	R(0.01)	-4.71
453		-----		-----	1636		-----		-----
463	D6379	18.80		-0.01	1694		-----		-----
468		-----		-----	1715		-----		-----
485		-----		-----	1720		-----		-----
496	D6379	18.04		-1.10	1724		-----		-----
603		-----		-----	1741	D6379	19.26		0.64
631		-----		-----	1776		-----		-----
633		-----		-----	1810	D6379	18.4		-0.58
657	IP436	19.19		0.54	1811	D6379	18.9		0.13
671		-----		-----	1833		-----		-----
704	D6379	19.13		0.45	1881		-----		-----
732		-----		-----	1883		-----		-----
798		-----		-----	1913		-----		-----
823	D6379	18.23		-0.83	1944		-----		-----
846		-----		-----	1961		-----		-----
851	D6379	18.34		-0.67	2129	IP391	18.748		-0.09
854		-----		-----	2130		-----		-----
862	EN12916	19.32		0.72	6040		-----		-----
869		-----		-----	6041		-----		-----
873		-----		-----	6103		-----		-----
875		-----		-----	6135		-----		-----
904		-----		-----	6147		-----		-----
962		-----		-----	6201	D6379	20.32	R(0.05)	2.15
963	D6379	18.9		0.13	6203		-----		-----
970		-----		-----	9090		-----		-----
974		-----		-----					
994		-----		-----					
995		-----		-----					
996		-----		-----					
997		-----		-----					
1011		-----		-----					
1016		-----		-----					
1026		-----		-----					
1039		-----		-----					
1049	D6379	18.585		-0.32					
1059		-----		-----					

normality	OK
n	24
outliers	2
mean (n)	18.811
st.dev. (n)	0.3803
R(calc.)	1.065
st.dev.(D6379:11)	0.7029
R(D6379:11)	1.968

Lab 171: First reported 20.8
Lab 399: First reported 16.542





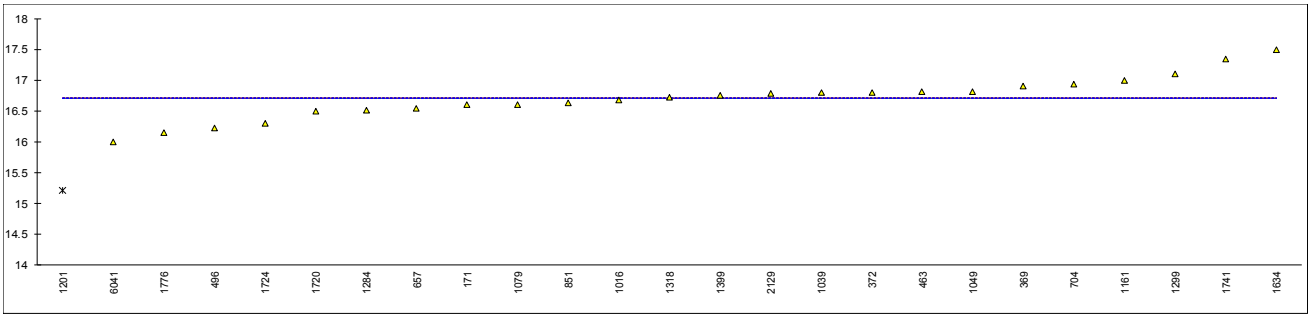
Determination of Aromatics by HPLC on sample #18160; results in %V/V

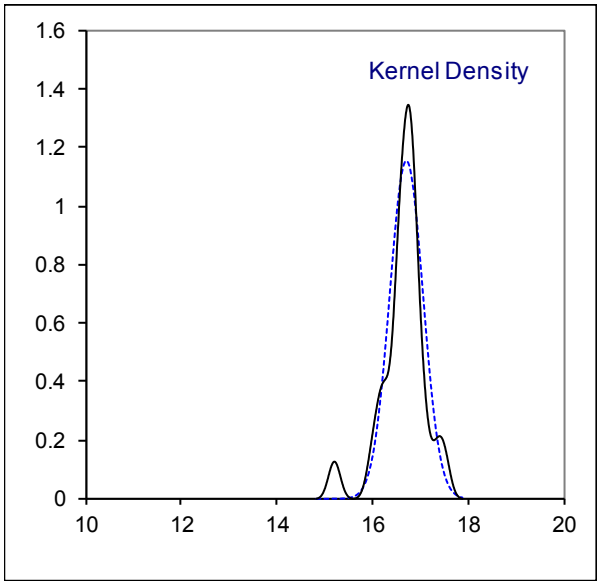
lab	method	value	mark	z(targ)
52		-----		-----
62		-----		-----
120		-----		-----
131		-----		-----
140		-----		-----
150		-----		-----
159		-----		-----
169		-----		-----
171	D6379	16.6	C	-----
175		-----		-----
177		-----		-----
194		-----		-----
221		-----		-----
224		-----		-----
225		-----		-----
228		-----		-----
230		-----		-----
237		-----		-----
238		-----		-----
254		-----		-----
256		-----		-----
258		-----		-----
273		-----		-----
311		-----		-----
317		-----		-----
323		-----		-----
334		-----		-----
335		-----		-----
336		-----		-----
353		-----		-----
369	D6379	16.9		-----
370		-----		-----
372	D1319	16.8		-----
391		-----		-----
399		-----		-----
440		-----		-----
445		-----		-----
447		-----		-----
448		-----		-----
453		-----		-----
463	D6379	16.81		-----
468		-----		-----
485		-----		-----
496	D6379	16.23		-----
603		-----		-----
631		-----		-----
633		-----		-----
657	IP436	16.54		-----
671		-----		-----
704	D6379	16.93		-----
732		-----		-----
798		-----		-----
823		-----		-----
846		-----		-----
851	D6379	16.63		-----
854		-----		-----
862		-----		-----
869		-----		-----
873		-----		-----
875		-----		-----
904		-----		-----
962		-----		-----
963		-----		-----
970		-----		-----
974		-----		-----
994		-----		-----
995		-----		-----
996		-----		-----
997		-----		-----
1011		-----		-----
1016	IP436	16.676		-----
1026		-----		-----
1039	D1319	16.8		-----
1049	D6379	16.81152		-----
1059		-----		-----
1062		-----		-----
1064		-----		-----
1065		-----		-----
1079	D6379	16.60		-----
1081		-----		-----
1082		-----		-----
1097		-----		-----
1109		-----		-----
1121		-----		-----
1126		-----		-----
1143		-----		-----
1150		-----		-----
1161	EN12916	17.0		-----
1182		-----		-----
1191		-----		-----
1201	D6379	15.21	R(0.01)	-----
1275		-----		-----
1279		-----		-----
1284	D6379	16.504		-----
1299	IP436	17.1		-----
1316		-----		-----
1318	D6379	16.72		-----
1320		-----		-----
1347		-----		-----
1348		-----		-----
1399	IP436	16.76		-----
1412		-----		-----
1417		-----		-----
1441		-----		-----
1448		-----		-----
1496		-----		-----
1520		-----		-----
1538		-----		-----
1586		-----		-----
1587		-----		-----
1610		-----		-----
1613		-----		-----
1631		-----		-----
1634	D6379	17.5		-----
1636		-----		-----
1694		-----		-----
1715		-----		-----
1720	D6379	16.5		-----
1724	D6379	16.3		-----
1741	D6379	17.34		-----
1776	D6379	16.1516		-----
1810		-----		-----
1811		-----		-----
1833		-----	W	-----
1881		-----		-----
1883		-----		-----
1913		-----		-----
1944		-----		-----
1961		-----		-----
2129	IP391	16.787		-----
2130		-----		-----
6040		-----		-----
6041	D1319	16.0		-----
6103		-----		-----
6135		-----		-----
6147		-----		-----
6201		-----		-----
6203		-----		-----
9090		-----		-----

normality	OK
n	24
outliers	1
mean (n)	16.708
st.dev. (n)	0.3457
R(calc.)	0.968
st.dev.(lit)	n.a.
R(lit)	n.a.

Compare R(iis17J02) = 0.988 & R(iis18J01) = 1.603

Lab 171: First reported 18.4
Lab 1833: test result withdrawn, reported 15



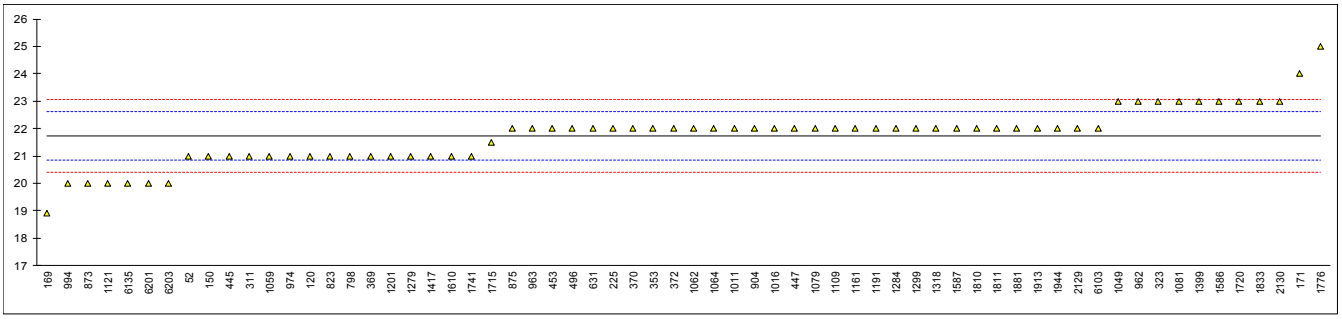


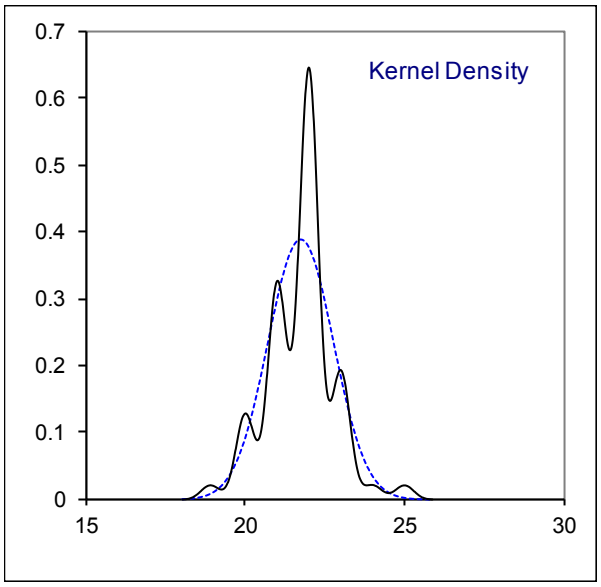
Determination of Color Saybolt (Automated) on sample #18160; cell size in mm;

lab	method	Cell (mm)	value	mark	z(targ)
52	D6045	100	21		-1.67
62		-----	-----		-----
120	D6045	50	21		-1.67
131		-----	-----		-----
140		-----	-----		-----
150	D6045	-----	21	C	-1.67
159		-----	-----		-----
169	D6045	50	18.9		-6.41
171	D6045	-----	24		5.10
175		-----	-----		-----
177		-----	-----		-----
194		-----	-----		-----
221		-----	-----		-----
224		-----	-----		-----
225	D6045	50	22		0.59
228		-----	-----		-----
230		-----	-----		-----
237		-----	-----		-----
238		-----	-----		-----
254		-----	-----		-----
256		-----	-----		-----
258		-----	-----		-----
273		-----	-----		-----
311	D6045	-----	21		-1.67
317		-----	-----		-----
323	D6045	10	23		2.84
334		-----	-----		-----
335		-----	-----		-----
336		-----	-----		-----
353	D6045	50	22		0.59
369	D6045	50	21		-1.67
370	D6045	50	22		0.59
372	D6045	50	22		0.59
391		-----	-----		-----
399		-----	-----		-----
440		-----	-----		-----
445	D6045	50	21		-1.67
447	D6045	100	22		0.59
448		-----	-----		-----
453		50	22		0.59
463		-----	-----		-----
468		-----	-----		-----
485		-----	-----		-----
496	D6045	-----	22		0.59
603		-----	-----		-----
631	D6045	100	22		0.59
633		-----	-----		-----
657		100	-----		-----
671		-----	-----		-----
704		-----	-----		-----
732		-----	-----		-----
798	D6045	-----	21		-1.67
823	D6045	50	21		-1.67
846		-----	-----		-----
851		-----	-----		-----
854		-----	-----		-----
862		-----	-----		-----
869		-----	-----		-----
873	D6045	-----	20		-3.93
875	D6045	-----	22		0.59
904	D6045	-----	22		0.59
962	D6045	-----	23		2.84
963	D6045	-----	22		0.59
970		-----	-----		-----
974	D6045	100	21		-1.67
994	D6045	50	20		-3.93
995		-----	-----		-----
996		-----	-----		-----
997		-----	-----		-----
1011	D6045	50	22		0.59
1016	D6045	-----	22		0.59
1026		-----	-----		-----
1039		100	-----		-----
1049	D6045	50	23		2.84
1059	D6045	50	21		-1.67
1062	D6045	50	22		0.59
1064	D6045	-----	22.0		0.59
1065		-----	-----		-----
1079	D6045	100	22		0.59
1081	D6045	100	23		2.84
1082		-----	-----		-----
1097		-----	-----		-----
1109	D6045	100	22		0.59
1121	D6045	100	20		-3.93
1126		-----	-----		-----
1143		-----	-----		-----
1150		-----	-----		-----
1161	D6045	-----	22		0.59
1182		-----	-----		-----
1191	D6045	100	22		0.59
1201	D6045	100	21		-1.67
1275		-----	-----		-----
1279	D6045	100	21		-1.67
1284	D6045	50	22		0.59
1299	D6045	-----	22		0.59
1316		-----	-----		-----
1318	D6045	100	22		0.59
1320		-----	-----		-----
1347		-----	-----		-----
1348		-----	-----		-----
1399	D6045	50	23		2.84
1412		-----	-----		-----
1417	D6045	-----	21		-1.67
1441		-----	-----		-----
1448		-----	-----		-----
1496		-----	-----		-----
1520		-----	-----		-----
1538		-----	-----		-----
1586	D6045	-----	23		2.84
1587	D6045	-----	22		0.59
1610	D6045	-----	21		-1.67
1613		-----	-----		-----
1631		-----	-----		-----
1634		-----	-----		-----
1636		-----	-----		-----
1694		-----	-----		-----
1715	D6045	100	21.5		-0.54
1720	D6045	50	23		2.84
1724		-----	-----		-----
1741	D6045	-----	21		-1.67
1776	D6045	-----	25.0		7.36
1810	D6045	50	22		0.59
1811	D6045	-----	22		0.59
1833	D6045	-----	23		2.84
1881	D6045	50	22		0.59
1883		-----	-----		-----
1913	D6045	50.00	22		0.59
1944	D6045	50	22		0.59
1961		-----	-----		-----
2129	D6045	50	22		0.59
2130	D6045	50	23		2.84
6040		-----	-----		-----
6041		-----	-----		-----
6103	D6045	-----	22		0.59
6135	D6045	-----	20		-3.93
6147		-----	-----		-----
6201	D6045	-----	20		-3.93
6203	D6045	50	20		-3.93
9090		-----	-----		-----

		Only 100mm cell	Only 50mm cell
normality	suspect	OK	suspect
n	64	13	24
outliers	0	0	0
mean (n)	21.74	21.58	21.70
st.dev. (n)	1.028	0.760	1.011
R(calc.)	2.88	2.13	2.83
st.dev.(D6045:12)	0.443	0.443	0.443
R(D6045:12)	1.24	1.24	1.24

Lab 150: First reported 28



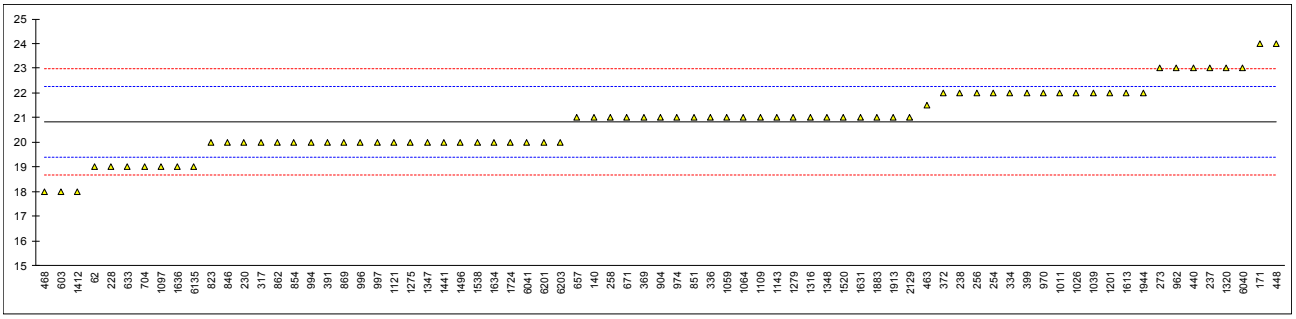


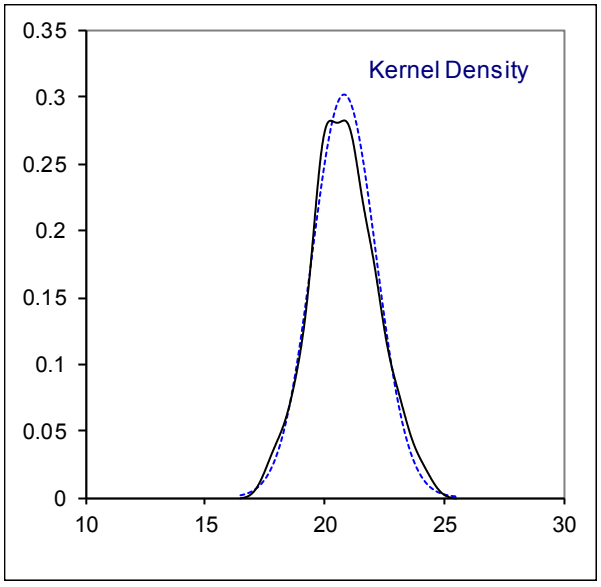
Determination of Color Saybolt (Manual) on sample #18160;

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1062		-----		-----
62	D156	19		-2.55	1064	D156	21.0		0.25
120		-----		-----	1065		-----		-----
131		-----		-----	1079		-----		-----
140	D156	21		0.25	1081		-----		-----
150		-----		-----	1082		-----		-----
159		-----		-----	1097	NFM07003	19		-2.55
169		-----		-----	1109	D156	21		0.25
171	D156	24		4.45	1121	D156	20		-1.15
175		-----		-----	1126		-----		-----
177		-----		-----	1143	D156	21		0.25
194		-----		-----	1150		-----		-----
221		-----		-----	1161		-----		-----
224		-----		-----	1182		-----		-----
225		-----		-----	1191		-----		-----
228	D156	19		-2.55	1201	D156	22		1.65
230	D156	20		-1.15	1275	D156	20		-1.15
237	D156	23		3.05	1279	D156	21		0.25
238	D156	22		1.65	1284		-----		-----
254	D156	22		1.65	1299		-----		-----
256	D156	22		1.65	1316	D156	21		0.25
258	D156	21		0.25	1318		-----		-----
273	D156	23	C	3.05	1320	D156	23		3.05
311		-----		-----	1347	D156	20		-1.15
317	D156	20		-1.15	1348	D156	21		0.25
323		-----		-----	1399		-----		-----
334	D156	22		1.65	1412	D156	18		-3.95
335		-----		-----	1417		-----		-----
336	D156	21		0.25	1441	D156	20		-1.15
353		-----		-----	1448		-----		-----
369	D156	21		0.25	1496	D156	20		-1.15
370		-----		-----	1520	D156	21		0.25
372	D156	22		1.65	1538	D156	20		-1.15
391	D156	20		-1.15	1586		-----		-----
399	D156	22		1.65	1587		-----		-----
440	D156	23.0		3.05	1610		-----		-----
445		-----		-----	1613	D156	22		1.65
447		-----		-----	1631	D156	21		0.25
448	D156	24		4.45	1634	D156	20		-1.15
453		-----		-----	1636	D156	19		-2.55
463	D156	21.5		0.95	1694		-----		-----
468	D156	18		-3.95	1715		-----		-----
485		-----		-----	1720		-----		-----
496		-----		-----	1724	D156	20		-1.15
603	D156	18		-3.95	1741		-----		-----
631		-----		-----	1776		-----		-----
633	D156	19		-2.55	1810		-----		-----
657	D156	21		0.25	1811		-----		-----
671	D156	21		0.25	1833		-----		-----
704	D156	19		-2.55	1881		-----		-----
732		-----		-----	1883	D156	21		0.25
798		-----		-----	1913	D156	21		0.25
823	D156	20		-1.15	1944	D156	22		1.65
846	GB/T3555	20		-1.15	1961		-----		-----
851	D156	21		0.25	2129	D156	21		0.25
854	D156	20		-1.15	2130		-----		-----
862	D156	20		-1.15	6040	D156	23		3.05
869	D156	20		-1.15	6041	D156	20		-1.15
873		-----		-----	6103		-----		-----
875		-----		-----	6135	D156	19		-2.55
904	D156	21		0.25	6147		-----		-----
962	D156	23		3.05	6201	D156	20		-1.15
963		-----		-----	6203	D156	20		-1.15
970	D156	22		1.65	9090		-----		-----
974	D156	21		0.25					
994	D156	20		-1.15					
995		-----		-----					
996	D156	20		-1.15					
997	D156	20		-1.15					
1011	D156	22		1.65					
1016		-----		-----					
1026	D156	22		1.65					
1039	D156	22		1.65					
1049		-----		-----					
1059	D156	21		0.25					

normality	OK
n	75
outliers	0
mean (n)	20.82
st.dev. (n)	1.325
R(calc.)	3.71
st.dev.(D156:15)	0.714
R(D156:15)	2

Lab 273: First reported 28





Determination of Copper Corrosion 2hr at 100°C on sample #18160;

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D130	1a		-----	1062	D130	1A		-----
62	D130	1a		-----	1064	D130	1a		-----
120	D130	1A		-----	1065		-----		-----
131	D130	1a		-----	1079	D130	1A		-----
140	D130	1a		-----	1081		-----		-----
150		-----		-----	1082		-----		-----
159	D130	1a		-----	1097	ISO2160	1a		-----
169	D130	1a		-----	1109	D130	1a		-----
171	D130	1a		-----	1121		-----		-----
175		-----		-----	1126		-----		-----
177	D130	1b		-----	1143		-----		-----
194		-----		-----	1150	ISO2160	1a		-----
221	D130	1A		-----	1161	ISO2160	1a		-----
224	D130	1		-----	1182		-----		-----
225	D130	1a		-----	1191		-----		-----
228	D130	1A		-----	1201	D130	1A		-----
230	D130	1A		-----	1275	IP154	1A		-----
237	D130	1		-----	1279	D130	1A		-----
238	D130	1a		-----	1284		-----		-----
254	D130	1a		-----	1299	D130	1A		-----
256	D130	1a		-----	1316	D130	1a		-----
258	D130	1a		-----	1318	D130	1a		-----
273	D130	1a		-----	1320		-----		-----
311	D130	1A		-----	1347	D130	1A		-----
317	D130	1a		-----	1348	D130	1A		-----
323	D130	1A		-----	1399		-----		-----
334		-----		-----	1412	D130	1a		-----
335		-----		-----	1417	D130	1B		-----
336		-----		-----	1441	D130	1a		-----
353	IP154	1a		-----	1448	D130	1a		-----
369	D130	1A		-----	1496	D130	1a		-----
370	D130	1A		-----	1520	D130	1a		-----
372	D130	1A		-----	1538	D130	1A		-----
391	D130	1a		-----	1586	D130	1a		-----
399		-----		-----	1587	D130	1a		-----
440	IP154	1A		-----	1610	D130	1a		-----
445	IP154	1a		-----	1613	D130	1a		-----
447	D130	1a		-----	1631	D130	1		-----
448	D130	1a		-----	1634	D130	1a		-----
453	IP154	1A		-----	1636	D130	1a		-----
463	D130	1A		-----	1694		-----		-----
468	D130	1A		-----	1715		-----		-----
485		-----		-----	1720		-----		-----
496		-----		-----	1724	D130	1a		-----
603	D130	1A		-----	1741	D130	1a		-----
631	D130	1a		-----	1776		-----		-----
633	D130	1a		-----	1810	D130	1		-----
657	D130	1a		-----	1811		-----		-----
671		-----		-----	1833	D130	1		-----
704	D130	1		-----	1881		-----		-----
732		-----		-----	1883	D130	1		-----
798	D130	1a		-----	1913	D130	1a		-----
823	D130	1a		-----	1944	D130	1a		-----
846	GB/T5096	1a		-----	1961		-----		-----
851	D130	1b		-----	2129	D130	1a		-----
854	D130	1a		-----	2130	D130	1a		-----
862	D130	1A		-----	6040	D130	1A		-----
869	D130	1a		-----	6041	D130	1b		-----
873	D130	1A		-----	6103	D130	1a		-----
875	D130	1a		-----	6135	D130	1b		-----
904	D130	1a		-----	6147		-----		-----
962		-----		-----	6201	D130	1A		-----
963	D130	1a		-----	6203	D130	1B		-----
970	D130	1a		-----	9090		-----		-----
974	D130	1a		-----					
994	D130	1a		-----					
995	D130	1a		-----					
996	D130	1a		-----					
997		-----		-----					
1011	D130	1a		-----					
1016		-----		-----					
1026		-----		-----					
1039		-----		-----					
1049	D130	1A		-----					
1059	D130	1a		-----					

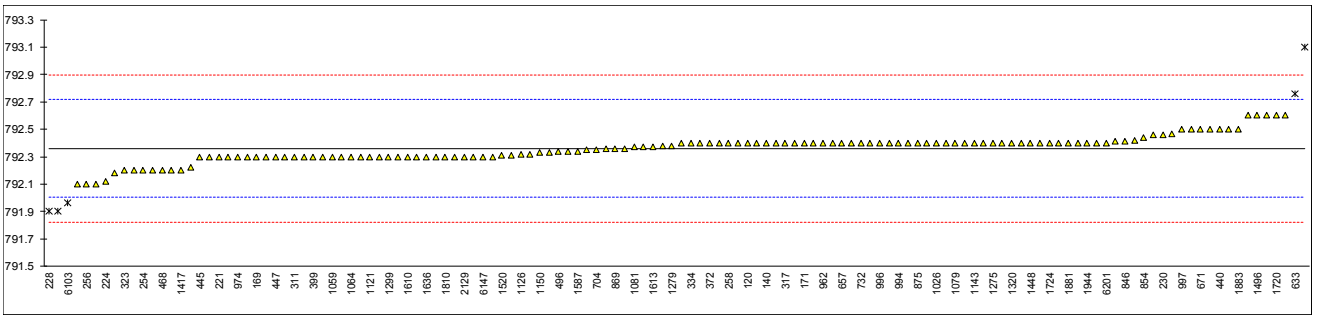
n	103
mean (n)	1 (1a / 1b)

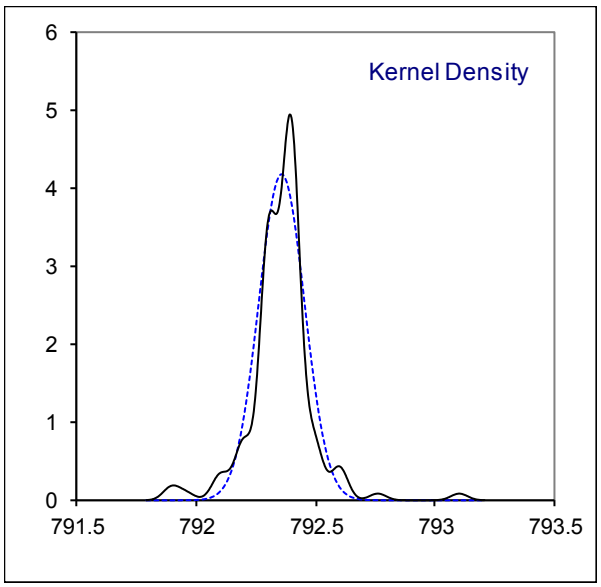
Determination of Density at 15°C on sample #18160; converted results to kg/m^3

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4052	792.3		-0.33	1062	D4052	792.3		-0.33
62	D4052	792.36		0.01	1064	D4052	792.30		-0.33
120	D4052	792.4		0.23	1065	D4052	792.4		0.23
131	D4052	792.35		-0.05	1079	D4052	792.4		0.23
140	D4052	792.4		0.23	1081	D4052	792.37		0.06
150	D4052	792.4		0.23	1082	D4052	792.4		0.23
159	D4052	792.5		0.79	1097	ISO12185	792.3		-0.33
169	D4052	792.3		-0.33	1109	D4052	792.34	C	-0.11
171	D4052	792.4		0.23	1121	D4052	792.3		-0.33
175	D4052	792.4		0.23	1126	D4052	792.32		-0.22
177	D4052	792.4	C	0.23	1143	ISO12185	792.4		0.23
194		-----		-----	1150	ISO12185	792.33		-0.16
221	D4052	792.3		-0.33	1161	ISO12185	792.22		-0.78
224	D1298	792.12		-1.34	1182	ISO12185	792.313		-0.26
225	D4052	792.4		0.23	1191	D4052	792.4		0.23
228	D1298	791.9	R(0.01)	-2.57	1201	D4052	792.3		-0.33
230	D4052	792.46		0.57	1275	IP365	792.4		0.23
237	D4052	792.4	C	0.23	1279	D4052	792.38		0.12
238	D4052	792.1		-1.45	1284	D4052	792.40		0.23
254	D4052	792.2		-0.89	1299	D4052	792.3		-0.33
256	D4052	792.1		-1.45	1316	D4052	792.2		-0.89
258	D4052	792.4		0.23	1318	D4052	792.33		-0.16
273	D4052	792.2		-0.89	1320	D4052	792.4		0.23
311	D4052	792.3		-0.33	1347	D4052	792.32		-0.22
317	D4052	792.4		0.23	1348	D4052	791.9	R(0.01)	-2.57
323	D4052	792.2		-0.89	1399	D4052	792.3		-0.33
334	D4052	792.4		0.23	1412	D4052	792.4		0.23
335		-----		-----	1417	IP365	792.2		-0.89
336	D4052	792.3		-0.33	1441	D4052	792.37		0.06
353	D4052	792.4		0.23	1448	D4052	792.4		0.23
369	D4052	792.3		-0.33	1496	D1298	792.6		1.35
370	D4052	792.4		0.23	1520	D4052	792.31		-0.27
372	D4052	792.4		0.23	1538	D1298	792.5		0.79
391	D4052	792.2		-0.89	1586	D4052	792.4		0.23
399	D4052	792.3		-0.33	1587	D4052	792.34		-0.11
440	D4052	792.5		0.79	1610	IP365	792.3		-0.33
445	D4052	792.3		-0.33	1613	D4052	792.37		0.06
447	D4052	792.3		-0.33	1631	D4052	792.3		-0.33
448	D4052	792.4		0.23	1634	D4052	792.355		-0.02
453	IP365	792.3		-0.33	1636	D4052	792.3		-0.33
463	D4052	792.38		0.12	1694	D4052	792.1	C	-1.45
468	D4052	792.2		-0.89	1715	ISO12185	792.6		1.35
485	D4052	792.3		-0.33	1720	D4052	792.6		1.35
496	D4052	792.34		-0.11	1724	D1298	792.40		0.23
603	D4052	792.4		0.23	1741	D4052	792.30		-0.33
631	D4052	792.47		0.62	1776	ISO12185	792.42		0.34
633	D1298	792.76	R(0.01)	2.25	1810	D4052	792.3		-0.33
657	D4052	792.4		0.23	1811	D4052	792.3		-0.33
671	D4052	792.5		0.79	1833	D4052	792.4		0.23
704	D4052	792.35		-0.05	1881	ISO12185	792.4	C	0.23
732	ISO12185	792.4		0.23	1883	D1298	792.5		0.79
798	D4052	792.3		-0.33	1913	D4052	792.40		0.23
823	D4052	792.41		0.29	1944	D4052	792.4		0.23
846	GB/T1884	792.41		0.29	1961		-----		-----
851	D4052	792.4		0.23	2129	D4052	792.3		-0.33
854	D4052	792.44		0.45	2130	IP365	792.4		0.23
862	D4052	792.46		0.57	6040	D1298	793.1	R(0.01)	4.15
869	D4052	792.36		0.01	6041	D1298	792.6		1.35
873	D4052	792.4		0.23	6103	ISO12185	791.963	C,R(0.01)	-2.22
875	D4052	792.4		0.23	6135	D4052	792.3		-0.33
904	D4052	792.6		1.35	6147	D4052	792.3	C	-0.33
962	D4052	792.4		0.23	6201	D4052	792.4		0.23
963	D4052	792.4		0.23	6203	D4052	792.3		-0.33
970	D4052	792.4		0.23	9090		-----		-----
974	D1298	792.3		-0.33					
994	D4052	792.4		0.23					
995	D4052	792.5		0.79					
996	D1298	792.4		0.23					
997	D4052	792.5		0.79					
1011	D4052	792.4		0.23					
1016		-----		-----					
1026	D4052	792.4	C	0.23					
1039	ISO12185	792.3		-0.33					
1049	D4052	792.18		-1.00					
1059	D4052	792.3		-0.33					

normality	suspect
n	129
outliers	5
mean (n)	792.359
st.dev. (n)	0.0954
R(calc.)	0.267
st.dev.(D4052:18)	0.1786
R(D4052:18)	0.5

Lab 177: First reported 792.8
Lab 237: First reported 793.2
Lab 1026: First reported 792.4 kg/l
Lab 1109: First reported 0.79234 kg/m^3
Lab 1694: First reported 0.7921 kg/m^3
Lab 1881: First reported 792.4 kg/l
Lab 6103: First reported 791.67
Lab 6147: First reported 0.7923 kg/m^3





Determination of Distillation ASTM D86 on sample #18160; results in °C

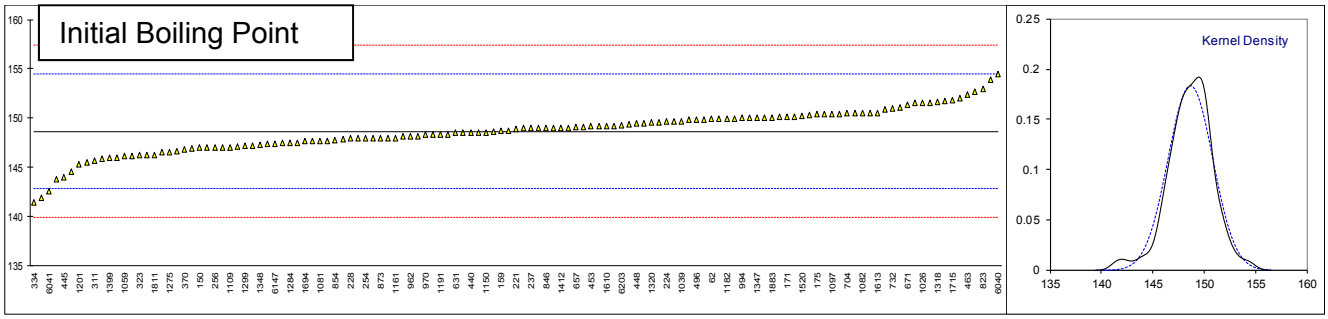
lab	method	IBP	mark	10% rec	mark	50% rec	mark	90% rec	mark	FBP	mark
52	D86-automated	148.6		167.8		195.8		243.6		276.2	
62	D86-automated	149.9		167.3		195.0		244.2		276.9	
120	D86-automated	148.5		167.2		195.1		244.8		273.3	
131		143.8		166.4		194.8		243.7		271.1	
140	D86-automated	151.5		168.5		196.4		243.9		276.9	
150	D86	147.0		166.3		195.2		243.4		273.8	
159	D86-automated	148.7		168.3		195.4		244.0		275.2	
169	D86-automated	147.0		168.3		195.9		245.6		277.1	
171	D86-automated	150.1		166.8		195.2		243.5		273.1	
175	D86-automated	150.4		168.2		196.0		246.4		277.2	
177	D86-automated	141.9		167.2		195.6		244.0		277.8	
194		-----		-----		-----		-----		-----	
221	D86-automated	148.9		167.8		196.3		244.1		277.5	
224	D86-manual	149.68		169.39		195.73		243.40		273.40	
225	D86-manual	150.0		168.0		195.0		243.0		277.0	
228	D86-manual	148.0		165.0		193.0		240.0		272.0	
230	D86-manual	150.9		167.0		196.3		244.9		282.0	
237	D86-manual	149.0		167.0		196.0		243.0		278.0	
238		148.0		165.5		192.5	R(0.05)	239.5		272.0	
254	D86-manual	148.0		167.0		196.0		243.0		276.0	
256	D86-manual	147.0		167.0		195.0		243.0		276.0	
258	D86-automated	153.9		169.6		197.2		246.5		275.0	
273	D86-automated	149.7		167.3		195.2		243.6		277.5	
311		145.7		166.9		195.2		243.6		274.4	
317	D86-automated	144.6		167.4		195.8		243.7		275.5	
323	D86-automated	146.3		169.2		196.0		245.3		274.8	
334	D86-automated	141.4		167.3		194.6		242.5		271.9	
335		-----		-----		-----		-----		-----	
336		-----		-----		-----		-----		-----	
353	D86-automated	148.5		167.6		195.3		244.3		272.7	
369	D86-automated	148.3		165.4		196.3		242.0		270.5	
370	D86-automated	146.8		168.0		196.5		244.9		276.4	
372	D86-automated	149.0		167.7		195.7		244.2		275.7	
391	D86-automated	152.0		198.2	R(0.01)	196.4		245.4		278.7	
399		-----		-----		-----		-----		-----	
440	IP123-manual	148.5		168.5		195.0		240.5		276.0	
445	D86-automated	144.0		166.9		195.2		245.0		275.7	
447		147.5		166.9		195.9		245.9		276.4	
448	D86-automated	149.5		168.1		196.4		246.4		279.0	
453	IP123-automated	149.2		168.4		195.7		245.2		277.2	
463	D86-automated	152.4		169.3		196.7		245.1		276.7	
468		-----		-----		-----		-----		-----	
485	D86-automated	149.95		168.90		196.40		244.10		274.85	
496	D86-automated	149.8		167.3		195.5		243.3		276.2	
603	D86-automated	149.9		168.3		196.4		243.2		277.2	
631	D86-manual	148.5		168.4		196.3		242.0		275.1	
633	D86-automated	150.1		167.6		195.2		245.1		274.6	
657	D86-automated	149.1		168.0		195.8		245.8		277.6	
671	D86-automated	151.4		166.5		194.8		242.6		269.4	
704	D86-manual	150.5		167.5		196.5		243.5		276.5	
732	ISO3405-manual	151.0		168.0		195.0		243.0		277.0	
798	D86-manual	148.0		168.0		196.0		242.5		278.0	
823	D86-automated	153.0		169.4		196.0		243.9		277.3	
846	GB/T6536	149.0		168.0		196.1		246.4		280.3	
851	D86-automated	152.7		169.2		196.3		244.0		277.1	
854	D86-automated	147.8		167.7		195.8		245.4		276.4	
862	D86-automated	147.7		167.6		195.6		244.9		276.3	
869	D86-automated	148.1		167.7		195.7		244.9		275.2	
873	D86-manual	148.0		166.5		196.5		244.5		276.0	
875	D86-manual	149.0		170.0		198.0		245.0		277.0	
904	D86-automated	150.5		166.2		193.8		241.3		274.8	
962	D86-automated	148.1		167.8		195.8		243.7		274.6	
963	D86-automated	148.0		168.8		195.9		242.5		275.2	
970		148.3		168.2		195.7		242.4		274.3	
974	D86-automated	148.1		169.2		196.7		243.2		274.5	
994	D86-manual	150.0		167.5		195.5		244.5		276.0	
995	D86-manual	147.0		167.0		196.0		246.0		276.5	
996	D86-manual	149.0		167.0		195.5		243.0		274.0	
997	D86-manual	146.5		167.0		196.0		244.5		276.5	
1011	D86-automated	149.8		167.6		195.4		244.6		277.5	
1016		-----		-----		-----		-----		-----	
1026		151.5		168.4		195.7		243.4		278.9	
1039	ISO3405-automated	149.7		167.0		195.3		243.6	C	274.6	
1049	D86-automated	150.4		168.5		196.6		245.8		278.2	
1059	D86-automated	146.2		167.8		195.1		243.2		276.1	

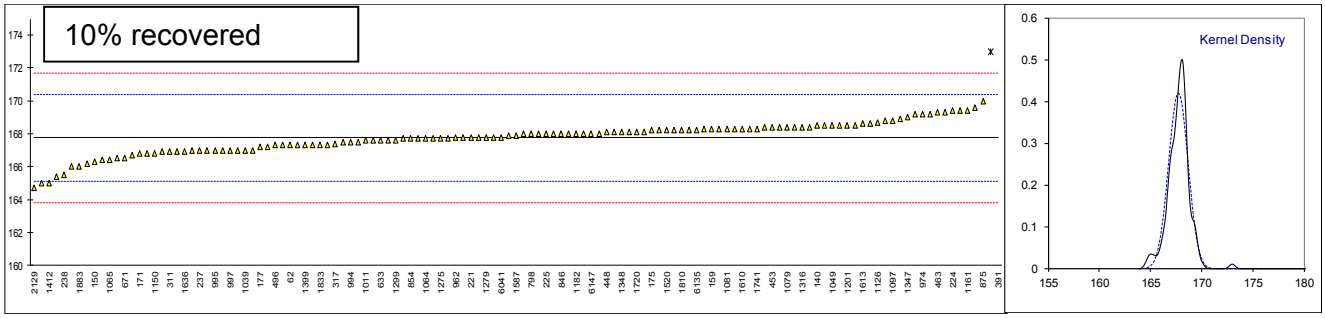
lab	method	IBP	mark	10% rec	mark	50% rec	mark	90% rec	mark	FBP	mark
1062	D86-automated	147.1		168.0		194.9		242.8		273.9	
1064	D86-automated	151.5		167.7		196.4		246.1		277.3	
1065		149.2		166.4		194.2		243.5		270.7	
1079	D86-automated	150.3		168.4		196.2		245.2		277.0	
1081	D86-automated	147.7		168.3		195.4		242.3		273.1	
1082		150.5		168.4		196.0		244.0		274.2	
1097	ISO3405-automated	150.4		168.8		196.5		245.0		276.5	
1109	D86-automated	147.0		166.7		195.3		243.2		274.8	
1121	D86-manual	145.5		168.5		197.5		243.0		275.0	
1126	In house	147.7		168.7		198.2		243.1		274.6	
1143	ISO3405-automated	150.4		167.7		196.1		245.7		277.9	
1150	ISO3405-automated	148.55		166.82		194.45		242.55		276.82	
1161	D86-automated	148.0		169.4		196.1		241.4		277.2	
1182	D86-automated	149.9		168.0		195.1		245.0		274.7	
1191		148.3		169.3		196.6		245.6		276.2	
1201	ISO3405-automated	145.3		168.5		196.2		246.3		277.1	
1275	IP123-automated	146.5		167.7		195.1		244.3		273.5	
1279	D86-automated	147.4		167.8		196.0		243.6		274.8	
1284	D86-automated	147.5		166.8		194.6		243.1		274.0	
1299	D86-automated	147.2		167.6		195.9		245.0		278.0	
1316	D86-automated	147.9		168.4		195.2		244.6		273.7	
1318	D86-automated	151.6		168.1		195.8		245.2		275.9	
1320		149.6		167.9		195.4		243.0		274.1	
1347	D86-manual	150		169		196		243		274	
1348	D86-manual	147.3		168.1		195.0		243.7		274.0	
1399	D86-automated	146.0		167.3		195.2		243.1		274.1	
1412	D86-manual	149.0		165.0		193.5		241.0		272.0	
1417	D86-automated	149.8		168.3		196.6		247.8		276.6	
1441	D86-automated	149.0		167.3		194.4		244.3		273.7	
1448	D86-automated	150.5		168.4		195.9		244.5		275.3	
1496	D86-automated	146.3		167.7		196.4		245.7		276.8	
1520	D86-manual	150.2		168.2		197.2		241.2		270.2	
1538		-----		-----		-----		-----		-----	
1586	D86-automated	150.1		168.2		196.5		246.5		277.1	
1587	D86-automated	147.5		167.9		195.8		242.9		275.3	
1610	D86-automated	149.2		168.3		196.7		246.0		277.6	
1613	D86-automated	150.5		168.6		196.6		244.8		278.6	
1631	D86-automated	151.7		167.5		194.9		243.5		276.6	
1634	D86-automated	147.2		168.1		196.1		244.9		276.2	
1636	D86-automated	149.1		166.9		195.2		243.5		275.7	
1694	D86	147.66		167.33		194.33		240.33		275.16	
1715	ISO3405-automated	151.8		168.3		195.7		243.8		276.5	
1720	D86-automated	149.6		168.1		195.9		243.0		278.5	
1724	D86-automated	146.9		167.8		195.3		242.8		275.5	
1741		150.0		168.3		195.5		245.2		275.4	
1776	ISO3405-automated	146.2		167.0		195.6		244.7		274.8	
1810	D86-automated	148.3		168.2		195.4		241.9		276.3	
1811	D86-automated	146.3		166.0		193.5		241.5		273.0	
1833	D86-automated	149.5		167.3		195.4		242.9		276.0	
1881		-----		-----		-----		-----		-----	
1883	D86-manual	150		166		195		243		275	
1913	D86-automated	149.2		168.5		196.2		245.7		276.0	
1944	D86-automated	146.6		168.2		195.7		243.7		276.7	
1961		-----		-----		-----		-----		-----	
2129	D86-automated	148.7		164.7		193.1		240.8		273.9	
2130	IP123-automated	146.0		168.1		196.0		244.8		275.3	
6040	D86-manual	154.5		173.0	R(0.01)	198.0		245.5		279.5	
6041	D86-automated	142.6		167.8		196.2		244.8		274.8	
6103	ISO3405-automated	151.1		168.0		195.5		244.2		276.2	
6135	D86-automated	145.9		168.2		196.3		244.5		276.8	
6147	D86-automated	147.4		168.0		195.6		242.5		276.1	
6201	D86-automated	149.4		168.0		195.8		244.6		276.3	
6203	D86-automated	149.3		168.6		195.8		244.9		274.3	
9090		-----		-----		-----		-----		-----	
	normality	suspect		suspect		suspect		OK		suspect	
	n	129		127		128		129		129	
	outliers	0		2		1		0		0	
	mean (n)	148.65		167.75		195.71		243.92		275.64	
	st.dev. (n)	2.172		0.950		0.848		1.485		2.015	
	R(calc.)	6.08		2.66		2.37		4.16		5.64	
	st.dev.(D86:17-Auto)	2.920		1.318		1.071		1.307		2.536	
	R(D86:17-Auto)	8.18		3.69		3		3.66		7.1	
Compare											
	R(D86:17-Manual)	4.58		3.05		3.07		3.93		4.43	

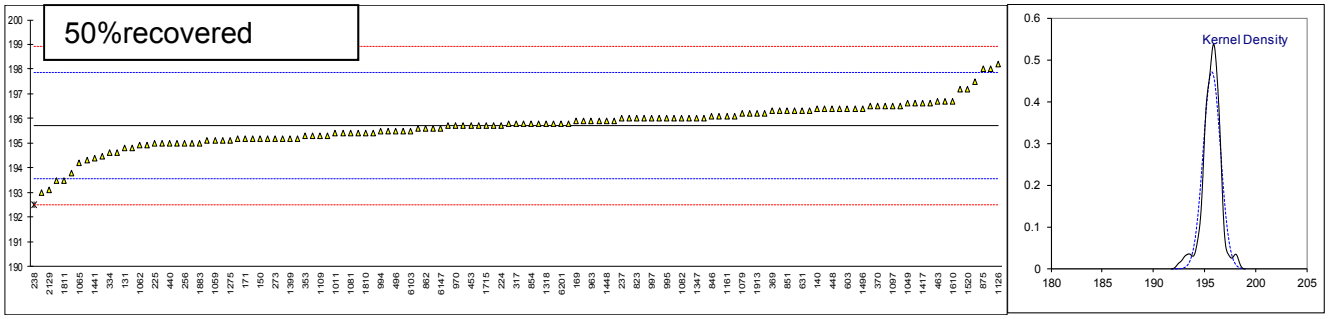
Lab 1039: First reported 258.6

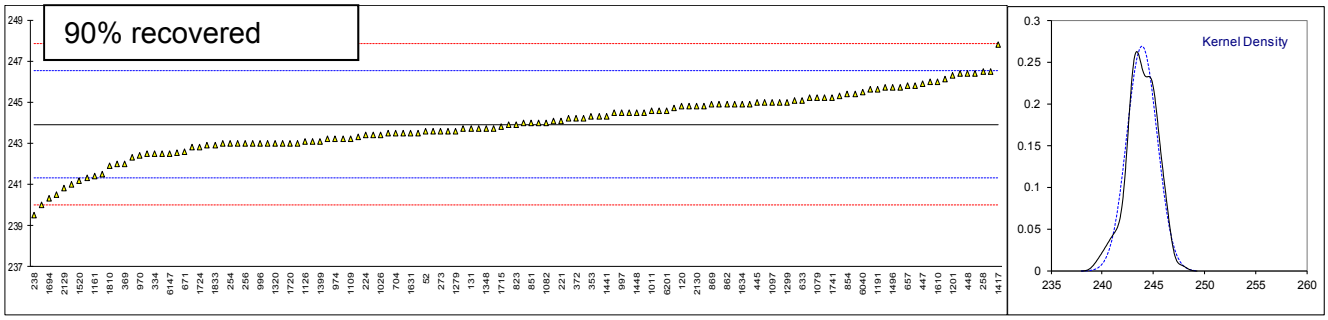
z-scores

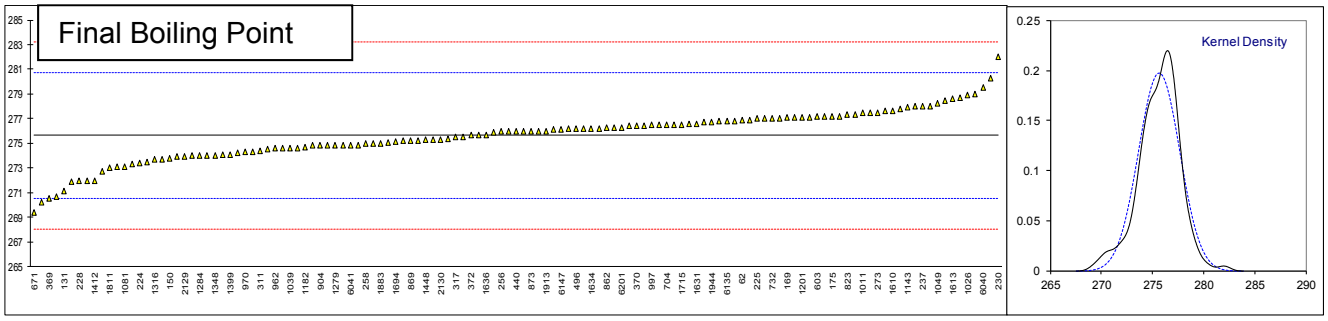
lab	IBP	10% rec	50% rec	90% rec	FBP	lab	IBP	10% rec	50% rec	90% rec	FBP
52	-0.02	0.04	0.09	-0.25	0.22	1062	-0.53	0.19	-0.75	-0.86	-0.69
62	0.43	-0.34	-0.66	0.21	0.50	1064	0.97	-0.04	0.65	1.67	0.66
120	-0.05	-0.42	-0.57	0.67	-0.92	1065	0.19	-1.02	-1.41	-0.32	-1.95
131	-1.66	-1.02	-0.85	-0.17	-1.79	1079	0.56	0.49	0.46	0.98	0.54
140	0.97	0.57	0.65	-0.02	0.50	1081	-0.33	0.42	-0.29	-1.24	-1.00
150	-0.57	-1.10	-0.47	-0.40	-0.72	1082	0.63	0.49	0.27	0.06	-0.57
159	0.02	0.42	-0.29	0.06	-0.17	1097	0.60	0.80	0.74	0.82	0.34
169	-0.57	0.42	0.18	1.28	0.58	1109	-0.57	-0.80	-0.38	-0.55	-0.33
171	0.50	-0.72	-0.47	-0.32	-1.00	1121	-1.08	0.57	1.67	-0.71	-0.25
175	0.60	0.34	0.27	1.90	0.62	1126	-0.33	0.72	2.33	-0.63	-0.41
177	-2.31	-0.42	-0.10	0.06	0.85	1143	0.60	-0.04	0.37	1.36	0.89
194	-----	-----	-----	-----	-----	1150	-0.04	-0.71	-1.17	-1.05	0.47
221	0.08	0.04	0.55	0.14	0.73	1161	-0.22	1.25	0.37	-1.93	0.62
224	0.35	1.24	0.02	-0.40	-0.88	1182	0.43	0.19	-0.57	0.82	-0.37
225	0.46	0.19	-0.66	-0.71	0.54	1191	-0.12	1.18	0.83	1.28	0.22
228	-0.22	-2.09	-2.53	-3.00	-1.43	1201	-1.15	0.57	0.46	1.82	0.58
230	0.77	-0.57	0.55	0.75	2.51	1275	-0.74	-0.04	-0.57	0.29	-0.84
237	0.12	-0.57	0.27	-0.71	0.93	1279	-0.43	0.04	0.27	-0.25	-0.33
238	-0.22	-1.71	-2.99	-3.38	-1.43	1284	-0.39	-0.72	-1.03	-0.63	-0.65
254	-0.22	-0.57	0.27	-0.71	0.14	1299	-0.50	-0.11	0.18	0.82	0.93
256	-0.57	-0.57	-0.66	-0.71	0.14	1316	-0.26	0.49	-0.47	0.52	-0.76
258	1.80	1.40	1.39	1.97	-0.25	1318	1.01	0.27	0.09	0.98	0.10
273	0.36	-0.34	-0.47	-0.25	0.73	1320	0.32	0.11	-0.29	-0.71	-0.61
311	-1.01	-0.64	-0.47	-0.25	-0.49	1347	0.46	0.95	0.27	-0.71	-0.65
317	-1.39	-0.27	0.09	-0.17	-0.05	1348	-0.46	0.27	-0.66	-0.17	-0.65
323	-0.81	1.10	0.27	1.05	-0.33	1399	-0.91	-0.34	-0.47	-0.63	-0.61
334	-2.48	-0.34	-1.03	-1.09	-1.47	1412	0.12	-2.09	-2.06	-2.24	-1.43
335	-----	-----	-----	-----	-----	1417	0.39	0.42	0.83	2.97	0.38
336	-----	-----	-----	-----	-----	1441	0.12	-0.34	-1.22	0.29	-0.76
353	-0.05	-0.11	-0.38	0.29	-1.16	1448	0.63	0.49	0.18	0.44	-0.13
369	-0.12	-1.78	0.55	-1.47	-2.03	1496	-0.81	-0.04	0.65	1.36	0.46
370	-0.63	0.19	0.74	0.75	0.30	1520	0.53	0.34	1.39	-2.08	-2.14
372	0.12	-0.04	-0.01	0.21	0.02	1538	-----	-----	-----	-----	-----
391	1.15	23.10	0.65	1.13	1.21	1586	0.50	0.34	0.74	1.97	0.58
399	-----	-----	-----	-----	-----	1587	-0.39	0.11	0.09	-0.78	-0.13
440	-0.05	0.57	-0.66	-2.62	0.14	1610	0.19	0.42	0.93	1.59	0.77
445	-1.59	-0.64	-0.47	0.82	0.02	1613	0.63	0.64	0.83	0.67	1.17
447	-0.39	-0.64	0.18	1.51	0.30	1631	1.04	-0.19	-0.75	-0.32	0.38
448	0.29	0.27	0.65	1.90	1.33	1634	-0.50	0.27	0.37	0.75	0.22
453	0.19	0.49	-0.01	0.98	0.62	1636	0.15	-0.64	-0.47	-0.32	0.02
463	1.28	1.18	0.93	0.90	0.42	1694	-0.34	-0.32	-1.29	-2.75	-0.19
468	-----	-----	-----	-----	-----	1715	1.08	0.42	-0.01	-0.09	0.34
485	0.44	0.87	0.65	0.14	-0.31	1720	0.32	0.27	0.18	-0.71	1.13
496	0.39	-0.34	-0.19	-0.48	0.22	1724	-0.60	0.04	-0.38	-0.86	-0.05
603	0.43	0.42	0.65	-0.55	0.62	1741	0.46	0.42	-0.19	0.98	-0.09
631	-0.05	0.49	0.55	-1.47	-0.21	1776	-0.84	-0.57	-0.10	0.60	-0.33
633	0.50	-0.11	-0.47	0.90	-0.41	1810	-0.12	0.34	-0.29	-1.55	0.26
657	0.15	0.19	0.09	1.44	0.77	1811	-0.81	-1.33	-2.06	-1.85	-1.04
671	0.94	-0.95	-0.85	-1.01	-2.46	1833	0.29	-0.34	-0.29	-0.78	0.14
704	0.63	-0.19	0.74	-0.32	0.34	1881	-----	-----	-----	-----	-----
732	0.80	0.19	-0.66	-0.71	0.54	1883	0.46	-1.33	-0.66	-0.71	-0.25
798	-0.22	0.19	0.27	-1.09	0.93	1913	0.19	0.57	0.46	1.36	0.14
823	1.49	1.25	0.27	-0.02	0.66	1944	-0.70	0.34	-0.01	-0.17	0.42
846	0.12	0.19	0.37	1.90	1.84	1961	-----	-----	-----	-----	-----
851	1.39	1.10	0.55	0.06	0.58	2129	0.02	-2.31	-2.43	-2.39	-0.69
854	-0.29	-0.04	0.09	1.13	0.30	2130	-0.91	0.27	0.27	0.67	-0.13
862	-0.33	-0.11	-0.10	0.75	0.26	6040	2.00	3.98	2.14	1.21	1.52
869	-0.19	-0.04	-0.01	0.75	-0.17	6041	-2.07	0.04	0.46	0.67	-0.33
873	-0.22	-0.95	0.74	0.44	0.14	6103	0.84	0.19	-0.19	0.21	0.22
875	0.12	1.71	2.14	0.82	0.54	6135	-0.94	0.34	0.55	0.44	0.46
904	0.63	-1.18	-1.78	-2.01	-0.33	6147	-0.43	0.19	-0.10	-1.09	0.18
962	-0.19	0.04	0.09	-0.17	-0.41	6201	0.26	0.19	0.09	0.52	0.26
963	-0.22	0.80	0.18	-1.09	-0.17	6203	0.22	0.64	0.09	0.75	-0.53
970	-0.12	0.34	-0.01	-1.16	-0.53	9090	-----	-----	-----	-----	-----
974	-0.19	1.10	0.93	-0.55	-0.45						
994	0.46	-0.19	-0.19	0.44	0.14						
995	-0.57	-0.57	0.27	1.59	0.34						
996	0.12	-0.57	-0.19	-0.71	-0.65						
997	-0.74	-0.57	0.27	0.44	0.34						
1011	0.39	-0.11	-0.29	0.52	0.73						
1016	-----	-----	-----	-----	-----						
1026	0.97	0.49	-0.01	-0.40	1.29						
1039	0.36	-0.57	-0.38	-0.25	-0.41						
1049	0.60	0.57	0.83	1.44	1.01						
1059	-0.84	0.04	-0.57	-0.55	0.18						


Initial Boiling Point
Kernel Density


10% recovered
Kernel Density


50%recovered
Kernel Density


90% recovered
Kernel Density

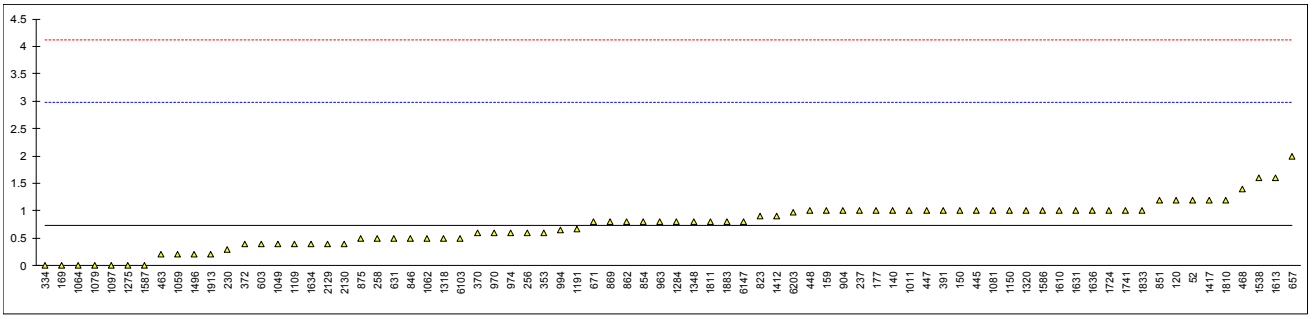

Final Boiling Point
Kernel Density

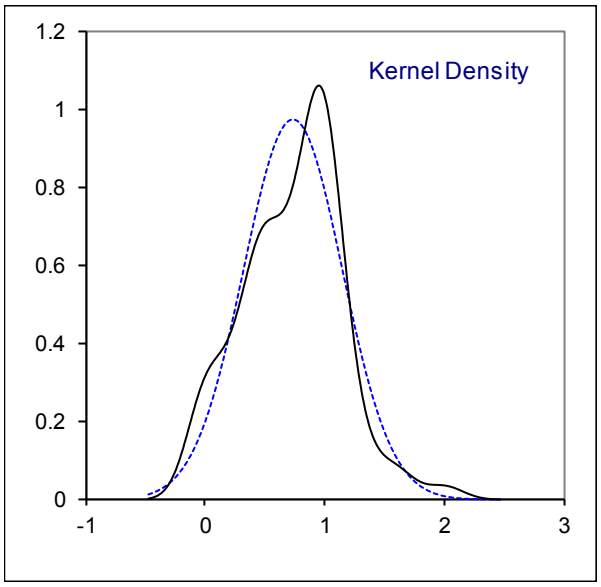
Determination of Existent Gum (unwashed) on sample #18160; results in mg/100mL

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	IP540	1.2		0.41	1062	D381	0.5		-0.21
62	IP540	<1		-----	1064	D381	0.0		-0.66
120	D381	1.2		0.41	1065		-----		-----
131		-----		-----	1079	D381	0		-0.66
140	D381	1.0		0.23	1081	IP540	1.0	C	0.23
150	D381	1		0.23	1082		-----		-----
159	D381	1		0.23	1097	IP540	0		-0.66
169	D381	0.000		-0.66	1109	IP540	0.4		-0.30
171	D381	<1		-----	1121		-----		-----
175		-----		-----	1126		-----		-----
177	D381	1		0.23	1143		-----		-----
194		-----		-----	1150	ISO6246	1.0		0.23
221		-----		-----	1161		-----		-----
224		-----		-----	1182		-----		-----
225		-----		-----	1191	IP540	0.66		-0.07
228		-----		-----	1201	D381	< 0.1		-----
230	IP540	0.3		-0.39	1275	IP540	0.0		-0.66
237	D381	1.0		0.23	1279	D381	<1		-----
238		-----		-----	1284	IP540	0.8		0.06
254		-----		-----	1299	D381	<1		-----
256	IP540	0.6		-0.12	1316	D381	<1		-----
258	D381	0.5		-0.21	1318	D381	0.5		-0.21
273	D381	<1		-----	1320	D381	1		0.23
311	IP540	<1		-----	1347	D381	< 1		-----
317	D381	<1		-----	1348	D381	0.8		0.06
323	D381	<1		-----	1399		-----		-----
334	D381	0.0		-0.66	1412	D381	0.9		0.14
335		-----		-----	1417	IP540	1.2		0.41
336		-----		-----	1441		-----		-----
353	IP540	0.6		-0.12	1448		-----		-----
369	IP540	<0.5		-----	1496	D381	0.2		-0.48
370	IP540	0.6		-0.12	1520	D381	< 1		-----
372	D381	0.4		-0.30	1538	IP540	1.6		0.77
391	D381	1		0.23	1586	D381	1		0.23
399		-----		-----	1587	IP540	0.0		-0.66
440	IP540	<1		-----	1610	IP540	1		0.23
445	IP540	1		0.23	1613	D381	1.6		0.77
447	IP540	1		0.23	1631	IP540	1		0.23
448	IP540	1		0.23	1634	D381	0.4		-0.30
453	IP540	<1.0		-----	1636	IP540	1.0		0.23
463	IP540	0.2		-0.48	1694		-----		-----
468	IP540	1.4		0.59	1715		-----		-----
485		-----		-----	1720		-----		-----
496		-----		-----	1724	IP540	1.0		0.23
603	IP540	0.4		-0.30	1741	D381	1.0		0.23
631	IP540	0.5		-0.21	1776		-----		-----
633		-----		-----	1810	D381	1.2		0.41
657	IP540	2.0		1.12	1811	D381	0.8		0.06
671	IP540	0.8		0.06	1833	IP540	1.0		0.23
704	GOST1567	< 1		-----	1881		-----		-----
732		-----		-----	1883	D381	0.8		0.06
798		-----		-----	1913	D381	0.20		-0.48
823	D381	0.9		0.14	1944		-----		-----
846	GB/T8019	0.5		-0.21	1961		-----		-----
851	IP540	1.2		0.41	2129	D381	0.4		-0.30
854	IP540	0.8		0.06	2130	IP540	0.4		-0.30
862	D381	0.8		0.06	6040		-----		-----
869	IP540	0.8		0.06	6041	D381	＜1		-----
873		-----		-----	6103	D381	0.50		-0.21
875	IP540	0.50		-0.21	6135		-----		-----
904	D381	1.0		0.23	6147	IP540	0.8		0.06
962	D381	<1		-----	6201	D381	<1		-----
963	D381	0.8		0.06	6203	D381	0.98		0.22
970	D381	0.6		-0.12	9090		-----		-----
974	D381	0.6		-0.12					
994	D381	0.65		-0.08					
995		-----		-----					
996		-----		-----					
997		-----		-----					
1011	D381	1		0.23					
1016		-----		-----					
1026		-----		-----					
1039	ISO6246	<1.0		-----					
1049	D381	0.4		-0.30					
1059	D381	0.2		-0.48					

normality	OK
n	76
outliers	0
mean (n)	0.738
st.dev. (n)	0.4106
R(calc.)	1.150
st.dev.(D381:12)	1.1240
R(D381:12)	3.147

Lab 1081: First reported 10



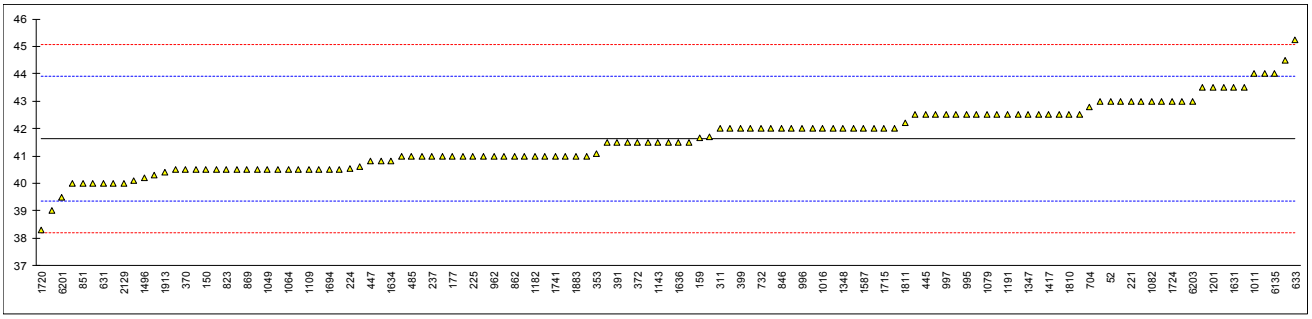


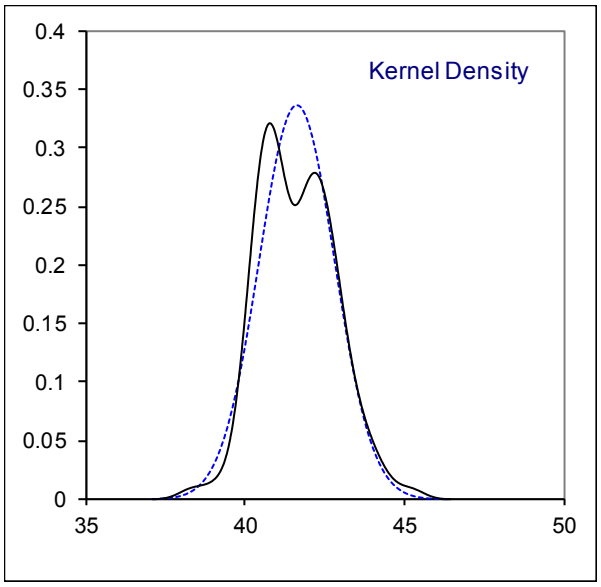
Determination of Flash Point on sample #18160; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D56	43.0		1.21	1062	IP170	40.5		-0.98
62	D56	42.5		0.77	1064	IP170	40.50		-0.98
120	IP170	40.6		-0.89	1065		-----		-----
131	D56	40.1		-1.33	1079	IP170	42.5		0.77
140	D56	42.5		0.77	1081	IP170	42.5		0.77
150	D56	40.5		-0.98	1082	IP170	43.0		1.21
159	D56	41.67		0.04	1097	ISO13736	40.5		-0.98
169	D56	40		-1.42	1109	IP170	40.5		-0.98
171	D56	41.5		-0.11	1121	IP170	39.0		-2.29
175	D56	42.5		0.77	1126	ISO2719	44.5		2.52
177	D56	41.0		-0.54	1143	IP170	41.5		-0.11
194		-----		-----	1150	D56	43		1.21
221	IP170	43.0		1.21	1161		-----		-----
224	IP170	40.53		-0.96	1182	D93	41.0		-0.54
225	IP170	41.0		-0.54	1191	IP170	42.5		0.77
228	IP170	41.0		-0.54	1201	IP170	43.5		1.64
230	IP170	40.5		-0.98	1275	IP170	40.0		-1.42
237	IP170	41.0		-0.54	1279	D56	40.3		-1.16
238	IP170	40.0		-1.42	1284	IP170	40.5		-0.98
254	IP170	41.5		-0.11	1299	IP170	42.5		0.77
256	IP170	41.0		-0.54	1316	IP170	42.0		0.33
258	IP170	40.5		-0.98	1318	IP170	41.0		-0.54
273	IP170	43.0		1.21	1320	D56	41.5		-0.11
311	IP170	42.0		0.33	1347	IP170	42.5		0.77
317	IP170	41.0		-0.54	1348	IP170	42.0		0.33
323	IP170	42.0		0.33	1399		-----		-----
334	IP170	42.0		0.33	1412	D93	42.5		0.77
335		-----		-----	1417	IP170	42.5		0.77
336		-----		-----	1441	D93	42.0	C	0.33
353	IP170	41.1		-0.46	1448		-----		-----
369	IP170	40.5		-0.98	1496	IP170	40.2		-1.24
370	IP170	40.5		-0.98	1520	D93	44.0		2.08
372	IP170	41.5		-0.11	1538		-----		-----
391	IP170	41.5		-0.11	1586	IP170	43.5		1.64
399	IP170	42.0		0.33	1587	IP170	42.0		0.33
440	IP170	42.0		0.33	1610	IP170	42.0		0.33
445	IP170	42.5		0.77	1613	D56	42.5		0.77
447	IP170	40.8		-0.72	1631	IP170	43.5		1.64
448	IP170	41.7		0.07	1634	IP170	40.8		-0.72
453	IP170	40.5		-0.98	1636	IP170	41.5		-0.11
463	IP170	40.8		-0.72	1694	IP170	40.5		-0.98
468	IP170	42.5		0.77	1715	D56	42		0.33
485	D56	41.0		-0.54	1720	D3828	38.3		-2.91
496	D3828	43.5		1.64	1724	IP170	43		1.21
603	IP170	42.0		0.33	1741	IP170	41.0		-0.54
631	D56	40.0		-1.42	1776	IP170	41.0		-0.54
633	D56	45.23		3.16	1810	D56	42.5		0.77
657	IP170	42.0		0.33	1811	D56	42.2		0.51
671	IP170	41.0		-0.54	1833	IP170	42.0		0.33
704	ISO2719	42.8		1.03	1881		-----		-----
732	ISO2719	42.0		0.33	1883	D56	41		-0.54
798		-----		-----	1913	IP170	40.4		-1.07
823	IP170	40.5		-0.98	1944	ISO13736	41		-0.54
846	GB/T261	42.0		0.33	1961		-----		-----
851	IP170	40.0		-1.42	2129	IP170	40.0		-1.42
854	IP170	40.5		-0.98	2130	IP170	42.5		0.77
862	IP170	41.0		-0.54	6040	D56	43.5		1.64
869	IP170	40.5		-0.98	6041	IP170	43.0		1.21
873		-----		-----	6103	ISO13736	41.5		-0.11
875		-----		-----	6135	D93	44.0		2.08
904		-----		-----	6147	IP170	40.5		-0.98
962	D56	41.0		-0.54	6201	ISO13736	39.5		-1.86
963	IP170	41.0		-0.54	6203	D56	43.0		1.21
970	IP170	41.0		-0.54	9090		-----		-----
974	IP170	41.5		-0.11					
994	D56	43.0		1.21					
995	IP170	42.5		0.77					
996	D56	42.0		0.33					
997	IP170	42.5		0.77					
1011	IP170	44		2.08					
1016	IP170	42.0		0.33					
1026		-----		-----					
1039	IP170	43.0		1.21					
1049	ISO13736	40.5		-0.98					
1059	IP170	41.0		-0.54					

normality	OK
n	123
outliers	0
mean (n)	41.62
st.dev. (n)	1.186
R(calc.)	3.32
st.dev.(IP170:14)	1.143
R(IP170:14)	3.2

Lab 1441: First reported 46



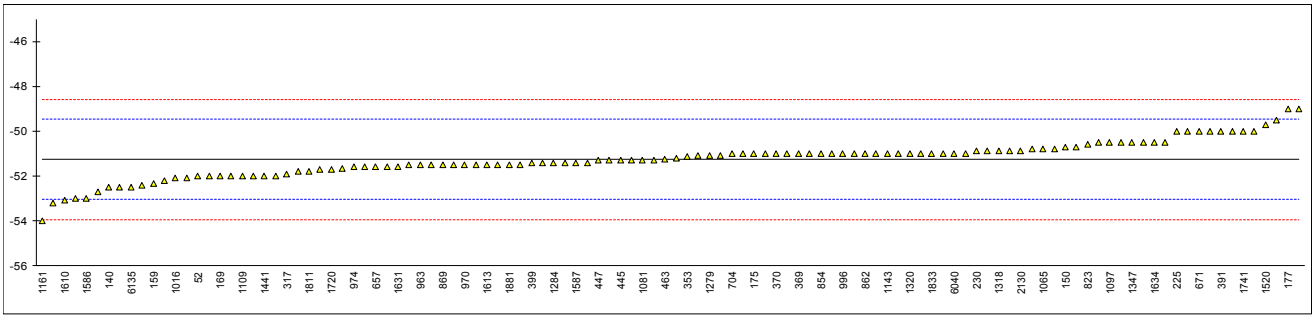


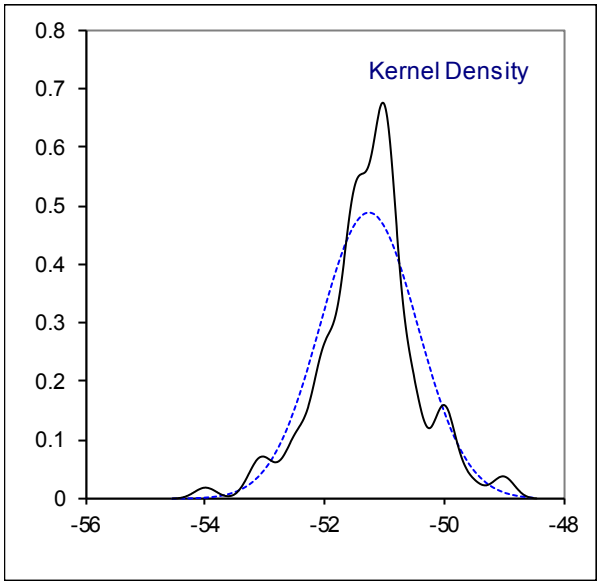
Determination of Freezing Point on sample #18160; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5972	-52.0		-0.83	1062	D2386	-51.3		-0.05
62	D5972	-53.		-1.95	1064	D7153	-51.1		0.18
120	D2386	-51.8		-0.61	1065	D2386	-50.8		0.51
131		-----		-----	1079	D5972	-52.7	C	-1.62
140	D5972	-52.5		-1.39	1081	D7153	-51.3		-0.05
150	D7153	-50.7		0.62	1082	IP529	-51.3		-0.05
159	D2386	-52.34		-1.21	1097	IP529	-50.5		0.85
169	D2386	-52		-0.83	1109	D5972	-52.0		-0.83
171	D2386	-49.0		2.53	1121	IP16	-51.0		0.29
175	D2386	-51		0.29	1126		-----		-----
177	D2386	-49.0		2.53	1143	D2386	-51.0		0.29
194		-----		-----	1150	D2386	-50.5		0.85
221		-----		-----	1161	D2386	-54.0		-3.07
224		-----		-----	1182	D5972	-51.6		-0.38
225	D2386	-50.0		1.41	1191	IP529	-51.4		-0.16
228	D2386	-51		0.29	1201	D2386	-52.4		-1.28
230	D2386	-50.9		0.40	1275	IP529	-51.0		0.29
237	D2386	-51.5		-0.27	1279	D7153	-51.1		0.18
238		-----		-----	1284	D7153	-51.4		-0.16
254	D2386	-51.5		-0.27	1299	D7153	-50.9		0.40
256	D2386	-50.0		1.41	1316	D7153	-51.2		0.06
258	D2386	-51.0		0.29	1318	D7153	-50.9		0.40
273		-----		-----	1320	D2386	-51.0		0.29
311	D2386	-50.5		0.85	1347	D2386	-50.5		0.85
317	D5972	-51.9		-0.72	1348	D2386	-50.5		0.85
323	D2386	-51.0		0.29	1399	D7153	-51.0		0.29
334	D2386	-50.7		0.62	1412	D2386	-52		-0.83
335		-----		-----	1417		-----		-----
336		-----		-----	1441	D5972	-52.0		-0.83
353	IP16	-51.11		0.17	1448		-----		-----
369	D2386	-51.0		0.29	1496	D5972	-51.4		-0.16
370	D2386	-51.0		0.29	1520	D2386	-49.7		1.74
372	D2386	-50.0		1.41	1538	D2386	-50.9		0.40
391	D2386	-50.0		1.41	1586	D2386	-53.0		-1.95
399	D7153	-51.4		-0.16	1587	IP529	-51.4		-0.16
440	IP16	-51.0		0.29	1610	D5972	-53.1		-2.06
445	D7153	-51.3		-0.05	1613	D7153	-51.5		-0.27
447	IP529	-51.3		-0.05	1631	D7153	-51.6		-0.38
448	IP529	-50.8		0.51	1634	D2386	-50.5		0.85
453	D5972	-52.5		-1.39	1636	D2386	-50.5	C	0.85
463	D2386	-51.25		0.01	1694		-----		-----
468		-----		-----	1715	D5972	-51.65		-0.44
485		-----		-----	1720	D7153	-51.7		-0.50
496		-----		-----	1724	D2386	-51.5		-0.27
603	D2386	-50.0		1.41	1741	D2386	-50		1.41
631	D5972	-51.6		-0.38	1776	IP529	-52.2		-1.06
633		-----		-----	1810	D2386	-52		-0.83
657	D7153	-51.6		-0.38	1811	D2386	-51.8		-0.61
671	D2386	-50.0		1.41	1833	IP435	-51.0		0.29
704	D2386	-51		0.29	1881	D2386	-51.5		-0.27
732		-----		-----	1883	D2386	-51		0.29
798		-----		-----	1913	D2386	-50.0		1.41
823	D2386	-50.6		0.74	1944		-----		-----
846	GB/T2430	-51.0		0.29	1961		-----		-----
851	D2386	-51.09		0.19	2129	D2386	-49.5		1.97
854	D2386	-51.0		0.29	2130	IP529	-50.9		0.40
862	D2386	-51.0		0.29	6040	D2386	-51.0		0.29
869	D2386	-51.5		-0.27	6041	D7153	-52.1		-0.94
873		-----		-----	6103	D7153	-51.4		-0.16
875		-----		-----	6135	D5972	-52.5		-1.39
904		-----		-----	6147	D7153	-50.8	C	0.51
962		-----		-----	6201	D7153	-51.0		0.29
963	D2386	-51.5		-0.27	6203	D2386	-51,.5		-----
970	D2386	-51.5		-0.27	9090		-----		-----
974	D2386	-51.6		-0.38					
994	D2386	-51		0.29					
995	D2386	-51.5		-0.27					
996	D2386	-51.0		0.29					
997	D2386	-52.0		-0.83					
1011	D2386	-51.5		-0.27					
1016	D5972	-52.1		-0.94					
1026	D2386	-53.2		-2.18					
1039	IP529	-51.7		-0.50					
1049	D7153	-51.3		-0.05					
1059	D2386	-52.0		-0.83					

normality	suspect
n	114
outliers	0
mean (n)	-51.26
st.dev. (n)	0.819
R(calc.)	2.29
st.dev.(D2386:15e1)	0.893
R(D2386:15e1)	2.5

Lab 1079: First reported -46.5
Lab 1636: First reported 50.5
Lab 6147: First reported 50.8



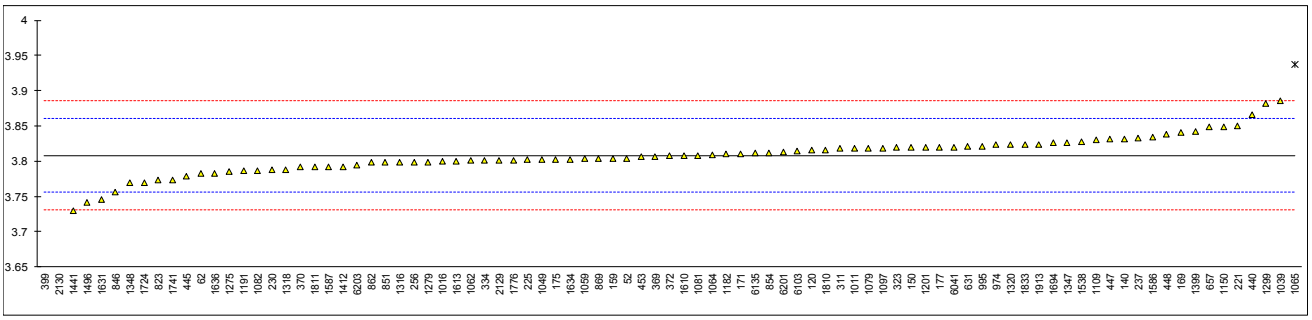


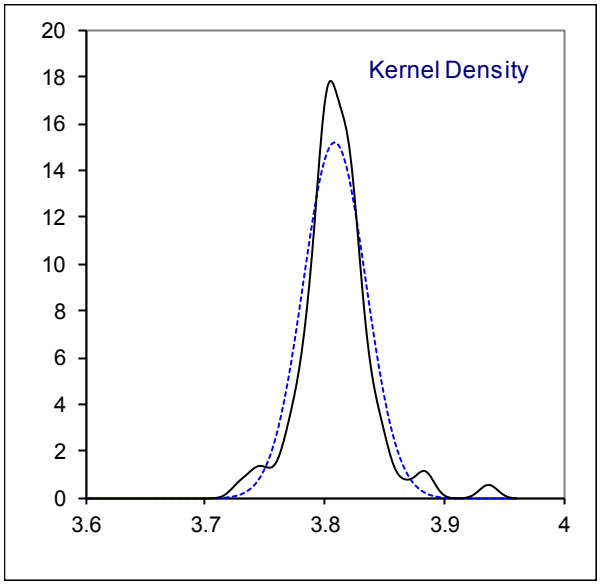
Determination of Kinematic Viscosity at -20°C on sample #18160; results in mm^2/s

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D445	3.8041		-0.16	1062	D445	3.8010		-0.28
62	D445	3.782		-1.01	1064	D445	3.8090		0.03
120	D445	3.816		0.30	1065	D445	3.9369	R(0.01)	4.98
131		-----		-----	1079	D445	3.818		0.38
140	D445	3.831		0.88	1081	D445	3.808		-0.01
150	D445	3.819		0.42	1082	D445	3.787		-0.82
159	D445	3.804		-0.16	1097	ISO3104	3.8187		0.41
169	D445	3.8402		1.24	1109	D445	3.8302		0.85
171	D445	3.8107	C	0.10	1121		-----		-----
175	D445	3.802		-0.24	1126		-----		-----
177	D445	3.820		0.46	1143		-----		-----
194		-----		-----	1150	ISO3104	3.8482		1.55
221	D445	3.850		1.62	1161		-----		-----
224		-----		-----	1182	D7042	3.8104		0.09
225	D445	3.802		-0.24	1191	D445	3.7863		-0.85
228		-----		-----	1201	D7042	3.8194		0.43
230	D445	3.7876		-0.80	1275	IP71	3.784975		-0.90
237	D445	3.833		0.96	1279	D445	3.799		-0.35
238		-----		-----	1284		-----		-----
254		-----		-----	1299	D445	3.882	C	2.86
256	D445	3.799		-0.35	1316	D445	3.798		-0.39
258		-----		-----	1318	D7042	3.788		-0.78
273		-----		-----	1320	D445	3.823		0.57
311	D445	3.818		0.38	1347	D445	3.826		0.69
317		-----		-----	1348	D445	3.769		-1.52
323	D445	3.819		0.42	1399	D445	3.842		1.31
334	D445	3.801		-0.28	1412	D445	3.792		-0.63
335		-----		-----	1417		-----		-----
336		-----		-----	1441	D445	3.729	C	-3.06
353		-----		-----	1448		-----		-----
369	D445	3.8063		-0.07	1496	D445	3.742		-2.56
370	D445	3.7912		-0.66	1520		-----		-----
372	D445	3.807		-0.04	1538	D445	3.828		0.77
391		-----		-----	1586	D445	3.834		1.00
399	D445	3.438	C,R(0.01)	-14.32	1587	D445	3.79147		-0.65
440	D445	3.8657		2.23	1610	IP71	3.807		-0.04
445	D7042	3.778		-1.17	1613	D445	3.800		-0.32
447	D445	3.831	C	0.88	1631	D445	3.746		-2.41
448	D445	3.838	C	1.15	1634	D445	3.802		-0.24
453	IP71	3.806		-0.08	1636	D445	3.7823		-1.00
463		-----		-----	1694	D445	3.8255		0.67
468		-----		-----	1715		-----		-----
485		-----		-----	1720		-----		-----
496		-----		-----	1724	D445	3.769		-1.52
603		-----		-----	1741	D445	3.773	C	-1.36
631	D445	3.8204		0.47	1776	D445	3.8012		-0.27
633		-----		-----	1810	D445	3.816		0.30
657	D445	3.848		1.54	1811	D445	3.7913		-0.65
671		-----		-----	1833	D445	3.823		0.57
704		-----		-----	1881		-----		-----
732		-----		-----	1883		-----		-----
798		-----		-----	1913	D445	3.824		0.61
823	D445	3.773		-1.36	1944		-----		-----
846	GB/T265	3.7564		-2.00	1961		-----		-----
851	D445	3.798		-0.39	2129	D445	3.8011		-0.27
854	D445	3.8112		0.12	2130	IP71	3.5506	R(0.01)	-9.97
862	D445	3.798		-0.39	6040		-----		-----
869	D445	3.8033		-0.19	6041	D445	3.820		0.46
873		-----		-----	6103	ISO3104	3.8148		0.26
875		-----		-----	6135	D445	3.811		0.11
904		-----		-----	6147		-----		-----
962		-----		-----	6201	D445	3.813		0.19
963		-----		-----	6203	D445	3.7950		-0.51
970		-----		-----	9090		-----		-----
974	D445	3.823		0.57					
994		-----		-----					
995	D445	3.821		0.50					
996		-----		-----					
997		-----		-----					
1011	D445	3.818		0.38					
1016	D445	3.8000		-0.32					
1026		-----		-----					
1039	D445	3.885		2.97					
1049	D445	3.802		-0.24					
1059	D445	3.803		-0.20					

normality	suspect
n	86
outliers	3
mean (n)	3.8082
st.dev. (n)	0.02626
R(calc.)	0.0735
st.dev.(D445:17a)	0.02584
R(D445:17a)	0.0724

Lab 171: First reported 3.438
Lab 399: First reported 3.685
Lab 447: First reported 3.649
Lab 448: First reported 3.895
Lab 1299: First reported 3.886
Lab 1441: First reported 3.66
Lab 1741: First reported 3.703



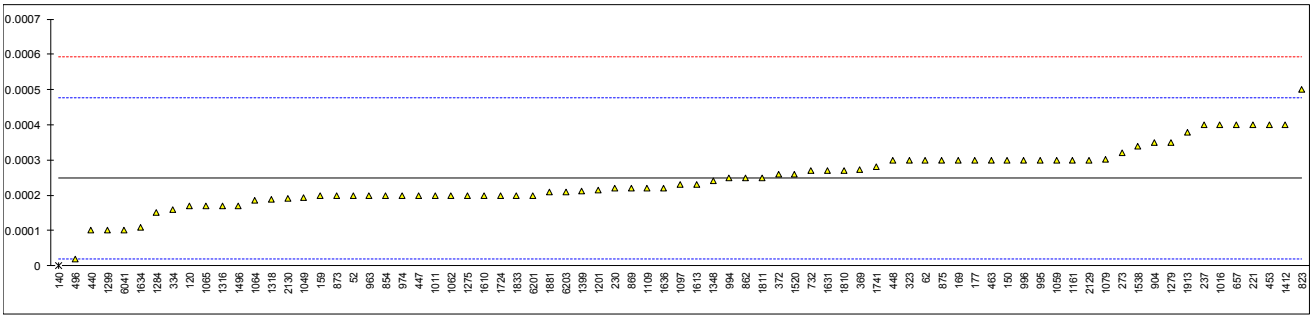


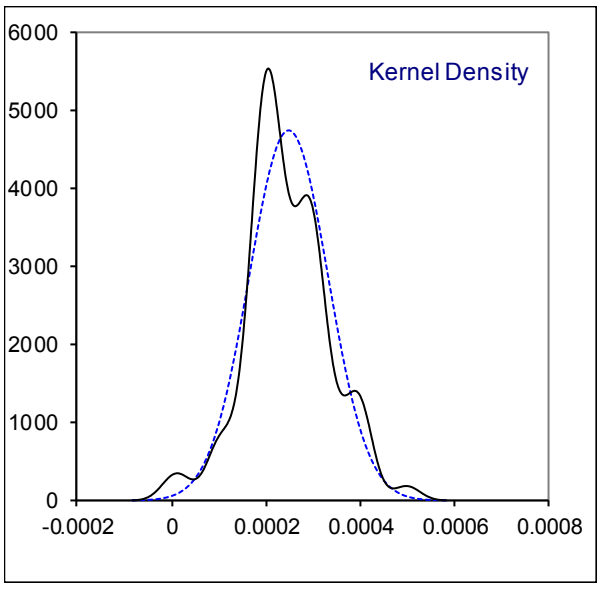
Determination of Mercaptan Sulphur as S on sample #18160; converted results to %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3227	0.00020		-0.42	1062	D3227	0.0002		-0.42
62	D3227	0.0003		0.45	1064	D3227	0.000185		-0.55
120	D3227	0.00017		-0.69	1065	D3227	0.00017		-0.69
131		-----		-----	1079	D3227	0.000301		0.46
140	D3227	0	ex	-2.17	1081		-----		-----
150	D3227	0.0003		0.45	1082		-----		-----
159	D3227	0.0002		-0.42	1097	ISO3012	0.00023		-0.16
169	D3227	0.0003		0.45	1109	D3227	0.00022		-0.25
171	D3227	<0.0003		-----	1121		-----		-----
175		-----		-----	1126		-----		-----
177	D3227	0.0003		0.45	1143		-----		-----
194		-----		-----	1150		-----		-----
221	D3227	0.0004		1.32	1161	ISO3012	0.0003		0.45
224		-----		-----	1182		-----		-----
225		-----		-----	1191		-----		-----
228		-----		-----	1201	D3227	0.000216		-0.28
230	D3227	0.00022		-0.25	1275	IP342	0.0002		-0.42
237	D3227	0.0004		1.32	1279	D3227	0.00035		0.89
238		-----		-----	1284	D3227	0.0001506		-0.85
254		-----		-----	1299	D3227	0.0001		-1.30
256		-----		-----	1316	D3227	0.00017	C	-0.69
258		-----		-----	1318	D3227	0.000189		-0.52
273	D3227	0.00032		0.63	1320		-----		-----
311	D3227	<0.0003		-----	1347	D3227	<0.0003		-----
317		-----		-----	1348	IP342	0.00024	C	-0.07
323	D3227	0.0003		0.45	1399	D3227	0.000213		-0.31
334	D3227	0.00016		-0.77	1412	UOP163	0.0004		1.32
335		-----		-----	1417		-----		-----
336		-----		-----	1441		-----		-----
353		-----		-----	1448		-----		-----
369	D3227	0.000272		0.21	1496	D3227	0.00017		-0.69
370		-----		-----	1520	D3227	0.00026		0.10
372	D3227	0.00026		0.10	1538	D3227	0.00034	C	0.80
391	D3227	<0.0001		-----	1586		-----		-----
399		-----		-----	1587		-----		-----
440	D3227	0.0001		-1.30	1610	IP342	0.0002		-0.42
445	IP342	<0.0003		-----	1613	D3227	0.00023		-0.16
447	D3227	0.0002		-0.42	1631	D3227	0.00027		0.19
448	D3227	0.0003		0.45	1634	D3227	0.0001099		-1.21
453	IP342	0.0004		1.32	1636	D3227	0.00022		-0.25
463	D3227	0.00030		0.45	1694		-----		-----
468		-----		-----	1715		-----		-----
485		-----		-----	1720		-----		-----
496	D3227	0.00002		-2.00	1724	D3227	0.0002		-0.42
603		-----		-----	1741	D3227	0.00028		0.28
631		-----		-----	1776		-----		-----
633		-----		-----	1810	D3227	0.00027		0.19
657	D3227	0.0004		1.32	1811	D3227	0.00025		0.01
671		-----		-----	1833	D3227	0.0002		-0.42
704	D3227	< 0.0003		-----	1881	D3227	0.00021		-0.34
732	D3227	0.00027		0.19	1883		-----		-----
798		-----		-----	1913	D3227	0.00038		1.15
823	D3227	0.0005		2.20	1944		-----		-----
846	GB/T1792	<0.0003		-----	1961		-----		-----
851	D3227	<0.0003		-----	2129	D3227	0.0003		0.45
854	D3227	0.0002		-0.42	2130	IP342	0.00019		-0.51
862	D3227	0.00025		0.01	6040		-----		-----
869	D3227	0.00022		-0.25	6041	D3227	0.00010		-1.30
873	D3227	0.0002		-0.42	6103		-----		-----
875	D3227	0.0003		0.45	6135		-----		-----
904	D3227	0.00035		0.89	6147		-----		-----
962		-----		-----	6201	UOP163	0.0002		-0.42
963	D3227	0.0002		-0.42	6203	D3227	0.00021		-0.34
970		-----		-----	9090		-----		-----
974	D3227	0.0002		-0.42					
994	D3227	0.00025		0.01					
995	D3227	0.0003		0.45					
996	D3227	0.0003	C	0.45					
997		-----		-----					
1011	D3227	0.0002		-0.42					
1016	D3227	0.0004		1.32					
1026		-----		-----					
1039		-----		-----					
1049	D3227	0.000194		-0.48					
1059	D3227	0.0003		0.45					

normality	OK
n	76
outliers	0 (+1 excl)
mean (n)	0.000248
st.dev. (n)	0.0000840
R(calc.)	0.000235
st.dev.(D3227:16)	0.0001144
R(D3227:16)	0.000320

Lab 140: Test result excluded as zero is not a real result
Lab 996: First reported 0.0006
Lab 1316: First reported 0.00017 mg/kg
Lab 1348: First reported 0.00024 mg/kg
Lab 1538: First reported 0.00064



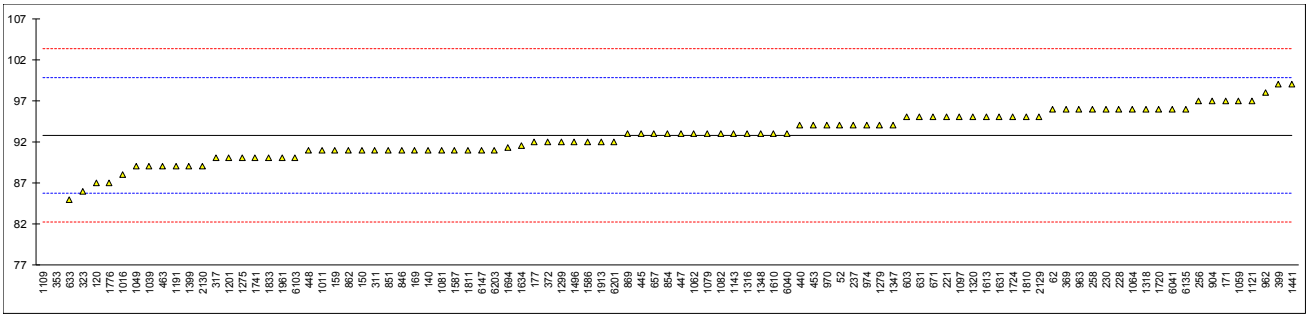


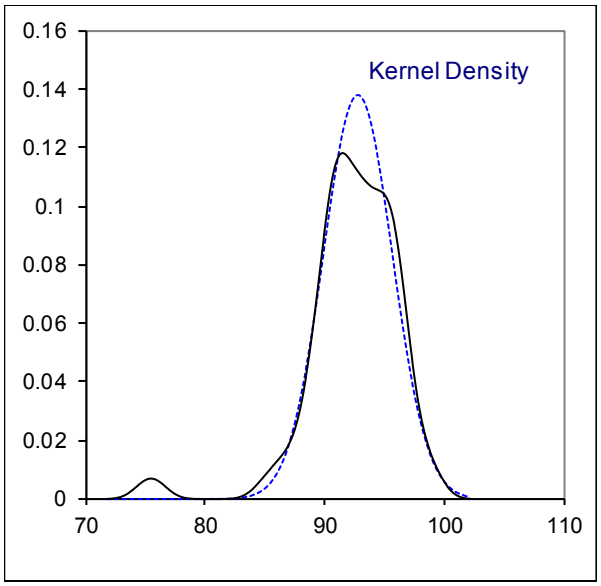
Determination of MSEP on sample #18160;

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3948	94		0.34	1062	D3948	93		0.05
62	D3948	96		0.91	1064	D3948	96		0.91
120	D3948	87		-1.65	1065		-----		-----
131		-----		-----	1079	D3948	93		0.05
140	D3948	91		-0.52	1081	D3948	91		-0.52
150	D3948	91		-0.52	1082	D3948	93		0.05
159	D3948	91		-0.52	1097	D3948	95		0.62
169	D3948	91	C	-0.52	1109	D3948	75	R(0.01)	-5.07
171	D3948	97		1.19	1121	D3948	97		1.19
175		-----		-----	1126		-----		-----
177	D3948	92		-0.23	1143	D3948	93		0.05
194		-----		-----	1150		-----		-----
221	D3948	95		0.62	1161		-----		-----
224		-----		-----	1182		-----		-----
225		-----		-----	1191	D3948	89		-1.09
228	D3948	96		0.91	1201	D3948	90		-0.80
230	D3948	96		0.91	1275	D3948	90		-0.80
237	D3948	94		0.34	1279	D3948	94		0.34
238		-----		-----	1284		-----		-----
254		-----		-----	1299	D3948	92		-0.23
256	D3948	97		1.19	1316	D3948	93		0.05
258	D3948	96		0.91	1318	D3948	96		0.91
273		-----		-----	1320	D3948	95		0.62
311	D3948	91		-0.52	1347	D3948	94		0.34
317	D3948	90		-0.80	1348	D3948	93		0.05
323	D3948	86		-1.94	1399	D3948	89		-1.09
334		-----		-----	1412		-----		-----
335		-----		-----	1417		-----		-----
336		-----		-----	1441	D3948	99		1.76
353	D3948	76	R(0.01)	-4.79	1448		-----		-----
369	D3948	96		0.91	1496	D3948	92		-0.23
370		-----		-----	1520		-----		-----
372	D3948	92		-0.23	1538		-----		-----
391		-----		-----	1586	D3948	92		-0.23
399	D3948	99		1.76	1587	D3948	91		-0.52
440	D3948	94		0.34	1610	D3948	93		0.05
445	D3948	93		0.05	1613	D3948	95.0		0.62
447	D3948	93		0.05	1631	D3948	95		0.62
448	D3948	91		-0.52	1634	D3948	91.5		-0.37
453	D3948	94		0.34	1636		-----		-----
463	D3948	89.0		-1.09	1694	D3948	91.33		-0.42
468		-----		-----	1715		-----		-----
485		-----		-----	1720	D3948	96		0.91
496		-----		-----	1724	D3948	95		0.62
603	D3948	95		0.62	1741	D3948	90		-0.80
631	D3948	95		0.62	1776	D3948	87		-1.65
633	D3948	85		-2.22	1810	D3948	95		0.62
657	D3948	93	C	0.05	1811	D3948	91		-0.52
671	D3948	95		0.62	1833	D3948	90		-0.80
704		-----		-----	1881		-----		-----
732		-----		-----	1883		-----		-----
798		-----		-----	1913	D3948	92		-0.23
823		-----		-----	1944		-----		-----
846	SH/T0616	91		-0.52	1961	D3948	90		-0.80
851	D3948	91		-0.52	2129	D3948	95		0.62
854	D3948	93		0.05	2130	D3948	89		-1.09
862	D3948	91		-0.52	6040	D3948	93		0.05
869	D3948	93		0.05	6041	D3948	96		0.91
873		-----		-----	6103	D3948	90		-0.80
875		-----		-----	6135	D3948	96		0.91
904	D3948	97		1.19	6147	D3948	91		-0.52
962	D3948	98		1.48	6201	D3948	92		-0.23
963	D3948	96		0.91	6203	D3948	91		-0.52
970	D3948	94		0.34	9090		-----		-----
974	D3948	94		0.34					
994		-----		-----					
995		-----		-----					
996		-----		-----					
997		-----		-----					
1011	D3948	91		-0.52					
1016	D3948	88		-1.37					
1026		-----		-----					
1039	D3948	89		-1.09					
1049	D3948	89		-1.09					
1059	D3948	97		1.19					

normality	OK
n	93
outliers	2
mean (n)	92.82
st.dev. (n)	2.885
R(calc.)	8.08
st.dev.(D3948:14)	3.514
R(D3948:14)	9.84

Lab 169: First reported 80
Lab 657: First reported 81



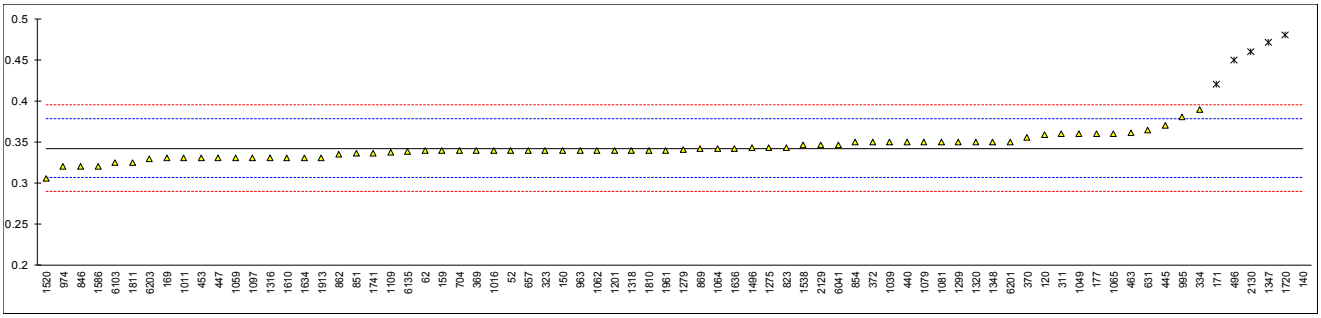


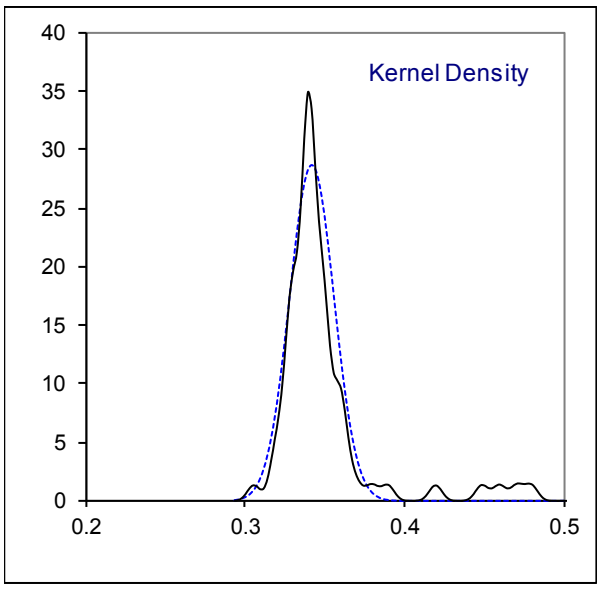
Determination of Naphthalenes on sample #18160; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D1840-B	0.34		-0.14	1062	D1840-A	0.34		-0.14
62	D1840-B	0.34		-0.14	1064	D1840-A	0.342		-0.02
120	D1840-B	0.359		0.94	1065	D1840-A	0.36		1.00
131		-----		-----	1079	D1840-A	0.35		0.43
140	D1840-B	0.87	R(0.01)	29.90	1081	D1840-B	0.35		0.43
150	D1840-B	0.34	C	-0.14	1082		-----		-----
159	D1840-B	0.34		-0.14	1097	D1840-A	0.330		-0.70
169	D1840-B	0.33		-0.70	1109	D1840-B	0.337		-0.31
171	D1840-B	0.42	R(0.01)	4.40	1121		-----		-----
175		-----		-----	1126		-----		-----
177	D1840-B	0.36	C	1.00	1143		-----		-----
194		-----		-----	1150		-----		-----
221		-----		-----	1161		-----		-----
224		-----		-----	1182		-----		-----
225		-----		-----	1191		-----		-----
228		-----		-----	1201	D1840-B	0.34		-0.14
230		-----		-----	1275	D1840-A	0.342975		0.03
237		-----		-----	1279	D1840-B	0.341		-0.08
238		-----		-----	1284		-----		-----
254		-----		-----	1299	D1840-B	0.35		0.43
256		-----		-----	1316	D1840-A	0.33		-0.70
258		-----		-----	1318	D1840-A	0.34		-0.14
273		-----		-----	1320	D1840-B	0.35		0.43
311	D1840-B	0.36		1.00	1347	D1840-B	0.471	R(0.01)	7.29
317		-----		-----	1348	D1840-B	0.35		0.43
323	D1840-A	0.34		-0.14	1399		-----		-----
334	D1840-A	0.39		2.70	1412		-----		-----
335		-----		-----	1417		-----		-----
336		-----		-----	1441		-----		-----
353		-----		-----	1448		-----		-----
369	D1840-B	0.34		-0.14	1496	D1840-B	0.3428		0.02
370	D1840-A	0.355		0.71	1520	D1840-B	0.306		-2.06
372	D1840-B	0.35		0.43	1538	D1840-B	0.346		0.20
391		-----		-----	1586	D1840-B	0.32		-1.27
399		-----		-----	1587		-----		-----
440	D1840-B	0.35		0.43	1610	D1840-B	0.33		-0.70
445	D1840-B	0.37		1.56	1613		-----		-----
447	D1840-B	0.33		-0.70	1631		-----		-----
448		-----		-----	1634	D1840-A	0.33		-0.70
453	D1840-B	0.33	C	-0.70	1636	D1840-B	0.342		-0.02
463	D1840-B	0.361		1.05	1694		-----		-----
468		-----		-----	1715		-----		-----
485		-----		-----	1720	D1840-B	0.48	C,R(0.01)	7.80
496	D1840-B	0.449	R(0.01)	6.04	1724		-----		-----
603		-----		-----	1741	D1840-A	0.336		-0.36
631	D1840-A	0.3646		1.26	1776		-----		-----
633		-----		-----	1810	D1840-A	0.34		-0.14
657	D1840-A	0.34		-0.14	1811	D1840-A	0.3254		-0.96
671		-----		-----	1833		-----		-----
704	D1840-A	0.34		-0.14	1881		-----		-----
732		-----		-----	1883		-----		-----
798		-----		-----	1913	D1840-B	0.330		-0.70
823	D1840-A	0.343		0.03	1944		-----		-----
846	SH/T0181	0.32		-1.27	1961	D1840-B	0.340		-0.14
851	D1840-A	0.336		-0.36	2129	D1840-B	0.346		0.20
854	D1840-A	0.35		0.43	2130	D1840-A	0.46	R(0.01)	6.66
862	D1840-B	0.335		-0.42	6040		-----		-----
869	D1840-A	0.342		-0.02	6041	D1840-B	0.3468		0.25
873		-----		-----	6103	D1840-B	0.325		-0.99
875		-----		-----	6135	D1840-A	0.3388		-0.20
904		-----		-----	6147		-----		-----
962		-----		-----	6201	D1840-A	0.35		0.43
963	D1840-A	0.34		-0.14	6203	D1840-B	0.3295		-0.73
970		-----		-----	9090		-----		-----
974	D1840-A	0.32		-1.27					
994		-----		-----					
995	D1840-B	0.38		2.13					
996		-----		-----					
997		-----		-----					
1011	D1840-B	0.33		-0.70					
1016	D1840-A	0.34		-0.14					
1026		-----		-----					
1039	D1840-B	0.35		0.43					
1049	D1840-A	0.360		1.00					
1059	D1840-B	0.33		-0.70					

	normality	suspect
	n	68
	outliers	6
	mean (n)	0.3424
	st.dev. (n)	0.01391
	R(calc.)	0.0390
	st.dev.(D1840-B:07)	0.01765
	R(D1840-B:07)	0.0494
Compare		
	R(D1840-A:07)	0.0401

Lab 150: First reported 0.28
Lab 177: First reported 0.52
Lab 453: First reported 0.25
Lab 1720: First reported 0.41

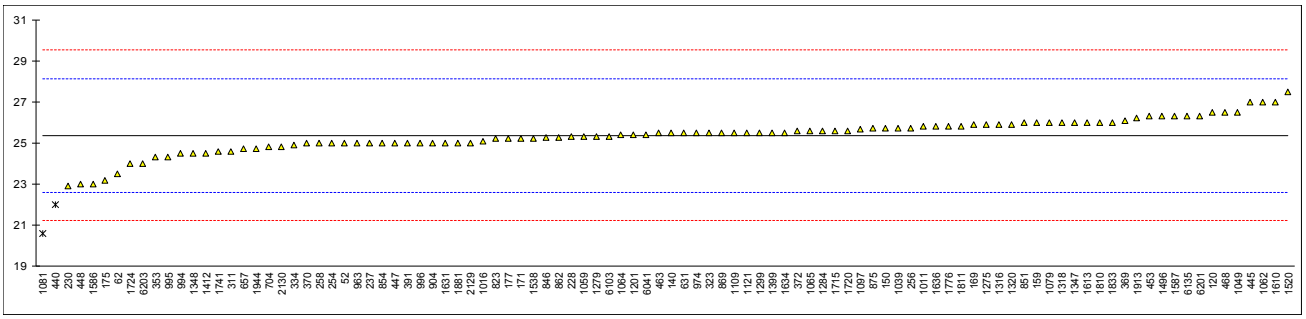


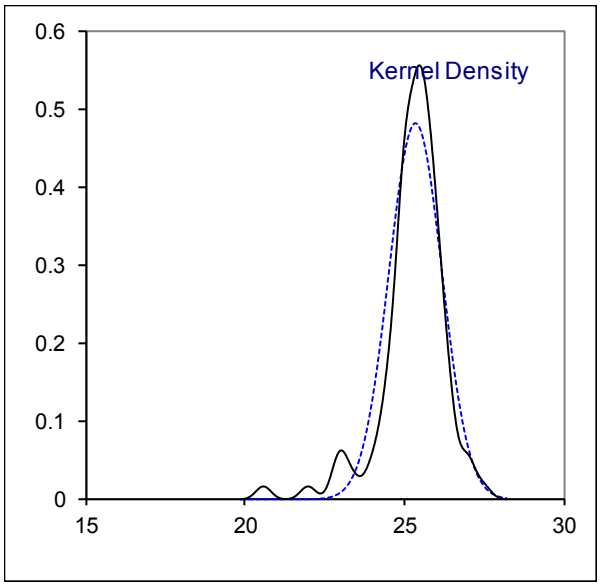


Determination of Smoke Point on sample #18160; results in mm

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D1322-manual	25		-0.27	1062	D1322-manual	27		1.17
62	D1322-manual	23.5		-1.34	1064	D1322-automated	25.4		0.02
120	D1322-automated	26.5		0.81	1065	D1322-automated	25.6		0.17
131		-----		-----	1079	D1322-automated	26.0		0.45
140	D1322-automated	25.5		0.09	1081	D1322-manual	20.6	R(0.01)	-3.43
150	D1322-automated	25.7		0.24	1082		-----		-----
159	D1322-automated	26.0		0.45	1097	D1322-automated	25.67		0.22
169	D1322-automated	25.9		0.38	1109	D1322-automated	25.5		0.09
171	D1322-automated	25.2		-0.12	1121	IP57-manual	25.5		0.09
175	D1322-manual	23.2		-1.56	1126		-----		-----
177	D1322-automated	25.2		-0.12	1143		-----		-----
194		-----		-----	1150		-----		-----
221		-----		-----	1161		-----		-----
224		-----		-----	1182		-----		-----
225		-----		-----	1191		-----		-----
228	D1322-manual	25.3		-0.05	1201	D1322-automated	25.4		0.02
230	D1322-manual	22.9		-1.77	1275	IP598-automated	25.9		0.38
237	D1322-automated	25.0		-0.27	1279	D1322-automated	25.3		-0.05
238		-----		-----	1284	D1322-automated	25.6		0.17
254	D1322-manual	25.0		-0.27	1299	D1322-automated	25.5		0.09
256	D1322-manual	25.74		0.27	1316	D1322-automated	25.9		0.38
258	D1322-manual	25.0		-0.27	1318	D1322-automated	26.0		0.45
273		-----		-----	1320	D1322-manual	25.9		0.38
311	D1322-manual	24.6		-0.55	1347	D1322-manual	26.0		0.45
317		-----		-----	1348	D1322-manual	24.5		-0.62
323	D1322-manual	25.5		0.09	1399	D1322-automated	25.5		0.09
334	D1322-automated	24.9		-0.34	1412	D1322-manual	24.5		-0.62
335		-----		-----	1417		-----		-----
336		-----		-----	1441		-----		-----
353	IP57-manual	24.30		-0.77	1448		-----		-----
369	D1322-manual	26.1		0.52	1496	D1322-automated	26.3		0.67
370	D1322-manual	25.0		-0.27	1520	D1322-manual	27.5		1.53
372	D1322-automated	25.6		0.17	1538	D1322-manual	25.2		-0.12
391	D1322-manual	25.0		-0.27	1586	D1322-manual	23.0		-1.70
399		-----		-----	1587	D1322-automated	26.3		0.67
440	D1322-manual	22.0	R(0.05)	-2.42	1610	IP598-manual	27.0		1.17
445	IP598-manual	27.0		1.17	1613	D1322-automated	26.0		0.45
447	D1322-manual	25.0		-0.27	1631	D1322-manual	25.0		-0.27
448	D1322-manual	23		-1.70	1634	D1322-automated	25.5		0.09
453	D1322-automated	26.3		0.67	1636	D1322-automated	25.8		0.31
463	D1322-manual	25.48		0.08	1694		-----		-----
468	D1322-manual	26.5		0.81	1715	D1322-manual	25.6		0.17
485		-----		-----	1720	D1322-automated	25.6		0.17
496		-----		-----	1724	D1322-manual	24		-0.98
603		-----		-----	1741	D1322-manual	24.59		-0.56
631	D1322-automated	25.5		0.09	1776	D1322-automated	25.8		0.31
633		-----		-----	1810	D1322-automated	26		0.45
657	D1322-manual	24.7		-0.48	1811	D1322-automated	25.8		0.31
671		-----		-----	1833	D1322-manual	26		0.45
704	D1322-manual	24.8		-0.41	1881	D1322-manual	25.0		-0.27
732		-----		-----	1883		-----		-----
798		-----		-----	1913	D1322-automated	26.2		0.60
823	D1322-automated	25.2		-0.12	1944	D1322-manual	24.7		-0.48
846	GB/T382	25.25		-0.09	1961		-----		-----
851	D1322-manual	26.0		0.45	2129	D1322-manual	25.0		-0.27
854	D1322-manual	25.0		-0.27	2130	IP598-automated	24.8		-0.41
862	D1322-manual	25.25		-0.09	6040		-----		-----
869	D1322-manual	25.5		0.09	6041	D1322-automated	25.4		0.02
873		-----		-----	6103	D1322-automated	25.3		-0.05
875	D1322-manual	25.7		0.24	6135	D1322-manual	26.3		0.67
904	D1322-manual	25		-0.27	6147		-----		-----
962		-----		-----	6201	D1322-manual	26.3		0.67
963	D1322-manual	25.0		-0.27	6203	D1322-manual	24.0		-0.98
970		-----		-----	9090		-----		-----
974	D1322-automated	25.5		0.09					
994	D1322-manual	24.5		-0.62					
995	D1322-manual	24.3		-0.77					
996	D1322-manual	25.0		-0.27					
997		-----		-----					
1011	D1322-automated	25.8		0.31					
1016	IP598-automated	25.1		-0.19					
1026		-----		-----					
1039	D1322-automated	25.7		0.24					
1049	D1322-automated	26.5		0.81					
1059	D1322-manual	25.3		-0.05					

			Manual only	Automated only
	normality	suspect	OK	OK
	n	98	54	45
	outliers	2	2	0
	mean (n)	25.37	25.13	25.63
	st.dev. (n)	0.830	0.999	0.451
	R(calc.)	2.33	2.80	1.26
	st.dev.(D1322-M:18)	1.392	1.375	0.328
	R(D1322-M:18)	3.90	3.85	--
Compare				
	R(D1322-A:18)	0.91	--	0.92

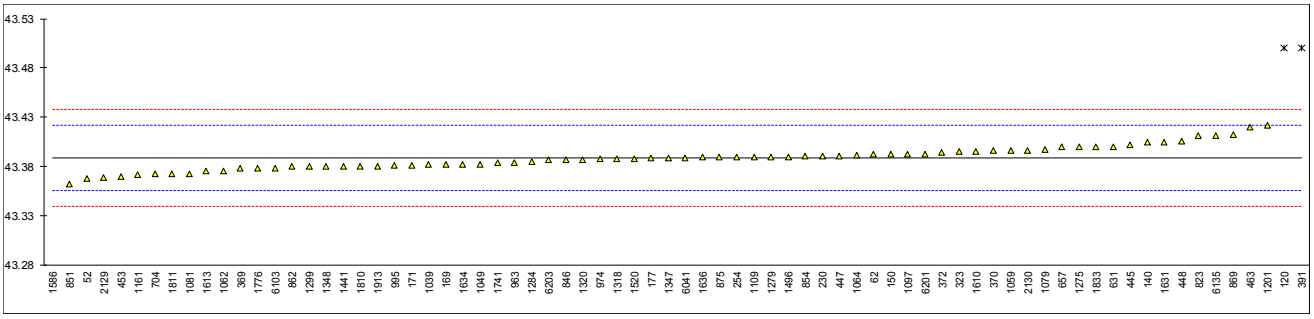


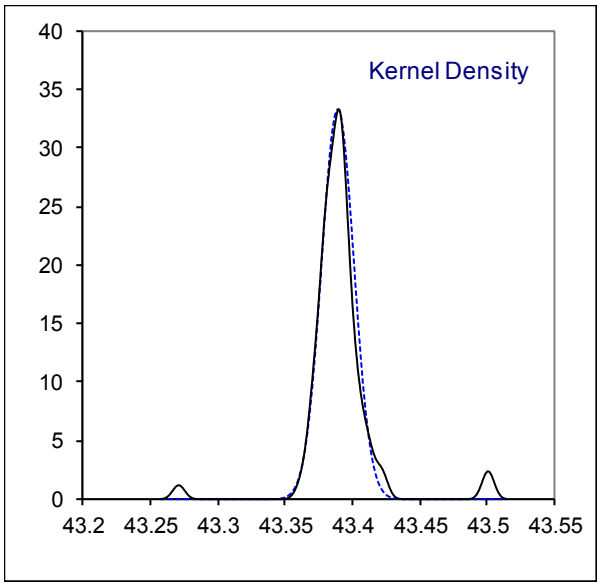


Determination of Specific Energy (Net, on Sulphur free basis) on sample #18160; results in MJ/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3338	43.368		-1.26	1062	D3338	43.376		-0.78
62	D3338	43.393		0.26	1064	D3338	43.3919		0.19
120	D3338	43.5	R(0.01)	6.77	1065		-----		-----
131		-----		-----	1079	D3338	43.397		0.50
140	D3338	43.405		0.99	1081	D3338	43.373		-0.96
150	D3338	43.393		0.26	1082		-----		-----
159		-----		-----	1097	D3338	43.393		0.26
169	D3338	43.382226		-0.40	1109	D3338	43.39		0.08
171	D3338	43.381		-0.47	1121		-----		-----
175		-----		-----	1126		-----		-----
177	D3338	43.389		0.02	1143		-----		-----
194		-----		-----	1150		-----		-----
221		-----		-----	1161	D3338	43.372		-1.02
224		-----		-----	1182		-----		-----
225		-----		-----	1191		-----		-----
228		-----		-----	1201	D3338	43.422		2.02
230	D3338	43.391		0.14	1275	D3338	43.4		0.69
237		-----		-----	1279	D3338	43.39		0.08
238		-----		-----	1284	D3338	43.3847		-0.25
254	D3338	43.39		0.08	1299	D3338	43.38		-0.53
256		-----		-----	1316		-----		-----
258		-----		-----	1318	D3338	43.388		-0.05
273		-----		-----	1320	D3338	43.387		-0.11
311		-----		-----	1347	D3338	43.389		0.02
317		-----		-----	1348	D3338	43.38		-0.53
323	D3338	43.395		0.38	1399		-----		-----
334		-----		-----	1412		-----		-----
335		-----		-----	1417		-----		-----
336		-----		-----	1441	D3338	43.38		-0.53
353		-----		-----	1448		-----		-----
369	D3338	43.378		-0.65	1496	D3338	43.390		0.08
370	D3338	43.3959		0.44	1520	D3338	43.3880		-0.05
372	D3338	43.394		0.32	1538		-----		-----
391	D3338	43.5	R(0.01)	6.77	1586	D3338	43.271	R(0.01)	-7.17
399		-----		-----	1587		-----		-----
440		-----		-----	1610	D3338	43.395		0.38
445	D3338	43.402		0.81	1613	D3338	43.37536		-0.81
447	D3338	43.391		0.14	1631	D3338	43.405		0.99
448	D3338	43.406		1.05	1634	D3338	43.3825		-0.38
453	D3338	43.370		-1.14	1636	D3338	43.3893		0.03
463	D3338	43.42		1.90	1694		-----		-----
468		-----		-----	1715		-----		-----
485		-----		-----	1720		-----		-----
496		-----		-----	1724		-----		-----
603		-----		-----	1741	D3338	43.3839		-0.29
631	D3338	43.4005		0.72	1776	D3338	43.378		-0.65
633		-----		-----	1810	D3338	43.38		-0.53
657	D3338	43.4		0.69	1811	D3338	43.3729		-0.96
671		-----		-----	1833	D3338	43.4		0.69
704	D3338	43.3723		-1.00	1881		-----		-----
732		-----		-----	1883		-----		-----
798		-----		-----	1913	D3338	43.38		-0.53
823	D3338	43.411		1.35	1944		-----		-----
846	GB/T2429	43.387		-0.11	1961		-----		-----
851	D3338	43.362		-1.63	2129	D3338	43.369		-1.20
854	D3338	43.391		0.14	2130	D3338	43.396		0.44
862	D3338	43.380		-0.53	6040		-----		-----
869	D3338	43.4123		1.43	6041	D3338	43.389		0.02
873		-----		-----	6103	D3338	43.3785		-0.62
875	D3338	43.39		0.08	6135	D3338	43.411		1.35
904		-----		-----	6147		-----		-----
962		-----		-----	6201	D3338	43.393		0.26
963	D3338	43.384		-0.29	6203	D3338	43.3869		-0.11
970		-----		-----	9090		-----		-----
974	D3338	43.388		-0.05					
994		-----		-----					
995	D3338	43.381		-0.47					
996		-----		-----					
997		-----		-----					
1011		-----		-----					
1016		-----		-----					
1026		-----		-----					
1039	D3338	43.382		-0.41					
1049	D3338	43.38253		-0.38					
1059	D3338	43.396		0.44					

normality	OK
n	71
outliers	3
mean (n)	43.3887
st.dev. (n)	0.01196
R(calc.)	0.0335
st.dev.(D3338:09e2)	0.01643
R(D3338:09e2)	0.046



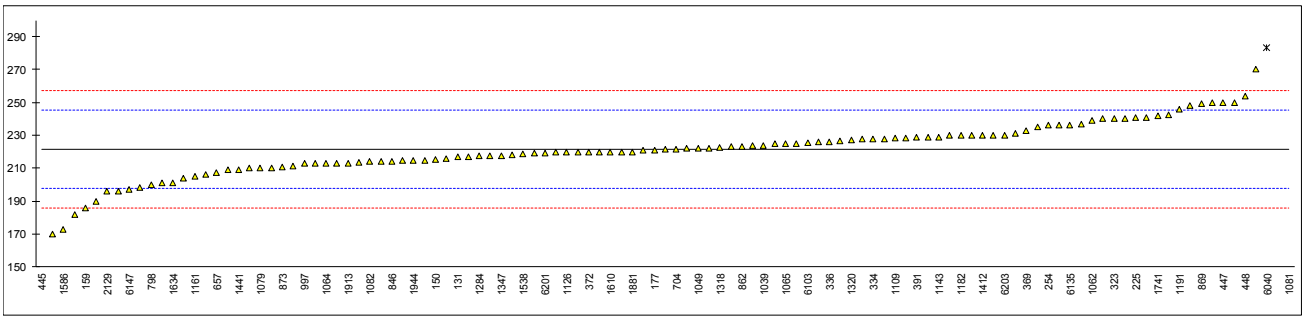


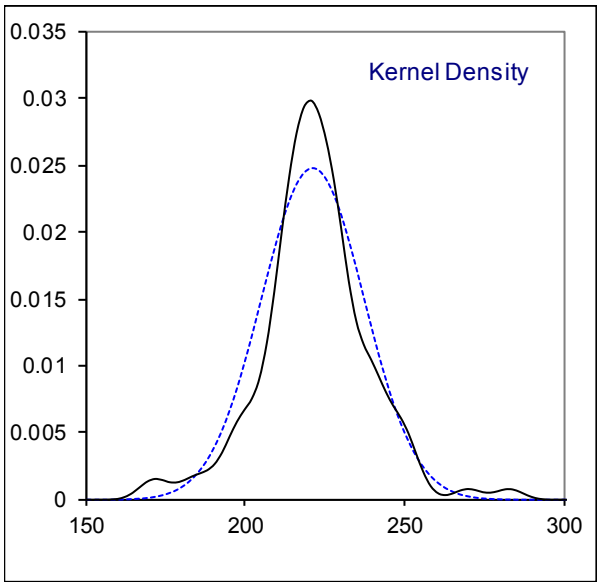
Determination of Sulphur, Total on sample #18160; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5453	213.2		-0.69	1062	D5453	239		1.49
62	D5453	210		-0.95	1064	D5453	213.14		-0.69
120	D4294	424	C,R(0.01)	17.06	1065	IP336	225		0.31
131	D5453	217	C	-0.37	1079	D5453	210		-0.95
140	D2622	223		0.14	1081	D4294	570.54	R(0.01)	29.39
150	D5453	215		-0.53	1082	D4294	214		-0.62
159	D5453	186		-2.97	1097	D5453	221.43		0.01
169	D4294	235.1		1.16	1109	D2622	228.2		0.58
171	D5453	204		-1.46	1121	IP336	240.4	C	1.60
175		-----		-----	1126	ISO20846	219.8		-0.13
177	D4294	221		-0.03	1143	ISO8754	229		0.64
194		-----		-----	1150	ISO20884	231.29	C	0.84
221		-----		-----	1161	ISO20846	205		-1.38
224	D4294	211.42		-0.83	1182	D4294	230		0.73
225	D4294	241		1.65	1191	D4294	246		2.08
228		-----		-----	1201	ISO20884	236		1.23
230	D4294	240		1.57	1275	D4294	215.59		-0.48
237		-----		-----	1279	D4294	236.7		1.29
238	D4294	209		-1.04	1284	D2622	217.3		-0.34
254	D4294	236		1.23	1299	D2622	210	C	-0.95
256		-----		-----	1316	D4294	219.7		-0.14
258	D5453	201		-1.71	1318	D5453	222.5		0.10
273	D5453	217.72		-0.30	1320	ISO20884	227		0.48
311	D2622	218		-0.28	1347	D5453	217.8		-0.30
317		-----		-----	1348	D4294	230		0.73
323	IP336	240		1.57	1399	D4294	181.7		-3.34
334	D5453	228		0.56	1412	D5453	230		0.73
335		-----		-----	1417		-----		-----
336	D5453	226		0.39	1441	D7039	209.1		-1.03
353		-----		-----	1448		-----		-----
369	IP336	233		0.98	1496	D4294	198.2		-1.95
370		-----		-----	1520	D4294	214		-0.62
372	D5453	220		-0.11	1538	D4294	218.7		-0.22
391	D5453	229		0.64	1586	D5453	173		-4.07
399	D5453	225.0		0.31	1587		-----		-----
440	D5453	214.9		-0.54	1610	IP336	220	C	-0.11
445	IP336	0.036	R(0.01)	-18.63	1613	D4294	214.5		-0.58
447	IP336	250		2.41	1631		213.7		-0.64
448	IP336	254		2.75	1634	D5453	201.0		-1.71
453	IP336	270	C	4.10	1636	D4294	228.2		0.58
463	D4294	229.0		0.64	1694		-----		-----
468		-----		-----	1715		-----		-----
485	D4294	227.92		0.55	1720	D5453	217	C	-0.37
496		-----		-----	1724	D5453	220		-0.11
603		-----		-----	1741	D5453	242		1.74
631	D4294	226		0.39	1776	D5453	223.6		0.19
633		-----		-----	1810	D5453	228		0.56
657	D5453	207.243		-1.19	1811	D5453	241		1.65
671	D5453	242.55		1.79	1833	ISO20846	230		0.73
704	D4294	221.7		0.03	1881	D5453	220		-0.11
732	D4294	221		-0.03	1883		-----		-----
798	D4294	200		-1.80	1913	D4294	213.2		-0.69
823	D5453	222		0.06	1944	D5453	214.81		-0.55
846	SH/T0689	214.3		-0.59	1961		-----		-----
851	D4294	248		2.24	2129	D5453	195.8		-2.15
854	D4294	250		2.41	2130	IP336	170		-4.32
862	D2622	223		0.14	6040	D4294	283	R(0.05)	5.19
869	D4294	249		2.33	6041	D4294	225		0.31
873	ISO20846	211		-0.87	6103	D2622	225.4		0.34
875	D4294	220		-0.11	6135	D5453	236		1.23
904	D4294	196		-2.13	6147	D5453	197.4		-2.02
962		-----		-----	6201	D5453	219.5		-0.15
963	D5453	230		0.73	6203	D2622	230.2		0.75
970	D4294	220		-0.11	9090		-----		-----
974	D4294	222		0.06					
994	D5453	219		-0.20					
995	D5453	213		-0.70					
996	D5453	226.8		0.46					
997	D5453	213		-0.70					
1011	D4294	250		2.41					
1016		-----		-----					
1026	D4294	206		-1.29					
1039	ISO20884	224		0.22					
1049	D5453	222.0	C	0.06					
1059	ISO14596	190		-2.64					

normality	suspect
n	111
outliers	4
mean (n)	221.34
st.dev. (n)	16.120
R(calc.)	45.14
st.dev.(D5453:16e1)	11.881
R(D5453:16e1)	33.27

Lab 120: First reported 0.0203 mg/kg
Lab 131: First reported 18.8
Lab 453: First reported 0.022 mg/kg
Lab 1049: First reported 0.0222 mg/kg
Lab 1121: First reported 299.1
Lab 1150: First reported 147.42
Lab 1299: First reported 0.021 mg/kg
Lab 1610: First reported 0.022 mg/kg
Lab 1720: First reported 288





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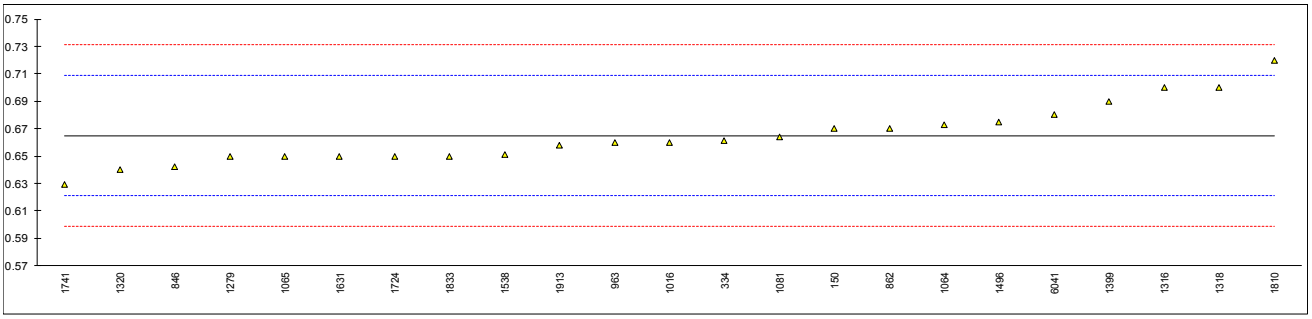
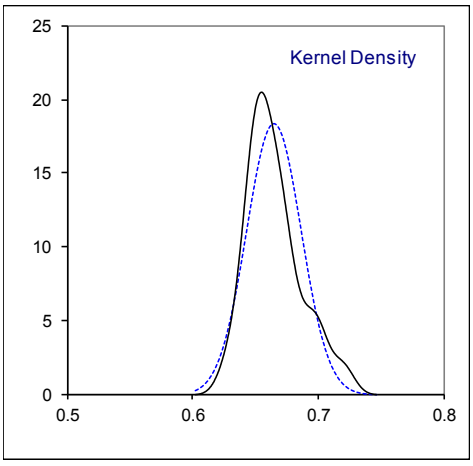
Determination of BOCLE on sample #18161; results in mm

lab	method	value	mark	z(targ)	remarks
150	D5001-semi-automatic	0.67		0.23	
171		-----		-----	
237		-----		-----	
323		-----		-----	
334	D5001-semi-automatic	0.661		-0.18	
496		-----		-----	
846	SH/T0687	0.642		-1.04	
862	D5001-semi-automatic	0.67		0.23	
963	D5001-semi-automatic	0.66		-0.22	
1016	D5001-semi-automatic	0.660		-0.22	
1064	D5001-full-automatic	0.673		0.37	
1065	D5001-semi-automatic	0.65		-0.68	
1081	D5001-semi-automatic	0.664		-0.04	
1279	D5001-semi-automatic	0.65		-0.68	
1316	D5001-semi-automatic	0.70		1.59	
1318	D5001-semi-automatic	0.70		1.59	
1320	D5001-semi-automatic	0.64		-1.13	
1399	D5001-automatic	0.690		1.14	
1496	D5001-semi-automatic	0.675		0.46	
1538	D5001-full-automatic	0.651		-0.63	
1631	D5001-semi-automatic	0.65		-0.68	
1724	D5001-full-automatic	0.65		-0.68	
1741	D5001-full-automatic	0.629		-1.63	
1810	D5001-full-automatic	0.72		2.50	
1833	D5001-semi-automatic	0.65		-0.68	
1913	D5001-full-automatic	0.658		-0.31	
6041	D5001-full-automatic	0.68		0.68	
9090		-----		-----	

			Only semi-automatic	Only full-automatic
	normality	OK	suspect	not OK
	n	23	14	6
	outliers	0	0	17
	mean (n)	0.6649	0.6643	0.6635
	st.dev. (n)	0.02177	0.01794	0.03112
	R(calc.)	0.0610	0.0502	0.0871
	st.dev.(D5001:10 (semi-automatic))	0.02205	0.02202	-----
	R(D5001:10 (semi-automatic))	0.0617	0.0616	-----
Compare				
	R(D5001:10 (full-automatic))	0.0354	-----	0.0352

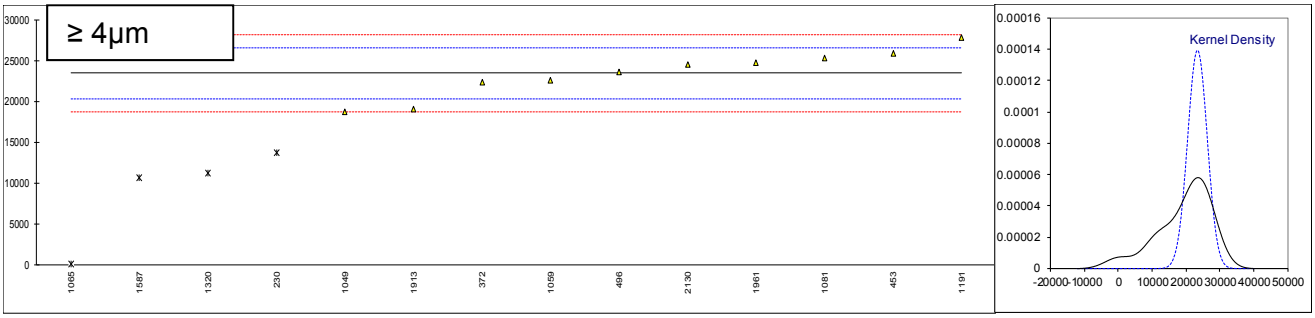


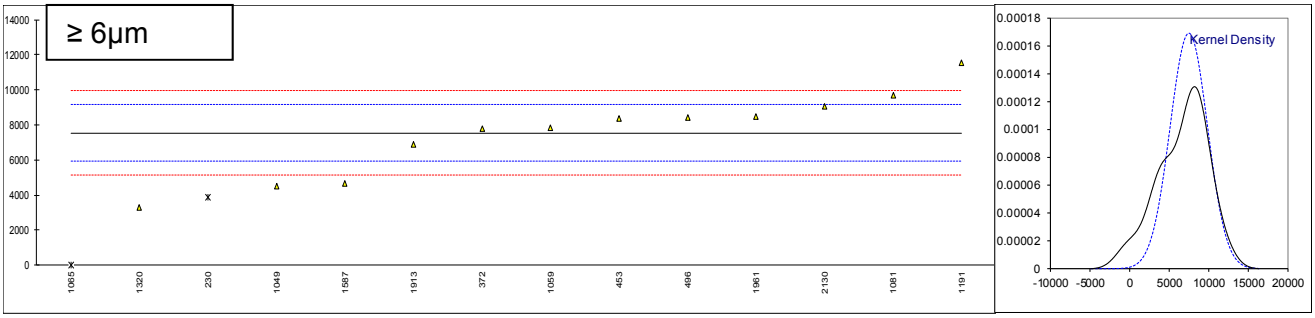


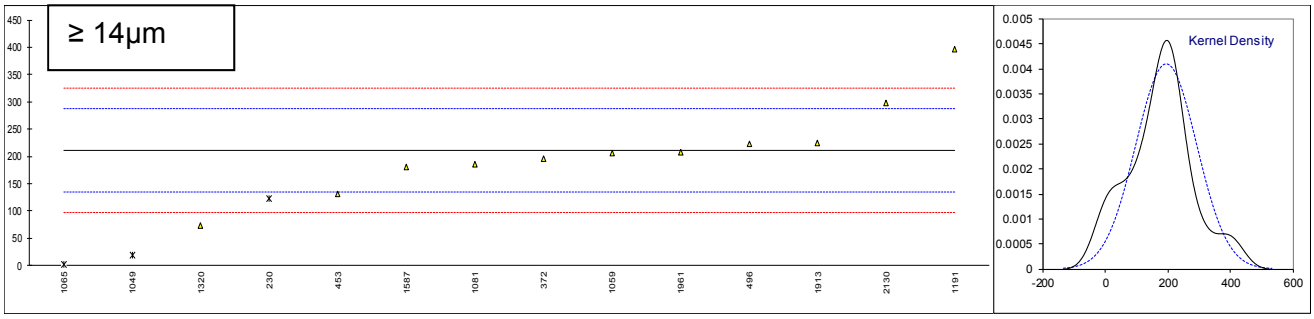
Determination of Particle Size Distribution on sample #18162 acc. to IP564, in (cumulative) counts/ml

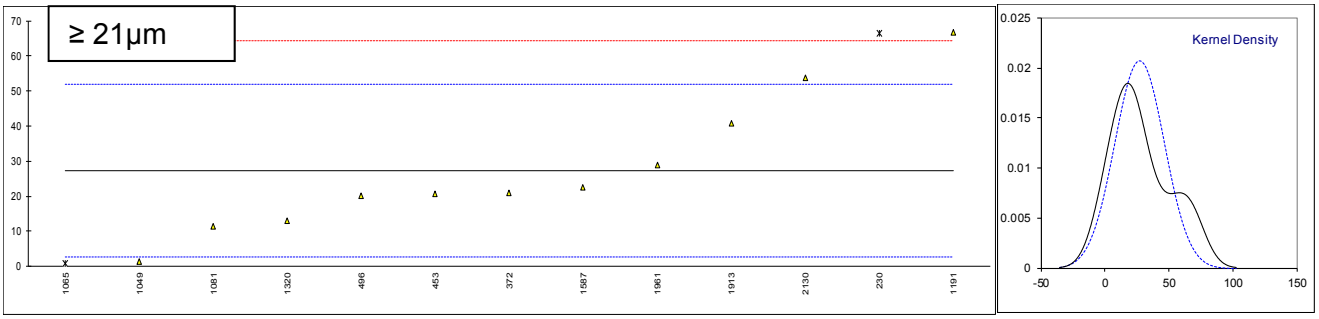
lab	method	≥4 µm	m	≥6 µm	m	≥14 µm	m	≥21 µm	m	≥25 µm	m	≥30 µm	m
140		-----		-----		-----		-----		-----		-----	
150		-----		-----		-----		-----		-----		-----	
171		-----		-----		-----		-----		-----		-----	
225		-----		-----		-----		-----		-----		-----	
230	IP564	13739.2	ex	3853.2	ex	121.9	ex	66.4	ex	60.3	G(1)	56.2	G(1)
237		-----		-----		-----		-----		-----		-----	
311		-----		-----		-----		-----		-----		-----	
323		-----		-----		-----		-----		-----		-----	
334		-----		-----		-----		-----		-----		-----	
335		-----		-----		-----		-----		-----		-----	
372	IP564	22400		7761		195		21		5		1.1	
447		-----		-----		-----		-----		-----		-----	
453	IP564	25839.3		8384.5		130.4		20.7		9.9		5.7	
496	IP564	23559.9		8431.1		223.6		20.1		6.6		1.3	
657		-----		-----		-----		-----		-----		-----	
823		-----		-----		-----		-----		-----		-----	
862		-----		-----		-----		-----		-----		-----	
963		-----		-----		-----		-----		-----		-----	
970		-----		-----		-----		-----		-----		-----	
974		-----		-----		-----		-----		-----		-----	
1011		-----		-----		-----		-----		-----		-----	
1016		-----		-----		-----		-----		-----		-----	
1039		-----		-----		-----		-----		-----		-----	
1049	IP564	18696.8		4487.9		18.5	ex	1.4		0.6		0.1	
1059	IP564	22566		7838		206		-----		-----		-----	
1062		-----		-----		-----		-----		-----		-----	
1064		-----		-----		-----		-----		-----		-----	
1065	IP564	164.4	G(5)	21.4	G(5)	2.1	ex	0.8	ex	0.5	ex	0.3	ex
1081	IP564	25309		9675		186		11.3		3.7		1.2	
1082		-----		-----		-----		-----		-----		-----	
1097		-----		-----		-----		-----		-----		-----	
1109		-----		-----		-----		-----		-----		-----	
1191	IP564	27749		11561		397		66.6		23.0		5.3	
1201		-----		-----		-----		-----		-----		-----	
1279		-----		-----		-----		-----		-----		-----	
1299		-----		-----		-----		-----		-----		-----	
1316		-----		-----		-----		-----		-----		-----	
1320	IP564	11255	G(5)	3308		74		13		6		2	
1402		-----		-----		-----		-----		-----		-----	
1417		-----		-----		-----		-----		-----		-----	
1496		-----		-----		-----		-----		-----		-----	
1538		-----		-----		-----		-----		-----		-----	
1587	IP564	10686.3	G(5)	4667.5		180.8		22.4		9.0		2.9	
1610		-----		-----		-----		-----		-----		-----	
1613		-----		-----		-----		-----		-----		-----	
1631		-----		-----		-----		-----		-----		-----	
1634		-----		-----		-----		-----		-----		-----	
1724		-----		-----		-----		-----		-----		-----	
1741		-----		-----		-----		-----		-----		-----	
1810		-----		-----		-----		-----		-----		-----	
1811		-----		-----		-----		-----		-----		-----	
1833		-----		-----		-----		-----		-----		-----	
1913	IP564	19085.5		6867.8		224.0		40.8		16.6		6.8	
1961	IP564	24767.6		8448.8		207.1		28.9		11.4		3.5	
2130	IP564	24492.8		9063.7		298.5		53.7		20.8		6.5	
6041		-----		-----		-----		-----		-----		-----	
6075		-----		-----		-----		-----		-----		-----	
6103		-----		-----		-----		-----		-----		-----	
6201		-----		-----		-----		-----		-----		-----	
9090		-----		-----		-----		-----		-----		-----	
	normality	OK		OK		not OK		OK		OK		OK	
	n	10		12		11		11		11		11	
	outliers	3 (+1ex)		1 (+1ex)		0 (+3ex)		0 (+2ex)		1 (+1ex)		1 (+1ex)	
	mean (n)	23447		7541.2		211.13		27.264		10.236		3.309	
	st.dev. (n)	2867.6		2363.50		83.474		19.2786		7.1566		2.4006	
	R(calc.)	8029		6617.8		233.73		53.980		20.038		6.722	
	st.dev.(IP564:13)	1561.1		805.68		37.991		12.3465		4.8952		1.9559	
	R(IP564:13)	4371		2255.9		106.38		34.570		13.706		5.477	

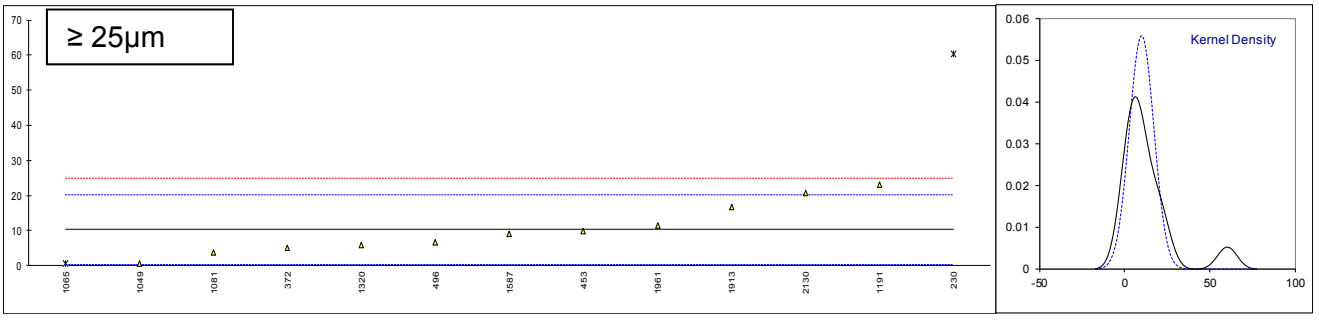
Lab 230: several test results were excluded, see §4.1
Lab 1049: test result was excluded as test result for ISO scale was an outlier
Lab 1065: several test results were excluded, see §4.1

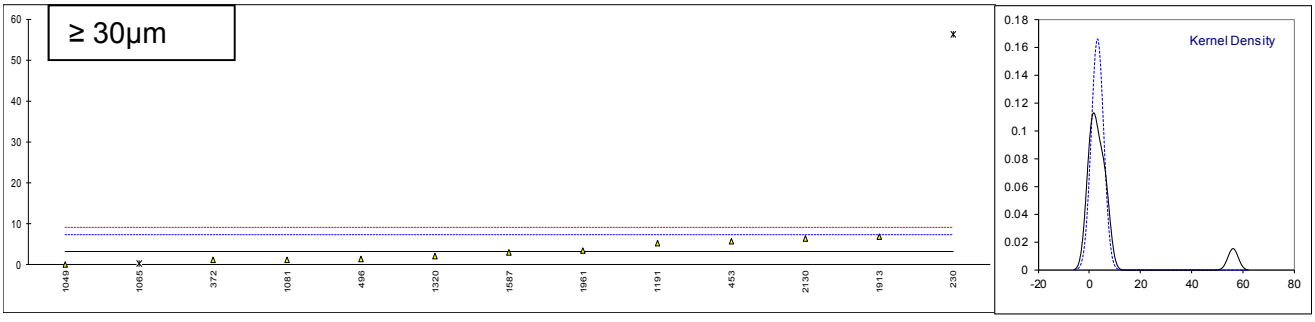

≥ 4µm
Kernel Density


≥ 6µm
Kernel Density


≥ 14µm
Kernel Density


≥ 21µm
Kernel Density


≥ 25µm
Kernel Density


≥ 30µm
Kernel Density

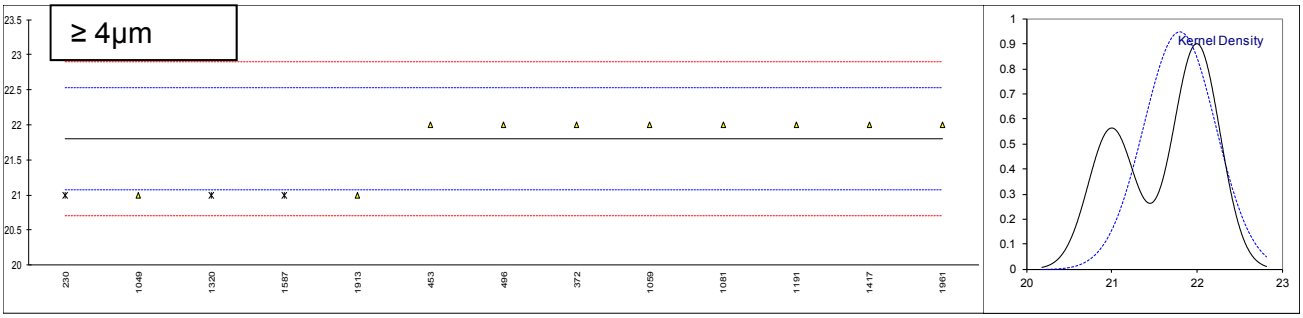
Determination of Particle Size Distribution on sample #18162 acc. to IP564, in (cumulative) counts/ml
z-scores

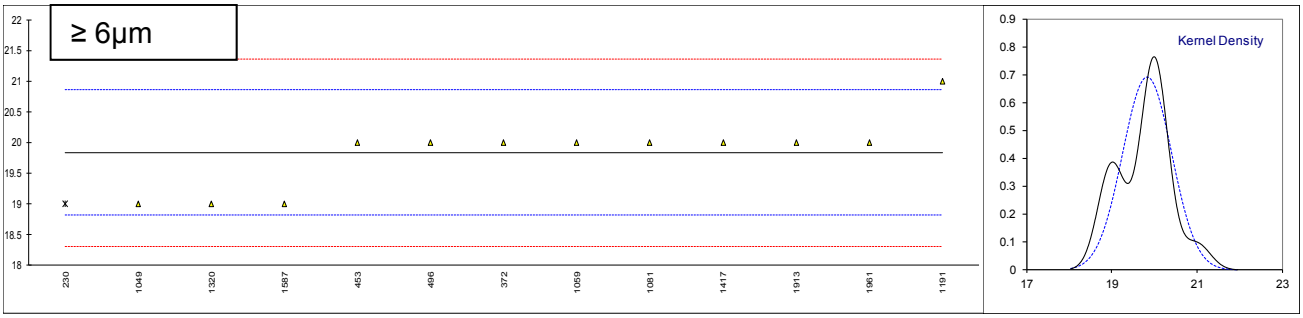
	Apparatus	≥4 µm	≥6 µm	≥14 µm	≥21 µm	≥25 µm	≥30 µm
140		-----	-----	-----	-----	-----	-----
150		-----	-----	-----	-----	-----	-----
171		-----	-----	-----	-----	-----	-----
225		-----	-----	-----	-----	-----	-----
230	Parker Hannifin	-6.22	-4.58	-2.35	3.17	10.23	27.04
237		-----	-----	-----	-----	-----	-----
311		-----	-----	-----	-----	-----	-----
323		-----	-----	-----	-----	-----	-----
334		-----	-----	-----	-----	-----	-----
335		-----	-----	-----	-----	-----	-----
372	Parker Hannifin	-0.67	0.27	-0.42	-0.51	-1.07	-1.13
447		-----	-----	-----	-----	-----	-----
453	Parker Hannifin	1.53	1.05	-2.12	-0.53	-0.07	1.22
496	Parker Hannifin	0.07	1.10	0.33	-0.58	-0.74	-1.03
657		-----	-----	-----	-----	-----	-----
823		-----	-----	-----	-----	-----	-----
862		-----	-----	-----	-----	-----	-----
963		-----	-----	-----	-----	-----	-----
970		-----	-----	-----	-----	-----	-----
974		-----	-----	-----	-----	-----	-----
1011		-----	-----	-----	-----	-----	-----
1016		-----	-----	-----	-----	-----	-----
1039		-----	-----	-----	-----	-----	-----
1049	Parker Hannifin	-3.04	-3.79	-5.07	-2.09	-1.97	-1.64
1059	Parker Hannifin	-0.56	0.37	-0.13	-----	-----	-----
1062		-----	-----	-----	-----	-----	-----
1064		-----	-----	-----	-----	-----	-----
1065	Parker Hannifin	-14.91	-9.33	-5.50	-2.14	-1.99	-1.54
1081	Parker Hannifin	1.19	2.65	-0.66	-1.29	-1.34	-1.08
1082		-----	-----	-----	-----	-----	-----
1097	Parker Hannifin	-----	-----	-----	-----	-----	-----
1109		-----	-----	-----	-----	-----	-----
1191	Parker Hannifin	2.76	4.99	4.89	3.19	2.61	1.02
1201		-----	-----	-----	-----	-----	-----
1279		-----	-----	-----	-----	-----	-----
1299		-----	-----	-----	-----	-----	-----
1316		-----	-----	-----	-----	-----	-----
1320	Parker Hannifin	-7.81	-5.25	-3.61	-1.16	-0.87	-0.67
1402		-----	-----	-----	-----	-----	-----
1417		-----	-----	-----	-----	-----	-----
1496		-----	-----	-----	-----	-----	-----
1538		-----	-----	-----	-----	-----	-----
1587	Parker Hannifin	-8.17	-3.57	-0.80	-0.39	-0.25	-0.21
1610		-----	-----	-----	-----	-----	-----
1613		-----	-----	-----	-----	-----	-----
1631		-----	-----	-----	-----	-----	-----
1634		-----	-----	-----	-----	-----	-----
1724		-----	-----	-----	-----	-----	-----
1741		-----	-----	-----	-----	-----	-----
1810		-----	-----	-----	-----	-----	-----
1811		-----	-----	-----	-----	-----	-----
1833		-----	-----	-----	-----	-----	-----
1913	Parker Hannifin	-2.79	-0.84	0.34	1.10	1.30	1.78
1961	Parker Hannifin	0.85	1.13	-0.11	0.13	0.24	0.10
2130	Parker Hannifin	0.67	1.89	2.30	2.14	2.16	1.63
6041		-----	-----	-----	-----	-----	-----
6075		-----	-----	-----	-----	-----	-----
6103		-----	-----	-----	-----	-----	-----
6201		-----	-----	-----	-----	-----	-----
9090		-----	-----	-----	-----	-----	-----

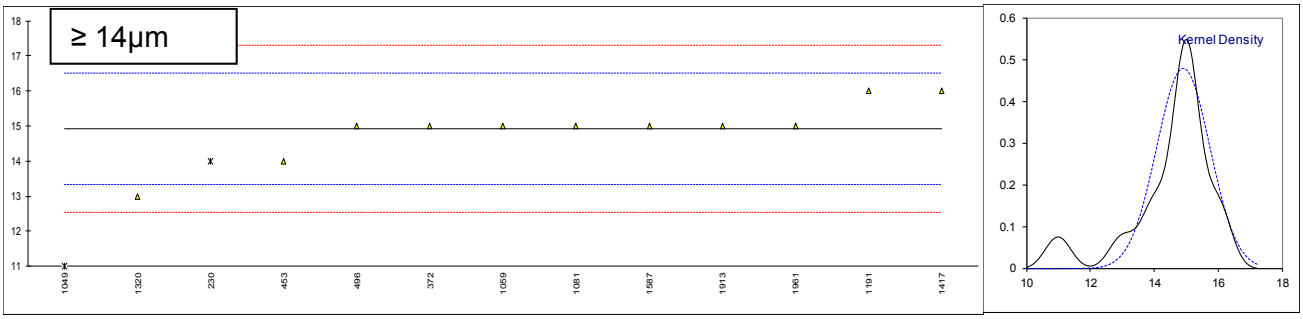
Determination of Particle Size Distribution on sample #18162 acc. to IP564, in ISO scale numbers

lab	method	≥4 µm	mark	z(targ)	≥6 µm	mark	z(targ)	≥14 µm	mark	z(targ)
140		-----		-----	-----		-----	-----		-----
150		-----		-----	-----		-----	-----		-----
171		-----		-----	-----		-----	-----		-----
225		-----		-----	-----		-----	-----		-----
230	ISO4406	21	ex	-2.19	19	ex	-1.63	14	ex	-1.15
237		-----		-----	-----		-----	-----		-----
311		-----		-----	-----		-----	-----		-----
323		-----		-----	-----		-----	-----		-----
334		-----		-----	-----		-----	-----		-----
335		-----		-----	-----		-----	-----		-----
372	ISO4406	22		0.55	20		0.33	15		0.11
447		-----		-----	-----		-----	-----		-----
453	ISO4406 acc. to IP564	22		0.55	20		0.33	14		-1.15
496	ISO4406	22		0.55	20		0.33	15		0.11
657		-----		-----	-----		-----	-----		-----
823		-----		-----	-----		-----	-----		-----
862		-----		-----	-----		-----	-----		-----
963		-----		-----	-----		-----	-----		-----
970		-----		-----	-----		-----	-----		-----
974		-----		-----	-----		-----	-----		-----
1011		-----		-----	-----		-----	-----		-----
1016		-----		-----	-----		-----	-----		-----
1039		-----		-----	-----		-----	-----		-----
1049	ISO4406 acc. to IP564	21		-2.19	19		-1.63	11	G(0.05)	-4.93
1059	ISO4406 acc. to IP564	22		0.55	20		0.33	15		0.11
1062		-----		-----	-----		-----	-----		-----
1064		-----		-----	-----		-----	-----		-----
1065		-----		-----	-----		-----	-----		-----
1081	ISO4406 acc. to IP564	22		0.55	20		0.33	15		0.11
1082		-----		-----	-----		-----	-----		-----
1097		-----		-----	-----		-----	-----		-----
1109		-----		-----	-----		-----	-----		-----
1191	ISO4406	22		0.55	21		2.29	16		1.37
1201		-----		-----	-----		-----	-----		-----
1279		-----		-----	-----		-----	-----		-----
1299		-----		-----	-----		-----	-----		-----
1316		-----		-----	-----		-----	-----		-----
1320		21	ex	-2.19	19		-1.63	13		-2.41
1402		-----		-----	-----		-----	-----		-----
1417	ISO4406	22		0.55	20		0.33	16		1.37
1496		-----		-----	-----		-----	-----		-----
1538		-----		-----	-----		-----	-----		-----
1587	ISO4406 acc. to IP564	21	ex	-2.19	19		-1.63	15		0.11
1610		-----		-----	-----		-----	-----		-----
1613		-----		-----	-----		-----	-----		-----
1631		-----		-----	-----		-----	-----		-----
1634		-----		-----	-----		-----	-----		-----
1724		-----		-----	-----		-----	-----		-----
1741		-----		-----	-----		-----	-----		-----
1810		-----		-----	-----		-----	-----		-----
1811		-----		-----	-----		-----	-----		-----
1833		-----		-----	-----		-----	-----		-----
1913		21		-2.19	20		0.33	15		0.11
1961	ISO4406 acc. to IP564	22		0.55	20		0.33	15		0.11
2130		-----		-----	-----		-----	-----		-----
6041		-----		-----	-----		-----	-----		-----
6075		-----		-----	-----		-----	-----		-----
6103		-----		-----	-----		-----	-----		-----
6201		-----		-----	-----		-----	-----		-----
9090		-----		-----	-----		-----	-----		-----
	normality	suspect			OK			not OK		
	n	10			12			11		
	outliers	0 (+3ex)			0 (+1ex)			2		
	mean (n)	21.8			19.8			14.9		
	st.dev. (n)	0.42			0.58			0.83		
	R(calc.)	1.2			1.6			2.3		
	st.dev.(IP564:13)	0.36			0.51			0.79		
	R(IP564:13)	1.0			1.4			2.2		

ex = test result is excluded as test result reported for (cumulative) counts is a statistical outlier


≥ 4µm
Kernel Density

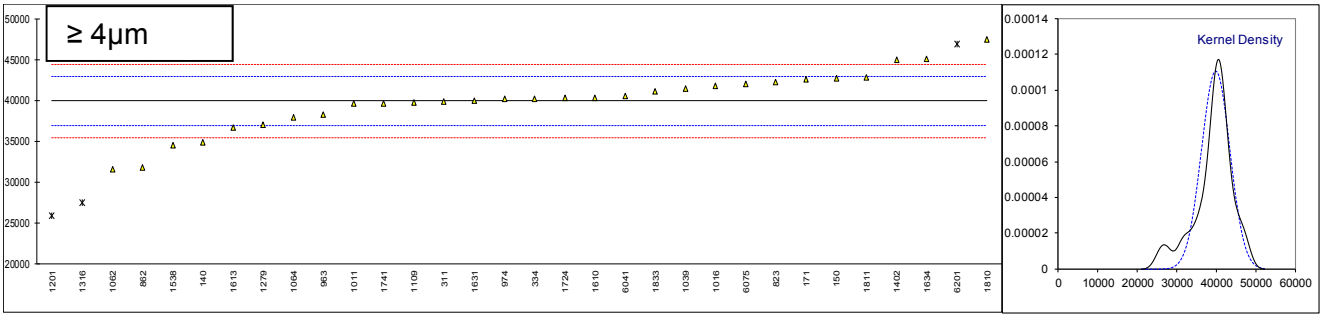

≥ 6µm
Kernel Density

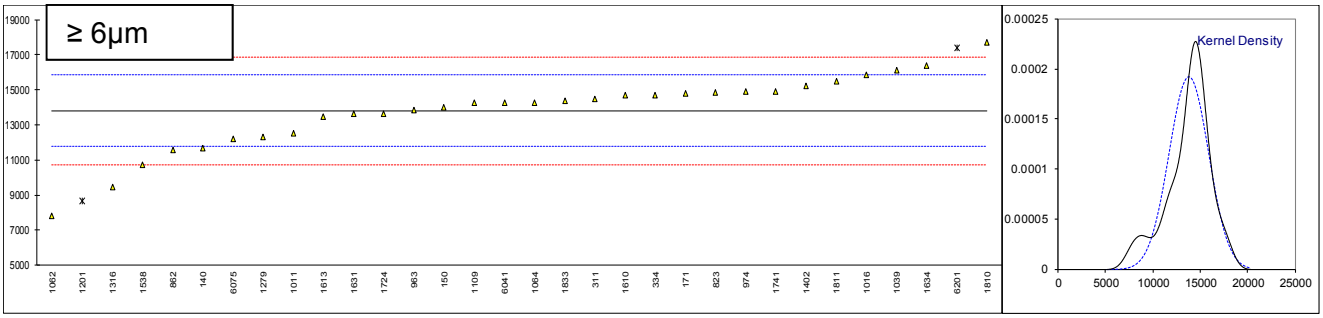

≥ 14µm
Kernel Density

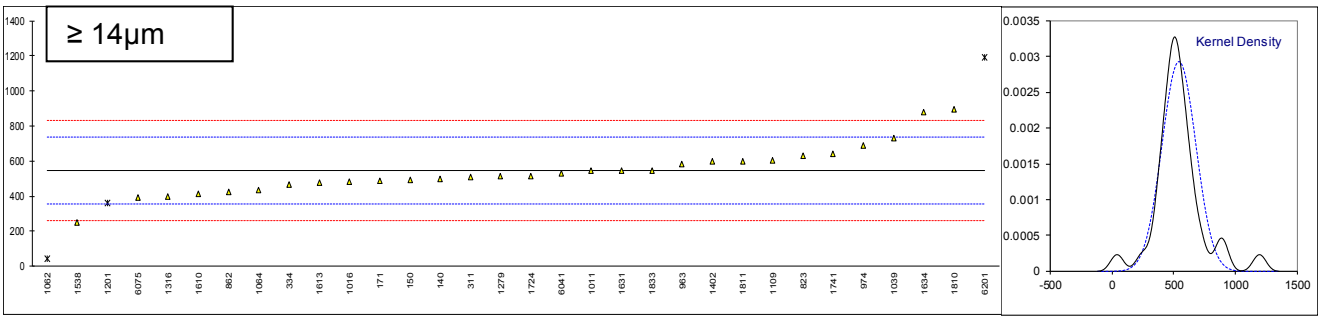
Determination of Particle Size Distribution on sample #18162 acc. to IP565, in (cumulative) counts/ml

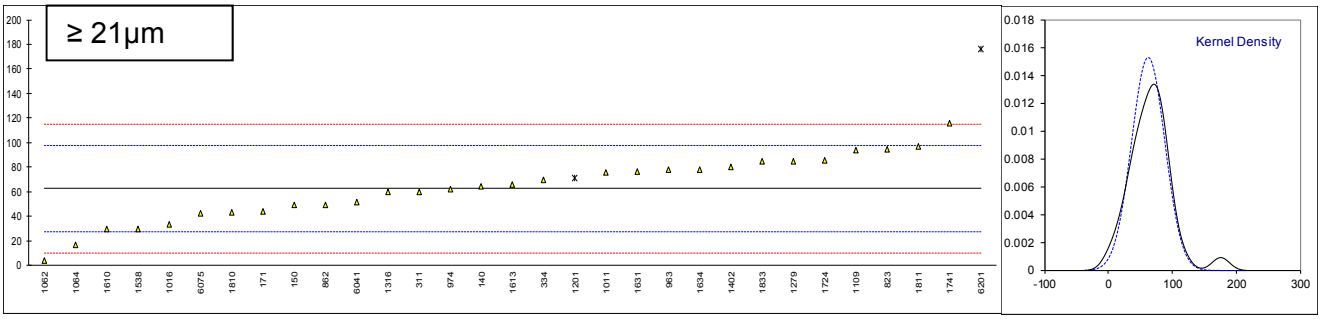
lab	method		≥4 µm	m	≥6 µm	m	≥14 µm	m	≥21 µm	m	≥25 µm	m	≥30 µm	m
140	IP565	C	34886		11666		498		64		23		7	
150	IP565		42736		14010		494		49		11		3	
171	IP565	C	42583		14815		488		44		9		4	
225			-----		-----		-----		-----		-----		-----	
230			-----		-----		-----		-----		-----		-----	
237			-----		-----		-----		-----		-----		-----	
311	IP565		39900	C	14500	C	510	C	60	C	15	C	5	C
323			-----		-----		-----		-----		-----		-----	
334	IP565		40249.8		14704		466.8		69.5		28.6		9.5	
335			-----		-----		-----		-----		-----		-----	
372			-----		-----		-----		-----		-----		-----	
447			-----		-----		-----		-----		-----		-----	
453			-----		-----		-----		-----		-----		-----	
496			-----		-----		-----		-----		-----		-----	
657			-----		-----		-----		-----		-----		-----	
823	IP565		42217.3		14836.9		629.2		94.3		34.1		11.6	
862	IP577	C	31854		11553		424		49		14		3	
963	IP565		38314.0		13867.3		580.9		77.8		21.2		5.0	
970			-----		-----		-----		-----		-----		-----	
974	IP565		40161		14896		688		62		21		7	
1011	IP565		39584.1		12517.5		544.3		75.4		27.4		9.1	
1016	IP565		41802.0		15844.5		484.6		33.3		7.4		2.3	
1039	IP565		41426.5		16096.4		730.0		-----	W	-----	W	-----	W
1049			-----		-----		-----		-----		-----		-----	
1059			-----		-----		-----		-----		-----		-----	
1062	IP565		31563	C	7797	C	44.7	C,R(5)	4.1	C	1.2	C	0.7	C
1064	IP565		37932.8		14288.5		436.3		16.4		2.8		0.7	
1065			-----		-----		-----		-----		-----		-----	
1081			-----		-----		-----		-----		-----		-----	
1082			-----		-----		-----		-----		-----		-----	
1097			-----		-----		-----		-----		-----		-----	
1109	IP565		39782.8		14245.2		601.7		94.1		32.1		10.7	
1191			-----		-----		-----		-----		-----		-----	
1201	IP565		25924.3	G(5)	8665.2	ex	358.8	ex	71.4	ex	36.7	ex	23.3	R(1)
1279	IP565		37066.8		12301.2		512.9		85.0		31.6		9.1	
1299			-----		-----		-----		-----		-----		-----	
1316	IP577		27505.7	G(5)	9427.0		397.8		59.9		22.1		4.7	
1320			-----		-----		-----		-----		-----		-----	
1402	IP565		44921.8		15196.3		597.9		80.1		22.6		6.0	
1417			-----		-----		-----		-----		-----		-----	
1496			-----	W	-----	W	-----	W	-----	W	-----	W	-----	W
1538	IP565		34582.2		10736.1		248.6		29.5		9.8		3.5	
1587			-----		-----		-----		-----		-----		-----	
1610	IP565		40319.8		14689.7		414.2		29.4		8.4		2.7	
1613	IP565		36685.8		13462.2		477.9		65.7		21.0		7.9	
1631	IP565		40000.9		13627		546		76.8		26		6.6	
1634	IP565		45078		16377		878		78		31		11	
1724	IP565		40294		13633		513		85.2		33		8.7	
1741	IP565		39651.3		14926.2		640.3		116.0		43.2		14.0	
1810	IP565		47417.5		17711.1		897.2		43	C	15	C	5	C
1811	IP565		42826.0		15490.8		601.1		96.5		34.1		9.9	
1833	IP565		41151		14397		548		84.8		31.8		9.1	
1913			-----		-----		-----		-----		-----		-----	
1961			-----		-----		-----		-----		-----		-----	
2130			-----		-----		-----		-----		-----		-----	
6041	IP565		40580.8		14249.5		528.5		51.6		17.1		3.8	
6075	IP565		41960.7		12220.9		390.3		42.3		15.1		4.9	
6103			-----		-----		-----		-----		-----		-----	
6201	IP565		46933.4	ex	17408.1	ex	1192.7	R(5)	176.4	R(1)	24.8	ex	5.9	ex
9090			-----		-----		-----		-----		-----		-----	
	normality		OK		suspect		suspect		OK		OK		OK	
	n		29		30		29		29		29		29	
	outliers		2 (+1ex)		0 (+2ex)		2 (+1ex)		1 (+1ex)		0 (+2ex)		0 (+2ex)	
	mean (n)		39915		13803		543.7		62.64		21.02		6.397	
	st.dev. (n)		3600.8		2073.0		136.16		26.024		10.642		3.4184	
	R(calc.)		10082		5804		381.2		72.87		29.80		9.571	
	st.dev.(IP565:13)		1490.8		1018.0		95.21		17.568		7.478		3.1480	
	R(IP565:13)		4174		2851		266.6		49.19		20.94		8.814	

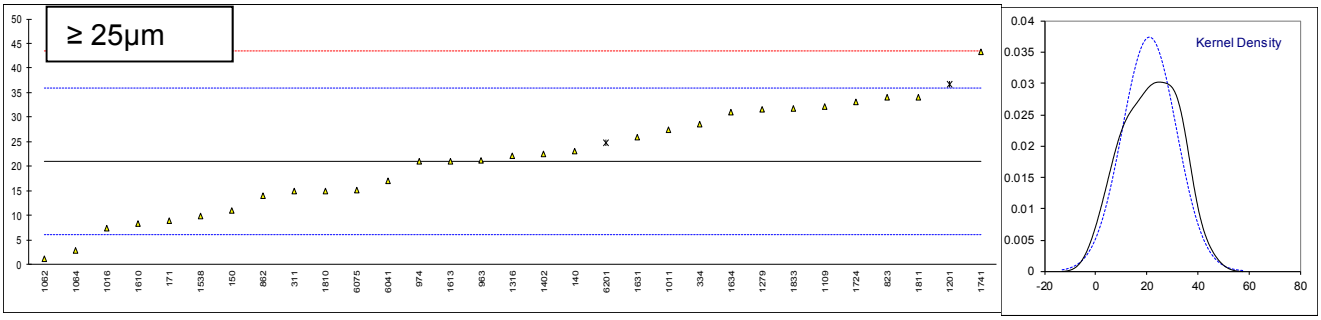
Lab 140 and 171: test results were reported by using Stanhope-Seta apparatus, which is IP565, therefore test method was adapted
Lab 862: test results were reported by using Pamas apparatus, which is IP577, therefore test method was adapted
Lab 311: First reported 93320, 14993, 747, 170, 73, 32
Lab 1039: test results withdrawn, reported 146.6, 59.9, 21
Lab 1062: First reported 34207, 10047, 237, 17.9, 7.4, 3.7
Lab 1496: test results withdrawn, reported 1060.5, 108.2, 7.5, 1.2, 0.6, 0.3
Lab 1810: First reported 174.2, 83.4, 32.2
ex = test result excluded, see §4.1

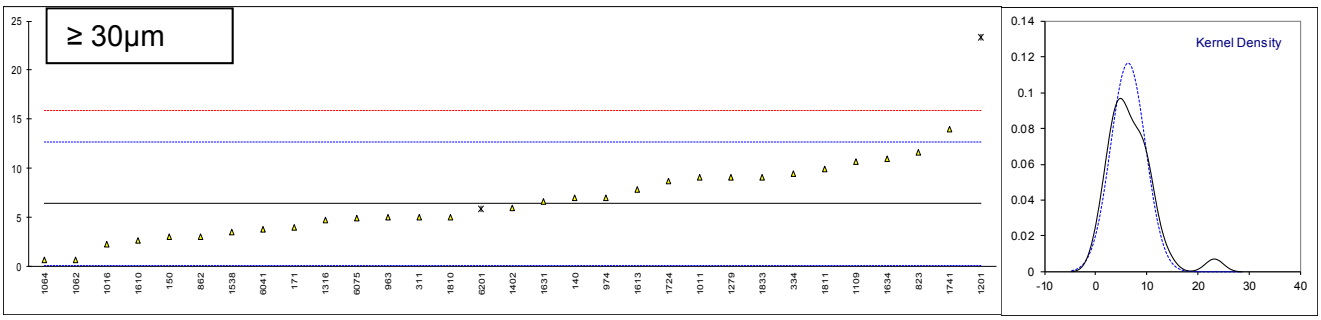

≥ 4µm
Kernel Density


≥ 6µm
Kernel Density


≥ 14µm
Kernel Density


≥ 21µm
Kernel Density


≥ 25µm
Kernel Density


≥ 30µm
Kernel Density

Determination of Particle Size Distribution on sample #18162 acc. to IP565, in (cumulative) counts/ml
z-scores

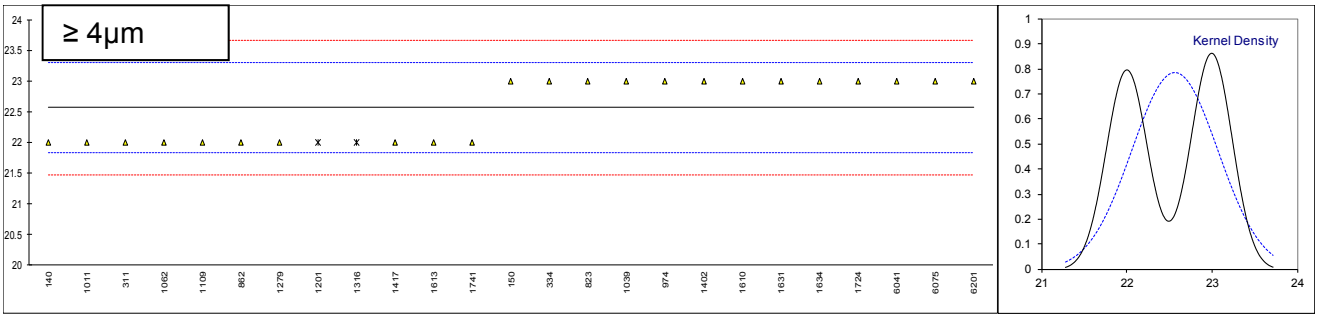
	Apparatus	≥4 µm	≥6 µm	≥14 µm	≥21 µm	≥25 µm	≥30 µm
140	Stanhope-Seta	-3.37	-2.10	-0.48	0.08	0.26	0.19
150	Stanhope-Seta	1.89	0.20	-0.52	-0.78	-1.34	-1.08
171	Stanhope-Seta	1.79	0.99	-0.59	-1.06	-1.61	-0.76
225		-----	-----	-----	-----	-----	-----
230		-----	-----	-----	-----	-----	-----
237		-----	-----	-----	-----	-----	-----
311	Stanhope-Seta	-0.01	0.68	-0.35	-0.15	-0.81	-0.44
323		-----	-----	-----	-----	-----	-----
334	Stanhope-Seta	0.22	0.89	-0.81	0.39	1.01	0.99
335		-----	-----	-----	-----	-----	-----
372		-----	-----	-----	-----	-----	-----
447		-----	-----	-----	-----	-----	-----
453		-----	-----	-----	-----	-----	-----
496		-----	-----	-----	-----	-----	-----
657		-----	-----	-----	-----	-----	-----
823	Stanhope-Seta	1.54	1.02	0.90	1.80	1.75	1.65
862	Pamas	-5.41	-2.21	-1.26	-0.78	-0.94	-1.08
963	Stanhope-Seta	-1.07	0.06	0.39	0.86	0.02	-0.44
970		-----	-----	-----	-----	-----	-----
974	Stanhope-Seta	0.17	1.07	1.52	-0.04	0.00	0.19
1011	Stanhope-Seta	-0.22	-1.26	0.01	0.73	0.85	0.86
1016	Stanhope-Seta	1.27	2.01	-0.62	-1.67	-1.82	-1.30
1039	Stanhope-Seta	1.01	2.25	1.96	-----	-----	-----
1049		-----	-----	-----	-----	-----	-----
1059		-----	-----	-----	-----	-----	-----
1062	Stanhope-Seta	-5.60	-5.90	-5.24	-3.33	-2.65	-1.81
1064	Stanhope-Seta	-1.33	0.48	-1.13	-2.63	-2.44	-1.81
1065		-----	-----	-----	-----	-----	-----
1081		-----	-----	-----	-----	-----	-----
1082		-----	-----	-----	-----	-----	-----
1097		-----	-----	-----	-----	-----	-----
1109	Stanhope-Seta	-0.09	0.43	0.61	1.79	1.48	1.37
1191		-----	-----	-----	-----	-----	-----
1201	Stanhope-Seta	-9.38	-5.05	-1.94	0.50	2.10	5.37
1279		-1.91	-1.47	-0.32	1.27	1.41	0.86
1299		-----	-----	-----	-----	-----	-----
1316	Pamas	-8.32	-4.30	-1.53	-0.16	0.14	-0.54
1320		-----	-----	-----	-----	-----	-----
1402	Stanhope-Seta	3.36	1.37	0.57	0.99	0.21	-0.13
1417		-----	-----	-----	-----	-----	-----
1496	Stanhope-Seta	-----	-----	-----	-----	-----	-----
1538	Stanhope-Seta	-3.58	-3.01	-3.10	-1.89	-1.50	-0.92
1587		-----	-----	-----	-----	-----	-----
1610	Stanhope-Seta	0.27	0.87	-1.36	-1.89	-1.69	-1.17
1613	Stanhope-Seta	-2.17	-0.33	-0.69	0.17	0.00	0.48
1631	Stanhope-Seta	0.06	-0.17	0.02	0.81	0.67	0.06
1634	Stanhope-Seta	3.46	2.53	3.51	0.87	1.33	1.46
1724	Stanhope-Seta	0.25	-0.17	-0.32	1.28	1.60	0.73
1741	Stanhope-Seta	-0.18	1.10	1.01	3.04	2.97	2.42
1810	Stanhope-Seta	5.03	3.84	3.71	-1.12	-0.81	-0.44
1811	Stanhope-Seta	1.95	1.66	0.60	1.93	1.75	1.11
1833	Stanhope-Seta	0.83	0.58	0.05	1.26	1.44	0.86
1913		-----	-----	-----	-----	-----	-----
1961		-----	-----	-----	-----	-----	-----
2130		-----	-----	-----	-----	-----	-----
6041	Stanhope-Seta	0.45	0.44	-0.16	-0.63	-0.52	-0.82
6075	Stanhope-Seta	1.37	-1.55	-1.61	-1.16	-0.79	-0.48
6103		-----	-----	-----	-----	-----	-----
6201	Stanhope-Seta	4.71	3.54	6.82	6.48	0.51	-0.16
9090		-----	-----	-----	-----	-----	-----

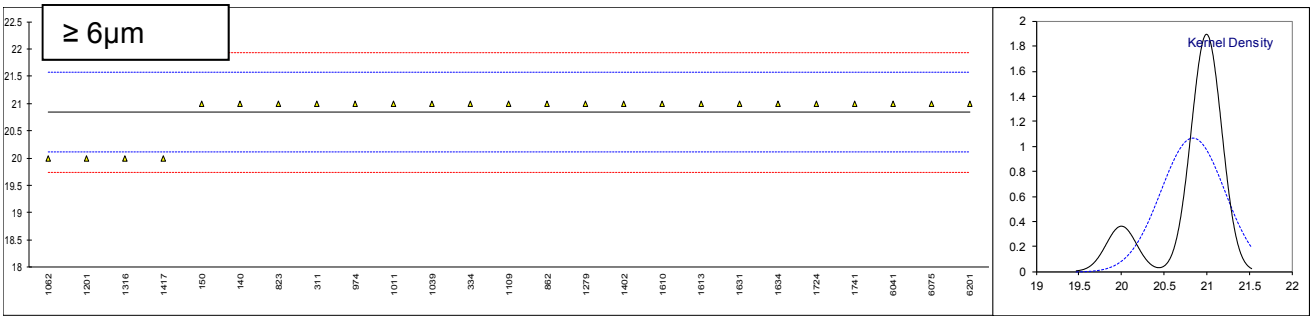
Determination of Particle Size Distribution on sample #18162 acc. to IP565, in ISO scale numbers

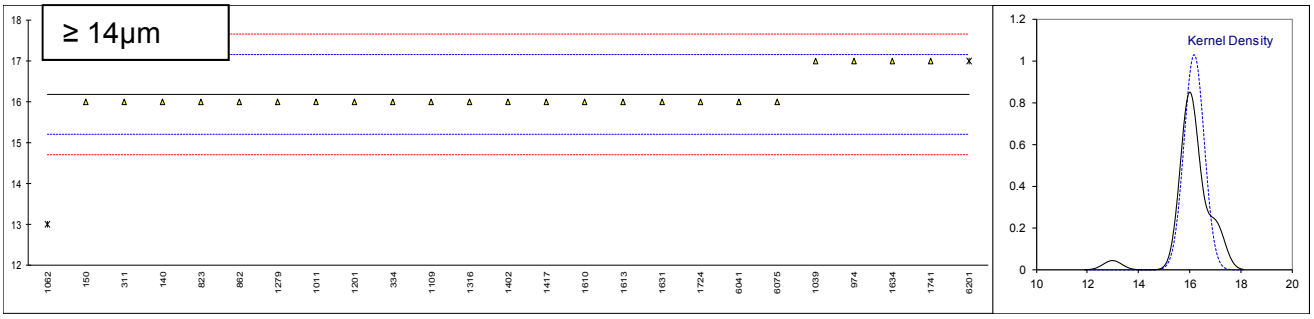
lab	method	≥4 µm	mark	z(targ)	≥6 µm	mark	z(targ)	≥14 µm	mark	z(targ)
140	ISO4406	22		-1.54	21		0.44	16		-0.42
150		23		1.19	21		0.44	16		-0.42
171		-----		-----	-----		-----	-----		-----
225		-----		-----	-----		-----	-----		-----
230		-----		-----	-----		-----	-----		-----
237		-----		-----	-----		-----	-----		-----
311	ISO4406 acc. to IP565	22		-1.54	21		0.44	16	C	-0.42
323		-----		-----	-----		-----	-----		-----
334	ISO4406 acc. to IP565	23		1.19	21		0.44	16		-0.42
335		-----		-----	-----		-----	-----		-----
372		-----		-----	-----		-----	-----		-----
447		-----		-----	-----		-----	-----		-----
453		-----		-----	-----		-----	-----		-----
496		-----		-----	-----		-----	-----		-----
657		-----		-----	-----		-----	-----		-----
823	ISO4406 acc. to IP565	23		1.19	21		0.44	16		-0.42
862	ISO4406	22		-1.54	21		0.44	16		-0.42
963		-----		-----	-----		-----	-----		-----
970		-----		-----	-----		-----	-----		-----
974	ISO4406 acc. to IP565	23	C	1.19	21		0.44	17		1.61
1011		22		-1.54	21		0.44	16		-0.42
1016		-----		-----	-----		-----	-----		-----
1039	ISO4406 acc. to IP565	23		1.19	21		0.44	17		1.61
1049		-----		-----	-----		-----	-----		-----
1059		-----		-----	-----		-----	-----		-----
1062	ISO4406 acc. to IP565	22		-1.54	20	C	-2.29	13	C,R(1)	-6.54
1064		-----		-----	-----		-----	-----		-----
1065		-----		-----	-----		-----	-----		-----
1081		-----		-----	-----		-----	-----		-----
1082		-----		-----	-----		-----	-----		-----
1097		-----		-----	-----		-----	-----		-----
1109	ISO4406 acc. to IP565	22		-1.54	21		0.44	16		-0.42
1191		-----		-----	-----		-----	-----		-----
1201	ISO4406 acc. to IP565	22	ex	-1.54	20		-2.29	16		-0.42
1279	ISO4406 acc. to IP565	22		-1.54	21		0.44	16		-0.42
1299		-----		-----	-----		-----	-----		-----
1316	ISO4406 acc. to IP577	22	ex	-1.54	20		-2.29	16		-0.42
1320		-----		-----	-----		-----	-----		-----
1402	ISO4406 acc. to IP565	23		1.19	21		0.44	16		-0.42
1417	ISO4406	22		-1.54	20		-2.29	16		-0.42
1496		-----	W	-----	-----	W	-----	-----	W	-----
1538		-----		-----	-----		-----	-----		-----
1587		-----		-----	-----		-----	-----		-----
1610	ISO4406	23		1.19	21		0.44	16		-0.42
1613	ISO4406 acc. to IP565	22		-1.54	21		0.44	16		-0.42
1631	ISO4406 acc. to IP565	23		1.19	21		0.44	16		-0.42
1634	ISO4406	23		1.19	21		0.44	17		1.61
1724	ISO4406 acc. to IP565	23		1.19	21		0.44	16		-0.42
1741	ISO4406 acc. to IP565	22		-1.54	21		0.44	17		1.61
1810		-----		-----	-----		-----	-----		-----
1811		-----		-----	-----		-----	-----		-----
1833		-----		-----	-----		-----	-----		-----
1913		-----		-----	-----		-----	-----		-----
1961		-----		-----	-----		-----	-----		-----
2130		-----		-----	-----		-----	-----		-----
6041	ISO4406 acc. to IP565	23		1.19	21		0.44	16		-0.42
6075	ISO4406 acc. to IP565	23		1.19	21		0.44	16		-0.42
6103		-----		-----	-----		-----	-----		-----
6201	ISO4406	23		1.19	21		0.44	17		1.61
9090		-----		-----	-----		-----	-----		-----

normality	OK	not OK	suspect
n	23	25	24
outliers	0 (+2ex)	0	1
mean (n)	22.6	20.8	16.2
st.dev. (n)	0.51	0.37	0.41
R(calc.)	1.4	1.0	1.2
st.dev.(IP565:13)	0.37	0.37	0.49
R(IP565:13)	1.0	1.0	1.4

Lab 311: first reported 17
Lab 974: first reported 24
Lab1062: first reported 21, 14
Lab 1496: test results withdrawn, reported 17, 14, 10
ex = test result excluded, see §4.1


≥ 4µm
Kernel Density

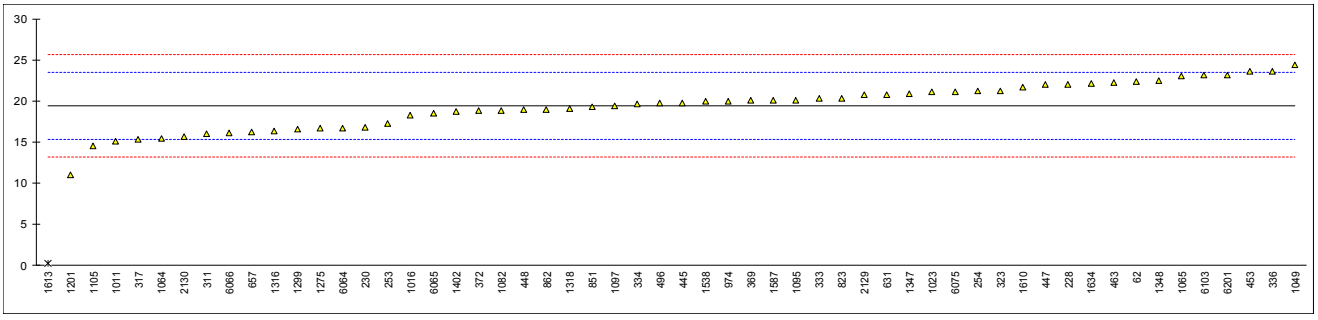

≥ 6µm
Kernel Density

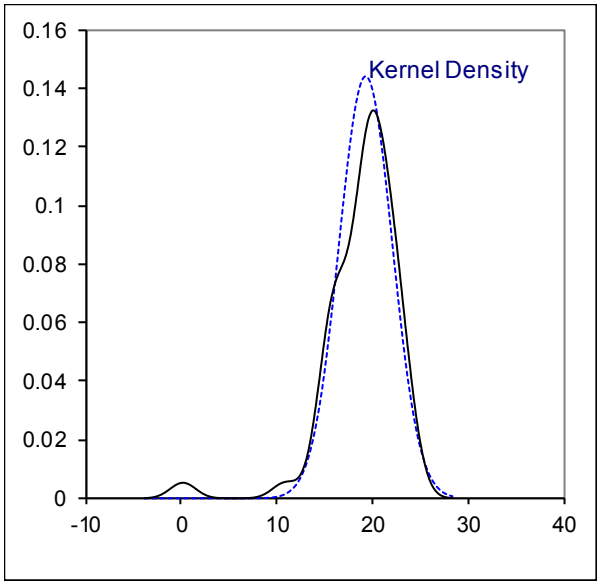

≥ 14µm
Kernel Density

Determination of FAME on sample #18163; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62	D7797	22.4		1.46	
140		-----		-----	
171		-----		-----	
194		-----		-----	
228	IP583	21.99		1.26	
230	IP585	16.761		-1.28	
237		-----		-----	
253	IP583	17.26		-1.04	
254	D7797	21.17		0.86	
311	IP585	16.0		-1.65	
317	IP585	15.3		-1.99	
323	IP585	21.2		0.87	
333	IP585	20.3		0.44	
334	IP585	19.6		0.10	
335		-----		-----	
336	IP585	23.6		2.04	
369	IP583	20.06		0.32	
372	IP590	18.8		-0.29	
445	IP590	19.76		0.18	
447	IP583	21.96		1.24	
448	IP583	18.97		-0.21	
453	IP590	23.6		2.04	
463	IP583	22.24		1.38	
496	IP585	19.72		0.16	
631	IP583	20.77		0.67	
657	IP585	16.2		-1.55	
823	IP585	20.33		0.45	
851	D7797	19.30		-0.05	
862	IP585	19.0		-0.19	
873		-----		-----	
974	IP583	20		0.29	
1011	IP585	15.05		-2.11	
1016	IP585	18.28		-0.54	
1023	D7797	21.13		0.84	
1049	IP583	24.43		2.44	
1062		-----		-----	
1064	IP585	15.391		-1.94	
1065	D7797	23		1.75	
1082	IP585	18.80		-0.29	
1095	IP585	20.1		0.34	
1097	IP583	19.39		0.00	
1105	IP585	14.50		-2.37	
1201	IP585	11.0		-4.07	
1275	IP585	16.7		-1.31	
1299	IP585	16.6		-1.36	
1316	IP585	16.37		-1.47	
1318	IP585	19.03		-0.18	
1320		-----		-----	
1347	D7797	20.93		0.74	
1348	D7797	22.41		1.46	
1402	IP585	18.7		-0.34	
1538	D7797	19.925		0.26	
1587	IP583	20.08		0.33	
1610	IP583	21.62		1.08	
1613	IP599	0.29840	R(0.01)	-9.26	
1631		-----		-----	
1634	IP585	22.11		1.31	
1724		-----	W	-----	Test result withdrawn, reported 9.44
1833		-----	W	-----	Test result withdrawn, reported 5.5
1913		-----		-----	
2129	IP590	20.75		0.66	
2130	IP590	15.63		-1.83	
6041		-----		-----	
6064	IP585	16.70		-1.31	
6065	IP585	18.50		-0.44	
6066	IP585	16.10		-1.60	
6075	IP590	21.15		0.85	
6103	D7797	23.09		1.79	
6201	IP585	23.1	C	1.79	First reported 42.5

				Only IP585	Only IP583/D7797
normality	OK			OK	OK
n	55			28	21
outliers	1	Spike		0	0
mean (n)	19.397	15.5	Recovery <125%	18.037	21.054
st.dev. (n)	2.7727			2.8091	1.6647
R(calc.)	7.763			7.866	4.661
st.dev.(IP585:10)	2.0630			1.9375	2.147
R(IP585:10)	5.776			5.425	--
Compare					
R(IP583:15)	5.930			--	6.013

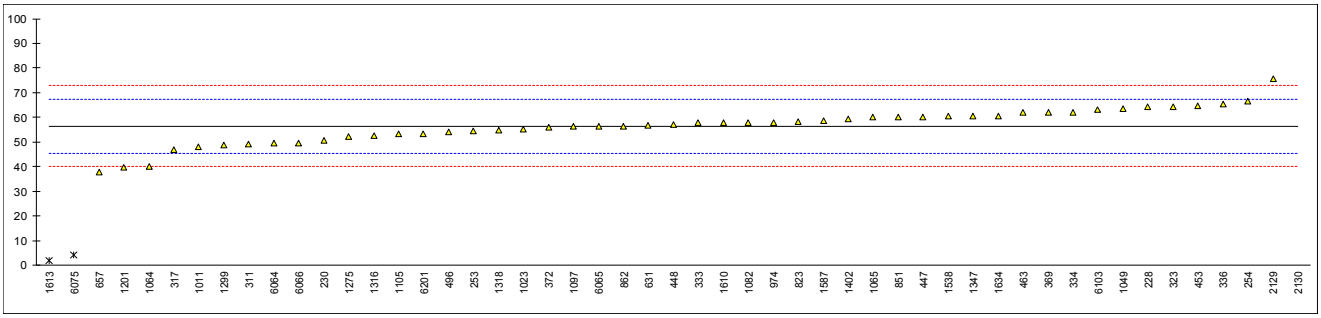


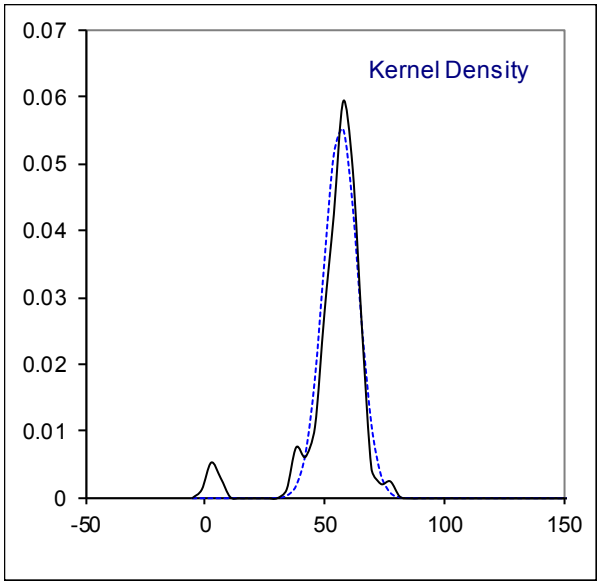


Determination of FAME on sample #18164; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
140		-----		-----	
171		-----		-----	
194		-----		-----	
228	IP583	64.24		1.41	
230	IP585	50.7895		-1.05	
237		-----		-----	
253	IP583	54.56		-0.36	
254	D7797	66.48		1.82	
311	IP585	49.2		-1.34	
317	IP585	47.1		-1.72	
323	IP585	64.4		1.44	
333	IP585	57.8		0.23	
334	IP585	62.2		1.04	
335		-----		-----	
336	IP585	65.6		1.66	
369	IP583	62.11		1.02	
372	IP590	56.0		-0.10	
445		-----		-----	
447	IP583	60.25		0.68	
448	IP583	57.19		0.12	
453	IP590	64.6		1.47	
463	IP583	61.87		0.98	
496	IP585	54.01		-0.46	
631	IP583	56.66		0.02	
657	IP585	37.8		-3.42	
823	IP585	58.33		0.33	
851	D7797	60.17		0.66	
862	IP585	56.5		0.00	
873		-----		-----	
974	IP583	58		0.27	
1011	IP585	48.10		-1.54	
1016		-----		-----	
1023	D7797	55.05		-0.27	
1049	IP583	63.36		1.25	
1062		-----		-----	
1064	IP585	40.219		-2.97	
1065	D7797	60		0.63	
1082	IP585	57.98		0.27	
1095		-----		-----	
1097	IP583	56.36		-0.03	
1105	IP585	53.4		-0.57	
1201	IP585	39.6		-3.09	
1275	IP585	52.2		-0.79	
1299	IP585	48.7		-1.43	
1316	IP585	52.50		-0.73	
1318	IP585	54.72		-0.33	
1320		-----		-----	
1347	D7797	60.38		0.70	
1348		-----		-----	
1402	IP585	59.5		0.54	
1538	D7797	60.335		0.70	
1587	IP583	58.65		0.39	
1610	IP583	57.96		0.26	
1613	IP599	1.9616	R(0.01)	-9.95	
1631		-----		-----	
1634	IP585	60.39		0.71	
1724		-----	W	-----	Test result withdrawn, reported 31.57
1833		-----		-----	
1913		-----		-----	
2129	IP590	75.70		3.50	
2130	IP590	993.33	R(0.01)	170.87	
6041		-----		-----	
6064	IP585	49.47		-1.29	
6065	IP585	56.4		-0.02	
6066	IP585	49.60		-1.26	
6075	IP590	4.37	R(0.01)	-9.51	
6103	D7797	63.33		1.24	
6201	IP585	53.4		-0.57	

				Only IP585	Only IP583/D7797
normality	suspect			OK	OK
n	48			26	19
outliers	3	Spike		0	0
mean (n)	56.524	55.4	Recovery <102%	53.073	59.840
st.dev. (n)	7.1580			7.1272	3.2192
R(calc.)	20.042			19.956	9.014
st.dev.(IP585:10)	5.4826			5.1646	2.8354
R(IP585:10)	15.351			14.461	--
Compare					
R(IP583:15)	7.775			--	7.939



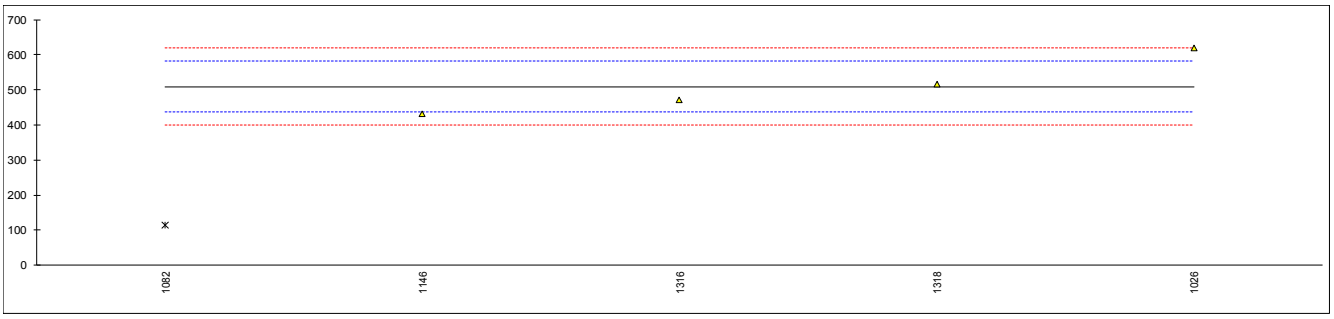


Determination of Copper as Cu on sample #18165; results in µg/kg

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
120		-----		-----	
132		-----		-----	
140		-----		-----	
150		-----		-----	
159		-----		-----	
171		-----		-----	
175		-----		-----	
177		-----		-----	
194		-----		-----	
225		-----		-----	
230		-----		-----	
237		-----		-----	
254		-----		-----	
256		-----		-----	
311		-----		-----	
323		-----		-----	
334		-----		-----	
335		-----		-----	
372		-----		-----	
391		-----		-----	
398		-----		-----	
399		-----		-----	
440		-----		-----	
445		-----		-----	
447		-----		-----	
453		-----		-----	
496		-----		-----	
631		-----		-----	
657		-----		-----	
823		-----		-----	
846		-----		-----	
851		-----		-----	
862		-----		-----	
869		-----		-----	
963		-----		-----	
974		-----		-----	
994		-----		-----	
1011		-----		-----	
1016		-----		-----	
1026	D5185	620	C	3.04	First reported <1 (0.62 mg/kg)
1039		-----		-----	
1064		-----		-----	
1079		-----		-----	
1081		-----		-----	
1082	D7111	115	C,G(0.05)	-10.87	First reported 0.115 µg/kg
1097		-----		-----	
1109		-----		-----	
1121		-----		-----	
1146	In house	432.3	C	-2.13	First reported 0.4323 µg/kg
1191		-----		-----	
1201		-----		-----	
1237		-----		-----	
1275		-----		-----	
1279		-----		-----	
1299		-----		-----	
1316	In house	470		-1.09	
1318	D6732	516		0.18	
1320		-----		-----	
1399		-----		-----	
1417		-----		-----	
1428		-----		-----	
1496		-----		-----	
1520		-----		-----	
1586		-----		-----	
1587		-----		-----	
1610		-----		-----	
1613		-----		-----	
1631		-----		-----	
1634		-----		-----	
1720		-----		-----	
1724		-----		-----	
1730		-----		-----	
1741		-----		-----	
1755		-----		-----	

lab	method	value	mark	z(targ)	remarks
1810		-----		-----	
1833		-----		-----	
1854		-----		-----	
1913		-----		-----	
1961		-----		-----	
2129		-----		-----	
2130		-----		-----	
6041		-----		-----	
6103		-----		-----	
6147		-----		-----	
6201		-----		-----	
6203		-----		-----	
9090		-----		-----	

normality	unknown
n	4
outliers	1
mean (n)	509.58
st.dev. (n)	81.184
R(calc.)	227.32
st.dev.(D6732:04)	36.315
R(D6732:04)	101.68



Determination of JFTOT at 260 °C on sample #18165; Visual tube rating (VTR), Interferometric tube rating (ITR) in nm and Ellipsometric tube rating (ETR) in nm, Delta P in mmHg, Evaluation Pass/Fail

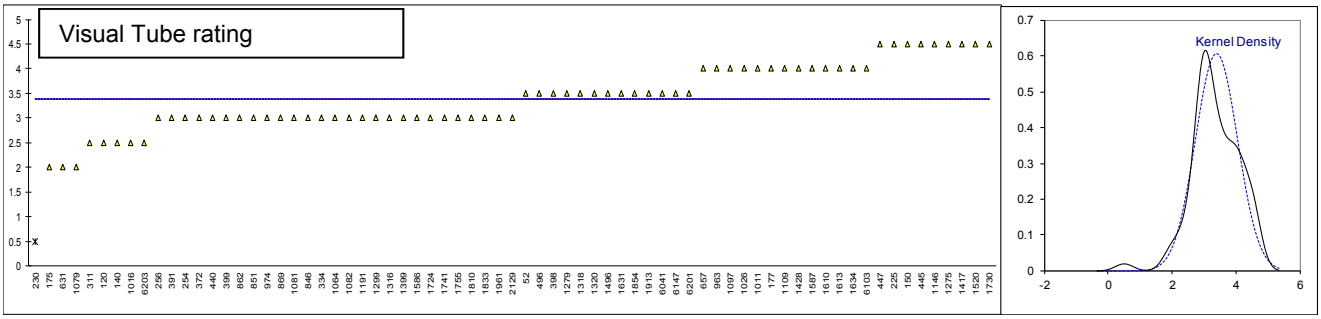
lab	method	VTR		ITR	ETR	Delta P	Pumped Vol	Heater Temp	Pass/Fail	remarks
52	D3241-A1	<4P		-----	-----	>250	440	260	Fail	
120	D3241-A1	<3		133	-----	100.4	500	260	-----	
132		-----		-----	-----	-----	-----	-----	-----	
140	D3241-A1	<3		-----	-----	254	450	260	Fail	
150	D3241-A1	>4		221	-----	250	450	260	Fail	
159		-----		178.8	-----	>280	450	260	Fail	C
171		-----		-----	-----	251	450	260	Fail	
175	D3241-A1	2P	C	-----	-----	251	440	260	Fail	
177	D3241-A1	4		125	-----	>250	450	260	Fail	
194		-----		-----	-----	-----	-----	-----	-----	
225	D3241-A1	>4		-----	-----	>25	-----	-----	-----	
230	D3241-A1	<1		-----	-----	>25	260	200	Fail	
237		-----		-----	-----	-----	-----	-----	-----	
254	D3241-A1	3		-----	-----	202	450	260	Fail	
256	D3241-A1	3		-----	-----	0	445	260.0	Fail	
311	D3241-A1	<3 Code p		-----	-----	280	460	260	-----	
323		-----		-----	-----	-----	-----	-----	-----	
334	D3241-A1	3		412.2	-----	280	510	260	Fail	
335		-----		-----	-----	-----	-----	-----	-----	
372	D3241-A1	3AP		-----	-----	>250	450	260	Fail	
391	D3241-A1	3P		-----	-----	280	450	260	Fail	
398	D3241-A1	<4 P		-----	-----	252.5	438	260	Fail	
399	D3241-A1	3		-----	-----	280	600	260	Fail	
440	IP323-B	3PA		-----	-----	252	450	260	Fail	
445	IP323-B	>4A		-----	-----	280.1	460	260	Fail	
447	D3241-A1	>4PA		-----	-----	-----	450	260	Fail	
453		-----		49.5	-----	280	470	260	Pass	
496	D3241-A1	>3	C	-----	-----	280.1	460	260	-----	
631	D3241-A1	2		-----	-----	<1.0	460	260.0	Pass	
657	D3241-A1	L4, P		-----	-----	253	450	260	Fail	
823		-----		-----	-----	-----	-----	-----	-----	
846	GB/T9169	3P		-----	-----	250.1	447	260	Fail	
851	D3241-A1	3A		83.6	-----	280.1	510	258	Fail	
862	D3241-A1	3P		-----	-----	280.1	600	260	Fail	
869	D3241-A1	3P		-----	199.63	252.6	466	260	Fail	
963	D3241-A1	4		-----	-----	280.1	460	260	Fail	
974	D3241-A1	3		-----	-----	>250	460	260	Fail	
994		-----		-----	-----	-----	-----	-----	-----	
1011	D3241-A1	4		-----	-----	280	500	260	-----	
1016	D3241-A1	<3		-----	-----	280.1	450	260	Fail	
1026	D3241-A1	4P	C	-----	-----	280	-----	260	Pass	
1039		-----		119..5	-----	280	450	260	Fail	
1064	D3241-A1	3P		-----	-----	>25	450.8	260	Fail	
1079	D3241-A1	2		-----	-----	412.3	450	260	Fail	
1081	D3241-A1	3P		-----	-----	251	451	260	Fail	
1082	D3241-A1	3P		209	-----	>125	100	260	Fail	
1097	D3241-A1	4P		-----	-----	Max : 280.1	455	260	Fail	
1109	D3241	4		-----	-----	280.1	450	260	Fail	
1121		-----		-----	-----	-----	-----	-----	-----	
1146	D3241-A1	>4P		327.3	-----	250	430	260	Fail	
1191	D3241-A1	3P		333	-----	251.7	510	260	Fail	
1201	D3241-A1	4 P		-----	-----	252.4	453.3	260	Fail	
1237	D3241-A1	3P		-----	-----	280.1	455	260	Fail	
1275	IP323-B	>4A		-----	-----	>280	425	265	Fail	
1279	D3241	<4		-----	-----	280	510	260	Fail	
1299		3p		-----	-----	0	450	260	Fail	
1316	D3241-A1	3PA		-----	176.06	250	456	260	Fail	
1318	D3241-A1	<4A		-----	-----	280.1	450	260	Fail	
1320	D3241-A1	<4		-----	-----	252	437	259,5 - 260,2	Fail	
1399	D3241	3		-----	306	3.6	450	-----	Fail	
1417	IP323-B	>4AP		-----	-----	125	450	260	-----	
1428		4		-----	-----	252	455	260	-----	
1496	D3241-A1	<4P		-----	307.11	250.7	450	260	Fail	
1520	D3241-A1	> 4		-----	-----	> 250	450	260	Fail	C
1586	D3241-A1	3P		-----	-----	280.1	510	260	Fail	
1587	D3241-A1	4AP		-----	-----	> 25.0	455	260	Fail	
1610	IP323	4		-----	-----	280	450	260	Fail	
1613	D3241-A1	4P		-----	-----	2.2	450	260	Fail	
1631	D3241-A1	<4		-----	-----	13	-----	280	-----	
1634	D3241-A1	4P		-----	-----	250	500	260	-----	
1720		-----		-----	-----	-----	-----	-----	-----	
1724	D3241-A1	3		-----	-----	0	-----	260	Fail	
1730	D3241-A1	>4		104	-----	250	460	260	-----	
1741	D3241-A1	3		-----	362.82	253.5	477	260	faill	

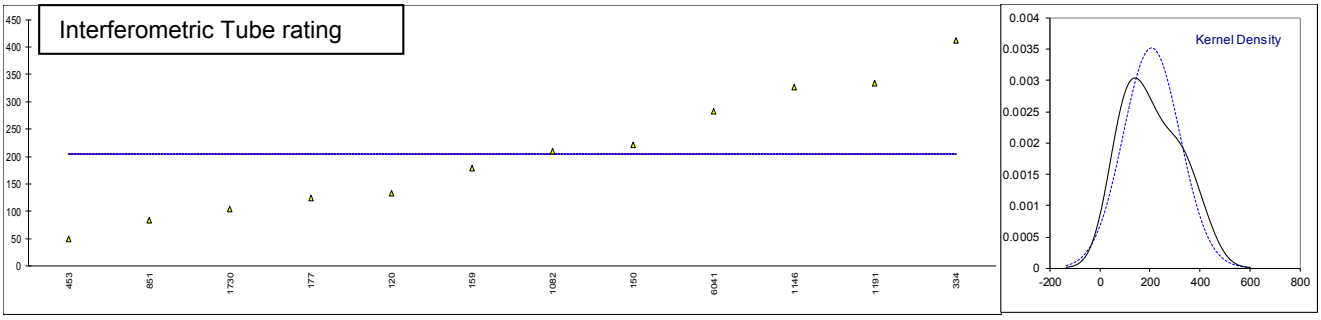
lab	method	VTR	ITR	ETR	Delta P	Pumped Vol	Heater Temp	Pass/Fail	remarks
1755	D3241-A1	3	-----	-----	2.5	400	260.0	pass	
1810	D3241-A1	3	-----	-----	258.3	-----	260	-----	
1833	D3241-A1	3	-----	-----	-----	-----	260	Fail	C
1854	D3241-A1	<4	-----	-----	251	470	260	-----	
1913	D3241-A1	<4	-----	-----	250.6	450	260	Fail	
1961	D3241-A1	3AP	-----	-----	280.1	470	260	Fail	
2129	D3241-A1	3P	-----	-----	250	450	260	Fail	
2130		-----	-----	-----	-----	-----	-----	-----	
6041	D3241-A1	＜4AP	283.3	-----	253	455	260	Fail	
6103	D3241-A1	4	-----	-----	100.7	450	260	Fail	
6147	D3241-A1	>3	-----	-----	5	580	260	Fail	
6201	D3241-A1	<4	-----	-----	252.8	432	260	Fail	
6203	D3241-A1	<3 P+A	-----	-----	0	450	260	Fail	
9090		-----	-----	-----	-----	-----	-----	-----	
	n	73	12	5	61	71	74		
Range of results									
	Min.	<1	49.5	176.06	0	100	200		
	Max.	>4	412.2	362.82	412.3	600	280		
	Pass							4	
	Fail							61	

Lab159: First reported Pass
Lab 175: First reported 2
Lab 496: First reported 260
Lab 1039: First reported 4
Lab 1586: First reported Pass
Lab 1854: First reported Pass

For the graphical display non-numeric values were calculated as follows: visual tube rating:< x as (x-0.5) and > x as (x+0.5)

Pass according to specification AFQRJOS is when VTR is less than 3 (no peacock or abnormal color), ITR/ETR is less than 85 and Delta P is maximum 25.





APPENDIX 2

Number of participants per country

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

APPENDIX 3

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's outlier test
R(0.05) = straggler in Rosner's outlier test
E = probably an error in calculations
W = test result withdrawn on request of participant
ex = test result excluded from statistical evaluation
U = test result probably reported in wrong unit
fr. = first reported
n.a. = not applicable
n.e. = not evaluated
n.d. = not detected
SDS = Safety Data Sheet

Literature:

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