Results of Proficiency Test
Jet Fuel A1
March 2018

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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Report: iis18J01

June 2018

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1 INTRODUCTION

Since 1995, the Institute for Interlaboratory Studies organises proficiency tests (PT) for Jet Fuel A1 twice per year. In the annual proficiency testing program of 2017/2018, it was decided to continue proficiency tests on Jet Fuel A1 and Jet Fuel Particle Size in accordance with the latest applicable version (October 2016) 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".
In total 98 laboratories from 50 different countries registered for participation in the interlaboratory study for Jet Fuel A1 and Particle Size Distribution. See appendix 4 for the number of participants per country. For Jet Fuel A1 (main round) 98 participants from 50 countries did register and for Particle Size Distribution 43 participants from 29 countries.
In this report, the results of the two proficiency tests are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organiser of this proficiency test. Sample analyses for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC 17025 accredited laboratory. For the main round, it was decided to send 2 litres of Jet Fuel labelled #18030 for the analyses according to the latest version of "Joint Fuelling System Check List for Jet A-1".
For the Particle Size Distribution round, it was decided to send one 0.5L of Jet Fuel A1, labelled #18031.
The participants were requested to report the test results using the indicated units and 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 March 2017 (iis-protocol, version 3.4). 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)

The necessary bulk material of Jet Fuel A1, approximately 400 litres, was obtained from a local refinery and homogenised in a mixing vessel. From this batch 268 amber glass bottles of one litre were filled, closed with inner and outer caps and labelled #18030. The homogeneity of the subsamples #18030 was checked by the determination of Density at 15°C in accordance with ASTM D4052 on eight stratified randomly selected samples.

	Density at 15°C in kg/m^3
Sample #18030-1	791.34
Sample #18030-2	791.34
Sample #18030-3	791.35
Sample #18030-4	791.35
Sample #18030-5	791.35
Sample #18030-6	791.35
Sample #18030-7	791.35
Sample #18030-8	791.35

Table 1: homogeneity test results of subsamples #18030

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 D4052:16
0.3 x R (ref. test method)	0.15

Table 2: evaluation of repeatability of subsamples #18030

The calculated repeatability is less than 0.3 times the reproducibility of the reference test method. Therefore, homogeneity of all subsamples #18030 was assumed.

2.4.2 JET FUEL PARTICLE SIZE DISTRIBUTION DETERMINATION (PS)

The bulk material of Jet Fuel A1 for Particle Size Distribution Determination was obtained from a local refinery. Approximately 44 litres bulk material was homogenized. From this material 68 amber glass bottles of 0.5 litres were filled, closed with inner and outer caps and labelled #18031. Each bottle was spiked with 1 ml of Lube oil, enriched with 5 mg/kg Arizona Dust A3. The homogeneity of the subsamples #18031 was checked by the determination of Particle Size Distribution in accordance with IP565 on seven stratified randomly selected samples.

	> 4 µm (c) counts/ml	> 6 µm (c) counts/ml	> 14 µm (c) counts/ml	> 21 µm (c) counts/ml	> 25 µm (c) counts/ml	> 30 µm (c) counts/ml
Sample #18031-1	16473	4820	121	16	7	3
Sample #18031-2	15781	4503	125	23	9	5
Sample #18031-3	16175	4844	176	32	14	6
Sample #18031-4	15657	4301	96	17	7	3
Sample #18031-5	15942	4663	145	24	10	4
Sample #18031-6	16149	4762	165	26	10	5
Sample #18031-7	16282	4837	154	28	12	6

Table 3: homogeneity test results of subsamples #18031

From the above test results, the repeatabilities were calculated and compared with the repeatabilities (r) and/or with 0.3 times the reproducibilities (R) 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	> 21 µm (c) counts/ml	> 25 µm (c) counts/ml	> 30 µm (c) counts/ml
r (observed)	804	575	78	16	7	4
reference test method	IP565:13	IP565:13	IP565:13	IP565:13	IP565:13	IP565:13
r (ref. test method)	1420	800	63	15	7	4

Table 4: evaluation of repeatabilities of subsamples #18031

The calculated repeatabilities (r) for the corresponding particle sizes are in agreement with the corresponding target repeatabilities (r) of the reference test method except for > 14 µm (c). Therefore, homogeneity of the subsamples of #18031 was assumed.

Depending on the registration to each of the participating laboratories 2 x 1 litre bottle of Jet Fuel A1 labelled #18030 and/or an 0.5 litre bottle of Jet Fuel PS labelled #18031 was/were sent on February 28, 2018. An SDS 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 #18030: Total Acidity, Aromatics by FIA, Aromatics by HPLC (in %M/M and %V/V), Colour Saybolt (ASTM D156 and ASTM 6045), Copper Corrosion (2hr ar 100°C), Density at 15°C, Distillation (IBP, 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 (on Sulphur free basis) and Total Sulphur.
The participants were requested to determine Particle Size Distribution only on sample #18031.

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. Therefore, each laboratory is advised to perform only those analyses that normally are done in daily routine (but the laboratories are allowed to do all analyses). Furthermore, it was requested to report the test results using the indicated units on the report form and not to round the test results more, 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 calculations.

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 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 March 2017 (iis-protocol, version 3.4).
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. When the uncertainty passed the evaluation, no remarks are made in the report. However, when the uncertainty failed the evaluation it is mentioned in the report and it will have consequences for the evaluation of the test results.
Finally, the reproducibilities were calculated from the standard deviations by multiplying them with a factor of 2.8.

3.2 GRAPHICS

In order to visualise the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported test results are plotted. The corresponding laboratory numbers are on the X-axis.
The straight horizontal line presents the consensus value (a trimmed mean). The four striped lines, parallel to the consensus value line, are the +3s, +2s, -2s and -3s target reproducibility limits of the selected reference test method. Outliers and other data, which were excluded from the calculations, are represented as a cross. Accepted data are represented as a triangle.
Furthermore, Kernel Density Graphs were made. This is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms. Also, a normal Gauss curve was projected over the Kernel Density Graph for reference.

3.3 Z-SCORES

To evaluate the performance of the participating laboratories the z-scores were calculated. As it was decided to evaluate the performance of the participants in this proficiency test (PT) against the literature requirements, e.g. ASTM or IP 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 targets 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, some problems were encountered with sample dispatch to the participants in Afghanistan and Saudi Arabia.
For the main round Jet Fuel A1, four participants reported the test results after the final reporting date and another two participants did not report any test results at all. For the Particle Size Distribution round, two participants reported the test results after the final reporting date and another ten participants did not report any test results at all. Not all laboratories were able to report all analyses requested.
Finally, 96 participants reported in total 1671 numerical test results. Observed were 46 outlying test results, which is 2.8% of the reported numerical test results. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

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 5.

In the iis PT reports, ASTM test methods are referred to with a number and if appropriate an indication of sub test method (e.g. D1840-B) and an added designation for the year that the test method was adopted or revised (e.g. D1840-B:07). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D1840-B:07(2017)). In the test results tables of appendix 1 only the test method number and year of adoption or revision e.g. D1840-B:07 will be used.

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

Since the Joint Fuelling System Check List for Jet-A1 is continuously updated, the participants are advised to monitor the updates. The latest version at the time of this Round Robin is “DEF STAN 91-091/Issue 9, dated: October 2016” and ASTM D1655:18a. One must keep in mind that ISO test methods are not mentioned in the “Checklist”.

Jet Fuel A1: sample #18030

Acidity, Total: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D3242:11(2017).

Aromatics by FIA: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with ASTM D1319:15.

Aromatics by HPLC: The determination in %M/M was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with ASTM D6379:11.
The determination in %V/V may 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 larger than the calculated reproducibility in %V/V of the proficiency tests iis17J01 and iis17J02 of 2017.

Colour Saybolt: The determination was very problematic for the automatic test method ASTM D6045. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not at all in agreement with the requirements of ASTM D6045:12(2017). Some of the variation may be caused by the fact that almost two third of the laboratories reported to have used a different cell than the suggested 100 mm cell in ASTM D6045. The variation in the test results in the group of 50 mm cell is larger than in the group of 100 mm cell (3.93 vs 2.97).
The determination for the manual test method ASTM D156 was also very problematic. No statistical outliers were observed. The calculated reproducibility is not at all in agreement with the requirements of ASTM D156:15.

Copper Corrosion: This determination was not problematic. Sixty-six participants reported a test result and agreed on a result of 1. One participant reported a test result of 2.

Density: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D4052:16.

Distillation: This determination was not problematic. In total, seven statistical outliers were observed. However, all calculated reproducibilities after rejection of the statistical outliers are in agreement with the automated mode requirements of ASTM D86:17.
When compared to the manual mode requirements of ASTM D86:17 only the calculated reproducibilities for 10% rec, 50% rec, 90% rec are in agreement.

Existent Gum: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with ASTM D381:12 (2017).

Flash Point: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in full agreement with IP170:14.
In the Joint Fuelling System Checklist both IP170/ISO13736 and ASTM D56 or ASTM D3828 are mentioned as test methods. Still some participants (six in total) reported test methods, which are not equivalent.

Freezing Point: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in full agreement with the requirements of ASTM D2386:15e1.

Kin. Viscosity at -20°C: 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 D445:17a.

Mercaptan Sulphur: This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D3227:16.

MSEP: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D3948:14.

Naphthalenes: This determination was not problematic for both procedures A and B. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D1840:07(2017) procedure A and B.

Smoke Point: This determination was not problematic depending on test mode used of ASTM D1322:15e1. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of the manual mode of ASTM D1322:15e1, but not with the strict requirements of the automated mode.

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

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

Jet Fuel PS sample #18031

Particle Size Distribution Determination:

The Joint Fuelling System Check List for Jet-A1 lists test methods IP564, IP565 and IP577 as the reference test methods to determine the Particle Size Distribution in Jet Fuel A1. Over the last few years, iis has observed and concluded that these methods are biased and not as interchangeable as it appears from the checklist. Although no equipment suppliers are mentioned in the test methods, the brand of the automatic particle counter (APC) defines the test method. 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, along with the method for calibration, the actual test method performed and the test method used for determining ISO code scaling. All participants mentioned the equipment used, eight participants used IP564, twenty-four used IP565, one participant used IP577. All participants reported (some after a correction) have used the method that corresponds with the equipment used. Most participants used ISO11171 for the calibration. All laboratories used ISO4406 for calculating the scale numbers from the counts per ml. Some laboratories reported the test method for this (IP564/IP565/IP577), which in fact is also ISO4406, because these methods refer to ISO4406 for assigning scale numbers. Almost 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. This is generally the case, the same is also documented in an article found on internet (see literature reference 4). Therefore, it was decided to evaluate both methods separately. The results of the participants performing IP577 were evaluated in the group of IP565, because the results were more compatible with the results of IP565 than those of IP564 at the particle size distribution found in this PT sample.

IP564: The determination according to IP564 was problematic. In total three statistical outliers of the sum participants were observed for the six particle size categories and therefore the three other test results were excluded. The calculated reproducibilities after rejection of the suspect data are all not in agreement with the requirements of IP564:13 except for ≥30µm (c).
The determination expressed in ISO scale numbers may be problematic. No statistical outliers were observed and three other test results were excluded. The calculated reproducibilities after rejection of the suspect data are in agreement with the indicative requirements of IP564:13 Annex C.

IP565: The determination according to IP565 was problematic. In total ten statistical outliers were observed for the six particle size categories and twenty-two other test results were excluded. The calculated reproducibilities after rejection of the suspect data are not in agreement with the requirements of IP565:13.
The determination expressed in ISO scale numbers may be problematic. Two statistical outliers were observed and six other test results were excluded. The calculated reproducibilities after rejection of the suspect data are not in agreement for ≥6 µm (c), and ≥14 µm (c) but for ≥4 µm (c) is in agreement with the indicative requirements of IP565:13 Annex C.

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	52	0.0012	0.0021	0.0014
Aromatics by FIA	%V/V	42	16.0	2.3	2.7
Aromatics by HPLC	%M/M	18	19.2	1.2	2.0
Aromatics by HPLC	%V/V	21	17.1	1.6	n.a.
Colour Saybolt (automated)		45	27.8	3.7	1.2
Colour Saybolt (manual)		42	27.3	5.0	2
Copper Corrosion 2hr at 100°C		66	1	n.a.	n.a.
Density at 15°C	kg/m^3	93	791.3	0.3	0.5
Initial Boiling Point	°C	87	147.5	6.2	8.1
Temp at 10% recovered	°C	87	167.1	2.4	3.7
Temp at 50% recovered	°C	84	193.8	2.1	3
Temp at 90% recovered	°C	87	245.2	3.9	3.7
Final Boiling Point	°C	88	279.9	5.2	7.1
Existent Gum (unwashed)	mg/100mL	48	0.80	1.54	3.17
Flash Point	°C	86	41.2	3.0	3.2
Freezing Point	°C	71	-47.7	2.4	2.5
Kinematic Viscosity at -20°C	mm^2/s	57	3.745	0.079	0.071
Mercaptan Sulphur as S	%M/M	37	0.0001	0.0004	0.0003
MSEP	rating	65	98.6	2.7	3.4
Naphthalenes	%V/V	40	0.20	0.03	0.04
Smoke Point	mm	64	25.6	2.8	3.9
Specific Energy (Net)	MJ/kg	51	43.395	0.042	0.046
Sulphur, Total	mg/kg	60	9.5	2.5	3.1

Table 5: comparison of the observed and target reproducibilities of sample #18030

Parameter - IP564	unit	n	average	2.8 * sd	R (lit)
Particle Size ≥4 µm (c)	counts/ml	7	11650	5130	2262
Particle Size ≥6 µm (c)	counts/ml	7	3500	2100	1093
Particle Size ≥14 µm (c)	counts/ml	7	104	73	58
Particle Size ≥21 µm (c)	counts/ml	6	21	27	26
Particle Size ≥25 µm (c)	counts/ml	6	9	15	12
Particle Size ≥30 µm (c)	counts/ml	6	4	6	6
Particle Size ≥4 µm (c)	ISO scale	6	20.8	1.1	1.0
Particle Size ≥6 µm (c)	ISO scale	6	18.8	1.1	1.4
Particle Size ≥14 µm (c)	ISO scale	6	13.7	1.5	2.2

Table 6: comparison of the observed and target reproducibilities of sample #18031 according to IP564

Parameter - IP565	unit	n	average	2.8 * sd	R (lit)
Particle Size ≥4 µm (c)	counts/ml	20	17034	5804	1896
Particle Size ≥6 µm (c)	counts/ml	20	4895	1732	1075
Particle Size ≥14 µm (c)	counts/ml	17	211	197	115
Particle Size ≥21 µm (c)	counts/ml	19	33	46	28
Particle Size ≥25 µm (c)	counts/ml	19	14	23	14
Particle Size ≥30 µm (c)	counts/ml	19	5	11	8
Particle Size ≥4 µm (c)	ISO scale	20	21.1	0.6	1.0
Particle Size ≥6 µm (c)	ISO scale	20	19.4	1.4	1.0
Particle Size ≥14 µm (c)	ISO scale	18	14.8	1.8	1.4

Table 7: comparison of the observed and target reproducibilities of sample #18031 according to IP565

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 MARCH 2018 WITH PREVIOUS PTS

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

Table 8: 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	March 2018	September 2017	March 2017	September 2016	March 2016
Acidity, Total	-	-	-	+/-	-
Aromatics by FIA	+	+	+	+	+/-
Aromatics by HPLC	+	+/-	+	+/-	-
Colour Saybolt (automated)	--	--	-	-	--
Colour Saybolt (manual)	--	-	-	--	--
Density at 15°C	+	+	+	+	+
Distillation	+	+	+	+	+
Existent Gum	++	++	++	++	++
Flash Point	+/-	+	+	+	+/-
Freezing Point	+/-	+	+	+/-	+
Kinematic Viscosity at -20°C	-	+/-	+/-	-	+
Mercaptan Sulphur	-	+	+/-	+/-	+/-
MSEP	+	+	+/-	+/-	+/-
Naphthalenes	+/-	-	+/-	-	+/-
Smoke Point	+	+	+	+	+
Specific Energy (Net)	+	+/-	+/-	+/-	+/-
Sulphur, Total	+	-	+/-	+/-	+/-

Parameter	March 2018	September 2017	March 2017	September 2016	March 2016
- Cumulative Counts/ml	--	-	--	+	--
- ISO scale numbers	+	+/-	+	-	-
- Cumulative Counts/ml	--	-	-	+	-
- ISO scale numbers	-	+/-	+	-	-

Table 9: comparison determinations against the requirements of the reference test methods

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

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

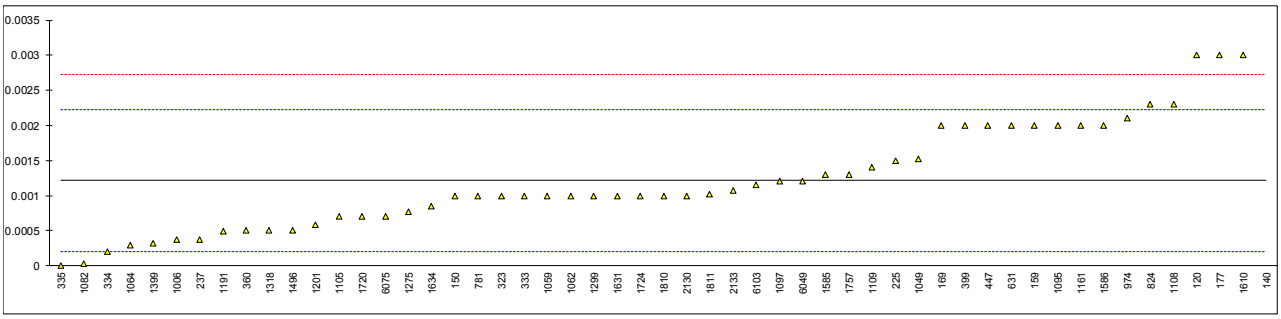
APPENDIX 1

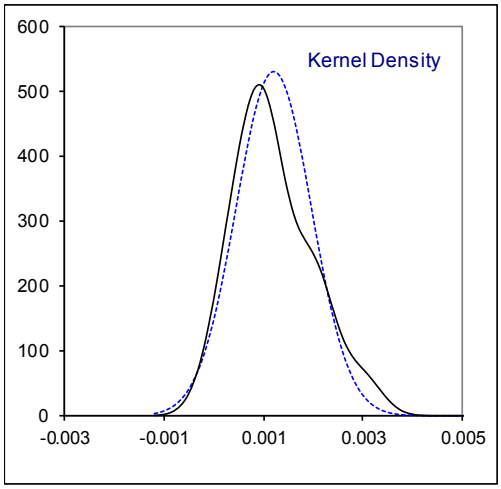
Determination of Acidity, Total on sample #18030; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
120	D664-A	0.003		3.53	
131		-----		-----	
132		-----		-----	
140	D3242	0.02	R(0.01)	37.15	
150	D3242	0.001	C	-0.43	first reported 0.006
159	D3242	0.002		1.55	
169	D3242	0.002		1.55	
171	D3242	<0.001		-----	
175		-----		-----	
177		0.003		3.53	
194		-----		-----	
225	D3242	0.0015		0.56	
228		-----		-----	
237	D3242	0.00037		-1.67	
238		-----		-----	
253		-----		-----	
273		-----		-----	
317		-----		-----	
323	D3242	0.001		-0.43	
333	D3242	0.001		-0.43	
334	D3242	0.0002		-2.01	
335	D3242	0.000		-2.40	
336		-----		-----	
353		-----		-----	
360	D3242	0.0005		-1.42	
391		-----		-----	
398		-----		-----	
399	D3242	0.0020		1.55	
447	D3242	0.002		1.55	
468		-----		-----	
594		-----		-----	
604		-----		-----	
631	D3242	0.002	C	1.55	first reported 0.0071
634		-----		-----	
663		-----		-----	
671		-----		-----	
781	D3242	0.001		-0.43	
785		-----		-----	
824	D3242	0.0023		2.14	
922		-----		-----	
962		-----		-----	
963		-----		-----	
970		-----		-----	
974	D3242	0.0021	C	1.75	first reported 0.004
998		-----		-----	
1006		0.00037		-1.67	
1023		-----		-----	
1049	D3242	0.00152		0.60	
1059	D3242	0.001		-0.43	
1062	D3242	0.0010		-0.43	
1064	D3242	0.0003		-1.81	
1080		-----		-----	
1082	D3242	0.000024		-2.36	
1095	D3242	0.002		1.55	
1097	D3242	0.0012		-0.03	
1105	D3242	0.0007		-1.02	
1108	D3242	0.0023		2.14	
1109	D3242	0.0014		0.36	
1126		-----		-----	
1161	D664-A	0.002		1.55	
1167		-----		-----	
1191	D3242	0.00049		-1.44	
1201	D3242	0.00058		-1.26	
1237		-----		-----	
1275	IP354	0.00077		-0.88	
1299	D3242	0.001		-0.43	
1318	D3242	0.0005		-1.42	
1397		-----		-----	
1399	D3242	0.00032		-1.77	
1428		-----		-----	
1429		-----		-----	
1496	D3242	0.0005		-1.42	
1498		-----		-----	
1531		-----		-----	
1585	D3242	0.0013		0.17	

lab	method	value	mark	z(targ)	remarks
1586	D3242	0.002		1.55	
1587		-----		-----	
1610	IP354	0.003		3.53	
1631	D3242	0.001		-0.43	
1634	D3242	0.00085	C	-0.72	first reported 0.0084
1720	D3242	0.0007		-1.02	
1724	D3242	0.001		-0.43	
1740		-----		-----	
1757	D3242	0.0013		0.17	
1770		-----		-----	
1776		-----		-----	
1787		-----		-----	
1810	D3242	0.001		-0.43	
1811	D3242	0.00102		-0.39	
1883		-----		-----	
2130	D3242	0.001		-0.43	
2133	D3242	0.00107		-0.29	
6049	D3242	0.0012		-0.03	
6054		-----		-----	
6075	D3242	0.0007		-1.02	
6101		-----		-----	
6103	D3242	0.00115		-0.13	
6174		-----		-----	

normality	OK
n	52
outliers	1
mean (n)	0.00122
st.dev. (n)	0.000754
R(calc.)	0.00211
st.dev.(D3242:11)	0.000506
R(D3242:11)	0.00142



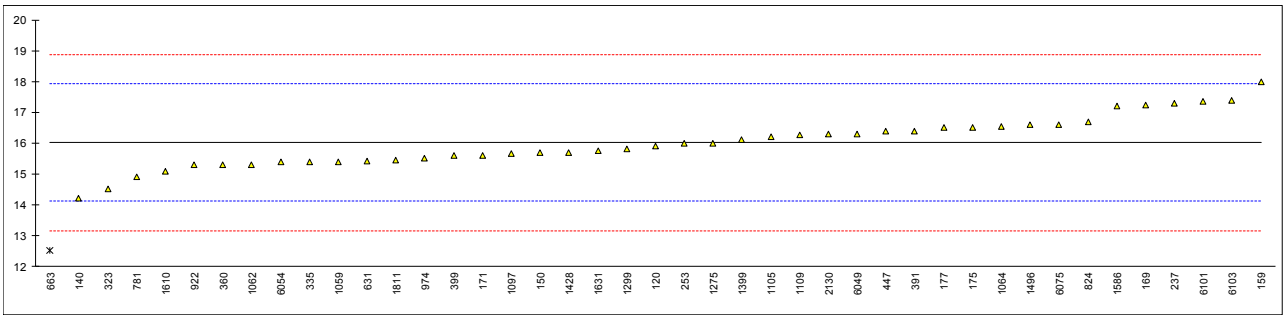


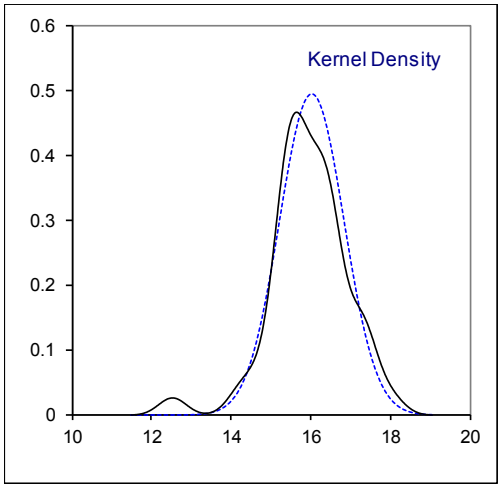
Determination of Aromatics by FIA (without oxygenate correction) on sample #18030; results in %V/V

lab	method	value	mark	z(targ)	remarks
120	D1319	15.9		-0.12	
131		-----		-----	
132		-----		-----	
140	D1319	14.2		-1.91	
150	D1319	15.7		-0.33	
159	D1319	18.0		2.08	
169	D1319	17.24		1.28	
171	D1319	15.6		-0.44	
175	D1319	16.5		0.51	
177		16.5		0.51	
194		-----		-----	
225		-----		-----	
228		-----		-----	
237	D1319	17.3		1.34	
238		-----		-----	
253	D1319	16.0		-0.02	
273		-----		-----	
317		-----		-----	
323	D1319	14.5		-1.59	
333		-----		-----	
334		-----		-----	
335	D1319	15.4		-0.65	
336		-----		-----	
353		-----		-----	
360	D1319	15.3		-0.75	
391	D1319	16.4		0.40	
398		-----		-----	
399	D1319	15.6		-0.44	
447	D1319	16.4		0.40	
468		-----		-----	
594		-----		-----	
604		-----		-----	
631	D1319	15.414		-0.63	
634		-----		-----	
663	D1319	12.52	R(0.01)	-3.67	
671		-----		-----	
781	D1319	14.9		-1.17	
785		-----		-----	
824	D1319	16.7		0.72	
922	D1319	15.3		-0.75	
962		-----		-----	
963		-----		-----	
970		-----		-----	
974	D1319	15.5		-0.54	
998		-----		-----	
1006		-----		-----	
1023		-----		-----	
1049		-----		-----	
1059	D1319	15.4		-0.65	
1062	D1319	15.3		-0.75	
1064	D1319	16.53		0.54	
1080		-----		-----	
1082		-----		-----	
1095		-----		-----	
1097	D1319	15.667		-0.37	
1105	D1319	16.196		0.19	
1108		-----		-----	
1109	D1319	16.26		0.25	
1126		-----		-----	
1161		-----		-----	
1167		-----		-----	
1191		-----		-----	
1201		-----		-----	
1237		-----		-----	
1275	IP156	16.0		-0.02	
1299	D1319	15.8		-0.23	
1318		-----		-----	
1397		-----		-----	
1399	D1319	16.11		0.10	
1428	D1319	15.7		-0.33	
1429		-----		-----	
1496	D1319	16.6		0.61	
1498		-----		-----	
1531		-----		-----	
1585		-----		-----	

lab	method	value	mark	z(targ)	remarks
1586	D1319	17.2		1.24	
1587		-----		-----	
1610	IP156	15.1		-0.96	
1631	D1319	15.74		-0.29	
1634		-----		-----	
1720		-----		-----	
1724		-----		-----	
1740		-----		-----	
1757		-----		-----	
1770		-----		-----	
1776		-----		-----	
1787		-----		-----	
1810		-----		-----	
1811	D1319	15.44		-0.61	
1883		-----		-----	
2130	D1319	16.3		0.30	
2133		-----		-----	
6049	D1319	16.30		0.30	
6054	D1319	15.387		-0.66	
6075	D1319	16.61		0.62	
6101	D1319	17.363		1.41	
6103	D1319	17.4		1.45	
6174		-----		-----	

normality	OK
n	42
outliers	1
mean (n)	16.018
st.dev. (n)	0.8086
R(calc.)	2.264
st.dev.(D1319:15)	0.9535
R(D1319:15)	2.670



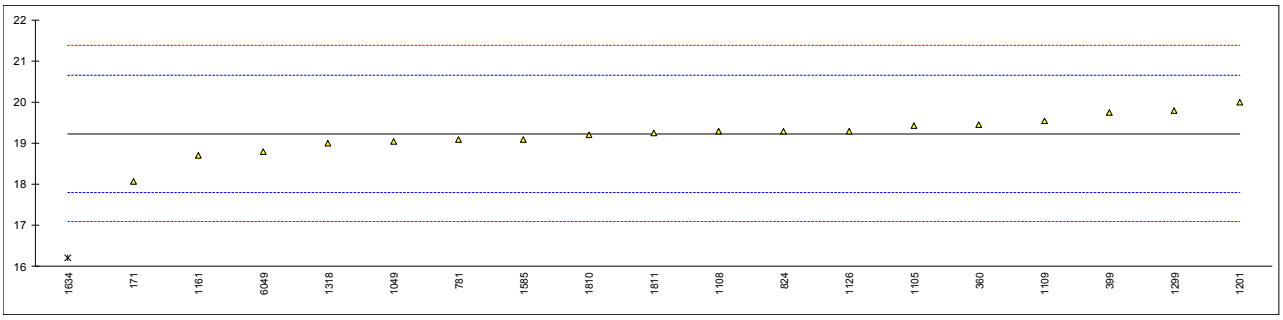


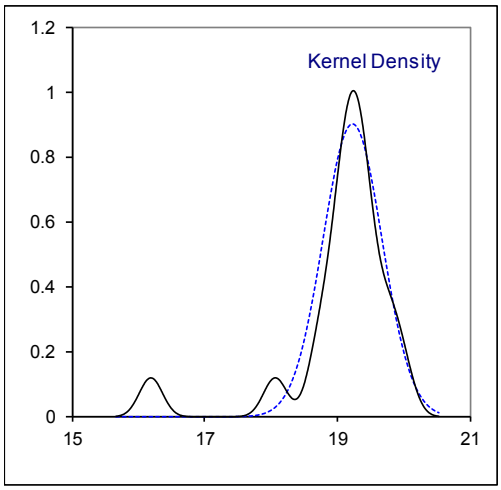
Determination of Aromatics by HPLC on sample #18030; results in %M/M

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
131		-----		-----	
132		-----		-----	
140		-----		-----	
150		-----		-----	
159		-----		-----	
169		-----		-----	
171	D6379	18.0675		-1.63	
175		-----		-----	
177		-----		-----	
194		-----		-----	
225		-----		-----	
228		-----		-----	
237		-----		-----	
238		-----		-----	
253		-----		-----	
273		-----		-----	
317		-----		-----	
323		-----		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
353		-----		-----	
360	D6379	19.46		0.33	
391		-----		-----	
398		-----		-----	
399	D6379	19.75		0.73	
447		-----		-----	
468		-----		-----	
594		-----		-----	
604		-----		-----	
631		-----		-----	
634		-----		-----	
663		-----		-----	
671		-----		-----	
781	D6379	19.08		-0.21	
785		-----		-----	
824	D6379	19.3		0.10	
922		-----		-----	
962		-----		-----	
963		-----		-----	
970		-----		-----	
974		-----		-----	
998		-----		-----	
1006		-----		-----	
1023		-----		-----	
1049	D6379	19.047		-0.25	
1059		-----		-----	
1062		-----		-----	
1064		-----		-----	
1080		-----		-----	
1082		-----		-----	
1095		-----		-----	
1097		-----		-----	
1105	D6379	19.433		0.29	
1108	D6379	19.3		0.10	
1109	IP391	19.53		0.42	
1126	EN12916	19.3		0.10	
1161	EN12916	18.7		-0.74	
1167		-----		-----	
1191		-----		-----	
1201	D6379	20.0		1.08	
1237		-----		-----	
1275		-----		-----	
1299	IP436	19.8		0.80	
1318	D6379	18.99		-0.33	
1397		-----		-----	
1399		-----		-----	
1428		-----		-----	
1429		-----		-----	
1496		-----		-----	
1498		-----		-----	
1531		-----		-----	
1585	D6379	19.09		-0.19	

lab	method	value	mark	z(targ)	remarks
1586		-----		-----	
1587		-----		-----	
1610		-----		-----	
1631		-----		-----	
1634	D6379	16.2	D(0.01)	-4.24	
1720		-----		-----	
1724		-----		-----	
1740		-----		-----	
1757		-----		-----	
1770		-----		-----	
1776		-----		-----	
1787		-----		-----	
1810	D6379	19.2		-0.04	
1811	D6379	19.25		0.03	
1883		-----		-----	
2130		-----		-----	
2133		-----		-----	
6049	EN12916	18.80		-0.60	
6054		-----		-----	
6075		-----		-----	
6101		-----		-----	
6103		-----		-----	
6174		-----		-----	

normality	suspect
n	18
outliers	1
mean (n)	19.228
st.dev. (n)	0.4432
R(calc.)	1.241
st.dev.(D6379:11)	0.7133
R(D6379:11)	1.997



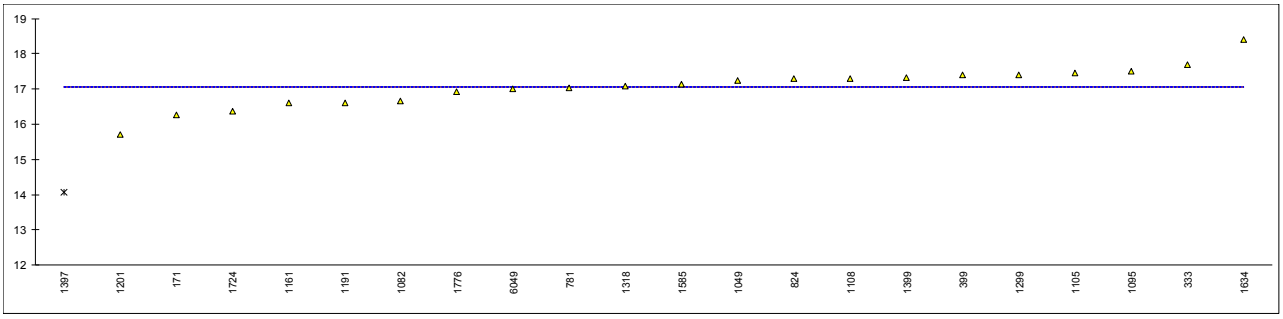


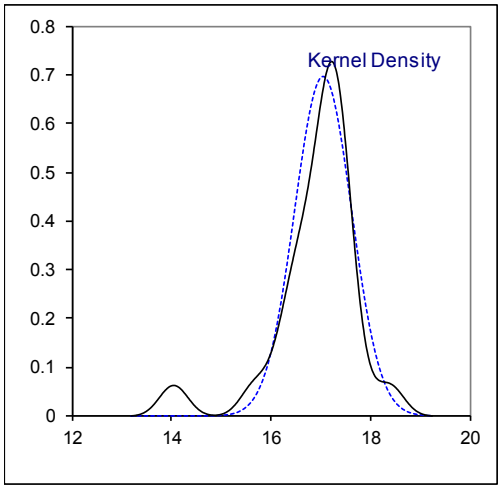
Determination of Aromatics by HPLC on sample #18030; results in %V/V

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
131		-----		-----	
132		-----		-----	
140		-----		-----	
150		-----		-----	
159		-----		-----	
169		-----		-----	
171	D6379	16.2564		-----	
175		-----		-----	
177		-----		-----	
194		-----		-----	
225		-----		-----	
228		-----		-----	
237		-----		-----	
238		-----		-----	
253		-----		-----	
273		-----		-----	
317		-----		-----	
323		-----		-----	
333	D6379	17.7		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
353		-----		-----	
360		-----		-----	
391		-----		-----	
398		-----		-----	
399	D6379	17.39		-----	
447		-----		-----	
468		-----		-----	
594		-----		-----	
604		-----		-----	
631		-----		-----	
634		-----		-----	
663		-----		-----	
671		-----		-----	
781	D6379	17.03		-----	
785		-----		-----	
824	D6379	17.3		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
970		-----		-----	
974		-----		-----	
998		-----		-----	
1006		-----		-----	
1023		-----		-----	
1049	D6379	17.23309		-----	
1059		-----		-----	
1062		-----		-----	
1064		-----		-----	
1080		-----		-----	
1082	D6379	16.67		-----	
1095	D6379	17.5		-----	
1097		-----		-----	
1105	D6379	17.44		-----	
1108	D6379	17.3		-----	
1109		-----		-----	
1126		-----		-----	
1161	EN12916	16.6		-----	
1167		-----		-----	
1191	D6379	16.60		-----	
1201	D6379	15.7		-----	
1237		-----		-----	
1275		-----		-----	
1299	IP436	17.4		-----	
1318	D6379	17.07		-----	
1397	D6379	14.06	C,R(0.01)	-----	
1399	IP436	17.33		-----	
1428		-----		-----	
1429		-----		-----	
1496		-----		-----	
1498		-----		-----	
1531		-----		-----	
1585	D6379	17.14		-----	

lab	method	value	mark	z(targ)	remarks
1586		-----		-----	
1587		-----		-----	
1610		-----		-----	
1631		-----		-----	
1634	D6379	18.4		-----	
1720		-----		-----	
1724	D6379	16.37		-----	
1740		-----		-----	
1757		-----		-----	
1770		-----		-----	
1776	D6379	16.932		-----	
1787		-----		-----	
1810		-----		-----	
1811		-----		-----	
1883		-----		-----	
2130		-----		-----	
2133		-----		-----	
6049	EN12916	17.01		-----	
6054		-----		-----	
6075		-----		-----	
6101		-----		-----	
6103		-----		-----	
6174		-----		-----	

normality	suspect
n	21
outliers	1
mean (n)	17.065
st.dev. (n)	0.5726
R(calc.)	1.603
R(lit)	unknown
Compare R(iis17J01)	1.231
Compare R(iis17J02)	0.988



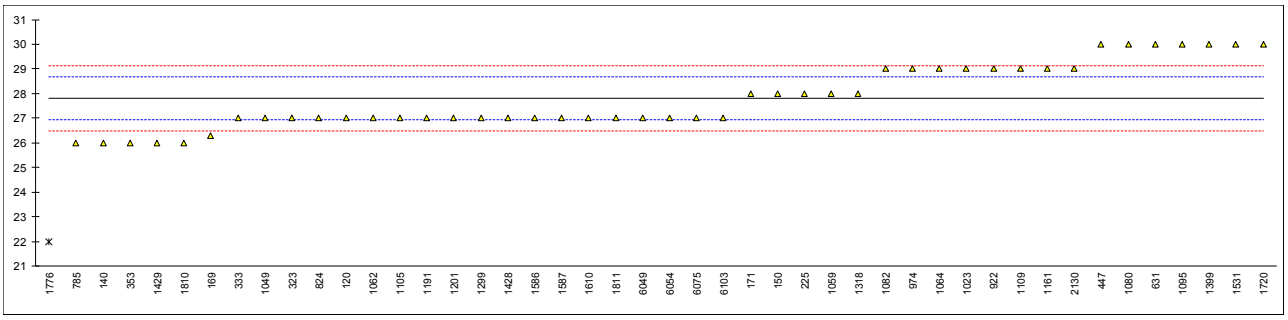


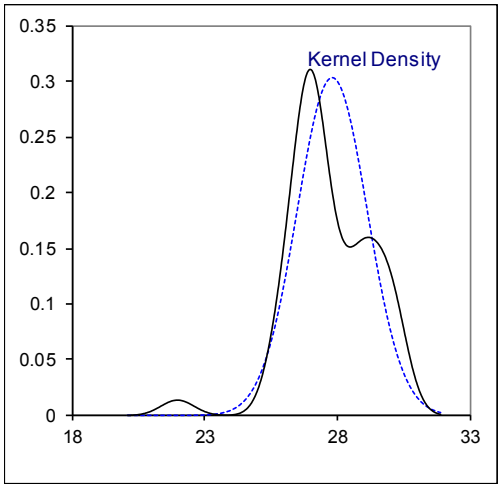
Determination of Color Saybolt (Automated) on sample #18030; cell size in mm;

lab	method	cell	value	mark	z(targ)	remarks
120	D6045	50	27		-1.82	
131		-----	-----		-----	
132		-----	-----		-----	
140	D6045	33	26		-4.08	
150	D6045	100	28		0.44	
159		-----	-----		-----	
169	D6045	33	26.3		-3.40	
171	D6045	-----	28		0.44	
175		-----	-----		-----	
177		-----	-----		-----	
194		-----	-----		-----	
225	D6045	-----	28		0.44	
228		-----	-----		-----	
237		-----	-----		-----	
238		-----	-----		-----	
253		-----	-----		-----	
273		-----	-----		-----	
317		-----	-----		-----	
323	D6045	10	27		-1.82	
333	D6045	-----	27		-1.82	
334		-----	-----		-----	
335		-----	-----		-----	
336		-----	-----		-----	
353	D6045	50	26		-4.08	
360		-----	-----		-----	
391		-----	-----		-----	
398		-----	-----		-----	
399		-----	-----		-----	
447	D6045	100	30		4.95	
468		-----	-----		-----	
594		-----	-----		-----	
604		-----	-----		-----	
631	D6045	50	30		4.95	
634		-----	-----		-----	
663		-----	-----		-----	
671		-----	-----		-----	
781		-----	-----		-----	
785	D6045	50	26		-4.08	
824	D6045	50	27		-1.82	
922	D6045	100	29		2.69	
962		-----	-----		-----	
963		-----	-----		-----	
970		-----	-----		-----	
974	D6045	100	29		2.69	
998		-----	-----		-----	
1006		-----	-----		-----	
1023	D6045	-----	29.0		2.69	
1049	D6045	50	27		-1.82	
1059	D6045	50	28		0.44	
1062	D6045	100	27		-1.82	
1064	D6045	50	29		2.69	
1080	D156	-----	30		4.95	
1082	D6045	100	29		2.69	
1095	D6045	-----	30		4.95	
1097		-----	-----		-----	
1105	D6045	-----	27		-1.82	
1108		-----	-----		-----	
1109	D6045	100	29		2.69	
1126		-----	-----		-----	
1161	D6045	-----	29		2.69	
1167		-----	-----		-----	
1191	D6045	100	27		-1.82	
1201	D6045	100	27		-1.82	
1237		-----	-----		-----	
1275		-----	-----		-----	
1299	D6045	50	27		-1.82	
1318	D6045	100	28		0.44	
1397		-----	-----		-----	
1399	D6045	50	30		4.95	
1428	D6045	50	27		-1.82	
1429	D6045	50	26		-4.08	
1496		-----	-----		-----	
1498		-----	-----		-----	
1531	D6045	50	30		4.95	
1585		-----	-----		-----	

lab	method	cell	value	mark	z(targ)	remarks
1586	D6045	50	27		-1.82	
1587	D6045	50	27		-1.82	
1610	D6045	50	27		-1.82	
1631		-----	-----		-----	
1634		-----	-----		-----	
1720	D6045	50	30		4.95	
1724		-----	-----		-----	
1740		-----	-----		-----	
1757		-----	-----		-----	
1770		-----	-----		-----	
1776	D6045	-----	22	R(0.01)	-13.11	
1787		-----	-----		-----	
1810	D6045	50	26		-4.08	
1811	D6045	50	27		-1.82	
1883		-----	-----		-----	
2130	D6045	50	29		2.69	
2133		-----	-----		-----	
6049	D6045	-----	27		-1.82	
6054	D6045	50	27		-1.82	
6075	D6045	50	27		-1.82	
6101		-----	-----		-----	
6103	D6045	-----	27		-1.82	
6174		-----	-----		-----	

			Test results 50mm Cell only	Test results 100mm Cell only
	normality	OK	OK	OK
	n	45	22	10
	outliers	1	0	0
	mean (n)	27.81	27.59	28.30
	st.dev. (n)	1.316	1.403	1.059
	R(calc.)	3.68	3.93	2.97
	st.dev.(D6045:12)	0.443	0.443	0.443
	R(D6045:12)	1.24	1.24	1.24



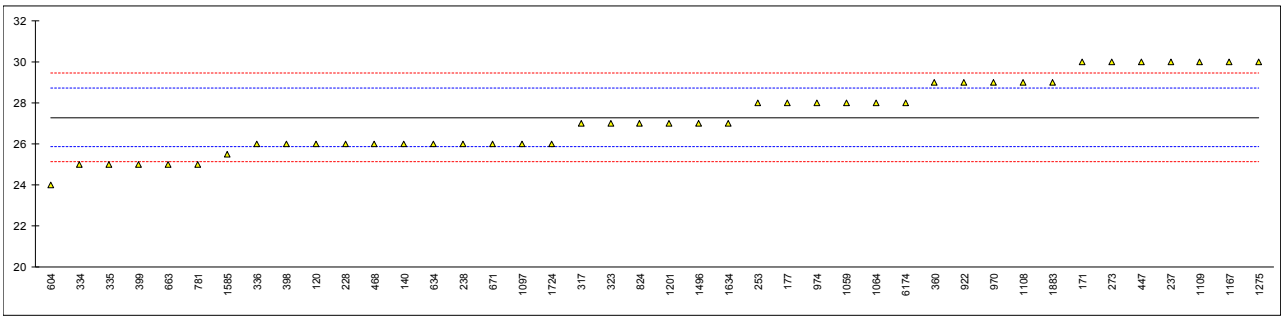


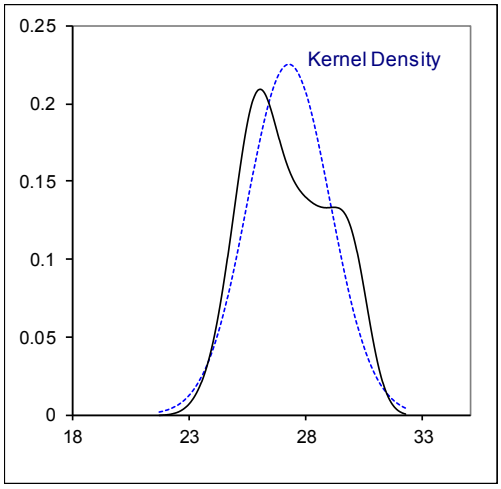
Determination of Color Saybolt (Manual) on sample #18030;

lab	method	value	mark	z(targ)	remarks
120	D156	26		-1.78	
131		-----		-----	
132		-----		-----	
140	D156	26		-1.78	
150		-----		-----	
159		-----		-----	
169		-----		-----	
171	D156	30		3.82	
175		-----		-----	
177		28		1.02	
194		-----		-----	
225		-----		-----	
228	D156	26	C	-1.78	first reported 20
237	D156	30		3.82	
238	D156	26		-1.78	
253	D156	28		1.02	
273	D156	30		3.82	
317	D156	27		-0.38	
323	D156	27		-0.38	
333		-----		-----	
334	D156	25		-3.18	
335	D156	25		-3.18	
336	D156	26		-1.78	
353		-----		-----	
360	D156	29		2.42	
391		-----		-----	
398	D156	26		-1.78	
399	D156	25		-3.18	
447	D156	30		3.82	
468	D156	26		-1.78	
594		-----		-----	
604	D156	24		-4.58	
631		-----		-----	
634	D156	26		-1.78	
663	D156	25		-3.18	
671	D156	26	C	-1.78	first reported 21
781	D156	25		-3.18	
785		-----		-----	
824	D156	27		-0.38	
922	D156	29		2.42	
962		-----		-----	
963		-----		-----	
970	D156	29		2.42	
974	D156	28		1.02	
998		-----		-----	
1006		-----		-----	
1023		-----		-----	
1049		-----		-----	
1059	D156	28		1.02	
1062		-----		-----	
1064	D156	28		1.02	
1080		-----		-----	
1082		-----		-----	
1095		-----		-----	
1097	NF M 07 003	26		-1.78	
1105		-----		-----	
1108	D156	29		2.42	
1109	D156	30		3.82	
1126		-----		-----	
1161		-----		-----	
1167	D156	30		3.82	
1191		-----		-----	
1201	D156	27		-0.38	
1237		-----		-----	
1275	D156	30		3.82	
1299		-----		-----	
1318		-----		-----	
1397		-----		-----	
1399		-----		-----	
1428		-----		-----	
1429		-----		-----	
1496	D156	27		-0.38	
1498		-----		-----	
1531		-----		-----	
1585	D156	25.5		-2.48	

lab	method	value	mark	z(targ)	remarks
1586		-----		-----	
1587		-----		-----	
1610		-----		-----	
1631		-----		-----	
1634	D156	27		-0.38	
1720		-----		-----	
1724	D156	26		-1.78	
1740		-----		-----	
1757		-----		-----	
1770		-----		-----	
1776		-----		-----	
1787		-----		-----	
1810		-----		-----	
1811		-----		-----	
1883	D156	29		2.42	
2130		-----		-----	
2133		-----		-----	
6049		-----		-----	
6054		-----		-----	
6075		-----		-----	
6101		-----		-----	
6103		-----		-----	
6174	D156	28		1.02	

normality	OK
n	42
outliers	0
mean (n)	27.27
st.dev. (n)	1.768
R(calc.)	4.95
st.dev.(D156:15)	0.714
R(D156:15)	2





Determination of Copper Corrosion 2hr at 100°C on sample #18030;

lab	method	value	mark	z(targ)	remarks
120	D130	1A		-----	
131	D130	1a		-----	
132		-----		-----	
140	D130	1		-----	
150		-----		-----	
159	D130	1a		-----	
169	D130	1A		-----	
171	D130	1a		-----	
175		-----		-----	
177		1a		-----	
194		-----		-----	
225	D130	1b		-----	
228	D130	1a		-----	
237	D130	1		-----	
238	D130	1a		-----	
253	D130	1A		-----	
273	D130	1a		-----	
317	D130	1a		-----	
323	D130	1B		-----	
333		-----		-----	
334		-----		-----	
335	D130	1b		-----	
336		-----		-----	
353	D130	1b		-----	
360	D130	1A		-----	
391	D130	1a		-----	
398		-----		-----	
399	D130	1A		-----	
447	D130	1a		-----	
468	D130	1b		-----	
594	GOST6321	1A		-----	
604		-----		-----	
631	D130	1b		-----	
634	D130	1a		-----	
663	D130	1b		-----	
671		-----		-----	
781	D130	1A		-----	
785	D130	1b		-----	
824	D130	1a		-----	
922	D130	1A		-----	
962		-----		-----	
963		-----		-----	
970	D130	1a		-----	
974	D130	1a		-----	
998		-----		-----	
1006	D130	1b		-----	
1023	D130	1b		-----	
1049	D130	1A		-----	
1059	D130	1a		-----	
1062	D130	2		-----	
1064	D130	1a		-----	
1080		-----		-----	
1082		-----		-----	
1095		-----		-----	
1097	ISO2160	1b		-----	
1105	D130	1a		-----	
1108		-----		-----	
1109	D130	1b		-----	
1126		-----		-----	
1161	ISO2160	1A		-----	
1167		-----		-----	
1191		-----		-----	
1201	D130	1a		-----	
1237		-----		-----	
1275	IP154	1		-----	
1299	D130	1B		-----	
1318	D130	1a		-----	
1397	D130	1		-----	
1399		-----		-----	
1428	D130	1A		-----	
1429	IP154	1B		-----	
1496	D130	1a		-----	
1498		-----		-----	
1531	D130	1		-----	
1585	D130	1a		-----	

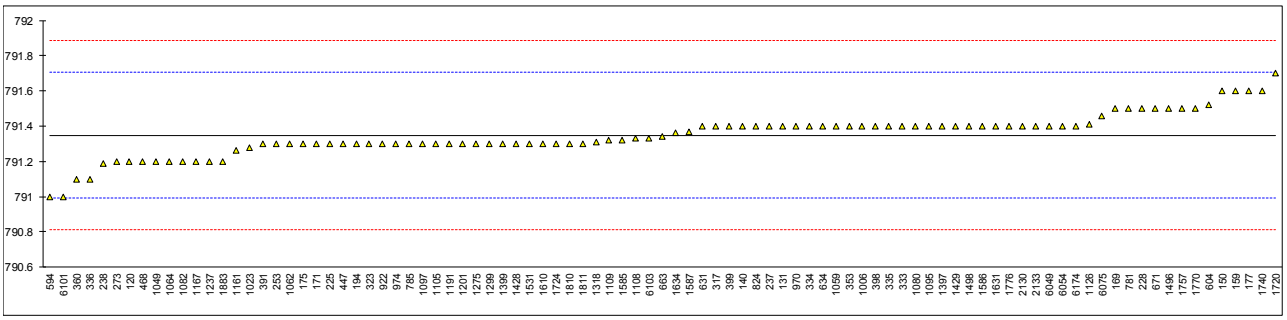
lab	method	value	mark	z(targ)	remarks
1586	D130	1a		-----	
1587	D130	1b		-----	
1610	D130	1b		-----	
1631	D130	1		-----	
1634	D130	1b		-----	
1720		-----		-----	
1724	D130	no 1a		-----	
1740	ISO2160	1A		-----	
1757		-----		-----	
1770		-----		-----	
1776		-----		-----	
1787		-----		-----	
1810		-----		-----	
1811		-----		-----	
1883	D130	1a		-----	
2130	D130	1a		-----	
2133		-----		-----	
6049	D130	1a		-----	
6054	D130	1b		-----	
6075	D130	1b		-----	
6101	D130	1a		-----	
6103	D130	1a		-----	
6174	D130	1A		-----	
	n	66			
	mean (n)	1			

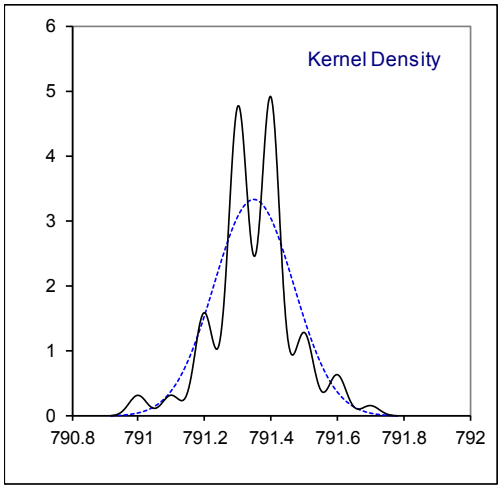
Determination of Density at 15°C on sample #18030; results in kg/m^3

lab	method	value	mark	z(targ)	remarks
120	D4052	791.2		-0.84	
131	D4052	791.4		0.28	
132		-----		-----	
140	D4052	791.4		0.28	
150	D4052	791.6		1.40	
159	D4052	791.6		1.40	
169	D4052	791.5		0.84	
171	D4052	791.3		-0.28	
175	D4052	791.3		-0.28	
177		791.6		1.40	
194	D4052	791.3		-0.28	
225	D4052	791.3		-0.28	
228	D4052	791.5		0.84	
237	D4052	791.4		0.28	
238	D4052	791.19		-0.89	
253	D4052	791.3		-0.28	
273	D4052	791.2	C	-0.84	first reported 790.7
317	D4052	791.4		0.28	
323	D4052	791.3		-0.28	
333	D4052	791.4		0.28	
334	D4052	791.4		0.28	
335	D4052	791.4		0.28	
336	D4052	791.1		-1.40	
353	IP365	791.4		0.28	
360	D4052	791.1		-1.40	
391	D4052	791.3		-0.28	
398	D4052	791.4		0.28	
399	D4052	791.4		0.28	
447	D4052	791.3		-0.28	
468	D4052	791.2		-0.84	
594	GOST3900	791.0		-1.96	
604	D4052	791.52		0.96	
631	D4052	791.4		0.28	
634	D4052	791.4		0.28	
663	D4052	791.34		-0.05	
671	D4052	791.5		0.84	
781	D4052	791.5		0.84	
785	D4052	791.3		-0.28	
824	D4052	791.4		0.28	
922	D4052	791.3		-0.28	
962		-----		-----	
963		-----		-----	
970	D4052	791.4		0.28	
974	D4052	791.3		-0.28	
998		-----		-----	
1006	D4052	791.4		0.28	
1023	D4052	791.28		-0.39	
1049	D4052	791.20		-0.84	
1059	D4052	791.4		0.28	
1062	D4052	791.3		-0.28	
1064	D4052	791.2		-0.84	
1080	D4052	791.4		0.28	
1082	D4052	791.2		-0.84	
1095	D4052	791.4		0.28	
1097	ISO12185	791.3		-0.28	
1105	D4052	791.3		-0.28	
1108	D4052	791.33		-0.11	
1109	D4052	791.32		-0.16	
1126	D4052	791.41		0.34	
1161	ISO12185	791.26		-0.50	
1167	ISO12185	791.2		-0.84	
1191	D4052	791.3		-0.28	
1201	D4052	791.3		-0.28	
1237	ISO12185	791.2		-0.84	
1275	IP365	791.3		-0.28	
1299	D4052	791.3		-0.28	
1318	D4052	791.31		-0.22	
1397	D4052	791.4		0.28	
1399	D4052	791.3	C	-0.28	first reported 784.469
1428	D4052	791.3		-0.28	
1429	D4052	791.4		0.28	
1496	D1298	791.5		0.84	
1498	D4052	791.4		0.28	
1531	ISO12185	791.30		-0.28	
1585	D4052	791.32		-0.16	

lab	method	value	mark	z(targ)	remarks
1586	D4052	791.4		0.28	
1587	D4052	791.37		0.12	
1610	IP365	791.3		-0.28	
1631	D4052	791.4		0.28	
1634	D4052	791.361		0.07	
1720	D4052	791.7		1.96	
1724	D4052	791.3		-0.28	
1740	D4052	791.6		1.40	
1757	D4052	791.50		0.84	
1770	D4052	791.5		0.84	
1776	ISO12185	791.40		0.28	
1787		-----		-----	
1810	ISO12185	791.3		-0.28	
1811	D4052	791.3		-0.28	
1883	D1298	791.2		-0.84	
2130	D4052	791.4		0.28	
2133	D4052	791.40		0.28	
6049	D4052	791.4		0.28	
6054	D4052	791.4		0.28	
6075	ISO12185	791.46		0.62	
6101	D4052	791.0		-1.96	
6103	ISO12185	791.33		-0.11	
6174	D4052	791.4		0.28	

normality	suspect
n	93
outliers	0
mean (n)	791.349
st.dev. (n)	0.1200
R(calc.)	0.336
st.dev.(D4052:16)	0.1786
R(D4052:16)	0.50





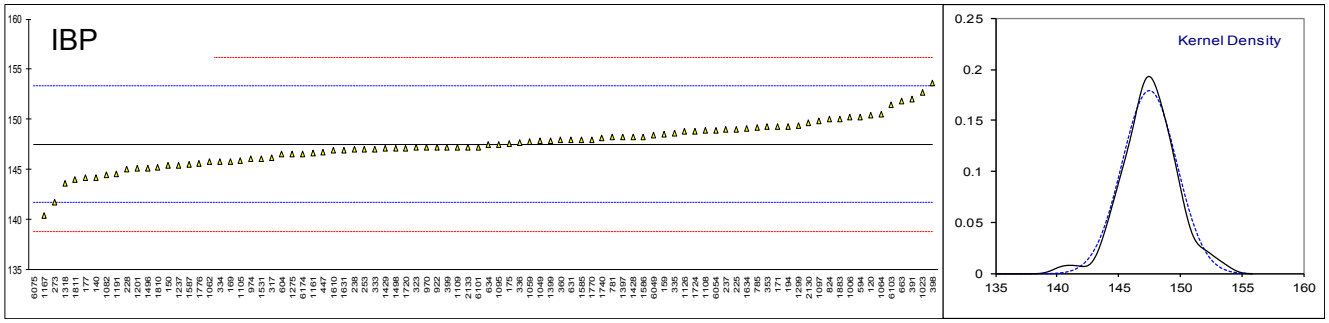
Determination of Distillation ASTM D86 on sample #18030; results in °C

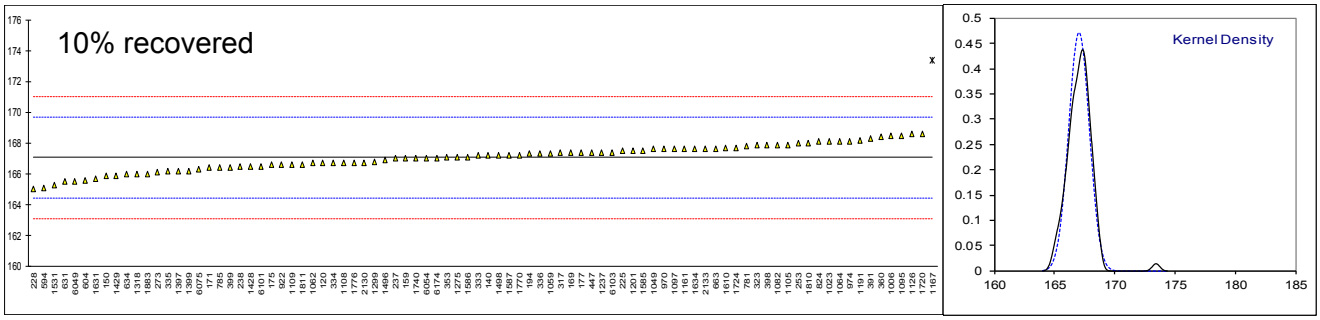
lab	method	IBP	m	10%rec	m	50%rec	m	90%rec	m	FBP	m
120	D86-A	150.4		166.7		193.8		245.9		279.9	
131		-----		-----		-----		-----		-----	
132		-----		-----		-----		-----		-----	
140	D86-A	144.2		167.2		193.4		244.7		278.5	
150	D86-A	145.4		165.9		192.5		243.4		277.0	
159	D86-A	148.5		167.0		193.7		245.3		278.3	
169	D86-A	145.8		167.4		193.8		245.8		280.1	
171	D86-A	149.3		166.4		192.8		247.7		279.9	
175	D86-A	147.6		166.6		193.7		247.8		280.3	
177		144.2		167.4		195.0		246.5		282.9	
194	D86-A	149.3		167.3		194.7		244.1		281.7	
225	D86-M	149.0		167.5		193.5		244.0		282.0	
228	D86-M	145.0		165.0		191.0	R(5)	239	C,R(1)	278.0	
237	D86-M	149.0		167.0		194.0		248.0		281.0	
238	D86-M	147.0		166.5		192.0		244.0		278.0	
253	D86-M	147.0		168.0		194.0		244.5		279.5	
273	D86-A	141.7		166.1		193.0		244.7		277.8	
317	D86-A	146.2		167.4		193.7		244.9		281.2	
323	D86-A	147.2		167.9		194.5		246.0		279.7	
333	D86-A	147.0		167.2		193.7		243.2		278.4	
334	D86-A	145.8		166.7		193.4		243.9		280.0	
335	D86-A	148.6		166.2		193.9		246.1		279.3	
336	D86-A	147.7		167.3		194.1		244.6		280.0	
353	D86-A	149.3		167.1		193.9		245		278.2	
360	D86-A	148.0		168.4		194.4		245.3		280.5	
391	D86-A	152.0		168.3		193.9		244.8		283.3	
398	D86-A	153.6		167.9		193.3		245.7		279.7	
399	D86-A	147.20		166.42		192.38		241.92		277.26	
447	D86-A	146.7		167.4		193.8		246.5		282.7	C
468		-----		-----		-----		-----		-----	
594	GOST2177	150.2		165.1		193.2		245.0		278.8	
604		146.5		165.6		192.0		246.5		278.0	
631	D86-M	148.0		165.5		192.0		244.0		275.5	
634	D86-M	147.5		166.0		193.0		246.0		276.0	
663	D86-A	151.85		167.65		193.40		245.65		280.60	
671		-----		-----		-----		-----		-----	
781	D86-A	148.2		167.8		193.9		244.7		282.9	
785	D86-A	149.2		166.4		193.3		245.8		280.0	
824	D86-A	150.0		168.1		194.2		245.5		279.7	
922	D86-A	147.2		166.6		193.3		244.9		280.0	
962		-----		-----		-----		-----		-----	
963		-----		-----		-----		-----		-----	
970	D86-A	147.2		167.6		194.2		245.3		279.8	
974	D86-A	146.1		168.1		194.5		245.7		279.5	
998		-----		-----		-----		-----		-----	
1006	D86-A	150.2		168.5		195.0		245.1		281.4	
1023	D86-A	152.7		168.1		196.6	R(5)	246.0		284.0	
1049	D86-A	147.9		167.6		194.5		246.8		282.4	
1059	D86-A	147.8		167.3		194.1		245.2		279.7	
1062	D86-A	145.8		166.7		193.4		243.8		278.4	
1064	D86-A	150.5		168.1		194.7		247.3		283.1	
1080		-----		-----		-----		-----		-----	
1082	D86-A	144.5		167.9		194.9		247.0		280.2	
1095	D2887	147.5		168.5		196.0		244.0		279.0	
1097		149.8		167.6		194.5		245.8		278.9	
1105	D86-A	145.9		167.9		194.3		245.1		278.5	
1108	D86-A	148.9		166.7		193.4		245.4		282.7	
1109	D86-A	147.2		166.6		193.6		245.3		279.8	
1126	D2887	148.8		168.6		197.6	R(1)	244.0		277.6	
1161	D86-A	146.6		167.6		194.3		244.3		281.6	
1167	ISO3405-A	140.4		173.4	R(1)	197.6	R(1)	249.4		280.7	
1191	D86-A	144.6		168.2		194.4		246.2		279.5	
1201	D86-A	145.1		167.5		194.4		247.0		281.9	
1237	ISO3405-A	145.4		167.4		193.6		243.3		278.4	
1275	IP123-A	146.5		167.1		193.6		246.5		279.4	
1299	D86-A	149.4		166.8		193.6		246.1		282.5	
1318	D86-A	143.6		166.0		192.9		244.5		277.9	
1397	D86-A	148.2		166.2		193.5		244.0		279.2	
1399	D86-A	147.9		166.2		192.8		244.4		278.7	
1428		148.2		166.5		193.2		243.3		281.7	
1429	D86-A	147.1		165.9		193.2		245.5		279.8	
1496	D86-A	145.1		166.9		194.5		246.7		281.2	
1498		147.1		167.2		194.3		247.4		281.4	
1531	D86-A	146.1		165.3		193.9		244.8		281.8	
1585	D86-M	148.0		167.5		194.0		246.0		279.5	

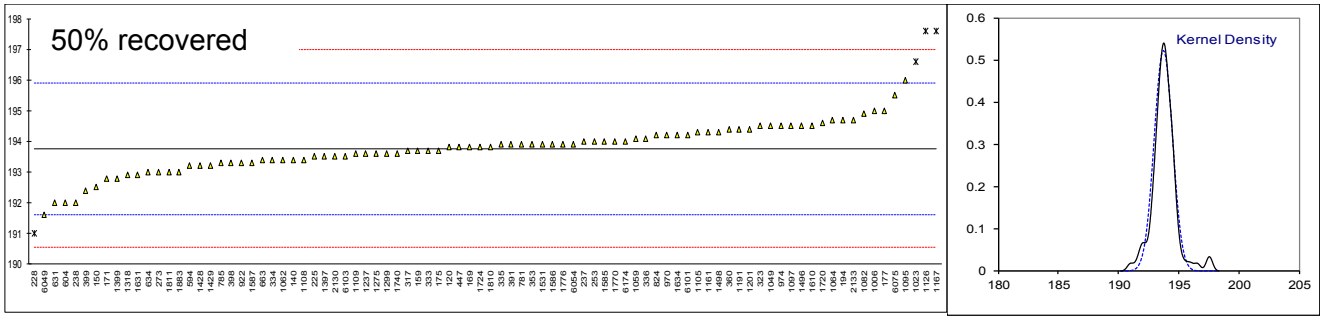
lab	method	IBP	m	10%rec	m	50%rec	m	90%rec	m	FBP	m
1586	D86-A	148.2		167.1		193.9		246.0		280.0	
1587	D86-A	145.5		167.2		193.3		243.1		279.2	
1610	D86-A	146.9		167.7		194.5		246.1		281.2	
1631	D86-A	146.9		165.7		192.9		243.9		280.9	
1634	D86-A	149.1		167.6		194.2		246.4		282.0	
1720	D86-A	147.1		168.6		194.6		245.9		283.3	
1724	D86-A	148.8		167.7		193.8		244.6		279.8	
1740	D86-A	148.1		167		193.6		244.3		279.5	
1757		-----		-----		-----		-----		-----	
1770		148.0		167.2		194.0		245.8		279.3	
1776		145.6		166.7		193.9		248.4		277.5	
1787		-----		-----		-----		-----		-----	
1810	D86-A	145.2		168.0		193.8		243.1		277.0	
1811	D86-A	144.0		166.6		193.0		242.5		279.3	
1883	D86-M	150		166		193		243		276	
2130	D86-A	149.7		166.7		193.5		244.8		283.2	
2133	D86-A	147.2		167.6		194.7		245.5		280.7	
6049		148.4		165.5		191.6		242.8		277.4	
6054	D86-A	148.9		167.0		193.9		245.4		279.8	
6075	ISO3405-A	132.1	R(1)	166.3		195.5		245.4		282.0	
6101	D86-A	147.2		166.5		194.2		245.8		279.5	
6103	ISO3405-A	151.45		167.4		193.5		244.35		279.6	
6174	D86-M	146.5		167.0		194.0		244.0		276.0	
	normality	suspect		OK		OK		OK		OK	
	n	87		87		84		87		88	
	outliers	1		1		4		1		0	
	mean (n)	147.520		167.059		193.761		245.227		279.887	
	st.dev. (n)	2.223		0.844		0.7649		1.375		1.862	
	R(calc.)	6.22		2.36		2.14		3.85		5.21	
	st.dev.(D86-A:17)	2.898		1.313		1.0714		1.314		2.536	
	R(D86-A:17)	8.11		3.68		3		3.68		7.1	
comp	R(D86-M:17)	4.62		3.03		3.1		4.1		4.56	

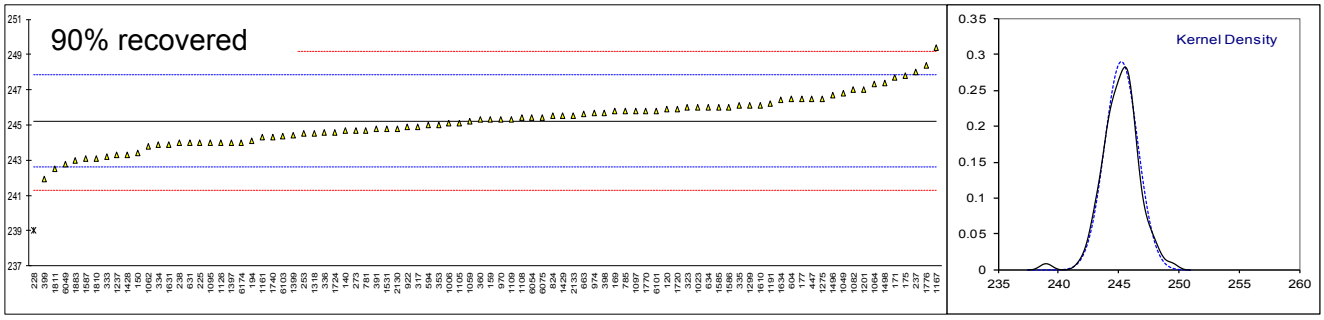
Lab 228 first reported: 241 for 90%recovered
Lab 447 first reported: 265.0 for FBP

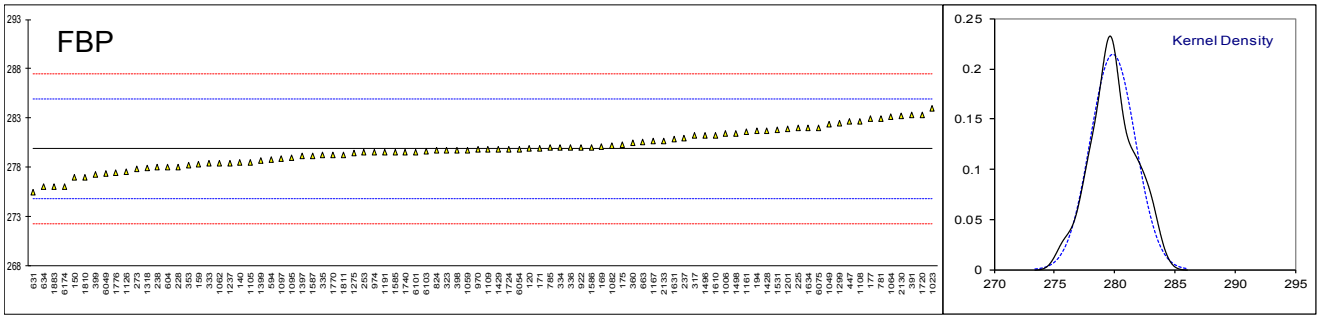
D86-A - mode automatic
D86-M - mode manual


IBP
Kernel Density


10% recovered
Kernel Density


50% recovered
Kernel Density


90% recovered
Kernel Density


FBP
Kernel Density

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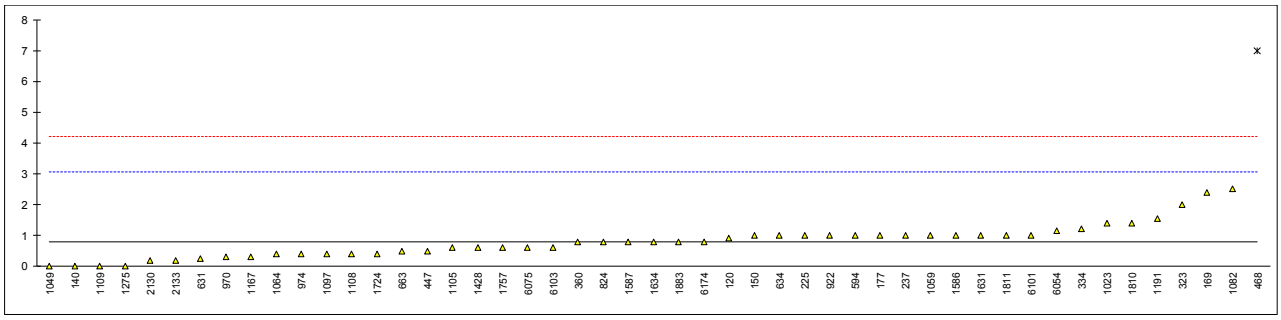
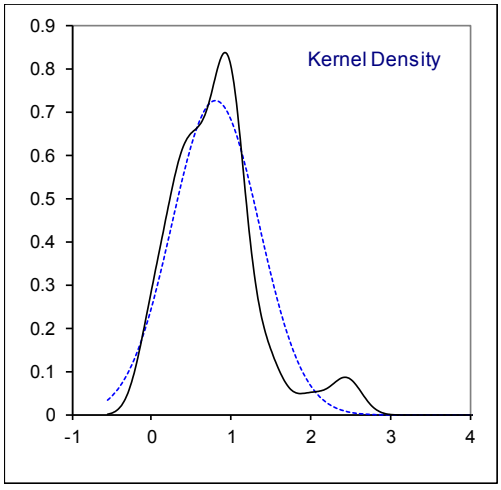
Determination of Existent Gum (unwashed) on sample #18030; results in mg/100mL

lab	method	value	mark	z(targ)	remarks
120	D381	0.9		0.09	
131		-----		-----	
132		-----		-----	
140	D381	0		-0.71	
150	D381	1		0.17	
159	D381	<1		-----	
169	D381	2.4		1.41	
171	D381	<1		-----	
175	D381	<1		-----	
177		1		0.17	
194		-----		-----	
225	D381	1.0		0.17	
228		-----		-----	
237	D381	1.0		0.17	
238		-----		-----	
253	IP540	< 1		-----	
273	D381	<0.01		-----	
317	D381	<1		-----	
323	D381	2.0		1.06	
333		-----		-----	
334	D381	1.2		0.35	
335	IP540	<1		-----	
336		-----		-----	
353	IP540	<1		-----	
360	D381	0.8		0.00	
391		-----		-----	
398		-----		-----	
399	D381	<1		-----	
447	IP540	0.5		-0.27	
468	IP540	7.0	R(0.01)	5.48	
594	GOST1568	1		0.17	
604		-----		-----	
631	IP540	0.25		-0.49	
634	D381	1		0.17	
663	D381	0.5		-0.27	
671		-----		-----	
781		-----		-----	
785		-----		-----	
824	D381	0.8		0.00	
922	D381	1.0		0.17	
962		-----		-----	
963		-----		-----	
970	IP540	0.3		-0.45	
974	D381	0.4		-0.36	
998		-----		-----	
1006		-----		-----	
1023	IP540	1.4		0.53	
1049	D381	0		-0.71	
1059	D381Mod.	1		0.17	
1062	D381	<1		-----	
1064	D381	0.40		-0.36	
1080	ISO6246	<1		-----	
1082	IP540	2.5		1.50	
1095	D381	<1		-----	
1097	IP540	0.4		-0.36	
1105	D381	0.60		-0.18	
1108	D381	0.4		-0.36	
1109	D381	0.0		-0.71	
1126		-----		-----	
1161		-----		-----	
1167	ISO6246	0.3		-0.45	
1191	IP540	1.56		0.67	
1201	D381	<0.5		-----	
1237		-----		-----	
1275	IP540	0.0		-0.71	
1299	D381	<1		-----	
1318	IP540	<1		-----	
1397		-----		-----	
1399		-----		-----	
1428	D381	0.6		-0.18	
1429		-----		-----	
1496	D381	<1		-----	
1498		-----		-----	
1531		-----		-----	
1585		-----		-----	

lab	method	value	mark	z(targ)	remarks
1586	D381	1		0.17	
1587	IP540	0.8		0.00	
1610	IP540	< 1		-----	
1631	IP540	1		0.17	
1634	D381	0.8		0.00	
1720		-----		-----	
1724	IP540	0.4		-0.36	
1740		-----		-----	
1757	D381	0.6		-0.18	
1770	D381	<1		-----	
1776		-----		-----	
1787		-----		-----	
1810	D381	1.4		0.53	
1811	D381	1.0		0.17	
1883		0.8		0.00	
2130	IP540	0.2		-0.53	
2133	D381	0.2		-0.53	
6049	IP540	<1.0		-----	
6054	IP540	1.14		0.30	
6075	IP540	0.6		-0.18	
6101	D381	1.0		0.17	
6103	D381	0.6		-0.18	
6174	D381	0.8		0.00	

normality	not OK
n	48
outliers	1
mean (n)	0.803
st.dev. (n)	0.5500
R(calc.)	1.540
st.dev.(D381:12)	1.1305
R(D381:12)	3.165



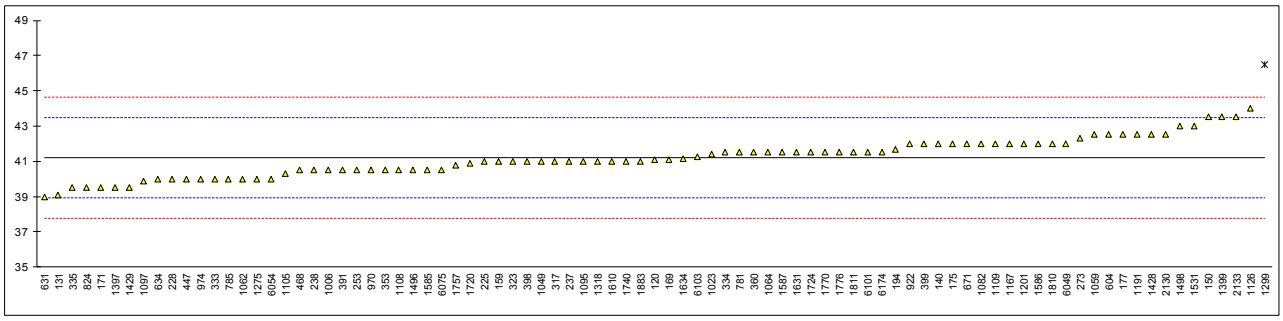


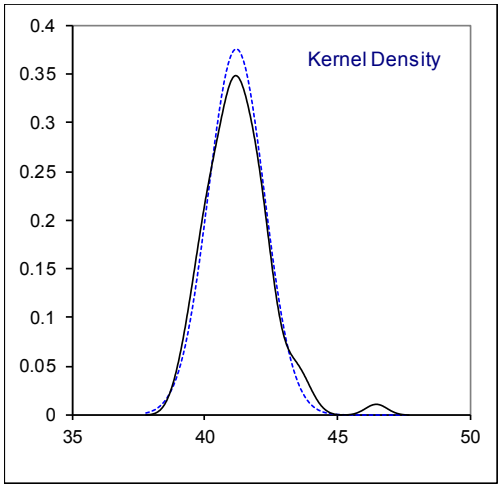
Determination of Flash Point on sample #18030; results in °C

lab	method	value	mark	z(targ)	remarks
120	D56	41.1	C	-0.08	first reported 106
131	D56	39.1		-1.83	
132		-----		-----	
140	D56	42		0.71	
150	D56	43.5		2.02	
159	D56	41.0		-0.17	
169	D56	41.1		-0.08	
171	D56	39.5		-1.48	
175	D56	42		0.71	
177		42.5		1.14	
194	D93	41.7		0.44	
225	IP170	41.0		-0.17	
228	IP170	40.0		-1.04	
237	IP170	41.0		-0.17	
238	IP170	40.5		-0.61	
253	IP170	40.5		-0.61	
273	IP170	42.3		0.97	
317	IP170	41.0		-0.17	
323	IP170	41.0		-0.17	
333	IP170	40.0		-1.04	
334	IP170	41.5		0.27	
335	IP170	39.5		-1.48	
336		-----		-----	
353	IP170	40.500		-0.61	
360	D56	41.5		0.27	
391	IP170	40.5		-0.61	
398	D3828	41.0		-0.17	
399	IP170	42		0.71	
447	IP170	40		-1.04	
468	IP170	40.5		-0.61	
594		-----		-----	
604	IP170	42.5		1.14	
631	D56	39.0		-1.92	
634	IP170	40.0		-1.04	
663		-----		-----	
671	IP170	42.0		0.71	
781	IP170	41.5		0.27	
785	IP170	40.0		-1.04	
824	IP170	39.5		-1.48	
922	IP170	42.0		0.71	
962		-----		-----	
963		-----		-----	
970	IP170	40.5		-0.61	
974	IP170	40.0		-1.04	
998		-----		-----	
1006	D56	40.5		-0.61	
1023	ISO13736	41.4		0.18	
1049	ISO13736	41.0		-0.17	
1059	IP170	42.5		1.14	
1062	IP170	40.0		-1.04	
1064	IP170	41.5		0.27	
1080		-----		-----	
1082	IP170	42.0		0.71	
1095	IP170	41.0		-0.17	
1097	ISO13736	39.9		-1.13	
1105	IP170	40.3		-0.78	
1108	D56	40.5		-0.61	
1109	IP170	42.0		0.71	
1126	D93	44.0		2.46	
1161		-----		-----	
1167	ISO2719	42.0		0.71	
1191	IP170	42.5		1.14	
1201	IP170	42.0		0.71	
1237		-----		-----	
1275	IP170	40.0		-1.04	
1299	IP170	46.5	R(0.01)	4.64	
1318	IP170	41.0		-0.17	
1397	D56	39.5		-1.48	
1399	IP170	43.5		2.02	
1428	D93	42.5		1.14	
1429	D56	39.5		-1.48	
1496	IP170	40.5		-0.61	
1498	D56	43.0		1.58	
1531	D93	43		1.58	
1585	IP170	40.5		-0.61	

lab	method	value	mark	z(targ)	remarks
1586	IP170	42.0		0.71	
1587	IP170	41.5		0.27	
1610	IP170	41.0		-0.17	
1631	IP170	41.5		0.27	
1634	IP170	41.15		-0.04	
1720	D3828	40.9		-0.26	
1724	IP170	41.5		0.27	
1740	IP170	41		-0.17	
1757	D56	40.8		-0.34	
1770	D56	41.5		0.27	
1776	IP170	41.5		0.27	
1787		-----		-----	
1810	IP170	42		0.71	
1811	D56	41.5		0.27	
1883	D56	41		-0.17	
2130	IP170	42.5		1.14	
2133	D93	43.5		2.02	
6049	IP170	42.0		0.71	
6054	IP170	40.0		-1.04	
6075	IP170	40.5		-0.61	
6101	IP170	41.5		0.27	
6103	ISO13736	41.25		0.05	
6174	IP170	41.5		0.27	

normality	OK
n	86
outliers	1
mean (n)	41.192
st.dev. (n)	1.0621
R(calc.)	2.974
st.dev.(IP170:14)	1.1429
R(IP170:14)	3.2



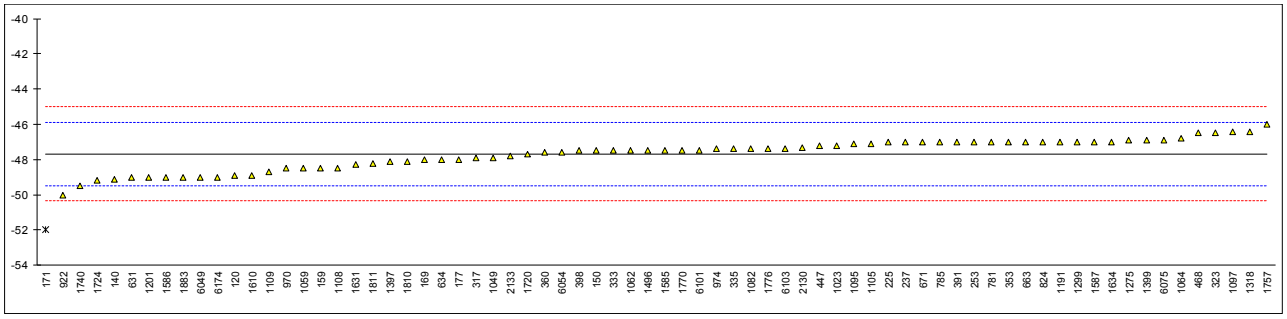


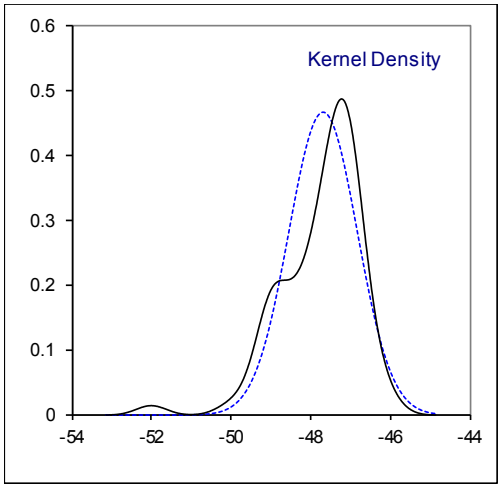
Determination of Freezing Point on sample #18030; results in °C

lab	method	value	mark	z(targ)	remarks
120	D5972	-48.9		-1.36	
131		-----		-----	
132		-----		-----	
140	D5972	-49.1		-1.58	
150	D7153	-47.5		0.21	
159	D2386	-48.5		-0.91	
169	D2386	-48.0		-0.35	
171	D2386	-52.0	R(0.01)	-4.83	
175		-----		-----	
177		-48.0		-0.35	
194		-----		-----	
225	D2386	-47.0		0.77	
228		-----		-----	
237	D2386	-47.0		0.77	
238		-----		-----	
253	D2386	-47.0		0.77	
273		-----		-----	
317	D5972	-47.9		-0.24	
323	D2386	-46.5		1.33	
333	IP529	-47.5		0.21	
334		-----		-----	
335	IP529	-47.4		0.32	
336		-----		-----	
353	IP16	-47		0.77	
360	D7153	-47.6		0.10	
391	D2386	-47.0		0.77	
398	D2386	-47.5		0.21	
399	D5972	<-80		<-36.19	possibly a false negative test result?
447	IP529	-47.2		0.54	
468	D2386	-46.5		1.33	
594		-----		-----	
604		-----		-----	
631	D2386	-49.0		-1.47	
634	D2386	-48.0		-0.35	
663	D2386	-47.0		0.77	
671	D2386	-47.0		0.77	
781	D2386	-47.0		0.77	
785	D2386	-47		0.77	
824	D2386	-47.0		0.77	
922	D2386	-50.0		-2.59	
962		-----		-----	
963		-----		-----	
970	D2386	-48.5	C	-0.91	first reported 48.5
974	D7153	-47.4		0.32	
998		-----		-----	
1006		-----		-----	
1023	D7153	-47.2		0.54	
1049	D7153	-47.9		-0.24	
1059	D2386	-48.5		-0.91	
1062	D2386	-47.5		0.21	
1064	D7153	-46.8		0.99	
1080		-----		-----	
1082	IP529	-47.4		0.32	
1095	D7153	-47.1		0.66	
1097	IP529	-46.4		1.44	
1105	D7153	-47.1		0.66	
1108	D5972	-48.5		-0.91	
1109	D5972	-48.7		-1.14	
1126		-----		-----	
1161		-----		-----	
1167		-----		-----	
1191	IP529	-47		0.77	
1201	D2386	-49.0		-1.47	
1237		-----		-----	
1275	IP529	-46.9		0.88	
1299	D2386	-47.0		0.77	
1318	D7153	-46.4		1.44	
1397	D7153	-48.1		-0.46	
1399	D7153	-46.9		0.88	
1428		-----	W	-----	first reported 50.9
1429		-----		-----	
1496	D2386	-47.5		0.21	
1498		-----		-----	
1531		-----		-----	
1585	D2386	-47.5		0.21	

lab	method	value	mark	z(targ)	remarks
1586	D2386	-49.0		-1.47	
1587	IP529	-47.0		0.77	
1610	D5972	-48.9		-1.36	
1631	D7153	-48.3		-0.69	
1634	D2386	-47.0		0.77	
1720	D7153	-47.7		-0.02	
1724	IP435	-49.2		-1.70	
1740	D2386	-49.5		-2.03	
1757	D2386	-46.0		1.89	
1770	D7153	-47.5		0.21	
1776	IP529	-47.4		0.32	
1787		-----		-----	
1810	D5972	-48.1		-0.46	
1811	D2386	-48.2		-0.58	
1883	D2386	-49		-1.47	
2130	IP529	-47.3		0.43	
2133	D7153	-47.8		-0.13	
6049	D2386	-49.0		-1.47	
6054	D7153	-47.6		0.10	
6075	IP529	-46.9		0.88	
6101	D2386	-47.5		0.21	
6103	D7153	-47.4		0.32	
6174	D2386	-49.0		-1.47	

normality	OK
n	71
outliers	1
mean (n)	-47.686
st.dev. (n)	0.8578
R(calc.)	2.402
st.dev.(D2386:15e1)	0.8929
R(D2386:15e1)	2.5



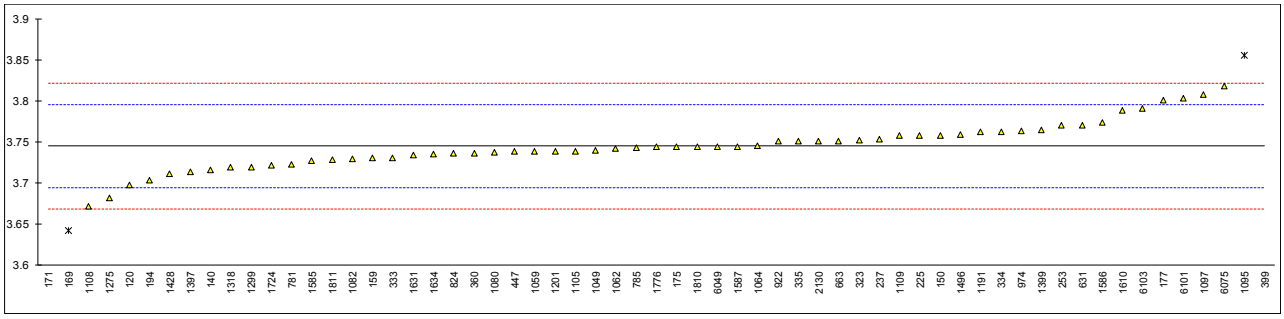


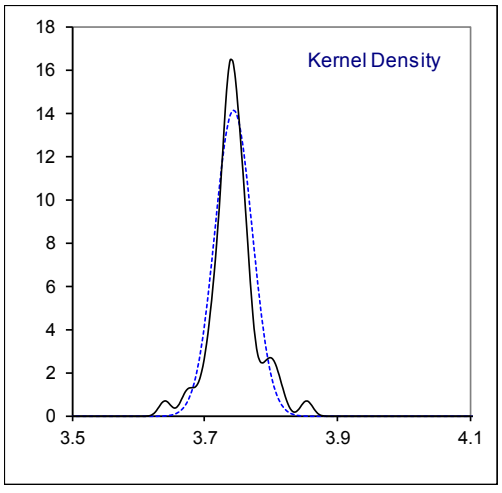
Determination of Kinematic Viscosity at -20°C on sample #18030; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
120	D445	3.698		-1.85	
131		-----		-----	
132		-----		-----	
140	D445	3.7155		-1.16	
150	D445	3.758		0.52	
159	D445	3.730		-0.59	
169	D445	3.6416	C,R(0.05)	-4.06	first reported 3.6375
171	D445	3.304	R(0.01)	-17.35	
175	D445	3.744		-0.04	
177		3.801		2.21	
194	D445	3.703		-1.65	
225	D445	3.758		0.52	
228		-----		-----	
237	D445	3.75294		0.32	
238		-----		-----	
253	D445	3.770		0.99	
273		-----		-----	
317		-----		-----	
323	D445	3.752		0.28	
333	D445	3.730		-0.59	
334	D445	3.762		0.67	
335	D445	3.751		0.24	
336		-----		-----	
353		-----		-----	
360	D445	3.7361		-0.35	
391		-----		-----	
398		-----		-----	
399	D445	4.210	C,R(0.01)	18.30	first reported 4.5920
447	D445	3.738		-0.27	
468		-----		-----	
594		-----		-----	
604		-----		-----	
631	D445	3.77003		0.99	
634		-----		-----	
663	D445	3.7513		0.25	
671		-----		-----	
781	D445	3.723		-0.86	
785	D445	3.743		-0.07	
824	D445	3.736		-0.35	
922	D445	3.751		0.24	
962		-----		-----	
963		-----		-----	
970		-----		-----	
974	D445	3.763		0.71	
998		-----		-----	
1006		-----		-----	
1023		-----		-----	
1049	D445	3.740		-0.19	
1059	D445	3.738		-0.27	
1062	D445	3.742		-0.11	
1064	D445	3.745		0.00	
1080	D7042	3.7369		-0.31	
1082	D445	3.7296		-0.60	
1095	D445	3.855	R(0.05)	4.33	
1097	ISO3104	3.8079		2.48	
1105	D445	3.739		-0.23	
1108	D445	3.672	C	-2.87	first reported 3.853
1109	D445	3.7578		0.51	
1126		-----		-----	
1161		-----		-----	
1167		-----		-----	
1191	D445	3.7618		0.67	
1201	D7042	3.738		-0.27	
1237		-----		-----	
1275	IP71	3.682		-2.47	
1299	D445	3.719		-1.02	
1318	D7042	3.7187		-1.03	
1397	D7042	3.713		-1.26	
1399	D445	3.765	C	0.79	first reported 5.259
1428	D445	3.711		-1.33	
1429		-----		-----	
1496	D445	3.759		0.56	
1498		-----		-----	
1531		-----		-----	
1585	D445	3.7277		-0.68	

lab	method	value	mark	z(targ)	remarks
1586	D445	3.774		1.15	
1587	D445	3.7444		-0.02	
1610	D7042	3.788		1.70	
1631	D445	3.734		-0.43	
1634	D445	3.735		-0.39	
1720		-----		-----	
1724	D445	3.721		-0.94	
1740		-----		-----	
1757		-----	W	-----	first reported 3.6615
1770		-----		-----	
1776	D445	3.7438		-0.04	
1787		-----		-----	
1810	D445	3.744		-0.04	
1811	D445	3.7288		-0.63	
1883		-----		-----	
2130	D445	3.751		0.24	
2133		-----		-----	
6049	D445	3.744		-0.04	
6054		-----		-----	
6075	D445	3.8179		2.87	
6101	D445	3.8026		2.27	
6103	ISO3104	3.79015		1.78	
6174		-----		-----	

normality	OK
n	57
outliers	4
mean (n)	3.7449
st.dev. (n)	0.02823
R(calc.)	0.0790
st.dev.(D445:17a)	0.02541
R(D445:17a)	0.0712



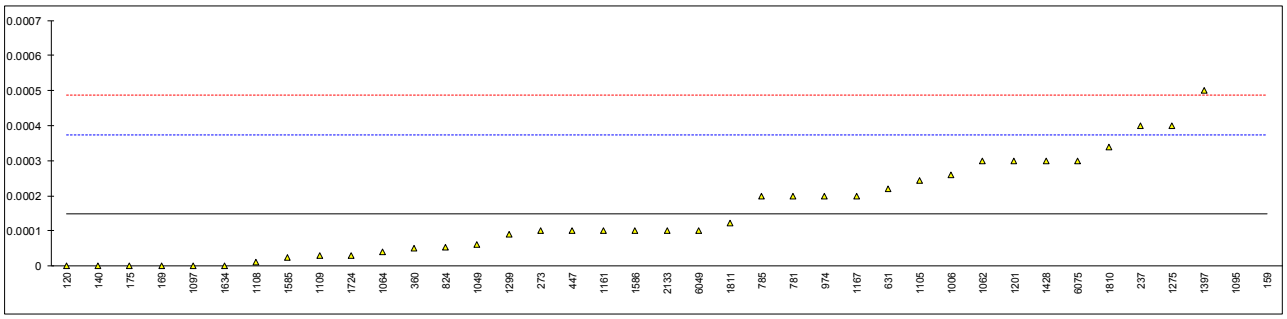


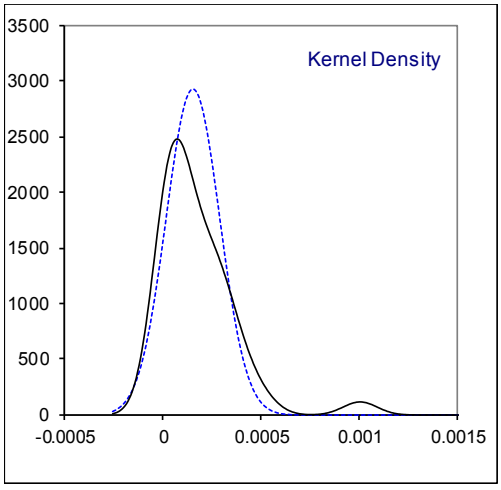
Determination of Mercaptan Sulphur as S on sample #18030; results in %M/M

lab	method	value	mark	z(targ)	remarks
120	D3227	0		-1.31	
131		-----		-----	
132		-----		-----	
140	D3227	0		-1.31	
150	D3227	<0.0003		-----	
159	D3227	0.0031	C,R(0.01)	26.14	first reported 31
169	D3227	0		-1.31	
171	D3227	<0.0003		-----	
175	D3227	0		-1.31	
177		<0.0003		-----	
194		-----		-----	
225		-----		-----	
228		-----		-----	
237	D3227	0.0004		2.23	
238		-----		-----	
253		-----		-----	
273	D3227	0.0001		-0.43	
317		-----		-----	
323	D3227	<0.0003		-----	
333		-----		-----	
334		-----		-----	
335	D3227	<0.0003	C	-----	first reported <0.0003 mg/kg
336		-----		-----	
353		-----		-----	
360	D3227	0.00005		-0.87	
391	D3227	<0.0001		-----	
398		-----		-----	
399		-----		-----	
447	D3227	0.0001		-0.43	
468		-----		-----	
594		-----		-----	
604		-----		-----	
631	D3227	0.00022		0.64	
634		-----		-----	
663		-----		-----	
671		-----		-----	
781	D3227	0.0002		0.46	
785	D3227	0.0002		0.46	
824	D3227	0.000054		-0.83	
922	D3227	<0.0003		-----	
962		-----		-----	
963		-----		-----	
970		-----		-----	
974	D3227	0.0002		0.46	
998		-----		-----	
1006	D3227	0.00026		0.99	
1023		-----		-----	
1049	D3227	0.000062		-0.76	
1059	D3227	<0.0003		-----	
1062	D3227	0.0003		1.35	
1064	D3227	0.00004		-0.96	
1080		-----		-----	
1082		-----		-----	
1095	D3227	0.001	R(0.01)	7.54	
1097	ISO3012	0		-1.31	
1105	D3227	0.000245		0.86	
1108	D3227	0.00001		-1.22	
1109	D3227	0.00003		-1.04	
1126		-----		-----	
1161	D3227	0.0001		-0.43	
1167	ISO3012	0.0002		0.46	
1191		-----		-----	
1201	D3227	0.0003		1.35	
1237		-----		-----	
1275	IP342	0.0004		2.23	
1299	D3227	0.00009		-0.51	
1318		-----		-----	
1397	D3227	0.0005		3.12	
1399	D3227	<0.0003		-----	
1428	D3227	0.0003		1.35	
1429		-----		-----	
1496		-----		-----	
1498		-----		-----	
1531		-----		-----	
1585	D3227	0.000024		-1.10	

lab	method	value	mark	z(targ)	remarks
1586	D3227	0.0001		-0.43	
1587		-----		-----	
1610	IP342	<0.0003		-----	
1631	D3227	<0.0003		-----	
1634	D3227	0		-1.31	
1720		-----		-----	
1724	D3227	0.00003		-1.04	
1740		-----		-----	
1757		-----		-----	
1770		-----		-----	
1776		-----		-----	
1787		-----		-----	
1810	D3227	0.00034	C	1.70	first reported 0.00034 mg/kg
1811	D3227	0.000121		-0.24	
1883		-----		-----	
2130	D3227	<0.0001		-----	
2133	D3227	0.0001		-0.43	
6049	D3227	0.0001	C	-0.43	first reported 0.0001 mg/kg
6054		-----		-----	
6075	D3227	0.0003		1.35	
6101		-----		-----	
6103		-----		-----	
6174		-----		-----	

normality	OK
n	37
outliers	2
mean (n)	0.000148
st.dev. (n)	0.0001361
R(calc.)	0.000381
st.dev.(D3227:16)	0.0001129
R(D3227:16)	0.000316



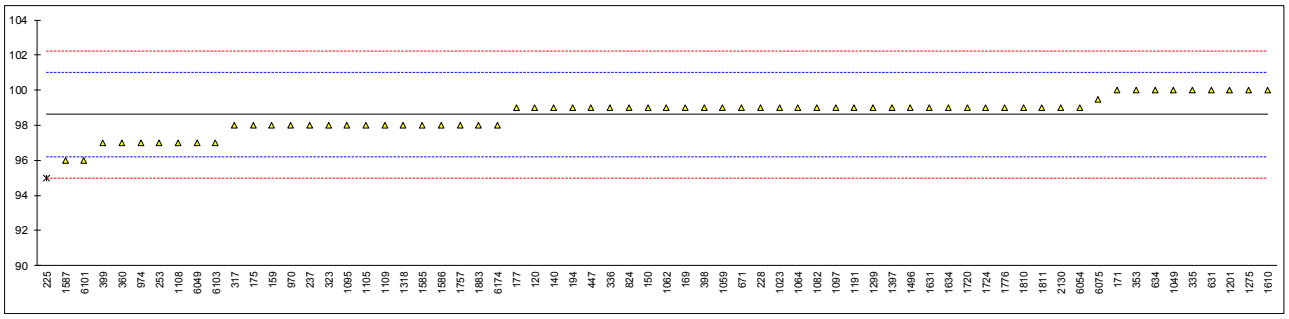


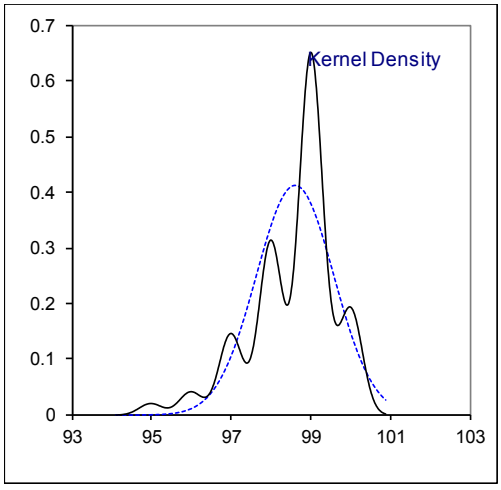
Determination of MSEP on sample #18030;

lab	method	value	mark	z(targ)	remarks
120	D3948	99		0.32	
131		-----		-----	
132		-----		-----	
140	D3948	99		0.32	
150	D3948	99		0.32	
159	D3948	98		-0.50	
169	D3948	99		0.32	
171	D3948	100		1.15	
175	D3948	98		-0.50	
177		99		0.32	
194	D3948	99		0.32	
225	D3948	95	C,R(0.05)	-2.99	first reported 85
228	D3948	99		0.32	
237	D3948	98		-0.50	
238		-----		-----	
253	D3948	97		-1.33	
273		-----		-----	
317	D3948	98		-0.50	
323	D3948	98		-0.50	
333		-----		-----	
334		-----		-----	
335	D3948	100		1.15	
336	D3948	99		0.32	
353	D3948	100		1.15	
360	D3948	97		-1.33	
391		-----		-----	
398	D3948	99		0.32	
399	D3948	97		-1.33	
447	D3948	99		0.32	
468		-----		-----	
594		-----		-----	
604		-----		-----	
631	D3948	100		1.15	
634	D3948	100		1.15	
663		-----		-----	
671	D3948	99		0.32	
781		-----		-----	
785		-----		-----	
824	D3948	99		0.32	
922		-----		-----	
962		-----		-----	
963		-----		-----	
970	D3948	98		-0.50	
974	D3948	97		-1.33	
998		-----		-----	
1006		-----		-----	
1023	D3948	99		0.32	
1049	D3948	100		1.15	
1059	D3948	99		0.32	
1062	D3948	99		0.32	
1064	D3948	99		0.32	
1080		-----		-----	
1082	D3948	99		0.32	
1095	D3948	98		-0.50	
1097	D3948	99		0.32	
1105	D3948	98		-0.50	
1108	D3948	97		-1.33	
1109	D3948	98		-0.50	
1126		-----		-----	
1161		-----		-----	
1167		-----		-----	
1191	D3948	99		0.32	
1201	D3948	100		1.15	
1237		-----		-----	
1275	D3948	100		1.15	
1299	D3948	99		0.32	
1318	D3948	98		-0.50	
1397	D3948	99		0.32	
1399		-----		-----	
1428		-----		-----	
1429		-----		-----	
1496	D3948	99		0.32	
1498		-----		-----	
1531		-----		-----	
1585	D3948	98.0		-0.50	

lab	method	value	mark	z(targ)	remarks
1586	D3948	98		-0.50	
1587	D3948	96		-2.16	
1610	D3948	100		1.15	
1631	D3948	99		0.32	
1634	D3948	99		0.32	
1720	D3948	99		0.32	
1724	D3948	99		0.32	
1740		-----		-----	
1757	D3948	98		-0.50	
1770		-----		-----	
1776	D3948	99		0.32	
1787		-----		-----	
1810	D7224	99		0.32	
1811	D3948	99		0.32	
1883	D3948	98	C	-0.50	first reported 94
2130	D3948	99		0.32	
2133		-----		-----	
6049	D3948	97		-1.33	
6054	D3948	99		0.32	
6075	D3948	99.5		0.74	
6101	D3948	96		-2.16	
6103	D3948	97		-1.33	
6174	D3948	98		-0.50	

normality	OK
n	65
outliers	1
mean (n)	98.61
st.dev. (n)	0.970
R(calc.)	2.72
st.dev.(D3948:14)	1.208
R(D3948:14)	3.38



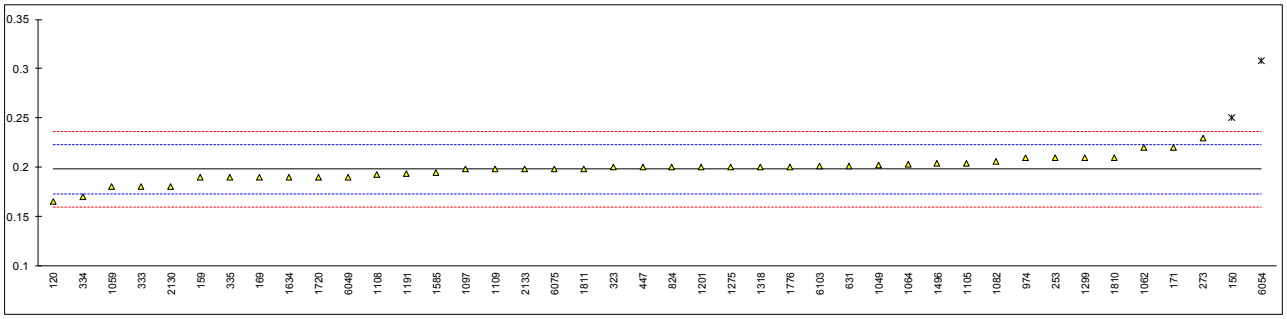


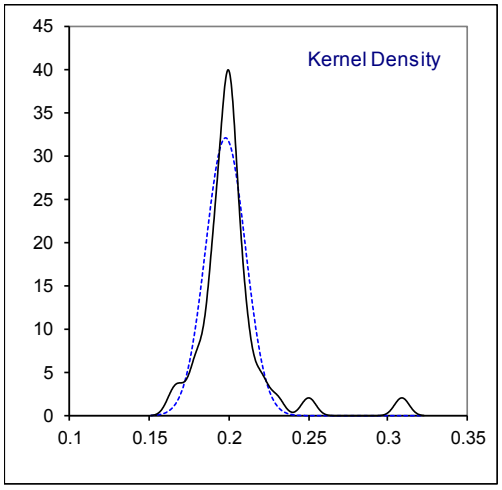
Determination of Naphthalenes on sample #18030; results in %V/V

lab	method	value	mark	z(targ)	remarks
120	D1840-meth.B	0.165		-2.59	
131		-----		-----	
132		-----		-----	
140		-----		-----	
150	D1840-meth.A	0.25	C,R(0.01)	4.10	first reported <0.03
159	D1840-meth.A	0.19	C	-0.63	first reported 0.31
169	D1840-meth.B	0.19		-0.63	
171	D1840-meth.A	0.22		1.73	
175		-----		-----	
177		<0.03		<-13.22	possibly a false negative test result?
194		-----		-----	
225		-----		-----	
228		-----		-----	
237		-----		-----	
238		-----		-----	
253	D1840-meth.B	0.21		0.95	
273	D1840-meth.A	0.23	C	2.52	first reported 0.38
317		-----		-----	
323	D1840-meth.A	0.20	C	0.16	first reported 0.31
333	D1840-meth.B	0.18	C	-1.41	first reported 0.13
334	D1840-meth.A	0.17		-2.20	
335	D1840-meth.B	0.19		-0.63	
336		-----		-----	
353		-----		-----	
360		-----		-----	
391		-----		-----	
398		-----		-----	
399		-----		-----	
447	D1840-meth.B	0.20		0.16	
468		-----		-----	
594		-----		-----	
604		-----		-----	
631	D1840-meth.A	0.201		0.24	
634		-----		-----	
663		-----		-----	
671		-----		-----	
781		-----		-----	
785		-----		-----	
824	D1840-meth.B	0.20		0.16	
922		-----		-----	
962		-----		-----	
963		-----		-----	
970		-----		-----	
974	D1840-meth.A	0.21		0.95	
998		-----		-----	
1006		-----		-----	
1023		-----		-----	
1049	D1840-meth.A	0.202		0.32	
1059	D1840-meth.B	0.18		-1.41	
1062	D1840-meth.A	0.22		1.73	
1064	D1840-meth.A	0.203		0.40	
1080		-----		-----	
1082	D1840-meth.A	0.206		0.63	
1095		-----		-----	
1097	D1840-meth.A	0.198		0.00	
1105	D1840-meth.A	0.204		0.48	
1108	D1840-meth.B	0.193		-0.39	
1109	D1840-meth.B	0.198		0.00	
1126		-----		-----	
1161		-----		-----	
1167		-----		-----	
1191	D1840-meth.A	0.194		-0.31	
1201	D1840-meth.B	0.20		0.16	
1237		-----		-----	
1275	D1840-meth.A	0.20	C	0.16	first reported 0.44
1299	D1840-meth.B	0.21		0.95	
1318	D1840-meth.B	0.20		0.16	
1397		-----		-----	
1399		-----		-----	
1428		-----		-----	
1429		-----		-----	
1496	D1840-meth.B	0.2038		0.46	
1498		-----		-----	
1531		-----		-----	
1585	D1840-meth.B	0.195		-0.23	

lab	method	value	mark	z(targ)	remarks
1586		-----		-----	
1587		-----		-----	
1610	D1840-meth.B	< 0.01		<-14.80	possibly a false negative test result?
1631		-----		-----	
1634	D1840-meth.B	0.19		-0.63	
1720	D1840-meth.B	0.19		-0.63	
1724		-----		-----	
1740		-----		-----	
1757		-----		-----	
1770		-----		-----	
1776	D1840-meth.A	0.20		0.16	
1787		-----		-----	
1810	D1840-meth.A	0.21		0.95	
1811	D1840-meth.A	0.1987		0.06	
1883		-----		-----	
2130	D1840-meth.B	0.18		-1.41	
2133	D1840-meth.A	0.198	C	0.00	first reported 0.099
6049	D1840-meth.B	0.19		-0.63	
6054	D1840-meth.B	0.3084	R(0.01)	8.69	
6075	D1840-meth.B	0.198		0.00	
6101		-----		-----	
6103	D1840-meth.B	0.2009	C	0.23	first reported 0.2575
6174		-----		-----	

normality	suspect
n	40
outliers	2
mean (n)	0.19796
st.dev. (n)	0.012473
R(calc.)	0.03492
st.dev.(D1840-B:07)	0.012703
R(D1840-B:07)	0.03557
Compare R(D1840-A:07)	0.03582



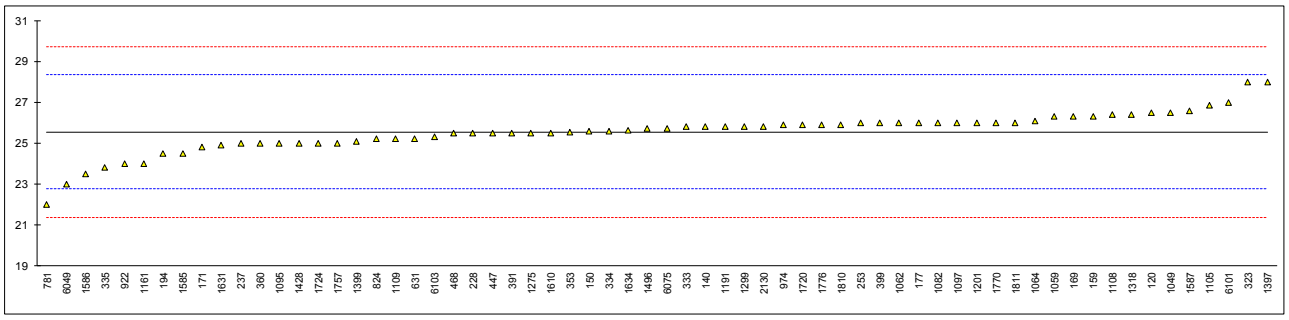


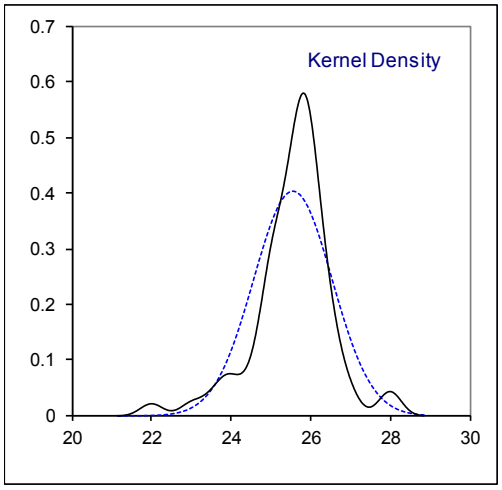
Determination of Smoke Point on sample #18030; results in mm

lab	method	value	mark	z(targ)	remarks
120	D1322-automated	26.5		0.68	
131		-----		-----	
132		-----		-----	
140	D1322-automated	25.8		0.17	
150	D1322-automated	25.6		0.03	
159	D1322-automated	26.3		0.53	
169	D1322-automated	26.3		0.53	
171	D1322-manual	24.8		-0.54	
175		-----		-----	
177		26.0		0.32	
194	D1322-manual	24.5		-0.76	
225		-----		-----	
228	D1322-automated	25.5		-0.04	
237	D1322-automated	25.0		-0.40	
238		-----		-----	
253	D1322-manual	26.0		0.32	
273		-----		-----	
317		-----		-----	
323	D1322-manual	28.0		1.76	
333	D1322-automated	25.8		0.17	
334	D1322-automated	25.6		0.03	
335	D1322-manual	23.8		-1.26	
336		-----		-----	
353	IP57-manual	25.52		-0.03	
360	D1322-manual	25.0		-0.40	
391	D1322-manual	25.5		-0.04	
398		-----		-----	
399	D1322-manual	26		0.32	
447	D1322-manual	25.5		-0.04	
468	D1322-manual	25.5		-0.04	
594		-----		-----	
604		-----		-----	
631	D1322-automated	25.24		-0.23	
634		-----		-----	
663		-----		-----	
671		-----		-----	
781	D1322-manual	22.0		-2.56	
785		-----		-----	
824	D1322-automated	25.2		-0.26	
922	D1322-manual	24		-1.12	
962		-----		-----	
963		-----		-----	
970		-----		-----	
974	D1322-automated	25.9		0.25	
998		-----		-----	
1006		-----		-----	
1023		-----		-----	
1049	D1322-automated	26.5		0.68	
1059	D1322-manual	26.3		0.53	
1062	D1322-manual	26		0.32	
1064	D1322-automated	26.1		0.39	
1080		-----		-----	
1082	D1322-automated	26.0		0.32	
1095	D1322-automated	25.0		-0.40	
1097	D1322-automated	26.0		0.32	
1105	D1322-automated	26.85		0.93	
1108	D1322-automated	26.4		0.61	
1109	D1322-automated	25.2		-0.26	
1126		-----		-----	
1161	ISO3014-manual	24.0		-1.12	
1167		-----		-----	
1191	D1322-automated	25.8		0.17	
1201	D1322-automated	26.0		0.32	
1237		-----		-----	
1275	IP598-automated	25.5		-0.04	
1299	D1322-automated	25.8		0.17	
1318	D1322-automated	26.4		0.61	
1397	D1322-manual	28		1.76	
1399	D1322-automated	25.1		-0.33	
1428	D1322-manual	25		-0.40	
1429		-----		-----	
1496	D1322-automated	25.7		0.10	
1498		-----		-----	
1531		-----		-----	
1585	D1322-manual	24.5		-0.76	

lab	method	value	mark	z(targ)	remarks
1586	D1322-manual	23.5		-1.48	
1587	D1322-automated	26.6		0.75	
1610	IP598-manual	25.5		-0.04	
1631	D1322-manual	24.9		-0.47	
1634	D1322-automated	25.65		0.07	
1720	D1322-automated	25.9		0.25	
1724	D1322-manual	25		-0.40	
1740		-----		-----	
1757	D1322-manual	25.0		-0.40	
1770	D1322-automated	26.0		0.32	
1776	D1322-automated	25.9		0.25	
1787		-----		-----	
1810	D1322-automated	25.9		0.25	
1811	D1322-automated	26.0		0.32	
1883		-----		-----	
2130	IP598-automated	25.8		0.17	
2133		-----		-----	
6049	D1322-manual	23.0		-1.84	
6054		-----		-----	
6075	D1322-automated	25.7		0.10	
6101	D1322-manual	27.0		1.04	
6103	D1322-automated	25.3		-0.19	
6174		-----		-----	

normality	not OK
n	64
outliers	0
mean (n)	25.56
st.dev. (n)	0.989
R(calc.)	2.77
st.dev.(D1322-M:15e1)	1.390
R(D1322-M:15e1)	3.89
Compare R(D1322-A:15e1)	0.92



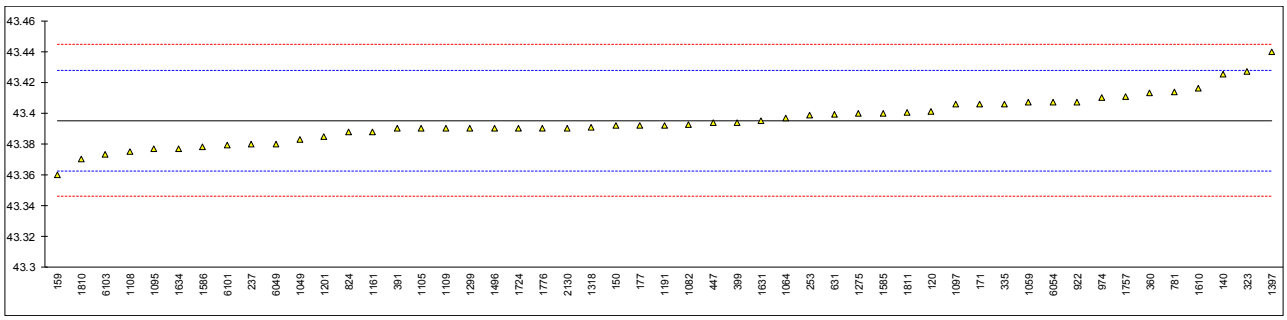


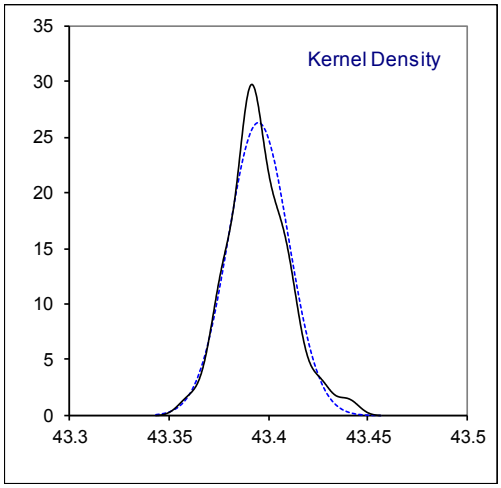
Determination of Specific Energy (Net, on Sulphur free basis) on sample #18030; results in MJ/kg

lab	method	value	mark	z(targ)	remarks
120	D3338	43.401		0.36	
131		-----		-----	
132		-----		-----	
140	D3338	43.425		1.82	
150	D3338	43.392		-0.19	
159	D3338	43.360		-2.13	
169		-----		-----	
171	D3338	43.406		0.67	
175		-----		-----	
177		43.392		-0.19	
194		-----		-----	
225		-----		-----	
228		-----		-----	
237	D3338	43.380		-0.92	
238		-----		-----	
253	D3338	43.3985		0.21	
273		-----		-----	
317		-----		-----	
323	D3338	43.427		1.94	
333		-----		-----	
334		-----		-----	
335	D3338	43.406		0.67	
336		-----		-----	
353		-----		-----	
360	D3338	43.413		1.09	
391	D3338	43.39		-0.31	
398		-----		-----	
399	D3338	43.394		-0.06	
447	D3338	43.394		-0.06	
468		-----		-----	
594		-----		-----	
604		-----		-----	
631	D3338	43.3991	C	0.25	first reported 43.5007
634		-----		-----	
663		-----		-----	
671		-----		-----	
781	D3338	43.414		1.15	
785		-----		-----	
824	D3338	43.388		-0.43	
922	D3338	43.4073		0.75	
962		-----		-----	
963		-----		-----	
970		-----		-----	
974	D3338	43.410		0.91	
998		-----		-----	
1006		-----		-----	
1023		-----		-----	
1049	D3338	43.3832		-0.72	
1059	D3338	43.407		0.73	
1062		-----		-----	
1064	D3338	43.3969		0.11	
1080		-----		-----	
1082	D3338	43.3927		-0.14	
1095	D3338	43.377		-1.10	
1097	D3338	43.406		0.67	
1105	D3338	43.39		-0.31	
1108	D3338	43.375	C	-1.22	first reported 43375
1109	D3338	43.39		-0.31	
1126		-----		-----	
1161	D3338	43.388		-0.43	
1167		-----		-----	
1191	D3338	43.392		-0.19	
1201	D3338	43.385		-0.61	
1237		-----		-----	
1275	D3338	43.4		0.30	
1299	D3338	43.39		-0.31	
1318	D3338	43.391		-0.25	
1397	D3338	43.44		2.74	
1399		-----		-----	
1428		-----		-----	
1429		-----		-----	
1496	D3338	43.390		-0.31	
1498		-----		-----	
1531		-----		-----	
1585	D3338	43.400		0.30	

lab	method	value	mark	z(targ)	remarks
1586	D3338	43.378		-1.04	
1587		-----		-----	
1610	D3338	43.416		1.28	
1631	D3338	43.395		0.00	
1634	D3338	43.377		-1.10	
1720		-----		-----	
1724	D3338	43.39		-0.31	
1740		-----		-----	
1757	D4529	43.411		0.97	
1770		-----		-----	
1776	D3338	43.39		-0.31	
1787		-----		-----	
1810	D3338	43.37		-1.52	
1811	D3338	43.4005		0.33	
1883		-----		-----	
2130	D3338	43.39		-0.31	
2133		-----		-----	
6049	D3338	43.38		-0.92	
6054	D3338	43.407		0.73	
6075		-----		-----	
6101	D3338	43.37913		-0.97	
6103	D3338	43.373		-1.34	
6174		-----		-----	

normality	OK
n	51
outliers	0
mean (n)	43.3951
st.dev. (n)	0.01514
R(calc.)	0.042
st.dev.(D3338:09e2)	0.01643
R(D3338:09e2)	0.046



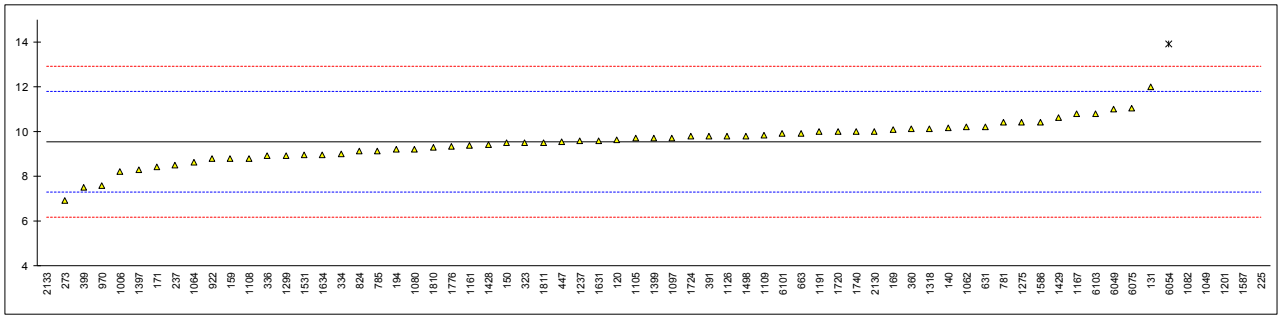


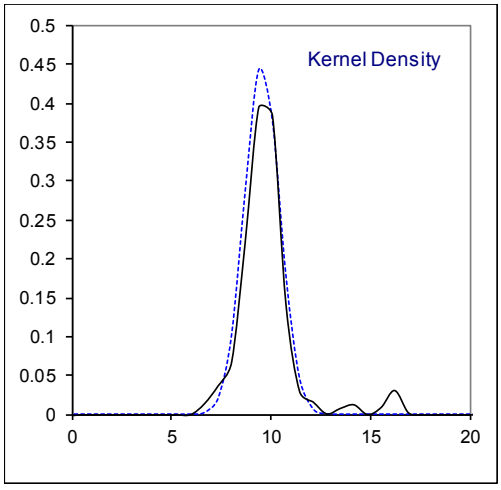
Determination of Sulphur, Total on sample #18030; results in mg/kg

lab	method	value	mark	z(targ)	remarks
120	D5453	9.613		0.07	
131	D5453	12		2.19	
132		-----		-----	
140	D2622	10.145		0.54	
150	D5453	9.5		-0.03	
159	D4294	8.8		-0.65	
169	D5453	10.07		0.48	
171	D5453	8.4		-1.01	
175		-----		-----	
177		-----		-----	
194	D2622	9.2		-0.30	
225	D4294	171	R(0.01)	143.73	
228		-----		-----	
237	D5453	8.5		-0.92	
238		-----		-----	
253		-----		-----	
273	D5453	6.9		-2.35	
317		-----		-----	
323	D5453	9.5		-0.03	
333		-----		-----	
334	ISO20846	9		-0.48	
335		-----		-----	
336	D5453	8.9		-0.57	
353		-----		-----	
360	D5453	10.1		0.50	
391	D5453	9.8		0.24	
398		-----		-----	
399	D5453	7.5		-1.81	
447	D5453	9.52		-0.01	
468		-----		-----	
594		-----		-----	
604		-----		-----	
631	D4294	10.21		0.60	
634		-----		-----	
663	D5453	9.92		0.34	
671		-----		-----	
781	D5453	10.4		0.77	
785	ISO20846	9.1		-0.39	
824	D5453	9.1		-0.39	
922	D5453	8.8		-0.65	
962		-----		-----	
963		-----		-----	
970	D5453	7.6		-1.72	
974		-----		-----	
998		-----		-----	
1006	D5453	8.2		-1.19	
1023		-----		-----	
1049	D5453	16.2	R(0.01)	5.93	
1059	ISO14596Mod.	<10		-----	
1062	D5453	10.2		0.59	
1064	D5453	8.64		-0.80	
1080	D5453	9.2		-0.30	
1082	D4294	16	R(0.01)	5.75	
1095		-----	W	-----	first reported 3
1097	D5453	9.70		0.15	
1105	D5453	9.69		0.14	
1108	D5453	8.8		-0.65	
1109	D2622	9.81		0.24	
1126	ISO20846	9.8		0.24	
1161	ISO20846	9.37		-0.15	
1167	ISO20846	10.8		1.13	
1191	D4294	10		0.41	
1201	D4294	32	R(0.01)	20.00	
1237	ISO20846	9.59		0.05	
1275	D4294	10.40		0.77	
1299	D2622	8.9	C	-0.57	first reported <0.002
1318	D5453	10.1		0.50	
1397	D5453	8.28		-1.12	
1399	D5453	9.69		0.14	
1428	ISO20846	9.4		-0.12	
1429	D5453	10.6		0.95	
1496		-----		-----	
1498	D5453	9.802		0.24	
1531	ISO20846	8.97		-0.50	
1585		-----		-----	

lab	method	value	mark	z(targ)	remarks
1586	D5453	10.4		0.77	
1587	D4294	51.5	R(0.01)	37.36	
1610	IP336	<100	C	-----	first reported <0.01 mg/kg
1631	D5453	9.59		0.05	
1634	D5453	8.97		-0.50	
1720	D5453	10.0		0.41	
1724	D5453	9.77		0.21	
1740	D5453	10		0.41	
1757		-----		-----	
1770		-----		-----	
1776	D5453	9.32		-0.19	
1787		-----		-----	
1810	D5453	9.3		-0.21	
1811	D5453	9.5		-0.03	
1883		-----		-----	
2130	D5453	10		0.41	
2133	D4294	-1.2	R(0.01)	-9.56	
6049	D5453	11.0		1.30	
6054	D4294	13.9	R(0.01)	3.89	
6075	ISO20846	11.03		1.33	
6101	D2622	9.9		0.32	
6103	D2622	10.8		1.13	
6174		-----		-----	

normality	suspect
n	60
outliers	7
mean (n)	9.535
st.dev. (n)	0.8855
R(calc.)	2.479
st.dev.(D5453:16e1)	1.1234
R(D5453:16e1)	3.146

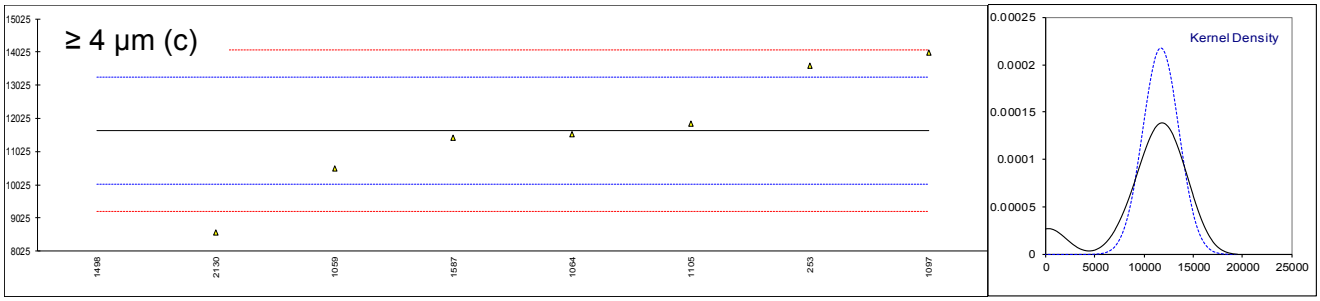


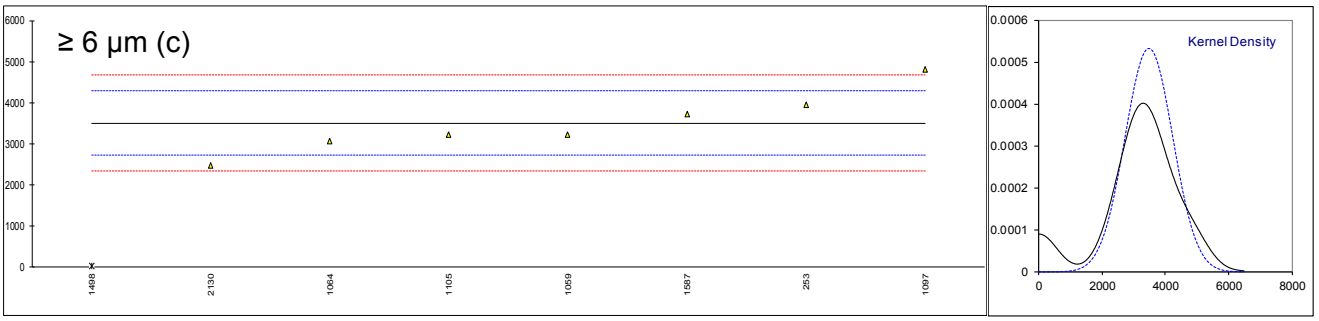


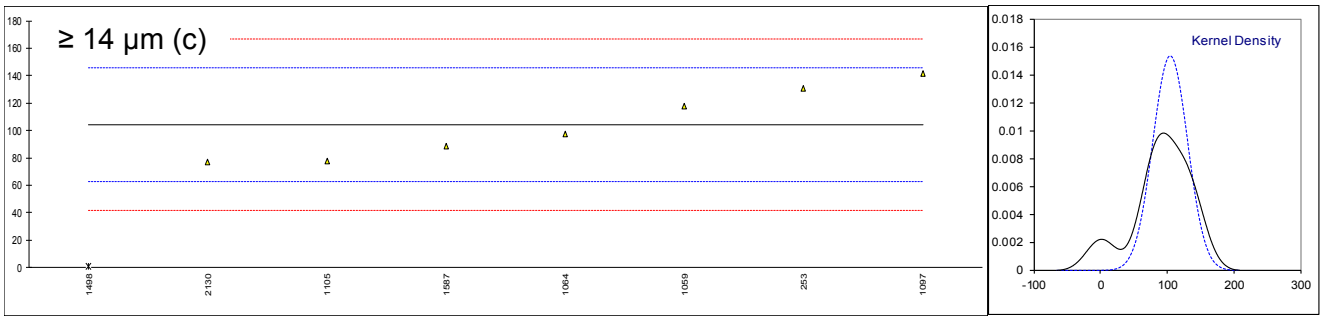
Determination of Particle Size Distribution on sample #18031 acc. to IP564, results in counts/ml

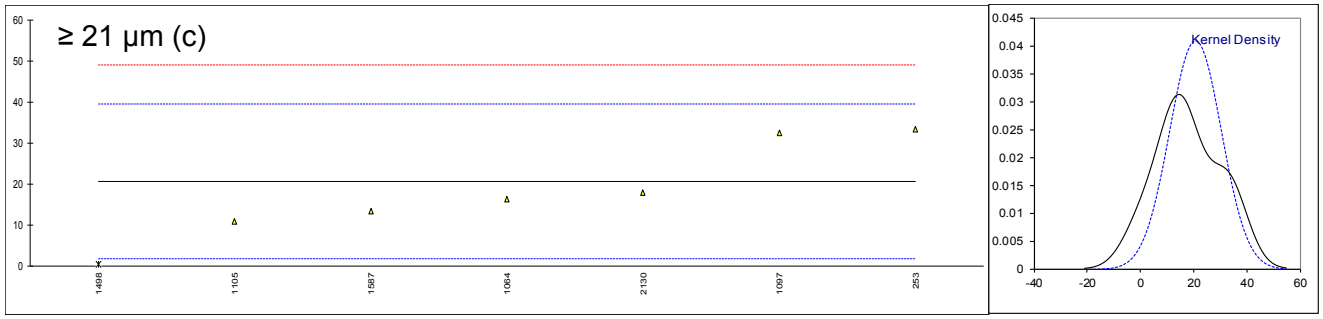
lab	method	≥4 µm (c)	m	≥6 µm (c)	m	≥14 µm (c)	m	≥21 µm (c)	m	≥25 µm (c)	m	≥30 µm (c)	m
140		-----		-----		-----		-----		-----		-----	
150		-----		-----		-----		-----		-----		-----	
171		-----		-----		-----		-----		-----		-----	
225		-----		-----		-----		-----		-----		-----	
237		-----		-----		-----		-----		-----		-----	
253	IP564	13612.9		3949.7		130.8		33.4		14.9		4.5	
323		-----		-----		-----		-----		-----		-----	
333		-----		-----		-----		-----		-----		-----	
334		-----		-----		-----		-----		-----		-----	
335		-----		-----		-----		-----		-----		-----	
360		-----		-----		-----		-----		-----		-----	
447		-----		-----		-----		-----		-----		-----	
781		-----		-----		-----		-----		-----		-----	
824		-----		-----		-----		-----		-----		-----	
922		-----		-----		-----		-----		-----		-----	
963		-----		-----		-----		-----		-----		-----	
970		-----		-----		-----		-----		-----		-----	
974		-----		-----		-----		-----		-----		-----	
1049		-----		-----		-----		-----		-----		-----	
1059	IP564	10509.0		3226.6		117.8		-----		-----		-----	
1064	IP564	11556.9		3072.6		97.1		16.4		6.4		1.8	
1095		-----		-----		-----		-----		-----		-----	
1097	IP564	13996.6		4821.1		141.5		32.5		16.9		8.1	
1105	IP564	11856.9		3212.1		77.6		10.9		3.2		2.4	
1108		-----		-----		-----		-----		-----		-----	
1109		-----		-----		-----		-----		-----		-----	
1201		-----		-----		-----		-----		-----		-----	
1299		-----		-----		-----		-----		-----		-----	
1397		-----		-----		-----		-----		-----		-----	
1496		-----		-----		-----		-----		-----		-----	
1498	IP564	212.9	D5	35.1	D5	0.9	D5	0.4	ex	0.3	ex	0.1	ex
1585		-----		-----		-----		-----		-----		-----	
1587	IP564	11428.6		3731.0		88.5		13.4		5.2		2.8	
1610		-----		-----		-----		-----		-----		-----	
1631		-----		-----		-----		-----		-----		-----	
1634		-----		-----		-----		-----		-----		-----	
1724		-----		-----		-----		-----		-----		-----	
1810		-----		-----		-----		-----		-----		-----	
1811		-----		-----		-----		-----		-----		-----	
2130	IP564	8588		2484		77		18		8		3	
6049		-----		-----		-----		-----		-----		-----	
6075		-----		-----		-----		-----		-----		-----	
6101		-----		-----		-----		-----		-----		-----	
	normality	unknown		unknown		unknown		unknown		unknown		unknown	
	n	7		7		7		6		6		6	
	outliers	1		1		1		0+1ex		0+1ex		0+1ex	
	mean (n)	11650		3500		104		20.77		9.10		3.77	
	st.dev. (n)	1832.0		749.8		25.9		9.753		5.532		2.305	
	R(calc.)	5130		2100		73		27.31		15.49		6.45	
	st.dev.(IP564:13)	807.8		390.4		20.8		9.404		4.352		2.226	
	R(IP564:13)	2262		1093		58		26.33		12.18		6.23	

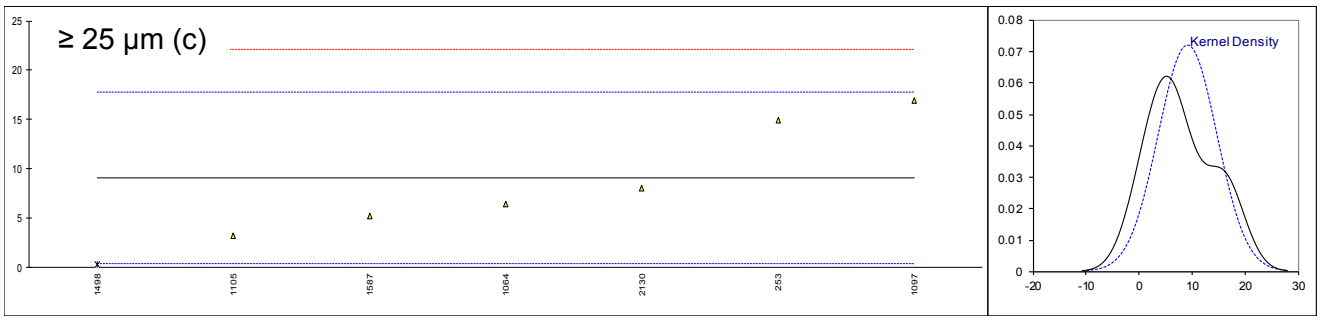
Lab 1498 three test results were excluded because the other related test results were statistical outliers.

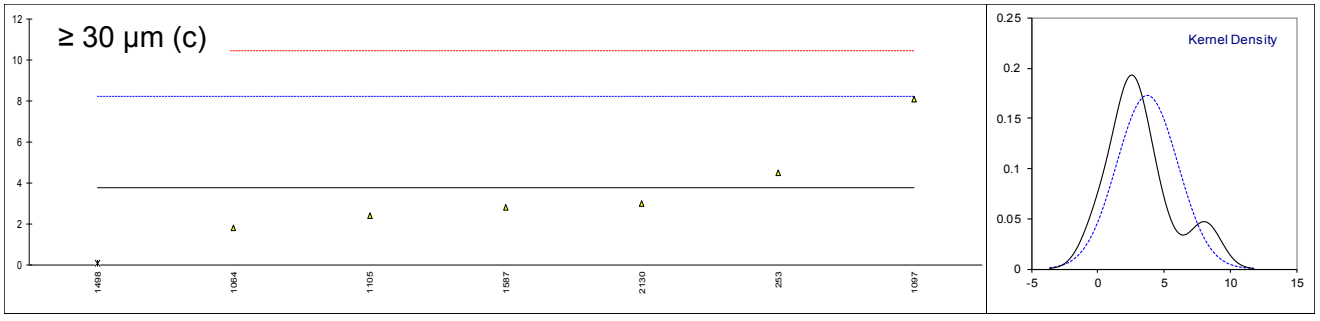

≥ 4 µm (c)
Kernel Density


≥ 6 µm (c)
Kernel Density


≥ 14 µm (c)
Kernel Density


≥ 21 µm (c)
Kernel Density

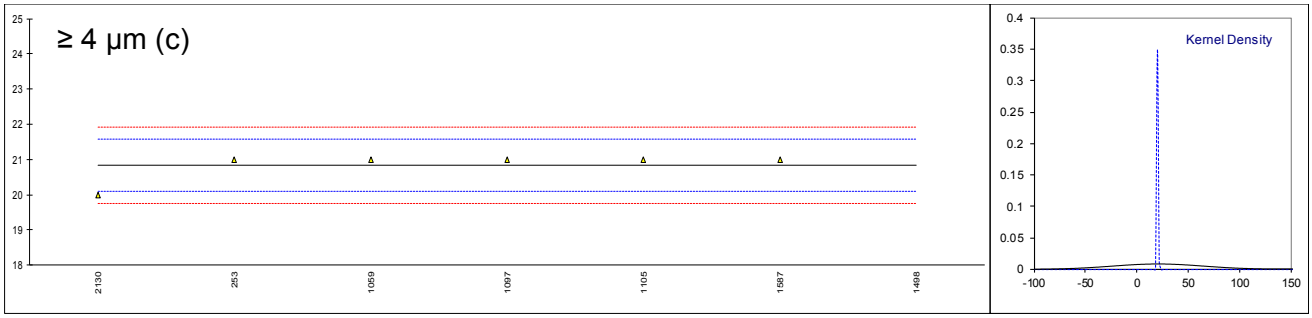

≥ 25 µm (c)
Kernel Density

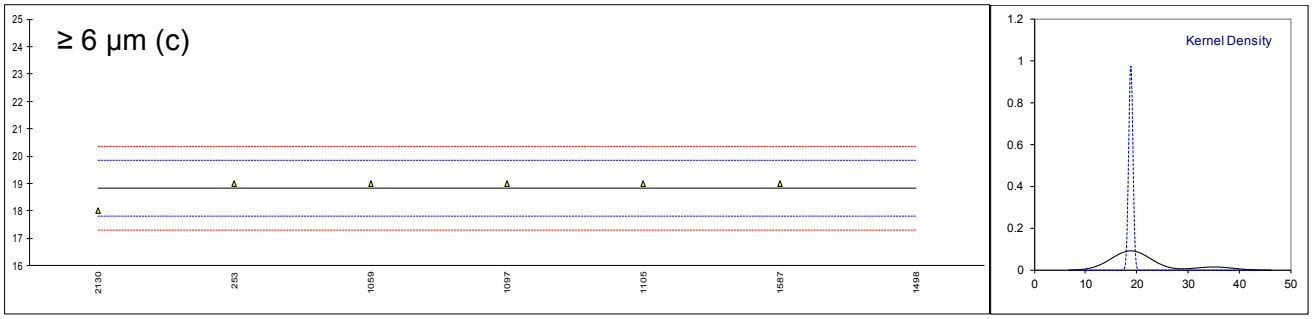

≥ 30 µm (c)
Kernel Density

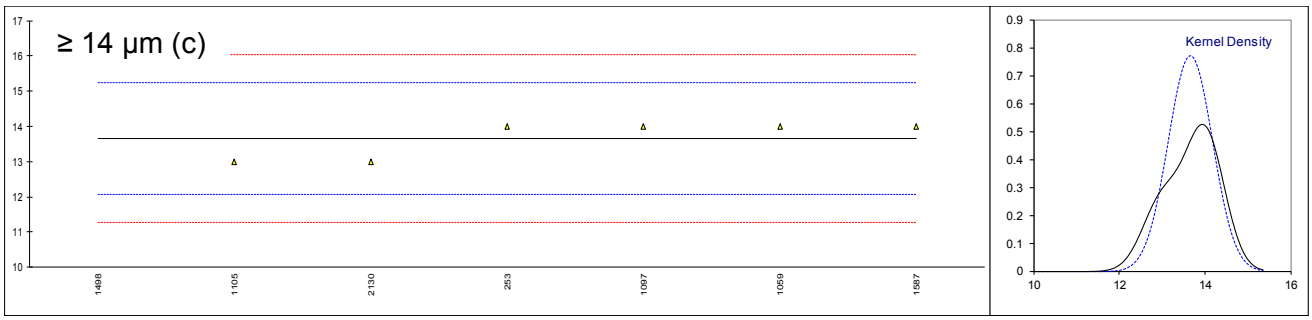
Determination of Particle Size Distribution by IP564 on sample #18031 acc. to ISO4406 scale, results in scale number

lab	method	≥4 µm (c)	mark	z(targ)	≥6 µm (c)	mark	z(targ)	≥14 µm (c)	mark	z(targ)
140		-----		-----	-----		-----	-----		-----
150		-----		-----	-----		-----	-----		-----
171		-----		-----	-----		-----	-----		-----
225		-----		-----	-----		-----	-----		-----
237		-----		-----	-----		-----	-----		-----
253	ISO4406 acc. to IP564	21		0.46	19		0.33	14		0.42
323		-----		-----	-----		-----	-----		-----
333		-----		-----	-----		-----	-----		-----
334		-----		-----	-----		-----	-----		-----
335		-----		-----	-----		-----	-----		-----
360		-----		-----	-----		-----	-----		-----
447		-----		-----	-----		-----	-----		-----
781		-----		-----	-----		-----	-----		-----
824		-----		-----	-----		-----	-----		-----
922		-----		-----	-----		-----	-----		-----
963		-----		-----	-----		-----	-----		-----
970		-----		-----	-----		-----	-----		-----
974		-----		-----	-----		-----	-----		-----
1049		-----		-----	-----		-----	-----		-----
1059	ISO4406 acc. to IP564	21		0.46	19		0.33	14		0.42
1064		-----		-----	-----		-----	-----		-----
1095		-----		-----	-----		-----	-----		-----
1097	ISO4406 acc. to IP564	21		0.46	19		0.33	14		0.42
1105	ISO4406	21		0.46	19		0.33	13		-0.84
1108		-----		-----	-----		-----	-----		-----
1109		-----		-----	-----		-----	-----		-----
1201		-----		-----	-----		-----	-----		-----
1299		-----		-----	-----		-----	-----		-----
1397		-----		-----	-----		-----	-----		-----
1496		-----		-----	-----		-----	-----		-----
1498	ISO4406 acc. to IP564	212.9	ex	526.52	35.1	ex	31.87	0.9	ex	-16.09
1585		-----		-----	-----		-----	-----		-----
1587	ISO4406 acc. to IP564	21		0.46	19		0.33	14		0.42
1610		-----		-----	-----		-----	-----		-----
1631		-----		-----	-----		-----	-----		-----
1634		-----		-----	-----		-----	-----		-----
1724		-----		-----	-----		-----	-----		-----
1810		-----		-----	-----		-----	-----		-----
1811		-----		-----	-----		-----	-----		-----
2130	ISO4406 acc. to IP564	20		-2.28	18		-1.63	13		-0.84
6049		-----		-----	-----		-----	-----		-----
6075		-----		-----	-----		-----	-----		-----
6101		-----		-----	-----		-----	-----		-----
	normality	unknown			unknown			unknown		
	n	6			6			6		
	outliers	0 + 1ex			0 + 1ex			0 + 1ex		
	mean (n)	20.83			18.83			13.67		
	st.dev. (n)	0.408			0.408			0.516		
	R(calc.)	1.14			1.14			1.45		
	st.dev.(IP564:13)	0.365			0.510			0.794		
	R(IP564:13)	1.02			1.43			2.22		

Lab 1498: test results were excluded because the test results were counts/ml instead of ISO4406 scale


≥ 4 µm (c)
2130
253
1059
1097
1105
1587
1498
Kernel Density

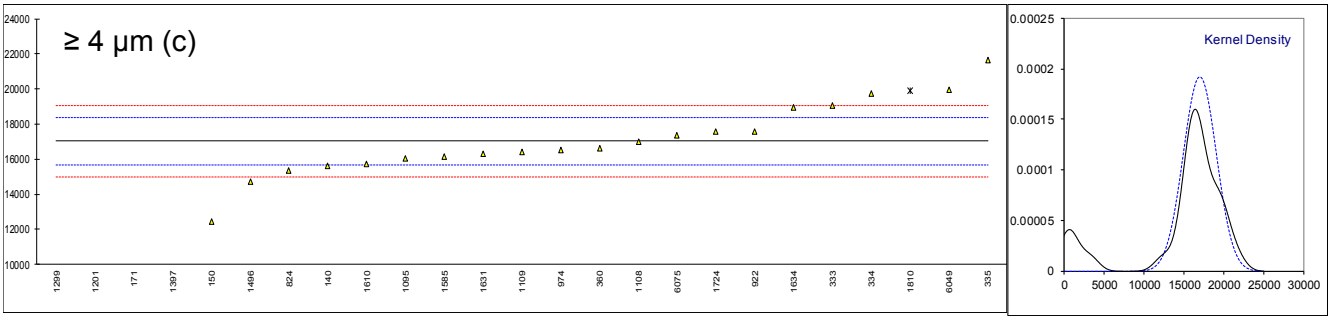

≥ 6 µm (c)
2130
253
1059
1097
1105
1587
1498
Kernel Density

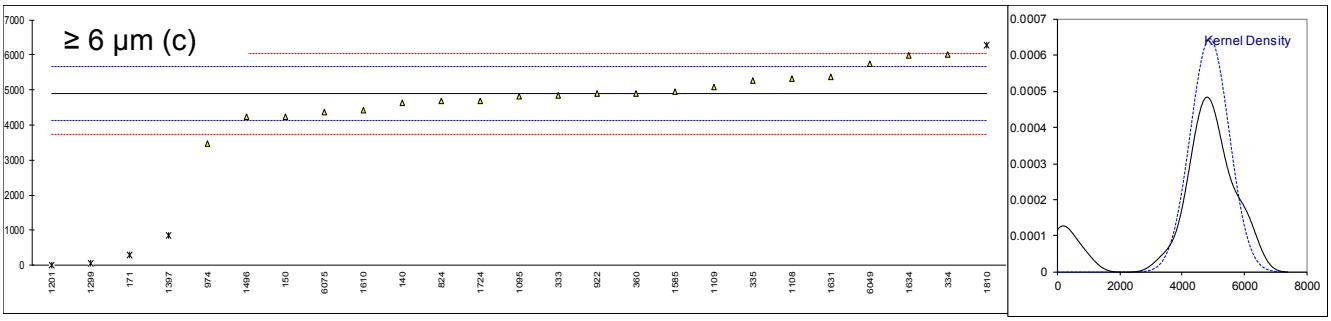

≥ 14 µm (c)
1498
1105
2130
253
1097
1059
1587
Kernel Density

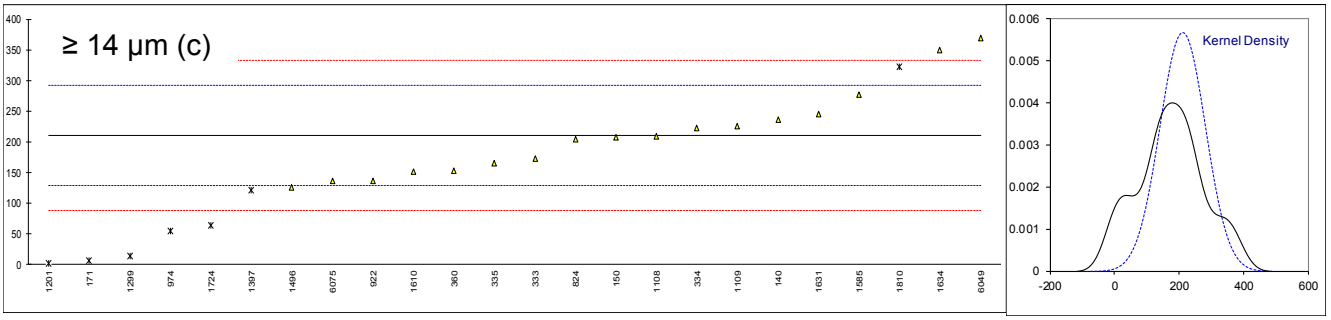
Determination of Particle Size Distribution on sample #18031 acc. to IP565, results in counts/ml

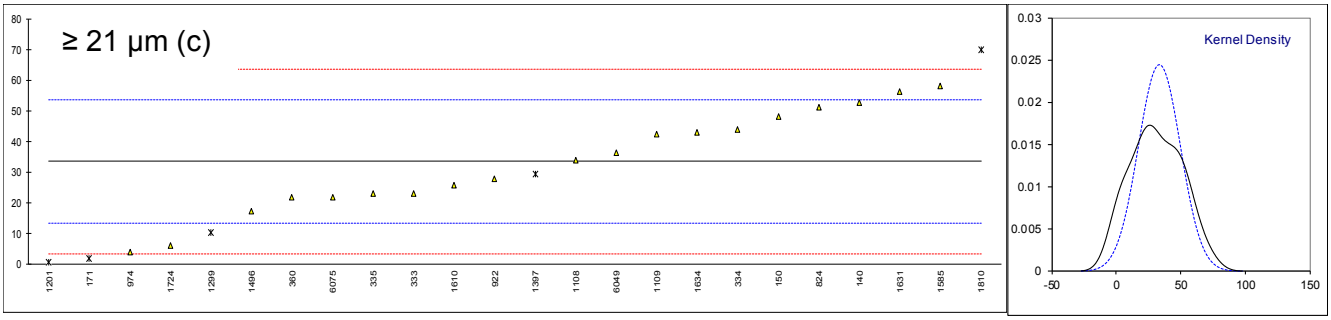
lab	method	≥4 µm (c)	m	≥6 µm (c)	m	≥14 µm (c)	m	≥21 µm (c)	m	≥25 µm (c)	m	≥30 µm(c)	m
140	IP564 *)	15632.6		4641.6		236.1		52.6		26.4		13.6	
150	IP565	12438		4242		207		48		24		12	
171	IP365	1013	R1	304	R5	7	ex	2	ex	0	ex	0	ex
225		-----		-----		-----		-----		-----		-----	
237		-----		-----		-----		-----		-----		-----	
253		-----		-----		-----		-----		-----		-----	
323		-----		-----		-----		-----		-----		-----	
333	IP565	19034		4838		173		23		9		4	
334	IP565	19727		6001		222		44		16		5	
335	IP565	21650		5278		165		23		9		4	
360	IP565	16635.5		4891.0		152.6		21.7		7.9		1.8	
447		-----		-----		-----		-----		-----		-----	
781		-----		-----		-----		-----		-----		-----	
824	IP565	15343		4683		204		51		25		12	
922	IP565	17597.8		4884.6		136.7		27.9		11.4		4.9	
963		-----		-----		-----		-----		-----		-----	
970		-----		-----		-----		-----		-----		-----	
974	IP565	16535		3481		54	R1	4		1.5		1	
1049		-----		-----		-----		-----		-----		-----	
1059		-----		-----		-----		-----		-----		-----	
1064		-----		-----		-----		-----		-----		-----	
1095	IP565	16041		4816		<200		<40		<40		<40	
1097		-----		-----		-----		-----		-----		-----	
1105		-----		-----		-----		-----		-----		-----	
1108	IP565	16986.5		5316.2		208.2		33.9		11.3		3.5	
1109	IP565	16403.4		5079.1		224.8		42.4		16.3		6.3	
1201	IP565	440	C,R1	10	C,R5	2.2	ex	0.6	ex	0.3	ex	0.1	ex
1299	IP577	257.8	ex	68.8	ex	14.4	ex	10.2	ex	9.0	ex	8.3	ex
1397	IP565	3208.9	R1	838.9	R5	121.8	ex	29.3	ex	16.3	ex	8.8	ex
1496	IP565	14712.1		4223.6		125.6		17.3		5.5		1.9	
1498		-----		-----		-----		-----		-----		-----	
1585	IP565	16155.9		4950.8		276.2		58.2		23.8		10.0	
1587		-----		-----		-----		-----		-----		-----	
1610	IP565	15721.8		4418.5		151.4		25.6		10.8		3.8	
1631	IP565	16282.0		5367.1		244.6		56.2		24.8		8.8	
1634	IP565	18931		5982		350		43		19		7	
1724	IP565	17551		4690		64.2	R1	6.1		2.5		1.0	
1810	IP565	19920	ex	6271	ex	322	ex	70	R1	34.7	C,R1	15	ex
1811		-----		-----		-----		-----		-----		-----	
2130		-----		-----		-----		-----		-----		-----	
6049	IP565	19968.9		5755.0		368.9		36.3		6.3		0.3	
6075	IP565	17336.33		4368.97		136.03		21.80		9.73		3.33	
6101		-----		-----		-----		-----		-----		-----	
normality		OK		OK		suspect		OK		OK		OK	
n		20		20		17		19		19		19	
outliers		3+2ex		3+2ex		2 +5ex		1+4ex		1+4ex		0+5ex	
mean (n)		17034		4895		211		33.47		13.70		5.49	
st.dev. (n)		2072.9		618.6		70.5		16.276		8.061		4.049	
R(calc.)		5804		1732		197		45.57		22.57		11.34	
st.dev.(IP565:13)		677.0		384.0		40.9		9.992		5.099		2.732	
R(IP565:13)		1896		1075		115		27.98		14.28		7.65	

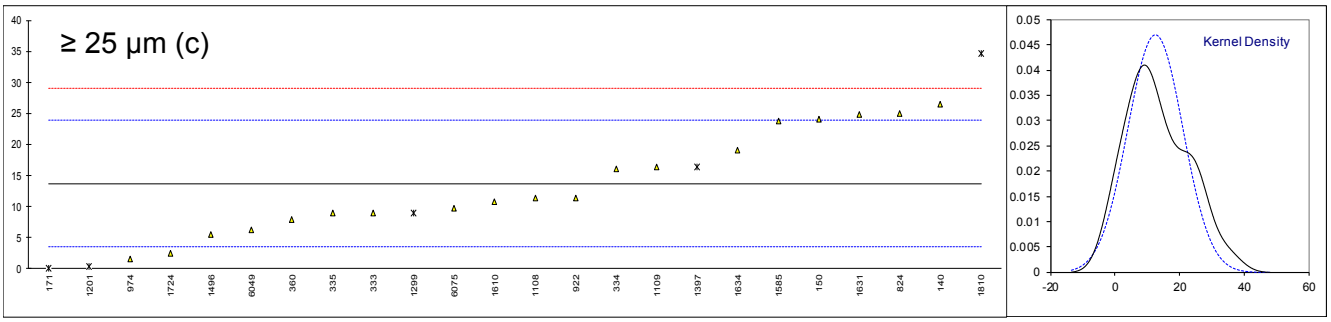
*) lab 140 reported to use Stanhope-Seta and test method IP564, Stanhope-Seta is in accordance with test method IP565. Therefore, test data is placed in IP565 tables
Lab 1201: first reported: 460.1 and 20.2
Lab 1299: test results are excluded as the reported equipment is Pamas, see also §4.1
Lab 1810: first reported: 347
Ex: Test results of labs: 171, 1201, 1397, 1810 which were not outlier, were excluded

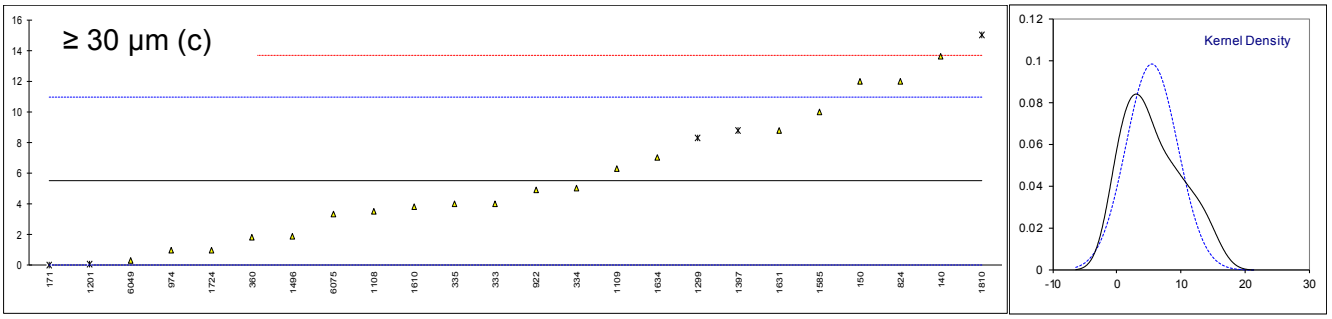

≥ 4 µm (c)
Kernel Density


≥ 6 µm (c)
Kernel Density


≥ 14 µm (c)
Kernel Density


≥ 21 µm (c)
Kernel Density

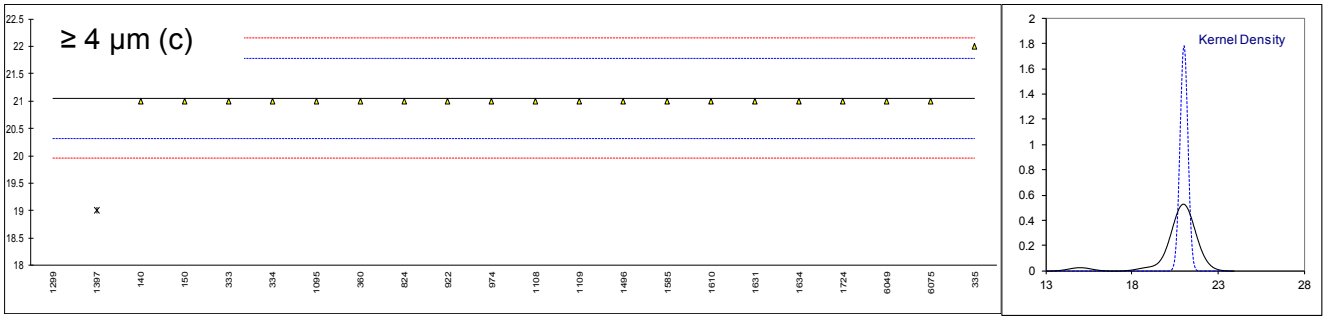

≥ 25 µm (c)
Kernel Density

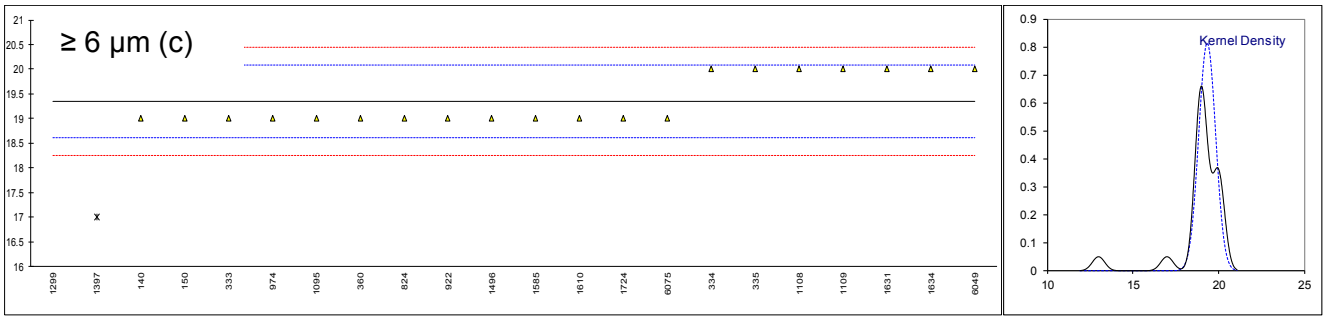

≥ 30 µm (c)
Kernel Density

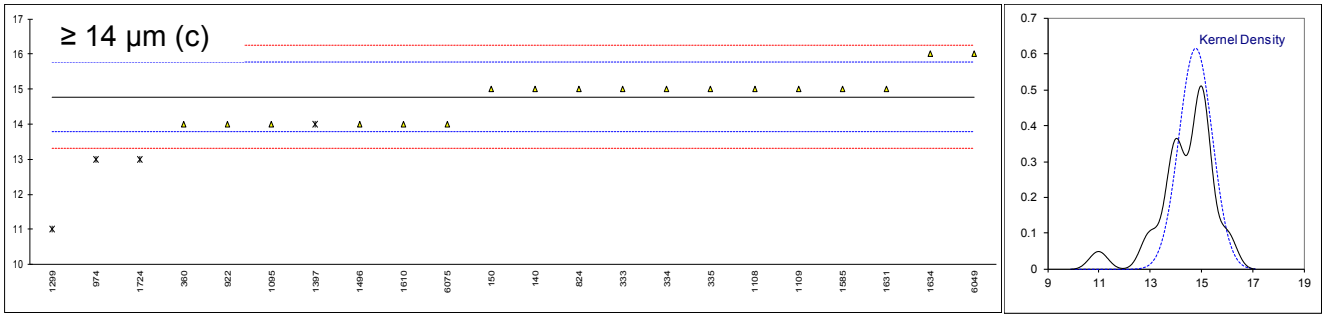
Determination of Particle Size Distribution by IP565 on sample #18031 acc. to ISO4406 scale, results in scale number

lab	method	≥4µm(c)	m	z(targ)	≥6µm(c)	m	z(targ)	≥14 µm(c)	m	z(targ)
140	ISO4406	21		-0.14	19		-0.96	15		0.45
150	ISO4406 acc. to IP565	21		-0.14	19		-0.96	15		0.45
171		-----		-----	-----		-----	-----		-----
225		-----		-----	-----		-----	-----		-----
237		-----		-----	-----		-----	-----		-----
253		-----		-----	-----		-----	-----		-----
323		-----		-----	-----		-----	-----		-----
333	ISO4406 acc. to IP565	21		-0.14	19		-0.96	15		0.45
334	ISO4406 acc. to IP565	21		-0.14	20		1.78	15		0.45
335	ISO4406 acc. to IP565	22		2.60	20		1.78	15		0.45
360	ISO4406 acc. to IP565	21		-0.14	19		-0.96	14		-1.59
447		-----		-----	-----		-----	-----		-----
781		-----		-----	-----		-----	-----		-----
824		21		-0.14	19		-0.96	15		0.45
922	ISO4406 acc. to IP565	21		-0.14	19		-0.96	14		-1.59
963		-----		-----	-----		-----	-----		-----
970		-----		-----	-----		-----	-----		-----
974	ISO4406	21		-0.14	19		-0.96	13	ex	-3.63
1049		-----		-----	-----		-----	-----		-----
1059		-----		-----	-----		-----	-----		-----
1064		-----		-----	-----		-----	-----		-----
1095	ISO4406 acc. to IP565	21		-0.14	19		-0.96	14		-1.59
1097		-----		-----	-----		-----	-----		-----
1105		-----		-----	-----		-----	-----		-----
1108	ISO4406 acc. to IP565	21		-0.14	20		1.78	15		0.45
1109	ISO4406 acc. to IP565	21		-0.14	20		1.78	15		0.45
1201		-----		-----	-----		-----	-----		-----
1299	ISO4406 acc. to IP577	15	ex	-16.53	13	ex	-17.35	11	ex	-7.70
1397	ISO4406	19	R1	-5.60	17	R1	-6.42	14	ex	-1.59
1496	ISO4406 acc. to IP565	21		-0.14	19		-0.96	14		-1.59
1498		-----		-----	-----		-----	-----		-----
1585	ISO4406 acc. to IP565	21		-0.14	19		-0.96	15		0.45
1587		-----		-----	-----		-----	-----		-----
1610	ISO4406	21		-0.14	19		-0.96	14		-1.59
1631	ISO4406 acc. to IP565	21		-0.14	20		1.78	15		0.45
1634	ISO4406 acc. to IP565	21		-0.14	20		1.78	16		2.49
1724	ISO4406 acc. to IP565	21		-0.14	19		-0.96	13	ex	-3.63
1810		-----		-----	-----		-----	-----		-----
1811		-----		-----	-----		-----	-----		-----
2130		-----		-----	-----		-----	-----		-----
6049	ISO4406	21		-0.14	20		1.78	16		2.49
6075	ISO4406 acc. to IP565	21		-0.14	19		-0.96	14		-1.59
6101		-----		-----	-----		-----	-----		-----
	normality	not OK			OK			OK		
	n	20			20			18		
	outliers	1 +1ex			1 +1ex			0+ 4ex		
	mean (n)	21.05			19.35			14.78		
	st.dev. (n)	0.224			0.489			0.647		
	R(calc.)	0.63			1.37			1.81		
	st.dev.(IP565:13)	0.366			0.366			0.490		
	R(IP565:13)	1.03			1.03			1.37		

Lab 1299: test results are excluded as the reported equipment is Pamas, see also §4.1
Lab1397: test result is excluded because the test results of the other related classes were statistical outliers.
Test results of labs: 974 and 1724 were excluded because corresponding test results in couns/ml were statistical outliers.


≥ 4 µm (c)
Kernel Density


≥ 6 µm (c)
Kernel Density


≥ 14 µm (c)
Kernel Density

APPENDIX 2

z-scores distillation

lab	method	IBP	10% rec.	50% rec.	90%rec.	FBP
120	D86-A	0.99	-0.27	0.04	0.51	0.01
131		-----	-----	-----	-----	-----
132		-----	-----	-----	-----	-----
140	D86-A	-1.15	0.11	-0.34	-0.40	-0.55
150	D86-A	-0.73	-0.88	-1.18	-1.39	-1.14
159	D86-A	0.34	-0.05	-0.06	0.06	-0.63
169	D86-A	-0.59	0.26	0.04	0.44	0.08
171	D86-A	0.61	-0.50	-0.90	1.88	0.01
175	D86-A	0.03	-0.35	-0.06	1.96	0.16
177		-1.15	0.26	1.16	0.97	1.19
194	D86-A	0.61	0.18	0.88	-0.86	0.71
225	D86-M	0.51	0.34	-0.24	-0.93	0.83
228	D86-M	-0.87	-1.57	-2.58	-4.74	-0.74
237	D86-M	0.51	-0.05	0.22	2.11	0.44
238	D86-M	-0.18	-0.43	-1.64	-0.93	-0.74
253	D86-M	-0.18	0.72	0.22	-0.55	-0.15
273	D86-A	-2.01	-0.73	-0.71	-0.40	-0.82
317	D86-A	-0.46	0.26	-0.06	-0.25	0.52
323	D86-A	-0.11	0.64	0.69	0.59	-0.07
333	D86-A	-0.18	0.11	-0.06	-1.54	-0.59
334	D86-A	-0.59	-0.27	-0.34	-1.01	0.04
335	D86-A	0.37	-0.65	0.13	0.66	-0.23
336	D86-A	0.06	0.18	0.32	-0.48	0.04
353	D86-A	0.61	0.03	0.13	-0.17	-0.67
360	D86-A	0.17	1.02	0.60	0.06	0.24
391	D86-A	1.55	0.95	0.13	-0.32	1.35
398	D86-A	2.10	0.64	-0.43	0.36	-0.07
399	D86-A	-0.11	-0.49	-1.29	-2.52	-1.04
447	D86-A	-0.28	0.26	0.04	0.97	1.11
468		-----	-----	-----	-----	-----
594	GOST2177	0.93	-1.49	-0.52	-0.17	-0.43
604		-0.35	-1.11	-1.64	0.97	-0.74
631	D86-M	0.17	-1.19	-1.64	-0.93	-1.73
634	D86-M	-0.01	-0.81	-0.71	0.59	-1.53
663	D86-A	1.49	0.45	-0.34	0.32	0.28
671		-----	-----	-----	-----	-----
781	D86-A	0.23	0.56	0.13	-0.40	1.19
785	D86-A	0.58	-0.50	-0.43	0.44	0.04
824	D86-A	0.86	0.79	0.41	0.21	-0.07
922	D86-A	-0.11	-0.35	-0.43	-0.25	0.04
962		-----	-----	-----	-----	-----
963		-----	-----	-----	-----	-----
970	D86-A	-0.11	0.41	0.41	0.06	-0.03
974	D86-A	-0.49	0.79	0.69	0.36	-0.15
998		-----	-----	-----	-----	-----
1006	D86-A	0.93	1.10	1.16	-0.10	0.60
1023	D86-A	1.79	0.79	2.65	0.59	1.62
1049	D86-A	0.13	0.41	0.69	1.20	0.99
1059	D86-A	0.10	0.18	0.32	-0.02	-0.07
1062	D86-A	-0.59	-0.27	-0.34	-1.09	-0.59
1064	D86-A	1.03	0.79	0.88	1.58	1.27
1080		-----	-----	-----	-----	-----
1082	D86-A	-1.04	0.64	1.06	1.35	0.12
1095	D2887	-0.01	1.10	2.09	-0.93	-0.35
1097		0.79	0.41	0.69	0.44	-0.39
1105	D86-A	-0.56	0.64	0.50	-0.10	-0.55
1108	D86-A	0.48	-0.27	-0.34	0.13	1.11
1109	D86-A	-0.11	-0.35	-0.15	0.06	-0.03
1126	D2887	0.44	1.17	3.58	-0.93	-0.90
1161	D86-A	-0.32	0.41	0.50	-0.71	0.68
1167	ISO3405-A	-2.46	4.83	3.58	3.18	0.32
1191	D86-A	-1.01	0.87	0.60	0.74	-0.15
1201	D86-A	-0.83	0.34	0.60	1.35	0.79
1237	ISO3405-A	-0.73	0.26	-0.15	-1.47	-0.59
1275	IP123-A	-0.35	0.03	-0.15	0.97	-0.19
1299	D86-A	0.65	-0.20	-0.15	0.66	1.03
1318	D86-A	-1.35	-0.81	-0.80	-0.55	-0.78
1397	D86-A	0.23	-0.65	-0.24	-0.93	-0.27
1399	D86-A	0.13	-0.65	-0.90	-0.63	-0.47
1428		0.23	-0.43	-0.52	-1.47	0.71
1429	D86-A	-0.14	-0.88	-0.52	0.21	-0.03
1496	D86-A	-0.83	-0.12	0.69	1.12	0.52
1498		-0.14	0.11	0.50	1.65	0.60

lab	method	IBP	10% rec.	50% rec.	90%rec.	FBP
1531	D86-A	-0.49	-1.34	0.13	-0.32	0.75
1585	D86-M	0.17	0.34	0.22	0.59	-0.15
1586	D86-A	0.23	0.03	0.13	0.59	0.04
1587	D86-A	-0.70	0.11	-0.43	-1.62	-0.27
1610	D86-A	-0.21	0.49	0.69	0.66	0.52
1631	D86-A	-0.21	-1.04	-0.80	-1.01	0.40
1634	D86-A	0.55	0.41	0.41	0.89	0.83
1720	D86-A	-0.14	1.17	0.78	0.51	1.35
1724	D86-A	0.44	0.49	0.04	-0.48	-0.03
1740	D86-A	0.20	-0.05	-0.15	-0.71	-0.15
1757		---	---	---	---	---
1770		0.17	0.11	0.22	0.44	-0.23
1776		-0.66	-0.27	0.13	2.42	-0.94
1787		---	---	---	---	---
1810	D86-A	-0.80	0.72	0.04	-1.62	-1.14
1811	D86-A	-1.21	-0.35	-0.71	-2.08	-0.23
1883	D86-M	0.86	-0.81	-0.71	-1.69	-1.53
2130	D86-A	0.75	-0.27	-0.24	-0.32	1.31
2133	D86-A	-0.11	0.41	0.88	0.21	0.32
6049		0.30	-1.19	-2.02	-1.85	-0.98
6054	D D86-A	0.48	-0.05	0.13	0.13	-0.03
6075	ISO3405-A	-5.32	-0.58	1.62	0.13	0.83
6101	D86-A	-0.11	-0.43	0.41	0.44	-0.15
6103	ISO3405-A	1.36	0.26	-0.24	-0.67	-0.11
6174	D86-M	-0.35	-0.05	0.22	-0.93	-1.53

z-scores Particle Size Distribution on sample #18031 acc. to IP564 results in counts/ml

		IP 564					
lab	method	>4 µm (c)	>6 µm (c)	>14 µm (c)	>21 µm (c)	>25 µm (c)	>30 µm (c)
140		-----	-----	-----	-----	-----	-----
150		-----	-----	-----	-----	-----	-----
171		-----	-----	-----	-----	-----	-----
225		-----	-----	-----	-----	-----	-----
237		-----	-----	-----	-----	-----	-----
253	IP564	2.43	1.15	1.27	1.34	1.33	0.33
323		-----	-----	-----	-----	-----	-----
333		-----	-----	-----	-----	-----	-----
334		-----	-----	-----	-----	-----	-----
335		-----	-----	-----	-----	-----	-----
360		-----	-----	-----	-----	-----	-----
447		-----	-----	-----	-----	-----	-----
781		-----	-----	-----	-----	-----	-----
824		-----	-----	-----	-----	-----	-----
922		-----	-----	-----	-----	-----	-----
963		-----	-----	-----	-----	-----	-----
970		-----	-----	-----	-----	-----	-----
974		-----	-----	-----	-----	-----	-----
1049		-----	-----	-----	-----	-----	-----
1059	IP564	-1.41	-0.70	0.65	-----	-----	-----
1064	IP564	-0.12	-1.09	-0.35	-0.46	-0.62	-0.88
1095		-----	-----	-----	-----	-----	-----
1097	IP564	2.91	3.38	1.79	1.25	1.79	1.95
1105	IP564	0.26	-0.74	-1.28	-1.05	-1.36	-0.61
1108		-----	-----	-----	-----	-----	-----
1109		-----	-----	-----	-----	-----	-----
1201		-----	-----	-----	-----	-----	-----
1299		-----	-----	-----	-----	-----	-----
1397		-----	-----	-----	-----	-----	-----
1496		-----	-----	-----	-----	-----	-----
1498	IP564	-14.16	-8.87	-4.97	-2.17	-2.02	-1.65
1585		-----	-----	-----	-----	-----	-----
1587	IP564	-0.27	0.59	-0.76	-0.78	-0.90	-0.43
1610		-----	-----	-----	-----	-----	-----
1631		-----	-----	-----	-----	-----	-----
1634		-----	-----	-----	-----	-----	-----
1724		-----	-----	-----	-----	-----	-----
1810		-----	-----	-----	-----	-----	-----
1811		-----	-----	-----	-----	-----	-----
2130	IP564	-3.79	-2.60	-1.31	-0.29	-0.25	-0.34
6049		-----	-----	-----	-----	-----	-----
6075		-----	-----	-----	-----	-----	-----
6101		-----	-----	-----	-----	-----	-----

z-scores Particle Size Distribution on sample #18031 acc. IP565 results in counts/ml

		IP565					
lab	method	>4 µm (c)	>6 µm (c)	>14 µm (c)	>21 µm (c)	>25 µm (c)	>30 µm (c)
140	IP565	-2.07	-0.66	0.62	1.91	2.49	2.97
150	IP565	-6.79	-1.70	-0.09	1.45	2.02	2.38
171	IP365	-23.66	-11.96	-4.98	-3.15	-2.69	-2.01
225		-----	-----	-----	-----	-----	-----
237		-----	-----	-----	-----	-----	-----
253		-----	-----	-----	-----	-----	-----
323		-----	-----	-----	-----	-----	-----
333	IP565	2.95	-0.15	-0.92	-1.05	-0.92	-0.54
334	IP565	3.98	2.88	0.28	1.05	0.45	-0.18
335	IP565	6.82	1.00	-1.12	-1.05	-0.92	-0.54
360	IP565	-0.59	-0.01	-1.42	-1.18	-1.14	-1.35
447		-----	-----	-----	-----	-----	-----
781		-----	-----	-----	-----	-----	-----
824	IP565	-2.50	-0.55	-0.16	1.75	2.22	2.38
922	IP565	0.83	-0.03	-1.81	-0.56	-0.45	-0.21
963		-----	-----	-----	-----	-----	-----
970		-----	-----	-----	-----	-----	-----
974	IP565	-0.74	-3.68	-3.83	-2.95	-2.39	-1.64
1049		-----	-----	-----	-----	-----	-----
1059		-----	-----	-----	-----	-----	-----
1064		-----	-----	-----	-----	-----	-----
1095	IP565	-1.47	-0.21	-----	-----	-----	-----
1097		-----	-----	-----	-----	-----	-----
1105		-----	-----	-----	-----	-----	-----
1108	IP565	-0.07	1.10	-0.06	0.04	-0.47	-0.73
1109	IP565	-0.93	0.48	0.34	0.89	0.51	0.30
1201	IP565	-24.51	-12.72	-5.10	-3.29	-2.63	-1.97
1299	IP577	-24.78	-12.57	-4.80	-2.33	-0.92	1.03
1397	IP565	-20.42	-10.56	-2.17	-0.42	0.51	1.21
1496	IP565	-3.43	-1.75	-2.08	-1.62	-1.61	-1.31
1498		-----	-----	-----	-----	-----	-----
1585	IP565	-1.30	0.14	1.60	2.47	1.98	1.65
1587		-----	-----	-----	-----	-----	-----
1610	IP565	-1.94	-1.24	-1.45	-0.79	-0.57	-0.62
1631	IP565	-1.11	1.23	0.83	2.27	2.18	1.21
1634	IP565	2.80	2.83	3.41	0.95	1.04	0.55
1724	IP565	0.76	-0.53	-3.58	-2.74	-2.20	-1.64
1810	IP565	4.26	3.58	2.72	3.66	4.12	3.48
1811		-----	-----	-----	-----	-----	-----
2130		-----	-----	-----	-----	-----	-----
6049	IP565	4.33	2.24	3.87	0.28	-1.45	-1.90
6075	IP565	0.45	-1.37	-1.83	-1.17	-0.78	-0.79
6101		-----	-----	-----	-----	-----	-----

APPENDIX 3

Equipment used in Particle Size distribution

lab	Equipment	Test Method based on equipment	Test Method reported	Calibration method reported	Remark
140	Stanhope-Seta	IP565	IP564	ISO11171	test method not in accordance with equipment
150	Stanhope-Seta	IP565	IP565	ISO11171	
171	Stanhope-Seta	IP565	IP565		
225					
237					
253	Parker Hannifin	IP564	IP564	Seta Verification material	
323					
333	Stanhope-Seta	IP565	IP565	ISO11171	
334	Stanhope-Seta	IP565	IP565	ISO11171	
335	Stanhope-Seta	IP565	IP565	ISO11171	
360	Stanhope-Seta	IP565	IP565	ISO11171	
447					
781					
824	Stanhope-Seta	IP565	IP565		
922	Stanhope-Seta	IP565	IP565		
963					
970					
974	Stanhope-Seta	IP565	IP565	ISO11171	
1049					
1059	Parker Hannifin	IP564	IP564	ISO11171	
1064	Parker Hannifin	IP564	IP564	ISO11171	
1095	Stanhope-Seta	IP565	IP565		
1097	Parker Hannifin	IP564	IP564	ISO11171	
1105	Parker Hannifin	IP564	IP564	ISO11171	
1108	Stanhope-Seta	IP565	IP565	ISO11171	
1109	Stanhope-Seta	IP565	IP565	ISO11171	
1201	Stanhope-Seta	IP565	IP565		
1299	Pamas	IP577	IP577	ISO11171	
1397	Stanhope-Seta	IP565	IP565	ISO11171	
1496	Stanhope-Seta	IP565	IP565	ISO11171	
1498	Parker Hannifin	IP564	IP564	ISO11171	
1585	Stanhope-Seta	IP565	IP565	ISO11171	
1587	Parker Hannifin	IP564	IP564	ISO11171	
1610	Stanhope-Seta	IP565	IP565	ISO11171	
1631	Stanhope-Seta	IP565	IP565		
1634	Stanhope-Seta	IP565	IP565	ISO11171	
1724	Stanhope-Seta	IP565	IP565	ISO11171	
1810	Stanhope-Seta	IP565	IP565	ISO11171	
1811					
2130	Parker Hannifin	IP564	IP564	ISO11171	
6049	Stanhope-Seta	IP565	IP565	ISO11171	
6075	Stanhope-Seta	IP565	IP565	ISO11171	
6101					

APPENDIX 4

Number of participants per country

2 labs in AFGHANISTAN
1 lab in AUSTRALIA
3 labs in BELGIUM
2 labs in BULGARIA
1 lab in CHILE
1 lab in CHINA, People's Republic
2 labs in COTE D'IVOIRE
1 lab in CROATIA
1 lab in CYPRUS
2 labs in CZECH REPUBLIC
1 lab in DENMARK
1 lab in DJIBOUTI
2 labs in FINLAND
5 labs in FRANCE
1 lab in FRENCH GUIANA
1 lab in GERMANY
3 labs in GREECE
1 lab in GUAM
1 lab in HUNGARY
1 lab in IRELAND
3 labs in ITALY
1 lab in LEBANON
1 lab in MALAYSIA
1 lab in MALTA
1 lab in MARTINIQUE
1 lab in MOROCCO
4 labs in NETHERLANDS
2 labs in NIGERIA
2 labs in NORWAY
1 lab in OMAN
1 lab in PAKISTAN
2 labs in PHILIPPINES
2 labs in PORTUGAL
3 labs in RUSSIAN FEDERATION
2 labs in SAUDI ARABIA
2 labs in SLOVENIA
1 lab in SOMALIA
2 labs in SOUTH AFRICA
2 labs in SOUTH KOREA
1 lab in SPAIN
1 lab in SUDAN
2 labs in SWEDEN
1 lab in TAIWAN
1 lab in THAILAND
1 lab in TOGO
1 lab in TUNISIA
5 labs in TURKEY
2 labs in UNITED ARAB EMIRATES
5 labs in UNITED KINGDOM
11 labs in UNITED STATES OF AMERICA

APPENDIX 5

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 calculations
U = probably reported in wrong unit
fr. = first reported
n.a. = not applicable
n.d. = not detected
SDS = Safety Data Sheet

Literature:

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9 M. Thompson and R. Wood, J. AOAC Int, 76, 926, (1993)
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