Institute for
Interlaboratory Studies

Results of Proficiency Test
Jet Fuel A1
September 2023

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

Author: ing. M. Meijer
Correctors: ing. G.A. Oosterlaken-Buijs & ing. A. Ouwerkerk
Approved by: ing. R.J. Starink

Report: iis23J02

November 2023

CONTENTS

1 INTRODUCTION

Since 1995 the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for the analysis of Jet Fuel A1 twice a year based on the latest version of the "Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS)", sometimes referred to as the "Joint Fuelling System Check List for Jet A-1". The interlaboratory study on Jet Fuel was extended with separate PTs for the determination of BOCLE, Particle Size Distribution, FAME, JFTOT and Particulate Contamination. During the annual proficiency testing program 2023 it was decided to continue the round robin for the analysis of Jet Fuel A1.

In this interlaboratory study registered for participation:
- 150 laboratories in 68 countries for regular analyzes in Jet Fuel A1 iis23J02
- 31 laboratories in 18 countries on the BOCLE determination iis23J02BOCLE
- 66 laboratories in 36 countries on the Particle Size determination iis23J02PS
- 78 laboratories in 41 countries on the FAME determination iis23J02FAME
- 105 laboratories in 53 countries on the JFTOT determination iis23J02JF
- 62 laboratories in 37 countries on the Particulate Contamination determination iis23J02CP

In total 166 laboratories in 70 countries registered for participation in one or more proficiency tests, see appendix 5 for the number of participants per country. In this report the results of the Jet Fuel A1 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 organizer of this proficiency test (PT). Sample analyzes for fit-for-use and homogeneity testing were subcontracted to a laboratory that has performed the tests in accordance with for ISO/IEC17043 relevant requirements of ISO/IEC17025.
In this proficiency test the participants received, depending on the registration, from one up to seven different samples of Jet Fuel, see table below.

Sample ID	PT ID	Quantity	Purpose
#23150	iis23J02	2x 1 L	Regular analyzes
#23151	iis23J02BOCLE	1x 250 mL	BOCLE
#23152	iis23J02PS	1x 0.5 L	Particle Size Distribution
#23153	iis23J02FAME	1x 100 mL	FAME
#23154	iis23J02FAME	1x 100 mL	FAME
#23155	iis23J02JF	1x 1 L, 70% filled	JFTOT
#23156	iis23J02CP	4x 1 L	Particulate Contamination

Table 1: Jet Fuel samples used in PT iis23J02

Participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in agreement with ISO/IEC17043:2010 (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 organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of June 2018 (iis-protocol, version 3.5). This protocol is electronically available through 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

For the preparation of the sample for the regular analyzes in Jet Fuel A1 a batch of approximately 400 liters of Jet Fuel A1 was obtained from a third party. After homogenization 335 amber glass bottles of 1 L were filled and labelled #23150.
The homogeneity of the subsamples was checked by the determination of Density at 15 °C in accordance with ASTM D4052 on 16 stratified randomly selected subsamples.

	Density at 15 °C in kg/m^3
sample #23150-1	796.58
sample #23150-2	796.58
sample #23150-3	796.57
sample #23150-4	796.57
sample #23150-5	796.57
sample #23150-6	796.56
sample #23150-7	796.56
sample #23150-8	796.56
sample #23150-9	796.56
sample #23150-10	796.56
sample #23150-11	796.56

	Density at 15 °C in kg/m^3
sample #23150-12	796.56
sample #23150-13	796.56
sample #23150-14	796.57
sample #23150-15	796.56
sample #23150-16	796.57

Table 2: homogeneity test results of subsamples #23150

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

	Density at 15 °C in kg/m^3
r (observed)	0.02
reference test method	ASTM D4052:22
0.3 x R (reference test method)	0.15

Table 3: evaluation of the repeatability of subsamples #23150

The calculated repeatability is in agreement with 0.3 times the reproducibility of the reference test method. Therefore, homogeneity of the subsamples was assumed.

For the preparation of the sample for the BOCLE determination in Jet Fuel A1 a batch of approximately 10 liters of Jet Fuel A1 was obtained from retain materials from earlier PTs. After homogenization 40 amber glass bottles of 250 mL were filled and labelled #23151. The homogeneity of the subsamples was checked by the determination of Density at 15 °C in accordance with ASTM D4052 on 8 stratified randomly selected subsamples.

	Density at 15 °C in kg/m^3
sample #23151-1	805.35
sample #23151-2	805.35
sample #23151-3	805.35
sample #23151-4	805.35
sample #23151-5	805.36
sample #23151-6	805.36
sample #23151-7	805.35
sample #23151-8	805.36

Table 4: homogeneity test results of subsamples #23151

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 D4052:22
0.3 x R (reference test method)	0.15

Table 5: evaluation of the repeatability of subsamples #23151

The calculated repeatability is in agreement with 0.3 times the reproducibility of the reference test method. Therefore, homogeneity of the subsamples was assumed.

For the preparation of the sample for the Particle Size determination in Jet Fuel A1 a batch of approximately 110 liters of Jet Fuel A1 was obtained from a third party. After homogenization 85 amber glass bottles of 0.5 L were filled and labelled #23152. Each bottle was spiked with 1 mL of Lube Oil which contained suspended Arizona Dust before filling with Jet Fuel A1. The homogeneity of the subsamples was checked by the determination of Particle Size Distribution in accordance with IP565 on 8 stratified randomly selected subsamples.

	> 4 µm (c) counts/mL	> 6 µm (c) counts/mL
sample #23152-1	19039	4707
sample #23152-2	19235	5011
sample #23152-3	19516	4842
sample #23152-4	19853	5304
sample #23152-5	20171	5547
sample #23152-6	20213	5251
sample #23152-7	20097	5461
sample #23152-8	19736	5168

Table 6: homogeneity test results of subsamples #23152

From the above test results the relative standard deviations (RSD) were calculated and compared with 0.3 times the corresponding average relative standard deviation obtained from nineteen iis PTs of IP565 test data from 2014 - 2023 in agreement with the procedure of ISO13528, Annex B2 in the next table.

	> 4 µm (c)	> 6 µm (c)
RSD% (observed)	2	6
reference method	iis PTs	iis PTs
0.3 x RSD% (reference method)	5	6

Table 7: evaluation of the relative standard deviations of subsamples #23152

The calculated relative standard deviations are in agreement with 0.3 times the corresponding average relative standard deviation obtained from the previous iis PTs. Therefore, homogeneity of the subsamples was assumed.

For the preparation of the samples for the FAME determination in Jet Fuel A1 it was decided to prepare two different PT samples: one with a high(er) and one with a low(er) level of FAME. For the high(er) level of FAME a batch of approximately 10 liters of Jet Fuel A1 was made available from retain materials from earlier PTs on Jet Fuel A1. After homogenization 100 amber glass bottles of 100 mL were filled and labelled #23153.
For the low(er) level of FAME a batch of approximately 10 liters of Jet Fuel A1 was made available from retain materials from earlier PTs on Jet Fuel A1. After homogenization 100 amber glass bottles of 100 mL were filled and labelled #23154.
The homogeneity of the subsamples #23153 and #23154 was checked by the determination of FAME in accordance with method IP585 on 8 stratified randomly selected subsamples.

	FAME in mg/kg #23153	FAME in mg/kg #23154
sample 1	42.5	17.5
sample 2	41.2	16.9
sample 3	42.1	17.0
sample 4	42.4	16.3
sample 5	43.3	16.2
sample 6	43.8	16.3
sample 7	40.6	15.7
sample 8	42.8	17.2

Table 8: homogeneity test results of subsamples #23153 and #23154

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

	FAME in mg/kg #23153	FAME in mg/kg #23154
r (observed)	2.9	1.7
reference test method	IP585:21	IP585:21
0.3 x R (reference test method)	3.5	1.5

Table 9: evaluation of the repeatabilities of subsamples #23153 and #23154

The calculated repeatabilities are in agreement with 0.3 times the corresponding reproducibility of the reference test method. Therefore, homogeneity of the subsamples was assumed.

For the preparation of the sample for the JFTOT determination in Jet Fuel A1 a batch of approximately 200 liters of Jet Fuel was made positive. After homogenization 125 amber glass bottles of 1 L were filled at a level of 70% and labelled #23155.
The homogeneity of the subsamples was checked by the determination of Density at 15 °C in accordance with ASTM D4052 on 8 stratified randomly selected subsamples.

	Density at 15 °C in kg/m^3
sample #23155-1	801.29
sample #23155-2	801.29
sample #23155-3	801.29
sample #23155-4	801.29
sample #23155-5	801.29
sample #23155-6	801.29
sample #23155-7	801.29
sample #23155-8	801.29

Table 10: homogeneity test results of subsamples #23155

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)	0.00
reference test method	ASTM D4052:22
0.3 x R (reference test method)	0.15

Table 11: evaluation of the repeatability of subsamples #23155

The calculated repeatability is in agreement with 0.3 times the reproducibility of the reference test method. Therefore, homogeneity of the subsamples was assumed.

For the preparation of the sample for Particulate Contamination determination in Jet Fuel A1 a batch of approximately 400 liters of Jet Fuel A1 was obtained from a third party. After homogenization 290 amber glass bottles of 1 L were filled and labelled #23156.
The homogeneity of the subsamples was checked by the determination of Density at 15 °C in accordance with ASTM D4052 on 14 stratified randomly selected subsamples.

	Density at 15 °C in kg/m^3
sample #23156-1	793.79
sample #23156-2	793.78
sample #23156-3	793.79
sample #23156-4	793.79
sample #23156-5	793.79
sample #23156-6	793.79
sample #23156-7	793.80
sample #23156-8	793.80
sample #23156-9	793.79
sample #23156-10	793.79
sample #23156-11	793.79

	Density at 15 °C in kg/m^3
sample #23156-12	793.80
sample #23156-13	793.80
sample #23156-14	793.80

Table 12: homogeneity test results of subsamples #23156

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

	Density at 15 °C in kg/m^3
r (observed)	0.02
reference test method	ASTM D4052:22
0.3 x R (reference test method)	0.15

Table 13: evaluation of the repeatability of subsamples #23156

The calculated repeatability is in agreement with 0.3 times the reproducibility of the reference test method. Therefore, homogeneity of the subsamples was assumed.

Depending on the registration of the participant the appropriate set of PT samples was sent on August 16, 2023. 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 D4306:20. The material has been found sufficiently stable for the period of the proficiency test.

2.6 ANALYZES

The participants were requested to determine on sample #23150: Appearance, Total Acidity, Aromatics by FIA, Mono Aromatics (MAH) by HPLC, Di Aromatics (DAH) by HPLC, Total Aromatics by HPLC (in %M/M and %V/V), Color Saybolt (automated and manual), Copper Corrosion 2 hrs at 100 °C, Density at 15 °C, Distillation at 760 mmHg (IBP, Temperature at 10%, 50%, 90% recovered and FBP, Distillation Residue and Distillation Loss), Existent Gum (unwashed), Flash Point, Freezing Point, Kinematic Viscosity at -20 °C, Mercaptan Sulfur as S, MSEP, Naphthalenes, Smoke Point, Specific Energy (Net) on Sulfur free basis and Total Sulfur.
On sample #23151 it was requested to determine: Wear Scar Diameter.
On sample #23152 it was requested to determine: Particle Size Distribution in counts/mL for ≥4, ≥6, ≥14, ≥21, ≥25 and ≥30 µm and scale number for ≥4, ≥6 and ≥14. Some extra information was asked about the equipment used for Particle Size Distribution.
On samples #23153 and #23154 it was requested to determine: FAME content.
On sample #23155 it was requested to determine: Copper and JFTOT.
On sample #22156 it was requested to determine: Particulate Contamination.

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

To get comparable test results a detailed report form and a letter of instructions are prepared. On the report form the reporting units are given as well as the reference test methods (when applicable) 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 reanalyzes). Additional or corrected test results are used for data analysis and the original test results are placed under 'Remarks' in the result tables in appendix 1. Test results that came in after the deadline were not taken into account in this screening for suspect data and thus these participants were not requested for checks.

3.1 STATISTICS

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report ‘iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation’ of June 2018 (iis-protocol, version 3.5).
For the statistical evaluation the *unrounded* (when available) figures were used instead of the rounded test results. Test results reported as ‘<…’ or ‘>…’ were not used in the statistical evaluation.

First, the normality of the distribution of the various data sets per determination was checked by means of the Lilliefors-test, a variant of the Kolmogorov-Smirnov test and by the calculation of skewness and kurtosis. Evaluation of the three normality indicators in combination with the visual evaluation of the graphic Kernel density plot, lead to judgement of the normality being either ‘unknown’, ‘OK’, ‘suspect’ or ‘not OK’. After removal of outliers, this check was repeated. If a data set does not have a normal distribution, the (results of the) statistical evaluation should be used with due care.

The assigned value is determined by consensus based on the test results of the group of participants after rejection of the statistical outliers and/or suspect data.

According to ISO13528 all (original received or corrected) results per determination were submitted to outlier tests. In the iis procedure for proficiency tests, outliers are detected prior to calculation of the mean, standard deviation and reproducibility. For small data sets, Dixon (up to 20 test results) or Grubbs (up to 40 test results) outlier tests can be used. For larger data sets (above 20 test results) Rosner's outlier test can be used. Outliers are marked by D(0.01) for the Dixon's test, by G(0.01) or DG(0.01) for the Grubbs' test and by R(0.01) for the Rosner's test. Stragglers are marked by D(0.05) for the Dixon's test, by G(0.05) or DG(0.05) for the Grubbs' test and by R(0.05) for the Rosner's test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

For each assigned value the uncertainty was determined in accordance with ISO13528. Subsequently the calculated uncertainty was evaluated against the respective requirement based on the target reproducibility in accordance with ISO13528. In this PT the criterion of ISO13528, paragraph 9.2.1, was met for all evaluated tests. Therefore, the uncertainty of all assigned values may be negligible and need not be included in the PT report.

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

3.2 GRAPHICS

In order to visualize the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported 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 (dotted line) was projected over the Kernel Density Graph (smooth line) for reference. The Gauss curve is calculated from the consensus value and the corresponding standard deviation.

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 (derived from e.g. ISO or ASTM test methods), the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation in this interlaboratory study.

The target standard deviation was calculated from the literature reproducibility by division with 2.8. In case no literature reproducibility was available, other target values were used, like Horwitz or an estimated reproducibility based on former iis proficiency tests.

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. Therefore, the usual interpretation of z-scores is as follows:

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

4 EVALUATION

In this proficiency test some problems were encountered with the dispatch of the samples.
For the regular analyzes Jet Fuel A1 ten participants reported test results after the final reporting date and twelve other participants did not report any test results.
For the BOCLE round three participants reported test results after the final reporting date and six other participants did not report any test results.
For the Particle Size Distribution round three participants reported test results after the final reporting date and fifteen other participants did not report any test results.
For the FAME round five participants reported test results after the final reporting date and seventeen other participants did not report any test results.
For the JFTOT round three participants reported test results after the final reporting date and twenty-one other participants did not report any test results.
For the Particulate Contamination round two participants reported test results after the final reporting date and thirteen other participants did not report any test results.
Not all participants were able to report all tests requested.
In total 150 participants reported 2944 numerical test results. Observed were 93 outlying test results, which is 3.2%. In proficiency tests outlier percentages of 3% - 7.5% are quite normal.

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

4.1 EVALUATION PER SAMPLE AND PER TEST

In this section the reported test results are discussed per sample and per test. The test methods which were used by the various laboratories were taken into account for explaining the observed differences when possible and applicable. These test methods are also in the tables together with the original data in appendix 1. The abbreviations, used in these tables, are explained in appendix 5.

In the iis PT reports ASTM test methods are referred to with a number (e.g. D3242) and an added designation for the year that the test method was adopted or revised (e.g. D3242:11). When a method has been reapproved an “R” will be added and the year of approval (e.g. D3242:11R17).

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 14, March 2022 and ASTM D1655:23. One must keep in mind that ISO test methods are not mentioned in the “Checklist”.

sample #23150

Appearance: (Almost) all reporting participants agreed about the appearance being Clear and Bright (Pass).

Total Acidity: The group of participants met the target requirements. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D3242:11R17.

Aromatics by FIA: The group of participants met the target requirements. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with ASTM D1319:20a.

Mono Aromatics (MAH) by HPLC: The group of participants met the target requirements. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D6379:21e1.

Di Aromatics (DAH) by HPLC: The group of participants had difficulty to meet the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D6379:21e1.

Total Aromatics by HPLC in %M/M: The group of participants met the target requirements. No statistical outliers were observed but three test results were excluded. The calculated reproducibility after rejection of the suspect data is in agreement with the requirements of ASTM D6379:21e1.

Total Aromatics by HPLC in %V/V: The group of participants had difficulty to meet the target requirements. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D6379:21e1.

Color Saybolt (automated): The group of participants met the target requirements. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D6045:20.

Color Saybolt (manual): The group of participants had difficulty to meet the target requirements. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D156:23.

Copper Corrosion: All reporting participants agreed on a test result of 1 (1a/1b).

Density at 15 °C: The group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D4052:22.

Distillation at 760 mmHg: The group of participants met the target requirements. Ten statistical outliers were observed over five parameters and two other test results were excluded. The calculated reproducibilities after rejection of the suspect data are all in agreement with the requirements of the automated method of ASTM D86:23.
When compared to the manual method requirements of ASTM D86:23 the calculated reproducibility is only for IBP not in agreement.

Existent Gum (unwashed): The group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with ASTM D381:22 and IP540:08R19.

Flash Point: The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of IP170:21.

Freezing Point: The group of participants met the target requirements. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D2386:19.

Kinematic Viscosity at -20 °C: The group of participants met the target requirements. Nine statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with ASTM D445:19.
In order to calculate z-scores it was decided to refer the calculated reproducibility to the older requirements of ASTM D445:19.

The updated requirements of ASTM D445 from 2021 onwards have become very strict compared to the previous version of the requirements of ASTM D445:19.

Mercaptan Sulfur: The group of participants met the target requirements. Six statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D3227:23.

MSEP: The group of participants met the target requirements. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D3948:22.

Naphthalenes: The group of participants met the target requirements. Five statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D1840:22.

Smoke Point: The group of participants may have had difficulty to meet the target requirements depending on the procedure used. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D1322:22 manual procedure but not with the strict requirements of ASTM D1322:22 automated procedure.
When the test results were evaluated separately for the manual or the automated procedure the calculated reproducibility for the automated procedure is still not in agreement with the respective requirements of ASTM D1322:22 automated procedure.

Specific Energy (Net) on Sulfur free basis: The group of participants had difficulty to meet the target requirements. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D3338:20a.

Total Sulfur: The group of participants met the target requirements. Five statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5453:19a and also with ASTM D4294:21 and ASTM D2622:21.

sample #23151

BOCLE: The group of participants had difficulty to meet the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D5001:19e1 semi-automatic and also not in agreement with ASTM D5001:19e1 full-automatic.

When the test results were evaluated separately for semi-automatic and full-automatic methods, the calculated reproducibilities are still not in agreement with the requirements of ASTM D5001:19e1.

sample #23152 Particle Size Distribution Determination

The Joint Fuelling System Check List for Jet-A1 lists test methods IP565 and IP577 as the reference test methods to determine the Particle Size Distribution in Jet Fuel A1.
Almost all reporting participants mentioned to have used IP565 and three participants used IP577. Two participants used IP564 which is not mentioned in the Checklist as test method since 2020. Therefore, and because it was observed in previous iis PTs that IP564 give deviating results compared to IP565, test results from IP564 are excluded.
It is observed that almost all of the reporting participants used ISO11171 for the calibration and all of the reporting participants used ISO4406 for calculating the scale numbers from the counts per mL.

IP counts: The group of participants may have had difficulty to meet the target requirements depending on the particle size channel used. Eleven statistical outliers were observed and sixteen other test results were excluded over six parameters. The calculated reproducibilities after rejection of the suspect data are not in agreement with the requirements of IP565:13 for ≥4 µm(c), ≥6 µm(c), ≥14 µm(c), ≥21 µm(c) and ≥25 µm(c) but is in agreement for ≥30 µm(c). At ≥4 µm(c) a large variation in test results is observed hence no z-scores are calculated.

ISO class: For the determination expressed in ISO scale numbers the group of participants may have had difficulty to meet the target requirements. One statistical outlier was observed and ten other test results were excluded over three parameters. The calculated reproducibilities after rejection of the suspect data are not in agreement with the indicative requirements of IP565:13 Annex C for particle size channels ≥4 µm(c) and ≥6 µm(c) but is in agreement for particle size channel ≥14 µm(c).

sample #23153 FAME content determination

GCMS/HPLC: The group of participants had difficulty to meet the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of IP585:21 and IP590:10.
When the test results were evaluated separately for IP585 and IP590 the calculated reproducibilities are still not in agreement with the requirements of IP585:21 but are in agreement with IP590:10.

FTIR: The group of participants met the target requirements. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of IP583:15.

sample #23154 FAME content determination

GCMS/HPLC: The group of participants had difficulty to meet the target requirements. Two statistical outliers were observed. The calculated reproducibility after

rejection of the statistical outliers is not in agreement with the requirements of IP585:21 and IP590:10.
When the test results were only evaluated for IP585 the calculated reproducibilities are still not in agreement with IP585:21.

FTIR: The group of participants had difficulty to meet the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of IP583:15.

sample #23155 JFTOT determination

Copper: Only three participants reported a numeric test result. Therefore, no z-scores are calculated.

JFTOT: Using the criteria from AFQRJOS on the test results (including the laboratories that did not report a pass or fail) all reporting laboratories would rate the sample as a Fail.

sample #23156

Particulate Contamination: The group of participants had difficulty to meet the target requirements. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of the ASTM D5452:23.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the reference test method and the reproducibility as found for the group of participating laboratories. The number of significant test results, the average, the calculated reproducibility (2.8 * standard deviation) and the target reproducibility derived from reference methods are presented in the next tables.

Parameter	unit	n	average	2.8 * sd	R(lit)
Appearance		106	Cl&Br (Pass)	n.a.	n.a.
Total Acidity	mg KOH/g	86	0.0073	0.0032	0.0035
Aromatics by FIA	%V/V	66	17.0	1.4	2.8
Mono Aromatics (MAH) by HPLC	%M/M	32	18.3	1.0	1.1
Di Aromatics (DAH) by HPLC	%M/M	34	1.21	0.37	0.17
Total Aromatics by HPLC	%M/M	33	19.6	0.9	1.2
Total Aromatics by HPLC	%V/V	44	17.5	1.5	1.1
Color Saybolt (automated)		54	29.9	0.9	1.2
Color Saybolt (manual)		60	29.3	2.5	2
Copper Corrosion 2 hrs at 100 °C		115	1 (1a/1b)	n.a.	n.a.
Density at 15 °C	kg/m^3	131	796.6	0.2	0.5
Initial Boiling Point	°C	126	149	5.3	8.2
Temp at 10% recovered	°C	128	164	2.2	3.6

Parameter	unit	n	average	2.8 * sd	R(lit)
Temp at 50% recovered	°C	127	188	1.9	3.0
Temp at 90% recovered	°C	128	227	3.2	3.4
Final Boiling Point	°C	126	247	4.1	7.1
Existent Gum (unwashed)	mg/100 mL	75	0.6	0.9	3.1
Flash Point	°C	124	38.5	3.5	3.2
Freezing Point	°C	114	-58.9	2.0	2.5
Kinematic Viscosity at -20 °C	mm^2/s	81	3.305	0.047	0.063
Mercaptan Sulfur as S	%M/M	79	0.0022	0.0003	0.0004
MSEP		97	94.2	9.1	8.7
Naphthalenes	%V/V	72	0.78	0.04	0.08
Smoke Point	mm	98	23.8	1.7	3.7
Specific Energy (Net)	MJ/kg	79	43.265	0.076	0.046
Total Sulfur	mg/kg	108	716	83	91
BOCLE	mm	24	0.65	0.07	0.06

Table 14: reproducibilities of tests on samples #23150 and #23151

Parameter	unit	n	average	2.8 * sd	R(lit)
Particle Size ≥4 µm (c)	counts/mL	45	20973	8268	(2288)
Particle Size ≥6 µm (c)	counts/mL	46	5184	2216	1133
Particle Size ≥14 µm (c)	counts/mL	46	129	103	77
Particle Size ≥21 µm (c)	counts/mL	46	15	23	14
Particle Size ≥25 µm (c)	counts/mL	42	3	6	5
Particle Size ≥30 µm (c)	counts/mL	43	1	2	2
Particle Size ≥4 µm (c)	ISO scale	45	21.7	1.3	1.0
Particle Size ≥6 µm (c)	ISO scale	45	19.6	1.4	1.0
Particle Size ≥14 µm (c)	ISO scale	43	14.1	1.3	1.4

Table 15: reproducibilities of tests on sample #23152 according to IP565

For results between brackets no z-scores are calculated.

Parameter	unit	n	average	2.8 * sd	R(lit)
FAME content GCMS/HPLC	mg/kg	39	49.8	23.9	13.6
FAME content FTIR	mg/kg	21	58.5	8.2	7.9

Table 16: reproducibilities of tests on sample #23153

Parameter	unit	n	average	2.8 * sd	R(lit)
FAME content GCMS/HPLC	mg/kg	35	18.7	8.6	5.6
FAME content FTIR	mg/kg	21	26.2	8.0	6.3

Table 17: reproducibilities of tests on sample #23154

Parameter	unit	n	average	2.8 * sd	R(lit)
Copper as Cu	µg/kg	4	>500	n.e.	n.e.
VTR (visual)		76	≥3	n.a.	n.a.

ITR (interferometric)	Nm	16	>85	n.a.	n.a.
ETR (elliptometric)	nm	13	>85	n.a.	n.a.
Delta P	mmHg	76	>25	n.a.	n.a.
JFTOT Evaluation (Pass/Fail)		77	Fail	n.a.	n.a.
Particulate Contamination	mg/L	44	0.14	0.19	0.14

Table 18: reproducibilities of tests on sample #23155 and #23156

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

4.3 COMPARISON OF THE PROFICIENCY TEST OF SEPTEMBER 2023 WITH PREVIOUS PTS

	September 2023	March 2023	September 2022	March 2022	September 2021
Number of reporting laboratories	150	74	168	80	160
Number of test results	2944	1363	2754	1400	3091
Number of statistical outliers	93	36	48	28	42
Percentage of statistical outliers	3.2%	2.6%	1.7%	2.0%	1.4%

Table 19: 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 to the requirements of the reference test methods. The conclusions are given in the following table.

Parameter	September 2023	March 2023	September 2022	March 2022	September 2021
Total Acidity	+/-	-	-	+/-	-
Aromatics by FIA	+	+	+	+	+
Aromatics by HPLC	-	+/-	-	-	-
Color Saybolt (automated)	+	--	++	--	--
Color Saybolt (manual)	-	-	++	-	--
Density at 15 °C	++	++	+	++	++
Distillation at 760 mmHg	+	+	+	+	+
Existent Gum (unwashed)	++	++	++	++	++
Flash Point	+/-	+	+/-	+/-	+
Freezing Point	+	+	+	+	+
Kinematic Viscosity at -20 °C	+	-	(--)	-	-
Mercaptan Sulfur	+	+	+	+	+/-
MSEP	+/-	+	+	+	+
Naphthalenes	++	+	+	+	+/-
Smoke Point	++	+	+	++	+
Specific Energy (Net)	-	-	+	+/-	+/-
Total Sulfur	+/-	-	-	-	-

Parameter	September 2023	March 2023	September 2022	March 2022	September 2021
BOCLE	-	-	+	n.a.	-
IP565 cumilative counts/mL	-	-	-	-	-
IP565 ISO scale numbers	-	-	+	+	+
FAME content	-	n.a.	-	n.a.	-
JFTOT finding correct Pass/Fail	+	n.a.	+	n.a.	+
Particulate Contamination	-	n.a.	+/-	n.a.	+

Table 20: comparison of determinations to the reference test methods

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
n.e. : not evaluated

APPENDIX 1

Determination of Appearance on sample #23150;

lab	method	value	lab	method	value
52	Visual	C & B	1064	Visual	C&B
62	Visual	pass	1065		-----
120	Visual	C&B	1082		-----
140	Visual	Clear and Bright	1097	Visual	B&C
150	Visual	C&B	1105	Visual	C&B
159	Visual	Pass, C&B	1121		-----
169	Visual	clear and bright	1126		-----
171	Visual	C&B	1131		-----
177	Visual	C&B	1141	Visual	clear & bright
194		-----	1182		-----
215	Visual	clear and bright	1191		-----
221		-----	1205		-----
224	Visual	Clear & Bright	1212	Visual	C&B
225	Visual	Clear & Bright	1237	Visual	clear and bright
228	Visual	C & B	1275	Visual	CBFSMW *)
235	Visual	C & B	1279	Visual	C&B and visually free from solid matter
237	Visual	C&B	1299	Visual	CL&BR
238	Visual	C&B	1318	Visual	Pass
253	Visual	Clear & Bright	1320	Visual	C&B
254	Visual	Clear & Bright	1357	Visual	Clear & Bright
256	Visual	Clear & bright	1372		-----
258	Visual	B&C	1399	Visual	Clear&Bright
273	Visual	Clear & Bright	1417	Visual	Clear & Bright
311		-----	1496	Visual	C&B
317	Visual	Clear and Bright	1528	Visual	C&B
323	Visual	CBL	1585	Visual	clear & bright
328	Visual	C&B	1586	Visual	Clear &Bright
333		-----	1587	Visual	Br&Cl
334	Visual	clear and bright	1610		-----
335	Visual	clear and bright	1613	Visual	B&C
365	D4176	Pass	1631	Visual	1
372	Visual	Clear & Bright	1634	Visual	C&B
391	Visual	C&B	1650		-----
396	Visual	Clear & Bright	1683	D6986	PASS
399	Visual	c&b	1710	Visual	Clear & Bright
440	Visual	Clear & bright	1715		-----
445	Visual	Clear & Bright	1720		-----
447	Visual	Clear & Bright	1724	Visual	clear and bright
460	Visual	Clear and Bright	1730		-----
467	Visual	C&B	1741	Visual	clear and bright
480		-----	1757		-----
496	Visual	c+b	1776		-----
603	Visual	Clear and Bright	1780	Visual	Clear and Bright
631	Visual	clear & bright	1833		-----
657	Visual	Bright & Clear	1852	Visual	clear & bright
704	Visual	clear&bright	1854		-----
736	Visual	cleare&bright	1913	Visual	C&B and visually free from solid matter
823	Visual	C&B	1961		-----
824	Visual	Clear & Bright	2130	Visual	Clear & Bright
851	D4176	Bright and Clear	2133	Visual	Clear & Bright
854	Visual	clear&bright	6035	Visual	Clear and Bright
862	Visual	C&B and visually free from solid matter	6041	Visual	Clear& Bright
869	Visual	Clear and Bright	6054		-----
904		-----	6075		-----
914	Visual	C&B and visually free from solid matter	6114	Visual	Clear & Bright
962		-----	6135		-----
963		-----	6142	Visual	C&B
970		-----	6168		-----
974	Visual	Clear & Bright	6174	Visual	Clear & Bright
994	Visual	C&B	6203	Visual	C&B
995	Visual	C&B	6238		-----
996	Visual	Cl&Br	6240	Visual	Clear and Bright
997	Visual	C&B	6266	Visual	Clear and bright
1011		-----	6312		-----
1016		-----	6321		-----
1023	Visual	Clear & bright	6324	Visual	Clear & Bright
1039	Visual	Clear & Bright	6331	Visual	Clear and Bright
1040	Visual	Clear&Bright	6344		-----
1049	Visual	Br & Cl	6346		-----
1059	Visual	Clear & Bright	6364	Visual	Clear & Bright
1062		-----	6384	Visual	Clear and bright

lab	method	value	lab	method	value
6404	Visual	clear, No solid	6530	Visual	PASS
6406	Visual	Clear and Bright	6539		-----
6479		-----	6540	Visual	C & B
6519	Visual	Clear and Bright	6544		-----

n	106
mean (n)	Clear and Bright (Pass)

*) CBFSMW = Clear, bright and visually free from solid matter and undissolved water at ambient fuel temperature

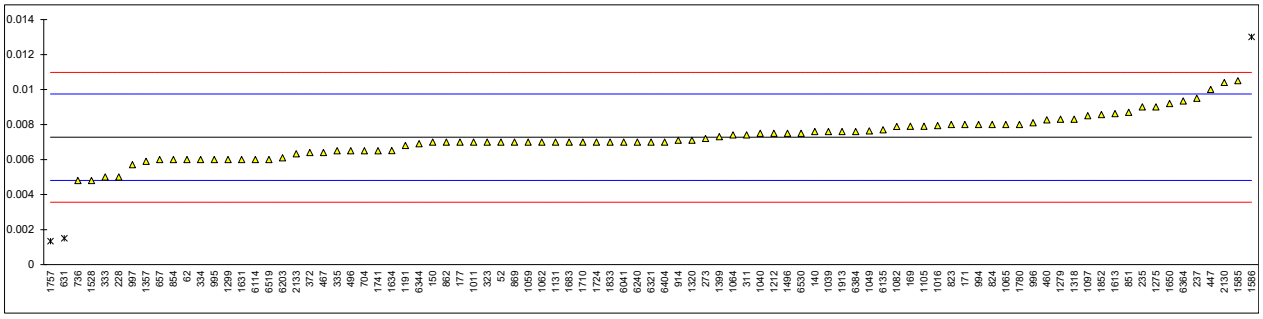
Determination of Total Acidity on sample #23150; results in mg KOH/g

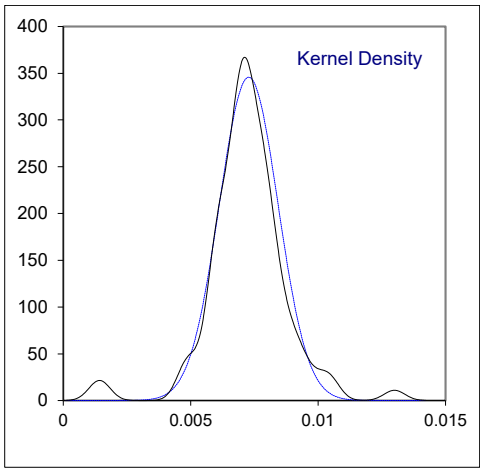
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3242	0.007		-0.22	1064	D3242	0.0074		0.10
62	D664-A	0.006		-1.03	1065	D664-A	0.008		0.58
120		-----		-----	1082	D3242	0.007884		0.49
140	D3242	0.0076	C	0.26	1097	D3242	0.0085		0.99
150	D3242	0.007	C	-0.22	1105	D3242	0.0079		0.50
159		-----		-----	1121		-----		-----
169	D3242	0.0079	C	0.50	1126		-----		-----
171	D3242	0.008		0.58	1131	D3242	0.007		-0.22
177	D3242	0.007		-0.22	1141		-----		-----
194		-----		-----	1182		-----		-----
215		-----		-----	1191	D3242	0.0068		-0.39
221		-----		-----	1205		-----		-----
224		-----		-----	1212	D3242	0.0075		0.18
225		-----		-----	1237		-----		-----
228	D3242	0.005	C	-1.84	1275	IP354	0.009		1.39
235	D3242	0.009		1.39	1279	D3242	0.0083		0.83
237	D3242	0.0095	C	1.80	1299	D3242	0.006		-1.03
238		-----		-----	1318	D3242	0.0083		0.83
253		-----		-----	1320	D3242	0.0071		-0.14
254		-----		-----	1357	D3242	0.0059		-1.11
256		-----		-----	1372		-----		-----
258		-----		-----	1399	D3242	0.0073		0.02
273	D3242	0.0072	C	-0.06	1417		-----		-----
311	D3242	0.0074		0.10	1496	D3242	0.0075		0.18
317		-----		-----	1528	D3242	0.0048	C	-2.00
323	D3242	0.007		-0.22	1585	D3242	0.0105		2.61
328		-----		-----	1586	D3242	0.013	C,R(0.01)	4.63
333	D3242	0.005		-1.84	1587		-----		-----
334	D3242	0.006		-1.03	1610		-----		-----
335	D3242	0.0065		-0.63	1613	D3242	0.00862		1.09
365		-----		-----	1631	D3242	0.006		-1.03
372	D3242	0.0064		-0.71	1634	D3242	0.006509		-0.62
391		-----		-----	1650	D3242	0.0092		1.56
396		-----		-----	1683	D3242	0.007		-0.22
399		-----		-----	1710	D3242	0.007		-0.22
440		-----		-----	1715		-----		-----
445		-----		-----	1720		-----		-----
447	D3242	0.01		2.20	1724	D3242	0.007		-0.22
460	D3242	0.00827		0.80	1730		-----		-----
467	D3242	0.0064		-0.71	1741	D3242	0.0065		-0.63
480		-----		-----	1757	D3242	0.00134	C,R(0.01)	-4.80
496	D3242	0.0065		-0.63	1776		-----		-----
603		-----		-----	1780	D3242	0.008		0.58
631	D3242	0.0015	C,R(0.01)	-4.67	1833	D3242	0.007		-0.22
657	D3242	0.006		-1.03	1852	D3242	0.00856		1.04
704	D3242	0.0065		-0.63	1854		-----		-----
736	D3242	0.0048		-2.00	1913	D3242	0.0076		0.26
823	D3242	0.008		0.58	1961		-----		-----
824	D3242	0.008		0.58	2130	D3242	0.0104		2.53
851	D3242	0.0087		1.15	2133	D3242	0.00633		-0.77
854	D3242	0.0060		-1.03	6035		-----		-----
862	D3242	0.007		-0.22	6041	D3242	0.0070		-0.22
869	D3242	0.007		-0.22	6054		-----		-----
904		-----		-----	6075		-----		-----
914	D3242	0.0071		-0.14	6114	D3242	0.006		-1.03
962		-----		-----	6135	D3242	0.0077		0.34
963		-----		-----	6142		-----		-----
970		-----		-----	6168		-----		-----
974		-----		-----	6174		-----		-----
994	D3242	0.008		0.58	6203	D3242	0.0061	C	-0.95
995	D3242	0.006		-1.03	6238		-----		-----
996	D3242	0.0081		0.67	6240	D3242	0.007		-0.22
997	D3242	0.0057		-1.27	6266		-----		-----
1011	D3242	0.007		-0.22	6312		-----		-----
1016	D3242	0.00794		0.54	6321	IP354	0.007		-0.22
1023		-----		-----	6324		-----		-----
1039	D3242	0.0076		0.26	6331		-----		-----
1040	D3242	0.0075		0.18	6344	D3242	0.0069		-0.30
1049	D3242	0.00763		0.29	6346		-----		-----
1059	D3242	0.007		-0.22	6364	D3242	0.00934		1.67
1062	D3242	0.007		-0.22	6384	D3242	0.0076		0.26

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404	D3242	0.007		-0.22	6530	D3242	0.0075		0.18
6406		-----		-----	6539		-----		-----
6479		-----		-----	6540		-----		-----
6519	D3242	0.006		-1.03	6544		-----		-----

normality	OK
n	86
outliers	3
mean (n)	0.00728
st.dev. (n)	0.001154
R(calc.)	0.00323
st.dev.(D3242:11R17)	0.001237
R(D3242:11R17)	0.00346

Lab 140 first reported 0.0135
Lab 150 first reported 0.000
Lab 169 first reported 0.079
Lab 228 first reported 0.000187
Lab 237 first reported 0.0028
Lab 273 first reported 0.0020
Lab 631 first reported 0.00223
Lab 1528 first reported 0.0022
Lab 1586 first reported 0.13
Lab 1757 first reported 0.0134
Lab 6203 first reported 0.0020





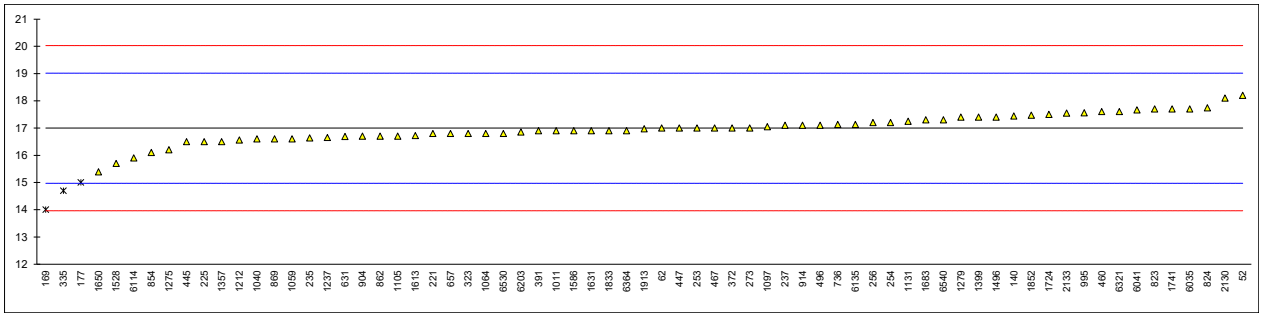
Determination of Aromatics by FIA on sample #23150; results in %V/V

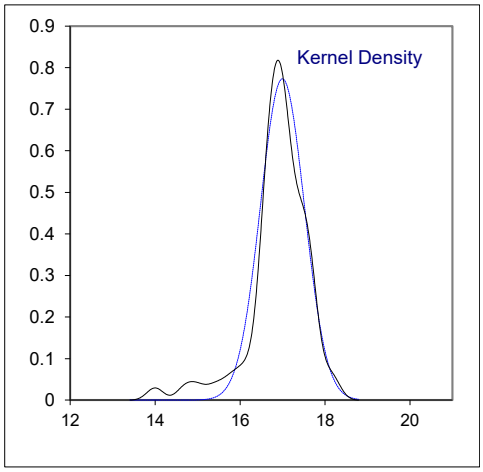
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D1319	18.2		1.19	1064	D1319	16.8		-0.19
62	D1319	17		0.00	1065		-----		-----
120		-----		-----	1082		-----		-----
140	D1319	17.440		0.44	1097	D1319	17.049		0.05
150		-----		-----	1105	D1319	16.70		-0.29
159		-----		-----	1121		-----		-----
169	D1319	14.0	R(0.01)	-2.96	1126		-----		-----
171		-----		-----	1131	D1319	17.25		0.25
177	D1319	15.0	R(0.05)	-1.97	1141		-----		-----
194		-----		-----	1182		-----		-----
215		-----		-----	1191		-----		-----
221	D1319	16.8		-0.19	1205		-----		-----
224		-----		-----	1212	D1319	16.56		-0.43
225	D1319	16.5		-0.49	1237	EN15553	16.65		-0.34
228		-----		-----	1275	IP156	16.2		-0.79
235	D1319	16.6345		-0.36	1279	D1319	17.4		0.40
237	D1319	17.1		0.10	1299		-----		-----
238		-----		-----	1318		-----		-----
253	D1319	17.00		0.00	1320		-----		-----
254	D1319	17.2		0.20	1357	D1319	16.5		-0.49
256	D1319	17.2		0.20	1372		-----		-----
258		-----		-----	1399	D1319	17.4		0.40
273	D1319	17.0		0.00	1417		-----		-----
311		-----		-----	1496	D1319	17.4		0.40
317		-----		-----	1528	D1319	15.7		-1.28
323	D1319	16.8		-0.19	1585		-----		-----
328		-----		-----	1586	D1319	16.9	C	-0.10
333		-----		-----	1587		-----		-----
334		-----		-----	1610		-----		-----
335	D1319	14.7	R(0.05)	-2.27	1613	D1319	16.72		-0.27
365		-----		-----	1631	D1319	16.9		-0.10
372	D1319	17.0		0.00	1634		-----		-----
391	D1319	16.9		-0.10	1650	D1319	15.39		-1.59
396		-----		-----	1683	D1319	17.3		0.30
399		-----		-----	1710		-----		-----
440		-----		-----	1715		-----		-----
445	D1319	16.5		-0.49	1720		-----		-----
447	D1319	17.0		0.00	1724	D1319	17.5		0.50
460	D1319	17.6		0.60	1730		-----		-----
467	D1319	17.0		0.00	1741	D1319	17.70		0.70
480		-----		-----	1757		-----		-----
496	D1319	17.1		0.10	1776		-----		-----
603		-----		-----	1780		-----		-----
631	D1319	16.69		-0.30	1833	D1319	16.9		-0.10
657	D1319	16.8		-0.19	1852	D1319	17.47		0.47
704		-----		-----	1854		-----		-----
736	D1319	17.13		0.13	1913	D1319	16.97		-0.03
823	D1319	17.7		0.70	1961		-----		-----
824	D1319	17.74		0.74	2130	IP156	18.1		1.09
851		-----		-----	2133	D1319	17.55		0.55
854	D1319	16.1		-0.89	6035	EN15553	17.7		0.70
862	D1319	16.7		-0.29	6041	D1319	17.66		0.66
869	D1319	16.6		-0.39	6054		-----		-----
904	D1319	16.7		-0.29	6075		-----		-----
914	D1319	17.1		0.10	6114	D1319	15.9		-1.08
962		-----		-----	6135	D1319	17.13		0.13
963		-----		-----	6142		-----		-----
970		-----		-----	6168		-----		-----
974		-----		-----	6174		-----		-----
994		-----		-----	6203	D1319	16.85		-0.14
995	D1319	17.56		0.56	6238		-----		-----
996		-----		-----	6240		-----		-----
997		-----		-----	6266		-----		-----
1011	D1319	16.9		-0.10	6312		-----		-----
1016		-----		-----	6321	IP156	17.6		0.60
1023		-----		-----	6324		-----		-----
1039		-----		-----	6331		-----		-----
1040	D1319	16.6		-0.39	6344		-----		-----
1049		-----		-----	6346		-----		-----
1059	D1319	16.6		-0.39	6364	D1319	16.9		-0.10
1062		-----		-----	6384		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404		-----		-----	6530	D1319	16.8		-0.19
6406		-----		-----	6539		-----		-----
6479		-----		-----	6540	D1319	17.3		0.30
6519		-----		-----	6544		-----		-----

normality	suspect
n	66
outliers	3
mean (n)	16.996
st.dev. (n)	0.5162
R(calc.)	1.445
st.dev.(D1319:20a)	1.0117
R(D1319:20a)	2.833

Lab 1586 first reported 19.9





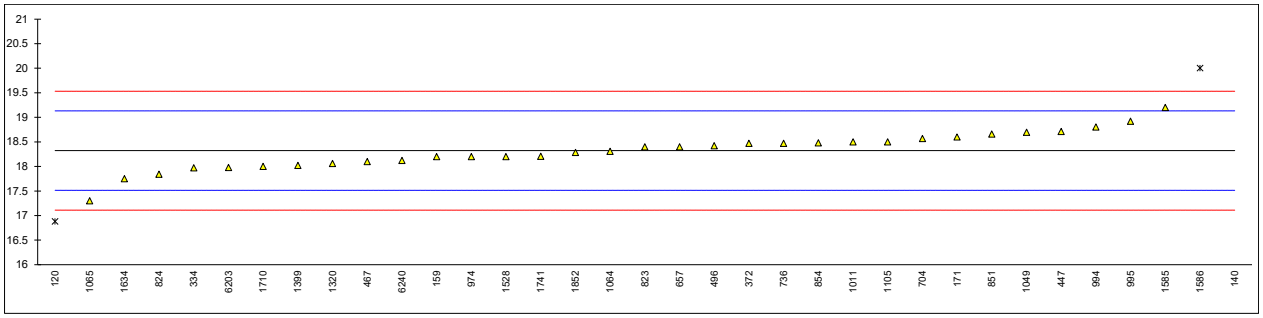
Determination of Mono Aromatics (MAH) by HPLC on sample #23150; results in %M/M

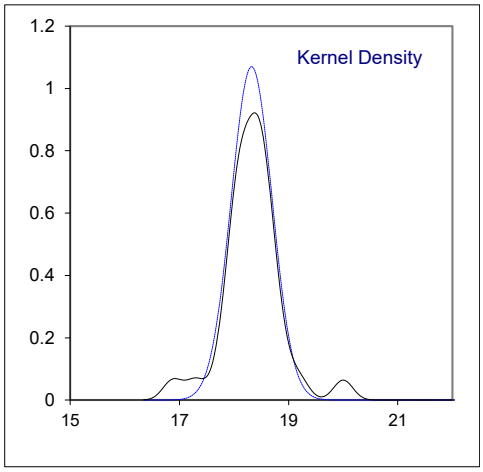
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1064	D6379	18.31		-0.03
62		-----		-----	1065	IP436	17.3		-2.53
120	D6379	16.88	C,R(0.05)	-3.58	1082		-----		-----
140	D6379	31.56	R(0.01)	32.80	1097		-----		-----
150		-----		-----	1105	D6379	18.50		0.44
159	D6379	18.2	C	-0.30	1121		-----		-----
169		-----		-----	1126		-----		-----
171	D6379	18.6		0.69	1131		-----		-----
177		-----		-----	1141		-----		-----
194		-----		-----	1182		-----		-----
215		-----		-----	1191		-----		-----
221		-----		-----	1205		-----		-----
224		-----		-----	1212		-----		-----
225		-----		-----	1237		-----		-----
228		-----		-----	1275		-----		-----
235		-----		-----	1279		-----		-----
237		-----		-----	1299		-----		-----
238		-----		-----	1318		-----		-----
253		-----		-----	1320	D6379	18.06		-0.65
254		-----		-----	1357		-----		-----
256		-----		-----	1372		-----		-----
258		-----		-----	1399	IP436	18.02		-0.75
273		-----		-----	1417		-----		-----
311		-----		-----	1496		-----		-----
317		-----		-----	1528	D6379	18.20		-0.30
323		-----		-----	1585	D6379	19.2		2.17
328		-----		-----	1586	D6379	20.0	R(0.05)	4.16
333		-----		-----	1587		-----		-----
334	D6379	17.97		-0.87	1610		-----		-----
335		-----		-----	1613		-----		-----
365		-----		-----	1631		-----		-----
372	D6379	18.47		0.36	1634	D6379	17.75		-1.42
391		-----		-----	1650		-----		-----
396		-----		-----	1683		-----		-----
399		-----		-----	1710	D6379	18.0	C	-0.80
440		-----		-----	1715		-----		-----
445		-----		-----	1720		-----		-----
447	IP436	18.71	C	0.96	1724		-----		-----
460		-----		-----	1730		-----		-----
467	D6379	18.1		-0.55	1741	D6379	18.206		-0.29
480		-----		-----	1757		-----		-----
496	D6379	18.42		0.24	1776		-----		-----
603		-----		-----	1780		-----		-----
631		-----		-----	1833		-----		-----
657	D6379	18.4		0.19	1852	D6379	18.283		-0.10
704	D6379	18.57		0.61	1854		-----		-----
736	D6379	18.47		0.36	1913		-----		-----
823	D6379	18.4		0.19	1961		-----		-----
824	D6379	17.84		-1.20	2130		-----		-----
851	D6379	18.6589		0.83	2133		-----		-----
854	D6379	18.48		0.39	6035		-----		-----
862		-----		-----	6041		-----		-----
869		-----		-----	6054		-----		-----
904		-----		-----	6075		-----		-----
914		-----		-----	6114		-----		-----
962		-----		-----	6135		-----		-----
963		-----		-----	6142		-----		-----
970		-----		-----	6168		-----		-----
974	D6379	18.2		-0.30	6174		-----		-----
994	D6379	18.8		1.18	6203	D6379	17.98		-0.85
995	D6379	18.92		1.48	6238		-----		-----
996		-----		-----	6240	D6379	18.12		-0.50
997		-----		-----	6266		-----		-----
1011	D6379	18.5		0.44	6312		-----		-----
1016		-----		-----	6321		-----		-----
1023		-----		-----	6324		-----		-----
1039		-----		-----	6331		-----		-----
1040		-----		-----	6344		-----		-----
1049	D6379	18.696		0.92	6346		-----		-----
1059		-----		-----	6364		-----		-----
1062		-----		-----	6384		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404		-----		-----	6530		-----		-----
6406		-----		-----	6539		-----		-----
6479		-----		-----	6540		-----		-----
6519		-----		-----	6544		-----		-----

n	32
outliers	3
mean (n)	18.323
st.dev. (n)	0.3729
R(calc.)	1.044
st.dev.(D6379:21e1)	0.4036
R(D6379:21e1)	1.130

Lab 120 first reported 20.00
Lab 159 first reported 14.23
Lab 447 first reported 21.18
Lab 1710 first reported 28.0



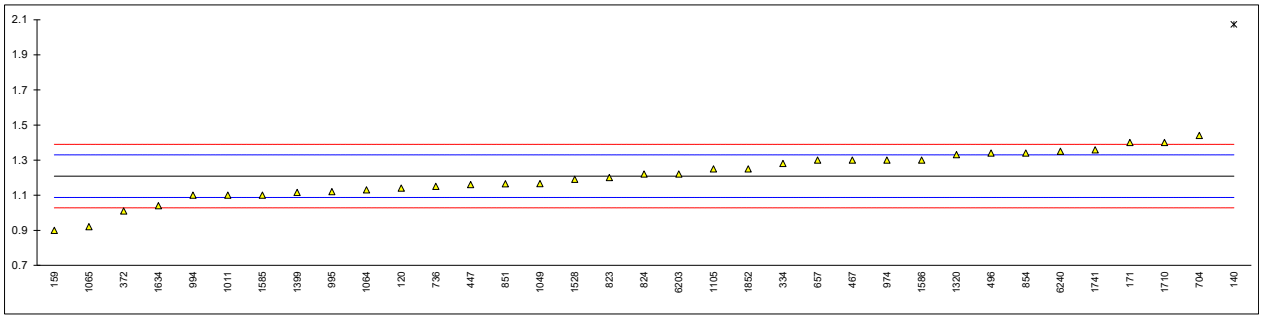


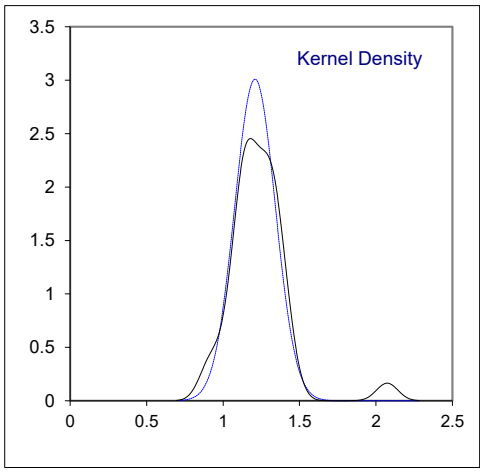
Determination of Di Aromatics (DAH) by HPLC on sample #23150; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1064	D6379	1.13		-1.30
62		-----		-----	1065	IP436	0.92		-4.77
120	D6379	1.14		-1.13	1082		-----		-----
140	D6379	2.073	R(0.01)	14.32	1097		-----		-----
150		-----		-----	1105	D6379	1.25		0.69
159	D6379	0.90		-5.11	1121		-----		-----
169		-----		-----	1126		-----		-----
171	D6379	1.4		3.17	1131		-----		-----
177		-----		-----	1141		-----		-----
194		-----		-----	1182		-----		-----
215		-----		-----	1191		-----		-----
221		-----		-----	1205		-----		-----
224		-----		-----	1212		-----		-----
225		-----		-----	1237		-----		-----
228		-----		-----	1275		-----		-----
235		-----		-----	1279		-----		-----
237		-----		-----	1299		-----		-----
238		-----		-----	1318		-----		-----
253		-----		-----	1320	D6379	1.33		2.01
254		-----		-----	1357		-----		-----
256		-----		-----	1372		-----		-----
258		-----		-----	1399	IP436	1.115		-1.55
273		-----		-----	1417		-----		-----
311		-----		-----	1496		-----		-----
317		-----		-----	1528	D6379	1.19		-0.30
323		-----		-----	1585	D6379	1.1		-1.79
328		-----		-----	1586	D6379	1.3		1.52
333		-----		-----	1587		-----		-----
334	D6379	1.28		1.19	1610		-----		-----
335		-----		-----	1613		-----		-----
365		-----		-----	1631		-----		-----
372	D6379	1.01		-3.28	1634	D6379	1.04		-2.79
391		-----		-----	1650		-----		-----
396		-----		-----	1683		-----		-----
399		-----		-----	1710	D6379	1.4		3.17
440		-----		-----	1715		-----		-----
445		-----		-----	1720		-----		-----
447	IP436	1.16		-0.80	1724		-----		-----
460		-----		-----	1730		-----		-----
467	D6379	1.3		1.52	1741	D6379	1.358		2.48
480		-----		-----	1757		-----		-----
496	D6379	1.34		2.18	1776		-----		-----
603		-----		-----	1780		-----		-----
631		-----		-----	1833		-----		-----
657	D6379	1.3		1.52	1852	D6379	1.250		0.69
704	D6379	1.44		3.84	1854		-----		-----
736	D6379	1.15		-0.97	1913		-----		-----
823	D6379	1.2		-0.14	1961		-----		-----
824	D6379	1.22		0.19	2130		-----		-----
851	D6379	1.1647		-0.72	2133		-----		-----
854	D6379	1.34		2.18	6035		-----		-----
862		-----		-----	6041		-----		-----
869		-----		-----	6054		-----		-----
904		-----		-----	6075		-----		-----
914		-----		-----	6114		-----		-----
962		-----		-----	6135		-----		-----
963		-----		-----	6142		-----		-----
970		-----		-----	6168		-----		-----
974	D6379	1.3		1.52	6174		-----		-----
994	D6379	1.1		-1.79	6203	D6379	1.22		0.19
995	D6379	1.12		-1.46	6238		-----		-----
996		-----		-----	6240	D6379	1.35		2.35
997		-----		-----	6266		-----		-----
1011	D6379	1.1		-1.79	6312		-----		-----
1016		-----		-----	6321		-----		-----
1023		-----		-----	6324		-----		-----
1039		-----		-----	6331		-----		-----
1040		-----		-----	6344		-----		-----
1049	D6379	1.165		-0.72	6346		-----		-----
1059		-----		-----	6364		-----		-----
1062		-----		-----	6384		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404		-----		-----	6530		-----		-----
6406		-----		-----	6539		-----		-----
6479		-----		-----	6540		-----		-----
6519		-----		-----	6544		-----		-----

normality	OK
n	34
outliers	1
mean (n)	1.208
st.dev. (n)	0.1326
R(calc.)	0.371
st.dev.(D6379:21e1)	0.0604
R(D6379:21e1)	0.169





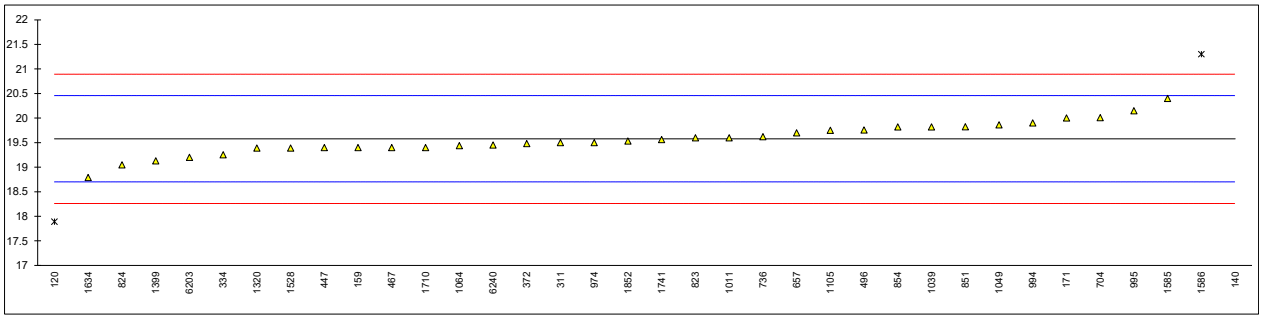
Determination of Total Aromatics by HPLC on sample #23150; results in %M/M

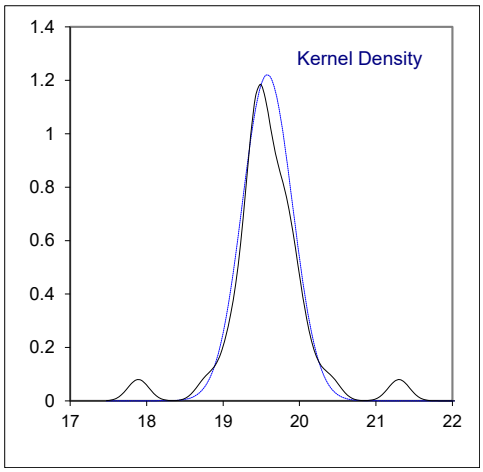
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1064	D6379	19.44		-0.32
62		-----		-----	1065		-----		-----
120	D6379	17.89	ex,C,E	-3.85	1082		-----		-----
140	D6379	33.633	ex	32.03	1097		-----		-----
150		-----		-----	1105	D6379	19.75		0.39
159	D6379	19.4	C,E	-0.41	1121		-----		-----
169		-----		-----	1126		-----		-----
171	D6379	20.0		0.96	1131		-----		-----
177		-----		-----	1141		-----		-----
194		-----		-----	1182		-----		-----
215		-----		-----	1191		-----		-----
221		-----		-----	1205		-----		-----
224		-----		-----	1212		-----		-----
225		-----		-----	1237		-----		-----
228		-----		-----	1275		-----		-----
235		-----		-----	1279		-----		-----
237		-----		-----	1299		-----		-----
238		-----		-----	1318		-----		-----
253		-----		-----	1320	D6379	19.39		-0.43
254		-----		-----	1357		-----		-----
256		-----		-----	1372		-----		-----
258		-----		-----	1399	IP436	19.13		-1.02
273		-----		-----	1417		-----		-----
311	D8267	19.5		-0.18	1496		-----		-----
317		-----		-----	1528	D6379	19.39		-0.43
323		-----		-----	1585	D6379	20.4	E	1.87
328		-----		-----	1586	D6379	21.3	ex	3.92
333		-----		-----	1587		-----		-----
334	D6379	19.25		-0.75	1610		-----		-----
335		-----		-----	1613		-----		-----
365		-----		-----	1631		-----		-----
372	D6379	19.48		-0.22	1634	D6379	18.79	C	-1.80
391		-----		-----	1650		-----		-----
396		-----		-----	1683		-----		-----
399		-----		-----	1710	D6379	19.4	C	-0.41
440		-----		-----	1715		-----		-----
445		-----		-----	1720		-----		-----
447	IP436	19.40	E	-0.41	1724		-----		-----
460		-----		-----	1730		-----		-----
467	D6379	19.4		-0.41	1741	D6379	19.564		-0.03
480		-----		-----	1757		-----		-----
496	D6379	19.76		0.41	1776		-----		-----
603		-----		-----	1780		-----		-----
631		-----		-----	1833		-----		-----
657	D6379	19.7		0.28	1852	D6379	19.533		-0.10
704	D6379	20.01		0.98	1854		-----		-----
736	D6379	19.62		0.10	1913		-----		-----
823	D6379	19.6		0.05	1961		-----		-----
824	D6379	19.05		-1.20	2130		-----		-----
851	D6379	19.8236		0.56	2133		-----		-----
854	D6379	19.82		0.55	6035		-----		-----
862		-----		-----	6041		-----		-----
869		-----		-----	6054		-----		-----
904		-----		-----	6075		-----		-----
914		-----		-----	6114		-----		-----
962		-----		-----	6135		-----		-----
963		-----		-----	6142		-----		-----
970		-----		-----	6168		-----		-----
974	D6379	19.5		-0.18	6174		-----		-----
994	D6379	19.9		0.73	6203	D6379	19.20		-0.86
995	D6379	20.15	E	1.30	6238		-----		-----
996		-----		-----	6240	D6379	19.45		-0.29
997		-----		-----	6266		-----		-----
1011	D6379	19.6		0.05	6312		-----		-----
1016		-----		-----	6321		-----		-----
1023		-----		-----	6324		-----		-----
1039	D6379	19.82	C	0.55	6331		-----		-----
1040		-----		-----	6344		-----		-----
1049	D6379	19.861		0.64	6346		-----		-----
1059		-----		-----	6364		-----		-----
1062		-----		-----	6384		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404		-----		-----	6530		-----		-----
6406		-----		-----	6539		-----		-----
6479		-----		-----	6540		-----		-----
6519		-----		-----	6544		-----		-----

normality	OK
n	33
outliers	0 +3ex
mean (n)	19.578
st.dev. (n)	0.3268
R(calc.)	0.915
st.dev.(D6379:21e1)	0.4388
R(D6379:21e1)	1.229

Lab 120 test result excluded as statistical outlier in one or two related parameters; fr. 21.14; calculation difference; iis calculated 18.02
Lab 140 test result excluded as statistical outlier in one or two related parameters
Lab 159 first reported 15.13 / calculation difference; iis calculated 19.1
Lab 447 calculation difference; iis calculated 19.87
Lab 995 calculation difference; iis calculated 20.04
Lab 1039 first reported test result in the unit %V/V
Lab 1585 calculation difference; iis calculated 20.3
Lab 1586 test result excluded as statistical outlier in one or two related parameters
Lab 1634 first reported 17.79
Lab 1710 first reported 29.4





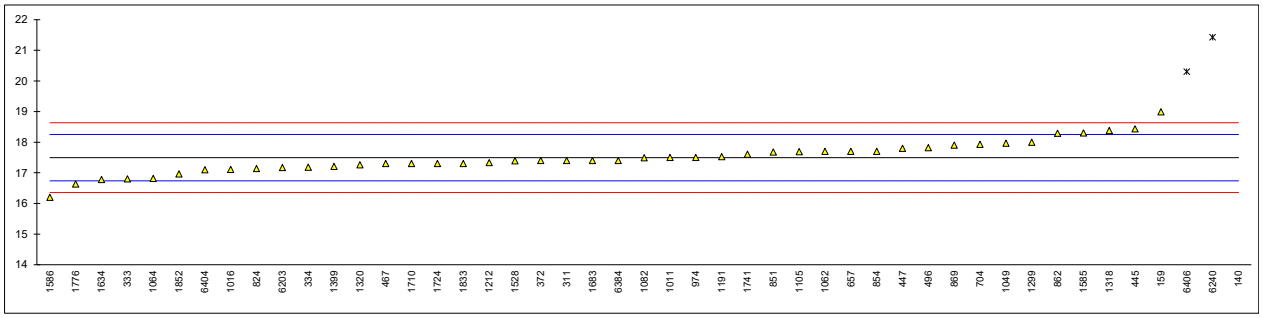
Determination of Total Aromatics by HPLC on sample #23150; results in %V/V

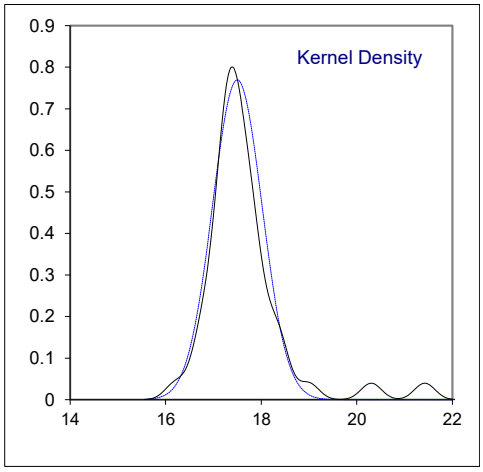
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1064	D6379	16.82		-1.78
62		-----		-----	1065		-----		-----
120		-----		-----	1082	D6379	17.489		-0.02
140	D6379	30.22	R(0.01)	33.61	1097		-----		-----
150		-----		-----	1105	D6379	17.69		0.51
159	D6379	18.99		3.95	1121		-----		-----
169		-----		-----	1126		-----		-----
171		-----		-----	1131		-----		-----
177		-----		-----	1141		-----		-----
194		-----		-----	1182		-----		-----
215		-----		-----	1191	D6379	17.531		0.09
221		-----		-----	1205		-----		-----
224		-----		-----	1212	D6379	17.33		-0.44
225		-----		-----	1237		-----		-----
228		-----		-----	1275		-----		-----
235		-----		-----	1279		-----		-----
237		-----		-----	1299	IP436	18.0		1.33
238		-----		-----	1318	D6379	18.38		2.34
253		-----		-----	1320	D6379	17.26		-0.62
254		-----		-----	1357		-----		-----
256		-----		-----	1372		-----		-----
258		-----		-----	1399	IP436	17.21		-0.75
273		-----		-----	1417		-----		-----
311	D8267	17.4		-0.25	1496		-----		-----
317		-----		-----	1528	D6379	17.39		-0.28
323		-----		-----	1585	D6379	18.3		2.13
328		-----		-----	1586	D6379	16.2		-3.42
333	D6379	16.8		-1.84	1587		-----		-----
334	D6379	17.18		-0.83	1610		-----		-----
335		-----		-----	1613		-----		-----
365		-----		-----	1631		-----		-----
372	D6379	17.40		-0.25	1634	D6379	16.78		-1.89
391		-----		-----	1650		-----		-----
396		-----		-----	1683	D6379	17.4		-0.25
399		-----		-----	1710	D6379	17.30	C	-0.52
440		-----		-----	1715		-----		-----
445	D6379	18.433		2.48	1720		-----		-----
447	IP436	17.80		0.80	1724	D6379	17.30		-0.52
460		-----		-----	1730		-----		-----
467	D6379	17.3		-0.52	1741	D6379	17.605		0.29
480		-----		-----	1757		-----		-----
496	D6379	17.82		0.86	1776	EN12916	16.63358		-2.28
603		-----		-----	1780		-----		-----
631		-----		-----	1833	D6379	17.3		-0.52
657	D6379	17.7		0.54	1852	D6379	16.966		-1.40
704	D6379	17.93		1.15	1854		-----		-----
736		-----		-----	1913		-----		-----
823		-----		-----	1961		-----		-----
824	D6379	17.14		-0.94	2130		-----		-----
851	D6379	17.68		0.49	2133		-----		-----
854	D6379	17.7		0.54	6035		-----		-----
862	D6379	18.29		2.10	6041		-----		-----
869	D6379	17.9		1.07	6054		-----		-----
904		-----		-----	6075		-----		-----
914		-----		-----	6114		-----		-----
962		-----		-----	6135		-----		-----
963		-----		-----	6142		-----		-----
970		-----		-----	6168		-----		-----
974	D6379	17.5		0.01	6174		-----		-----
994		-----		-----	6203	D6379	17.17		-0.86
995		-----		-----	6238		-----		-----
996		-----		-----	6240	D6379	21.42	C,R(0.01)	10.37
997		-----		-----	6266		-----		-----
1011	D6379	17.5		0.01	6312		-----		-----
1016	IP436	17.108		-1.02	6321		-----		-----
1023		-----		-----	6324		-----		-----
1039		-----		-----	6331		-----		-----
1040		-----		-----	6344		-----		-----
1049	D6379	17.964		1.24	6346		-----		-----
1059		-----		-----	6364		-----		-----
1062	D6379	17.7		0.54	6384	D6379	17.4		-0.25

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404	D6379	17.1		-1.04	6530		-----		-----
6406	D6379	20.30	R(0.01)	7.41	6539		-----		-----
6479		-----		-----	6540		-----		-----
6519		-----		-----	6544		-----		-----

normality	suspect
n	44
outliers	3
mean (n)	17.495
st.dev. (n)	0.5186
R(calc.)	1.452
st.dev.(D6379:21e1)	0.3786
R(D6379:21e1)	1.060

Lab 1710 first reported 27.30
Lab 6240 first reported 24.42



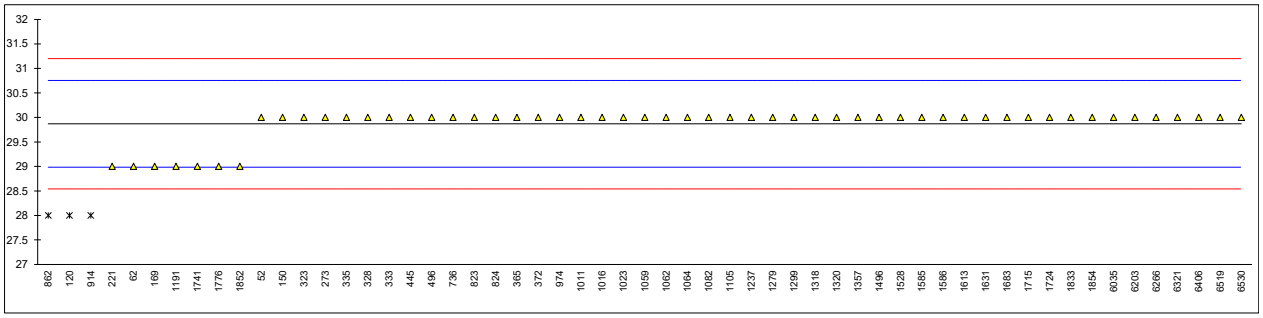


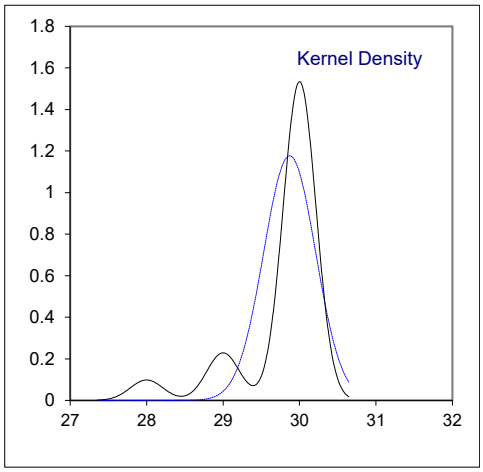
Determination of Color Saybolt (automated) on sample #23150;

lab	method	cell size	value	mark	z(targ)	lab	method	cell size	value	mark	z(targ)
52	D6045	-----	30		0.29	1064	D6045	50 mm	30		0.29
62	D6045	-----	29		-1.97	1065		-----	-----		-----
120	D6045	10 mm	28	R(0.01)	-4.22	1082	D6045	-----	30		0.29
140	D6045	50 mm	>+30		-----	1097		-----	-----		-----
150	D6045	-----	30		0.29	1105	D6045	50 mm	30		0.29
159	D6045	-----	>+30		-----	1121	D6045	100 mm	>30		-----
169	D6045	-----	29		-1.97	1126		-----	-----		-----
171	D6045	-----	>+30		-----	1131		-----	-----		-----
177		-----	-----		-----	1141		-----	-----		-----
194		-----	-----		-----	1182		-----	-----		-----
215		-----	-----		-----	1191	D6045	-----	29		-1.97
221	D6045	50 mm	29		-1.97	1205		-----	-----		-----
224		-----	-----		-----	1212		-----	-----		-----
225		-----	-----		-----	1237	D6045	-----	30		0.29
228		-----	-----		-----	1275		-----	-----		-----
235		-----	-----		-----	1279	D6045	50 mm	30		0.29
237		-----	-----		-----	1299	D6045	100 mm	30		0.29
238		-----	-----		-----	1318	D6045	100 mm	30		0.29
253		-----	-----		-----	1320	D6045	-----	30		0.29
254		-----	-----		-----	1357	D6045	50 mm	30		0.29
256		-----	-----		-----	1372		-----	-----		-----
258		-----	-----		-----	1399	D6045	50 mm	>+30		-----
273	D6045	50 mm	30		0.29	1417	D6045	50 mm	>30		-----
311		-----	-----		-----	1496	D6045	100 mm	30		0.29
317		-----	-----		-----	1528	D6045	50 mm	30		0.29
323	D6045	100 mm	30		0.29	1585	D6045	100 mm	30		0.29
328	D6045	-----	30		0.29	1586	D6045	50 mm	30		0.29
333	D6045	100 mm	30		0.29	1587	D6045	50 mm	>30		-----
334		-----	-----		-----	1610		-----	-----		-----
335	D6045	-----	30		0.29	1613	D6045	50 mm	30		0.29
365	D6045	50 mm	30		0.29	1631	D6045	-----	30		0.29
372	D6045	50 mm	30		0.29	1634		-----	-----		-----
391		-----	-----		-----	1650		-----	-----		-----
396	D6045	50 mm	>+30		-----	1683	D6045	50 mm	30		0.29
399		-----	-----		-----	1710	D6045	100 mm	>30		-----
440			-----		-----	1715	D6045	100 mm	30		0.29
445	D6045	-----	30		0.29	1720		-----	-----		-----
447		-----	-----		-----	1724	D6045	-----	30		0.29
460		-----	-----		-----	1730		-----	-----		-----
467		-----	-----		-----	1741	D6045	100 mm	29		-1.97
480		-----	-----		-----	1757		-----	-----		-----
496	D6045	-----	30		0.29	1776	D6045	-----	29		-1.97
603		-----	-----		-----	1780			-----		-----
631	D6045	50 mm	>+30		-----	1833	D6045	-----	30		0.29
657			-----		-----	1852	D6045	10 mm	29		-1.97
704		-----	-----		-----	1854	D6045	-----	30		0.29
736	D6045	-----	30		0.29	1913		-----	-----		-----
823	D6045	50 mm	30		0.29	1961		-----	-----		-----
824	D6045	50 mm	30		0.29	2130	D6045	50 mm	>+30		-----
851		-----	-----		-----	2133		-----	-----		-----
854		-----	-----		-----	6035	D6045	100 mm	30		0.29
862	D6045	-----	28	R(0.01)	-4.22	6041		-----	-----		-----
869		-----	-----		-----	6054		-----	-----		-----
904		-----	-----		-----	6075		-----	-----		-----
914	D6045	10 mm	28	R(0.01)	-4.22	6114		-----	-----		-----
962		-----	-----		-----	6135		-----	-----		-----
963		-----	-----		-----	6142		-----	-----		-----
970		-----	-----		-----	6168		-----	-----		-----
974	D6045	-----	30		0.29	6174		-----	-----		-----
994		-----	-----		-----	6203	D6045	50 mm	30		0.29
995		-----	-----		-----	6238		-----	-----		-----
996		-----	-----		-----	6240	D6045	100 mm	>30		-----
997		-----	-----		-----	6266	D6045	-----	30		0.29
1011	D6045	100 mm	30		0.29	6312		-----	-----		-----
1016	D6045	100 mm	30		0.29	6321	D6045	50 mm	30		0.29
1023	D6045	50 mm	30		0.29	6324		-----	-----		-----
1039			-----		-----	6331		-----	-----		-----
1040		-----	-----		-----	6344			-----		-----
1049	D6045	50 mm	>30		-----	6346		-----	-----		-----
1059	D6045	50 mm	30		0.29	6364		-----	-----		-----
1062	D6045	50 mm	30		0.29	6384	D6045	50 mm	>30		-----

lab	method	cell size	value	mark	z(targ)	lab	method	cell size	value	mark	z(targ)
6404		-----	-----		-----	6530	D6045	50 mm	30		0.29
6406	D6045	50 mm	30		0.29	6539		-----	-----		-----
6479		-----	-----		-----	6540		-----	-----		-----
6519	D6045	50 mm	30		0.29	6544		-----	-----		-----

normality	not OK
n	54
outliers	3
mean (n)	29.87
st.dev. (n)	0.339
R(calc.)	0.95
st.dev.(D6045:20)	0.443
R(D6045:20)	1.24





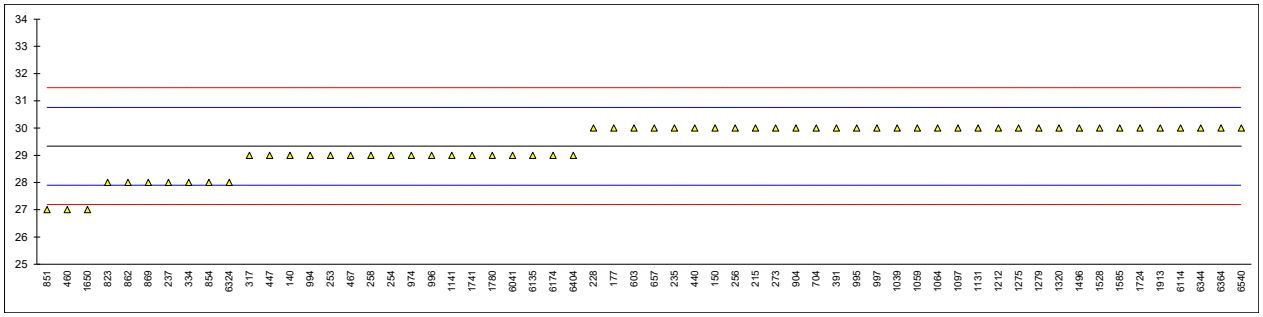
Determination of Color Saybolt (manual) on sample #23150;

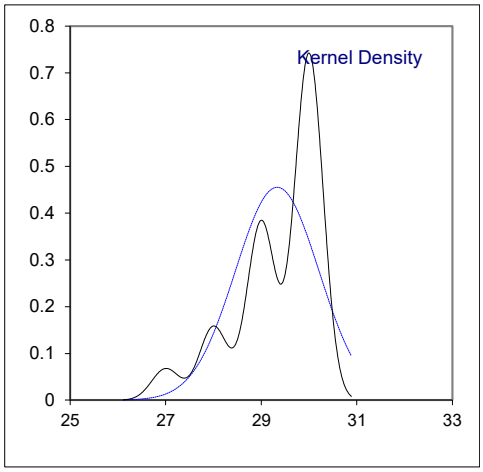
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	1064	D156	30		0.93
62		-----		-----	1065		-----		-----
120		-----		-----	1082		-----		-----
140	D156	29		-0.47	1097	NF M07-003	30		0.93
150	D156	30		0.93	1105		-----		-----
159		-----		-----	1121	D156	>30		-----
169		-----		-----	1126		-----		-----
171	D156	>+30		-----	1131	D156	30		0.93
177	D156	30		0.93	1141	D156	29		-0.47
194		-----		-----	1182		-----		-----
215	D156	30		0.93	1191		-----		-----
221		-----		-----	1205		-----		-----
224		-----		-----	1212	D156	30		0.93
225		-----		-----	1237		-----		-----
228	D156	30		0.93	1275	D156	30		0.93
235	D156	30		0.93	1279	D156	30		0.93
237	D156	28		-1.87	1299		-----		-----
238		-----		-----	1318		-----		-----
253	D156	29		-0.47	1320	D156	30		0.93
254	D156	29		-0.47	1357		-----		-----
256	D156	30		0.93	1372		-----		-----
258	D156	29		-0.47	1399		-----		-----
273	D156	30		0.93	1417		-----		-----
311		-----		-----	1496	D156	30		0.93
317	D156	29		-0.47	1528	D156	30		0.93
323		-----		-----	1585	D156	30		0.93
328		-----		-----	1586		-----		-----
333		-----		-----	1587		-----		-----
334	D156	28		-1.87	1610		-----		-----
335		-----		-----	1613		-----		-----
365		-----		-----	1631		-----		-----
372		-----		-----	1634	D156	> +30		-----
391	D156	30		0.93	1650	D156	27		-3.27
396		-----		-----	1683		-----		-----
399		-----		-----	1710	D156	>30		-----
440	D156	30		0.93	1715		-----		-----
445		-----		-----	1720		-----		-----
447	D156	29		-0.47	1724	D156	30		0.93
460	D156	27		-3.27	1730		-----		-----
467	D156	29		-0.47	1741	D156	29		-0.47
480		-----		-----	1757		-----		-----
496		-----		-----	1776		-----		-----
603	D156	30		0.93	1780	D156	29		-0.47
631		-----		-----	1833		-----		-----
657	D156	30		0.93	1852		-----		-----
704	D156	30		0.93	1854		-----		-----
736		-----		-----	1913	D156	30		0.93
823	D156	28		-1.87	1961		-----		-----
824		-----		-----	2130		-----		-----
851	D156	27		-3.27	2133		-----		-----
854	D156	28		-1.87	6035		-----		-----
862	D156	28		-1.87	6041	D156	29		-0.47
869	D156	28		-1.87	6054		-----		-----
904	D156	30		0.93	6075		-----		-----
914		-----		-----	6114	D156	30		0.93
962		-----		-----	6135	D156	29		-0.47
963		-----		-----	6142		-----		-----
970		-----		-----	6168		-----		-----
974	D156	29		-0.47	6174	D156	29		-0.47
994	D156	29		-0.47	6203		-----		-----
995	D156	30		0.93	6238		-----		-----
996	D156	29		-0.47	6240		-----		-----
997	D156	30		0.93	6266		-----		-----
1011		-----		-----	6312		-----		-----
1016		-----		-----	6321		-----		-----
1023		-----		-----	6324	D156	28		-1.87
1039	D156	30		0.93	6331		-----		-----
1040		-----		-----	6344	D156	30		0.93
1049		-----		-----	6346		-----		-----
1059	D156	30		0.93	6364	D156	30	C	0.93
1062		-----		-----	6384		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404	D156	29		-0.47	6530		-----		-----
6406		-----		-----	6539		-----		-----
6479		-----		-----	6540	D156	30		0.93
6519		-----		-----	6544		-----		-----

normality	OK
n	60
outliers	0
mean (n)	29.33
st.dev. (n)	0.877
R(calc.)	2.45
st.dev.(D156:23)	0.714
R(D156:23)	2

Lab 6364 first reported 26





Determination of Copper Corrosion 2 hrs at 100 °C on sample #23150;

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D130	1a		-----	1064	D130	1a		-----
62		-----		-----	1065		-----		-----
120	D130	1A		-----	1082		-----		-----
140	D130	1a		-----	1097	ISO2160	1a		-----
150		-----		-----	1105	D130	1a		-----
159	D130	1a		-----	1121	D130	1a		-----
169	D130	1a		-----	1126		-----		-----
171		-----		-----	1131	D130	1a		-----
177	D130	1a		-----	1141	D130	1A		-----
194		-----		-----	1182		-----		-----
215	D130	1A		-----	1191		-----		-----
221	D130	1		-----	1205		-----		-----
224	D130	1a		-----	1212	D130	1A		-----
225		-----		-----	1237	ISO2160	1a		-----
228	D130	1A		-----	1275	IP154	1A		-----
235	D130	1a		-----	1279	D130	1a		-----
237	D130	1A		-----	1299	D130	1A		-----
238	D130	1A		-----	1318	D130	1a		-----
253	D130	1a		-----	1320	D130	1a		-----
254	D130	1a		-----	1357	D130	1a		-----
256	D130	1a		-----	1372		-----		-----
258	D130	1a		-----	1399	D130	1A		-----
273	D130	1a		-----	1417	D130	1A		-----
311	D130	1b		-----	1496	D130	1a		-----
317	D130	1A		-----	1528	D130	1a		-----
323	D130	1A		-----	1585	D130	1A		-----
328	D130	1		-----	1586	IP154	1A		-----
333	D130	1a		-----	1587	D130	1a		-----
334	D130	1		-----	1610		-----		-----
335	D130	1B		-----	1613	D130	1a		-----
365	D130	1a		-----	1631	D130	1a		-----
372	D130	1a		-----	1634	D130	1a		-----
391	D130	1A		-----	1650	D130	1a		-----
396	D130	1A		-----	1683	D130	1a		-----
399	D130	1A		-----	1710	D130	1B		-----
440	IP154	1a		-----	1715		-----		-----
445	D130	1a		-----	1720		-----		-----
447	IP154	1A		-----	1724	D130	1a		-----
460	D130	1a		-----	1730		-----		-----
467	D130	1a		-----	1741	D130	1a		-----
480		-----		-----	1757	D130	1a		-----
496	ISO2160	1a		-----	1776		-----		-----
603	D130	1A		-----	1780	D130	1a		-----
631	D130	1a		-----	1833	D130	1a		-----
657	D130	1a		-----	1852	D130	1b		-----
704	D130	1a		-----	1854	D130	1A		-----
736	D130	1A		-----	1913	D130	1a		-----
823	D130	1a		-----	1961	D130	1a		-----
824	D130	1a		-----	2130	IP154	1a		-----
851	D130	1a		-----	2133	D130	1a		-----
854	D130	1a		-----	6035	ISO2160	1a		-----
862	D130	1a		-----	6041	D130	1a		-----
869	D130	1a		-----	6054		-----		-----
904	D130	1a		-----	6075		-----		-----
914	D130	1a		-----	6114	D130	1a		-----
962		-----		-----	6135	D130	1a		-----
963		-----		-----	6142		-----		-----
970		-----		-----	6168		-----		-----
974	D130	1a		-----	6174	D130	1A		-----
994	D130	1a		-----	6203	D130	1a		-----
995	D130	1a		-----	6238		-----		-----
996	D130	1a		-----	6240	D130	1a		-----
997		-----		-----	6266	D130	1a		-----
1011	D130	1a		-----	6312		-----		-----
1016		-----		-----	6321	IP154	1A		-----
1023	IP154	1a		-----	6324	D130	1a		-----
1039	ISO2160	1A		-----	6331		-----		-----
1040		-----		-----	6344	ISO2160	1a		-----
1049	D130	1A		-----	6346		-----		-----
1059	D130	1a		-----	6364	D130	1A		-----
1062	D130	1B		-----	6384	D130	1a		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404	D130	1a		-----	6530	D130	1A		-----
6406		-----		-----	6539	D130	1a		-----
6479		-----		-----	6540	D130	1a		-----
6519		-----		-----	6544	D130	1a		-----
	n	115							
	mean (n)	1(1a/1b)							

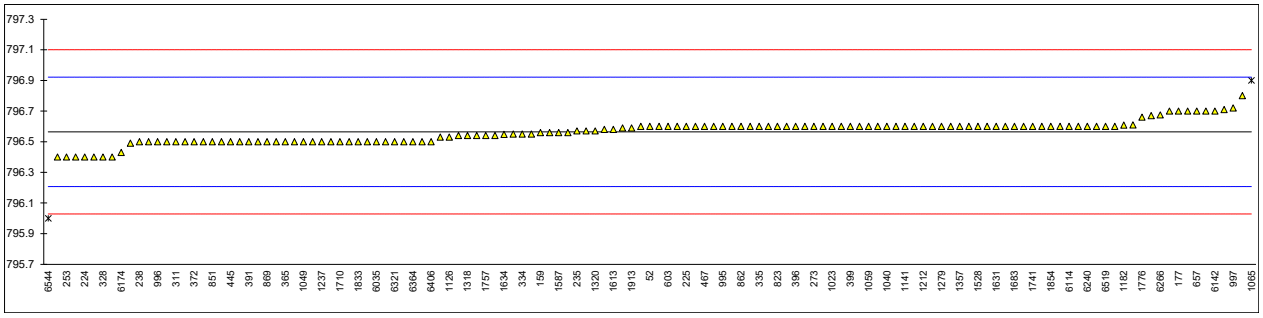
Determination of Density at 15 °C on sample #23150; results in kg/m^3

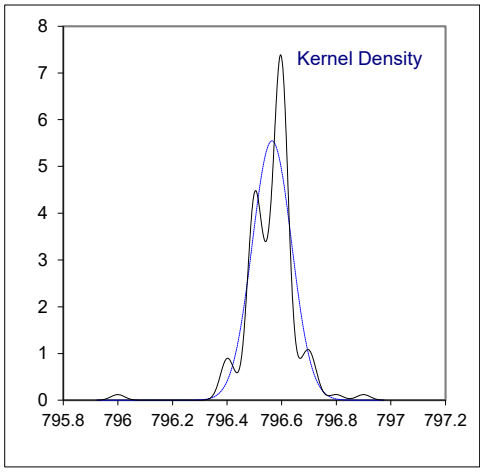
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4052	796.6		0.20	1064	D4052	796.5		-0.36
62	D4052	796.5		-0.36	1065	D4052	796.9	R(0.01)	1.88
120	D4052	796.6		0.20	1082	ISO12185	796.5		-0.36
140	D4052	796.57		0.03	1097	ISO12185	796.54		-0.14
150	D4052	796.4		-0.92	1105	D4052	796.59		0.14
159	D4052	796.56		-0.03	1121	D4052	796.6		0.20
169	D4052	796.6	C	0.20	1126	D4052	796.53		-0.20
171	D4052	796.7		0.76	1131	D4052	796.56		-0.03
177	D4052	796.7		0.76	1141	D4052	796.6		0.20
194		-----		-----	1182	ISO12185	796.608		0.24
215	D1298	796.8		1.32	1191	ISO12185	796.6		0.20
221	D4052	796.6		0.20	1205	ISO12185	796.49		-0.42
224	D1298	796.4		-0.92	1212	D4052	796.6		0.20
225	D4052	796.6		0.20	1237	ISO12185	796.5		-0.36
228	D4052	796.5		-0.36	1275	IP365	796.6		0.20
235	D4052	796.57		0.03	1279	D4052	796.6		0.20
237	D4052	796.5		-0.36	1299	D4052	796.6		0.20
238	D4052	796.5		-0.36	1318	D4052	796.54		-0.14
253	D4052	796.4		-0.92	1320	D4052	796.57		0.03
254	D4052	796.4		-0.92	1357	D4052	796.6		0.20
256	D4052	796.6		0.20	1372		-----		-----
258	D4052	796.6		0.20	1399	D4052	796.6		0.20
273	D4052	796.6		0.20	1417	IP365	796.5		-0.36
311	D4052	796.5		-0.36	1496	D4052	796.7		0.76
317	D4052	796.6		0.20	1528	D4052	796.6		0.20
323	D4052	796.6		0.20	1585	ISO12185	796.58		0.08
328	D4052	796.4		-0.92	1586	ISO12185	796.6		0.20
333	D4052	796.4		-0.92	1587	D4052	796.56		-0.03
334	D4052	796.55		-0.08	1610		-----		-----
335	D4052	796.6		0.20	1613	D4052	796.58		0.08
365	IP365	796.5		-0.36	1631	D4052	796.6		0.20
372	D4052	796.5		-0.36	1634	D4052	796.548		-0.09
391	D4052	796.5		-0.36	1650	D4052	796.60		0.20
396	D4052	796.6		0.20	1683	D4052	796.6	C	0.20
399	D4052	796.6		0.20	1710	D4052	796.5		-0.36
440	D4052	796.6		0.20	1715	ISO12185	796.5		-0.36
445	D4052	796.5		-0.36	1720		-----		-----
447	D4052	796.5		-0.36	1724	D4052	796.6		0.20
460	D4052	796.5		-0.36	1730	D4052	796.54		-0.14
467	D4052	796.6		0.20	1741	D4052	796.6		0.20
480	D4052	796.6		0.20	1757	D7777	796.54		-0.14
496	D4052	796.5		-0.36	1776	ISO12185	796.66		0.53
603	D4052	796.6		0.20	1780	D4052	796.60	C	0.20
631	D4052	796.71		0.81	1833	D4052	796.5		-0.36
657	D4052	796.7		0.76	1852	D4052	796.56		-0.03
704	D4052	796.55		-0.08	1854	D4052	796.6		0.20
736	D4052	796.6		0.20	1913	D4052	796.59		0.14
823	D4052	796.6		0.20	1961		-----		-----
824	D4052	796.6		0.20	2130	D4052	796.5		-0.36
851	D4052	796.5		-0.36	2133	D4052	796.67		0.59
854	D4052	796.61		0.25	6035	ISO12185	796.5		-0.36
862	D4052	796.6		0.20	6041	D4052	796.6		0.20
869	D4052	796.5		-0.36	6054		-----		-----
904	D4052	796.7		0.76	6075		-----		-----
914	D4052	796.53		-0.20	6114	D4052	796.6		0.20
962		-----		-----	6135	D4052	796.5		-0.36
963		-----		-----	6142	ISO12185	796.7		0.76
970		-----		-----	6168		-----		-----
974	D4052	796.5		-0.36	6174	D4052	796.43		-0.76
994	D4052	796.6		0.20	6203	D4052	796.6		0.20
995	D4052	796.6		0.20	6238		-----		-----
996	D4052	796.5		-0.36	6240	D4052	796.6		0.20
997	D4052	796.72		0.87	6266	D4052	796.675		0.62
1011	D4052	796.5		-0.36	6312		-----		-----
1016		-----		-----	6321	IP365	796.5		-0.36
1023	D4052	796.6		0.20	6324	D4052	796.5		-0.36
1039	ISO12185	796.6		0.20	6331		-----		-----
1040	D4052	796.60		0.20	6344	ISO12185	796.54		-0.14
1049	D4052	796.50		-0.36	6346		-----		-----
1059	D4052	796.6		0.20	6364	D4052	796.5		-0.36
1062	D4052	796.6		0.20	6384	D4052	796.6		0.20

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404	D4052	796.5		-0.36	6530	D4052	796.55		-0.08
6406	D4052	796.5		-0.36	6539	D4052	796.6		0.20
6479		-----		-----	6540	D4052	796.4		-0.92
6519	D4052	796.6		0.20	6544	D4052	796.0	R(0.01)	-3.16

normality	OK
n	131
outliers	2
mean (n)	796.565
st.dev. (n)	0.0719
R(calc.)	0.201
st.dev.(D4052:22)	0.1786
R(D4052:22)	0.50

Lab 169 first reported 46.1 kg/L
Lab 1683 first reported 0.7970 kg/L
Lab 1780 first reported 0.79660





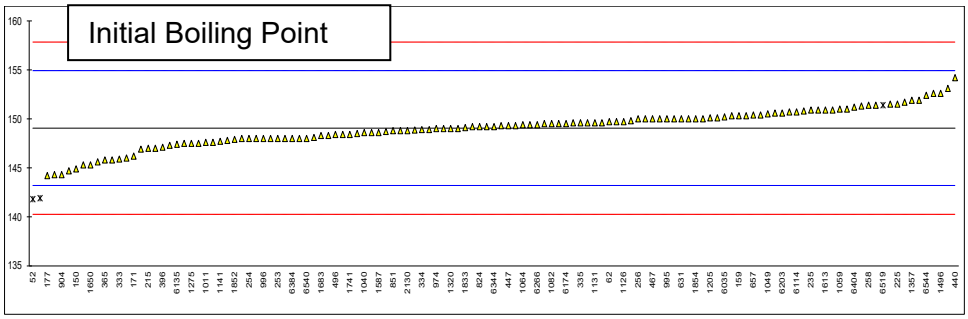
Determination of Distillation at 760 mmHg on sample #23150; results in °C

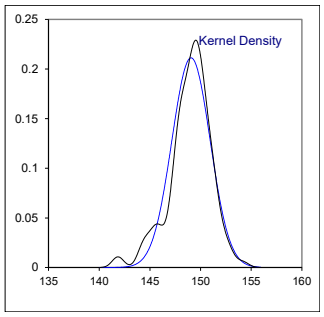
lab	method	IBP	mark	10% rec	mark	50% rec	mark	90% rec	mark	FBP	mark	Res.	Loss
52	D86-automated	141.8	C,R(5)	163.7		186.9	C	225.7	C	245.3	C	1.2	0.4 C
62	D86-automated	149.7		164.4		188.1		227.3		250.8	C	1.2	0.5
120		-----		164.7		187.6		224.9		-----		-----	-----
140	D86-automated	150.7		165.1		188.4		226.8		247.9		1.2	0.3
150	D86-automated	144.9		163.6		186.9		226.3		244.8		0.7	0.3
159	D86-automated	150.3		165.5		188.6		226.8		248.5		1.2	0.4
169	D86-automated	150.3		164.6		188.8		226.6		247.4		1.1	0.2
171	D86-automated	146.2		163.6		187.3		225.9		-----		1.3	0.1
177	D86-automated	144.2	C	164.1		187.9		225.3		246.8		0.6	0.4
194		-----		-----		-----		-----		-----		-----	-----
215	D86-manual	147.0		163.0		188.0		225.0		246.0		1.0	0.6
221	D86-automated	151.4		165.9		189.3		227.6		246.9		1.2	0.6
224	D86-manual	149.60		164.77		187.44		225.40		245.12		1.4	0.5
225	D86-manual	151.5		166.5		189.0		227.5		250.0		1.2	0.80
228	D86-manual	148.0		163.0		187.0		226.0		250.0	C	0.6	0.4
235	D86-automated	150.9		166.6		188.6		226.1		244.0		1.2	0.4
237	D86-manual	151.0		164	C	190.0		230.0		249.0		1.0	0.5
238	D86-manual	146.0		164.0		187.0		227.0		247.0		0.5	0.5
253	D86-manual	148.0		164.5		188.0		227.8		246.6		1.2	1.0
254	D86-manual	148.0		164.0		188.0		227.0		249.0		-----	-----
256	D86-manual	150.0		164.0		188.0		228.0		247.0		-----	-----
258	D86-automated	151.4		163.9		188.1		227.7		246.9		0.8	0.5
273	D86-automated	150.9		164.4	C	188.3	C	228.9		249.1	C	1.1	0.5
311	D86-automated	149.2		164.1		187.9		227.2		245.4		1.1	0.8
317	D86-automated	153.1		165.4		188.8		227.9		247.6		1.0	0.6
323	D86-automated	149.7		164.4		188.1		227.8		246.2		1.2	0.8
328	D86-automated	148.0		163.7		187.4		225.8		246.1		1.2	0.4
333	D86-automated	145.9		164.2		187.2		224.7		245.1		1.0	0.1
334		148.9		164.7		186.7		225.8		244.5		1.4	0.5
335	D86-automated	149.6		163.8		187.9		228.0		246.6		1.3	1.5
365	D86-automated	145.8		164.2		188.3		228.9		246.8		1.4	1.4
372	D86-automated	149.3		164.2		188.0	C	227.1		246.1		1.2	0.4
391		-----		-----		-----		-----		-----		-----	-----
396	D86	147.1		163.5		187.1		225.8		245.1		1.3	0.7
399	D86	150		165		189		228		247.5		1.5	0.6
440	D86-automated	154.2		166.0		188.9		227.3		248.2		0.3	0.0
445	D86-automated	144.3		164.2		186.6		226.9		246.2		1.2	0.8
447	D86-automated	149.3		164.0		187.8		227.2		247.2		1.2	0.6
460	D86	151.5		164.9		188.4		228.5		246.4		1.3	1.1
467	D86-automated	150.0		164.6		188.3		227.7		246.8		0.7	1.5
480	D86-automated	150.0		165.1		188.5		227.4		245.6		-----	-----
496	D86-automated	148.4		164.5		188.2		227.7		246.1		1.0	1.3
603	D86-automated	150.0		164.1		188.2		227.8		248.5		0.7	1.5
631	D86-manual	150.0		164.5	C	188.0	C	230.5		251.5		0.9	1.1
657	D86-automated	150.4		165.5		189.3		228.6		247.2		1.3	0.9
704	D86-manual	150.0		165.0		188.5		227.0		244.5		1.25	0.25
736	D86-manual	148.0		162.0		187.0		225.0		245.0		1.2	0.6
823	D86-automated	147.6		164.3		188.1		227.4		246.8		1.2	0.8
824	D86	149.2		164.1		187.4		227.1		245.7		1.2	0.5
851	D86-automated	148.8		164.7		187.8		226.6		245.8		1.2	0.5
854	D86-automated	149.2		164.8		188.0		227.2		246.7		1.2	0.6
862	D86-automated	149.6		164.2		187.6		226.8		247.8		1.0	0.6
869	D86-automated	150.4		164.6		188.2		227.4		245.7		1.2	0.7
904	D86-automated	144.3		162.2		184.7	R(1)	223.1		242.9		-----	-----
914	D86-automated	148.5		164.0		187.6		226.0		248.1		1.2	0.8
962		-----		-----		-----		-----		-----		-----	-----
963		-----		-----		-----		-----		-----		-----	-----
970		-----		-----		-----		-----		-----		-----	-----
974	D86-automated	149.0		165.9		188.9		228.9		246.5		1.2	1.0
994	D86-manual	149.5		163.5		187.0		225.0		249.0		-----	-----
995	D86-manual	150.0		164.0		188.0		225.5		246.0		1.2	0.6
996	D86-manual	148.0		162.5		187.5		226.0		248.0		1.0	0.5
997	D86-manual	149.0		165.0		188.0		225.5		246.0		1.2	0.8
1011	D86-automated	147.6		164.3		188.0		227.0		245.8		0.9	1.1
1016		-----		-----		-----		-----		-----		-----	-----
1023		-----		-----		-----		-----		-----		-----	-----
1039	D86-automated	150.6		165.0		188.2		227.2		246.2		1.4	0.8
1040		148.6		164.3		188.1		227.2		246.5		1.2	0.7
1049	D86-automated	150.5		164.9		188.2		227.8		247.0		1.2	0.8
1059	D86-automated	151.0		164.5		187.8		226.6		245.0		1.2	0.5
1062		146.9		165.0		187.7		226.0		245.1		1.2	0.3
1064	D86-automated	149.4		164.7		188.6		227.8		248.3		1.1	0.6
1065		141.9	R(5)	160.3	R(1)	191.8	R(1)	228.7	ex	258.2	R(1)	1.5	0.6
1082	ISO3405-automated	149.5		165.7		188.9		227.2		248.5		1.3	<0,1
1097	ISO3405-automated	150.8		164.3		188.1		226.8		245.8		1.0	0.3

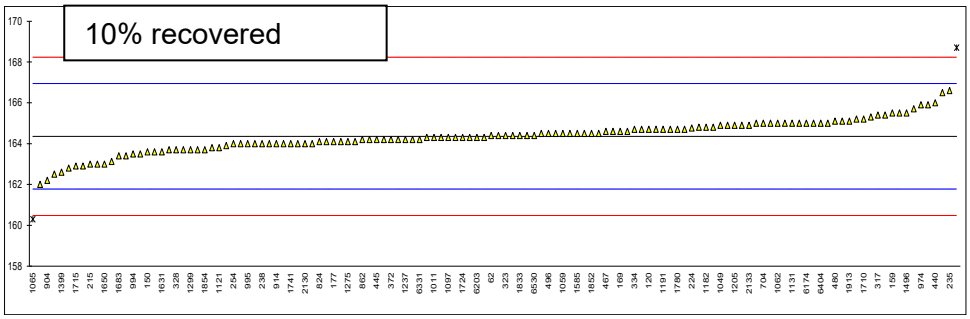
lab	method	IBP	mark	10% rec	mark	50% rec	mark	90% rec	mark	FBP	mark	Res.	Loss
1105	D86-automated	147.5		164.4		187.7		226.8		244.7		1.2	0.4
1121	D86-manual	145.8		163.8		188.8		225.7		246.7		0.8	0.2
1126	D86-automated	149.7		164.5		187.7		225.7		247.9		1.2	0.4
1131	D86-automated	149.6		165.0		188.5		227.6		246.2		1.0	1.0
1141	D86-automated	147.7		163.7		187.5		227.3		246.9		1.0	1.0
1182	D86-automated	150.3		164.8		188.4		227.7		247.3		1.3	0.5
1191	ISO3405-automated	145.6		164.7		187.9		226.9		246.5		1.1	0.5
1205		150.1		164.9		188.2		226.2		246.9		1.2	0.4
1212	D86-automated	148.8		164.2		188.3		227.9		247.4		1.2	1.3
1237	ISO3405-automated	151.3	C	164.2	C	187.2	C	225.6	C	245.6	C	1.2 C	0.4 C
1275	IP123-automated	147.5		164.1		187.4		226.9		245.2		1.2	0.5
1279	D86-automated	149.8		165.0		188.2		226.9		247.3		1.2	0.6
1299	D86-automated	148.6		163.7		187.1		227.1		246.4		1.1	0.7
1318	D86-automated	152.6		163.7		187.6		226.7		245.4		1.2	0.4
1320	D86-automated	149.0		164.1		187.4		225.3		245.1		1.0	0.1
1357	D86-automated	151.9		165.3		188.5		228.3		246.8		1.2	1.0
1372		-----		-----		-----		-----		-----		-----	-----
1399	D86-automated	145.3		162.6		186.3		225.8		245.0		1.1	0.7
1417	IP123-automated	148.9		164.0		188.7		229.0		246.0		1.5	1.4
1496	D86-automated	152.6		165.5		187.3		227.0		245.7		1.0	0.7
1528	D86-automated	151.9		165.2		189.0		227.7		247.2		1.4	0.4
1585	D86-automated	149.5		164.5		188.0		226.00		247.0		1.2	0.2
1586	D86-automated	148.4		164.3		187.8		227.3		246.7		1.2	0.8
1587	D86-automated	148.6		164.5		187.6		225.6		246.5		1.1	0.1
1610		-----		-----		-----		-----		-----		-----	-----
1613	D86-automated	150.9		164.9		187.8		225.9		246.6		1.1	0.6
1631	D86-automated	149.4		163.6		186.9		225.3		245.7		1.1	1
1634	D86-automated	148.85		164.70		188.75		227.55		247.60		1.1	0.5
1650	D86-automated	145.3		163.0		187.0		226.3		247.3		1.1	0.7
1683	D86-automated	148.3		163.4		186.5	C	225.2		244.1		1.2	1.1
1710	D86-automated	149.3	C	165.2	C	188.1	C	227.1	C	246.1	C	1.0	0.6 C
1715	ISO3405-automated	151.7		162.9		186.8		226.8		245.6		0.9	1
1720		-----		-----		-----		-----		-----		-----	-----
1724	D86-automated	149		164.3		186.1		225.7		245.6		1.2	0.8
1730		-----		-----		-----		-----		-----		-----	-----
1741	D86-automated	148.4		164.0		188.1		228.0		247.4		1.2	0.8
1757	D86-automated	149.6		164.3		187.4		225.5		243.4		1.2	1.2
1776	ISO3405-automated	147.3		164.0		188.0		227.0		246.0		1.2	0.8
1780	D86	148.1		164.7		188.4		228.1		244.7		1.2	1.3
1833	ISO3405-automated	149.1		164.4		187.2		226.1		246.5		1.2	0.3
1852	D86-automated	147.9		164.5		188.3		226.7		250.2		1.2	0.9
1854	ISO3405-automated	150.0		163.7		187.0		225.7		244.1		-----	-----
1913	D86-automated	150.00		165.10		188.20		227.50		247.55		1.25	0.30
1961		-----		-----		-----		-----		-----		-----	-----
2130	D86-automated	148.8		164.0		188.0		227.8		246.7		1.2	0.9
2133	D86-automated	150.9		164.9		188.6		226.8		247.2		1.2	0.3
6035	ISO3405-automated	150.2		164.8		188.5		227.5		245.4		1.2	0.5
6041	D86-automated	147.0		165.4		188.4		227.9		246.6		1.3	0.5
6054		-----		-----		-----		-----		-----		-----	-----
6075		-----		-----		-----		-----		-----		-----	-----
6114	D86-automated	150.7		164.6		187.6		226.8		246.5		1.3	0.2
6135	D86-automated	147.4		164.5		187.4		227.1		246.2		1.1	0.6
6142	ISO3405-automated	144.7		162.8		186.7		226.2		246.5		1.2	0.9
6168		-----		-----		-----		-----		-----		-----	-----
6174	D86-manual	149.5		165.0		188.5		228.0		249.5		0.6	0.4
6203	D86-automated	150.6		164.3		188.2		227.8		246.8		1.2	0.9
6238		-----		-----		-----		-----		-----		-----	-----
6240	D86-automated	148.3		164.3		188.3		226.9		246.3		1.2	0.5
6266	D86-automated	149.4		164.2		187.6		225.3		245.7		1.15	0.2
6312		-----		-----		-----		-----		-----		-----	-----
6321	IP123-automated	148.0		164.0		187.7		226.9		246.7		1.3	0.5
6324	D86-manual	147.5		165		188		227		247		1.0	0.5
6331	D86-automated	148.7		164.2		187.0		226.2		245.9		1.1	0.2
6344	D86-automated	149.2		163.4		186.5		225.2		244.1		1.1	0.6
6346		-----		-----		-----		-----		-----		-----	-----
6364		150.1		162.9		186.4		225.2		244.9		1.6	0.7
6384	D86-automated	148.0		164.4		188.3		227.8		247.0		1.2	0.9
6404	D86-automated	151.2		165.0		187.4		226.0		246.9		1.1	0.7
6406	D86-automated	147.8		164.7		188.0		226.1		246.3		1.4	0.1
6479		-----		-----		-----		-----		-----		-----	-----
6519	ISO3405-automated	151.4	ex,C	168.7	C,R(1)	194.3	C,R(1)	237.3	C,R(1)	267.2	C,R(1)	1.2	0.2
6530	D86-automated	148.0		164.4		188.1		227.7		246.7		1.2	0.8
6539		-----		-----		-----		-----		-----		-----	-----
6540	D86-manual	148.0		165.0		188.0		228.0		249.0		-----	-----
6544	D86-automated	152.40		163.13		187.20		227.39		246.41		1.27	0.56

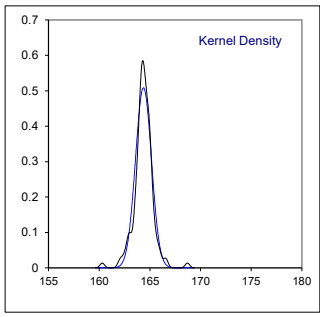
lab	method	IBP	mark	10% rec	mark	50% rec	mark	90% rec	mark	FBP	mark	Res.	Loss
	normality	OK		suspect		OK		OK		suspect			
	n	126		128		127		128		126			
	outliers	2 +1ex		2		3		1 +1ex		2			
	mean (n)	149.06		164.36		187.88		226.85		246.59			
	st.dev. (n)	1.888		0.785		0.690		1.126		1.453			
	R(calc.)	5.29		2.20		1.93		3.15		4.07			
	st.dev.(D86-A:23)	2.928		1.291		1.071		1.215		2.536			
	R(D86-A:23)	8.20		3.62		3.0		3.40		7.1			
Compare:													
	R(D86-M:23)	4.22		2.83		2.84		3.36		3.93			

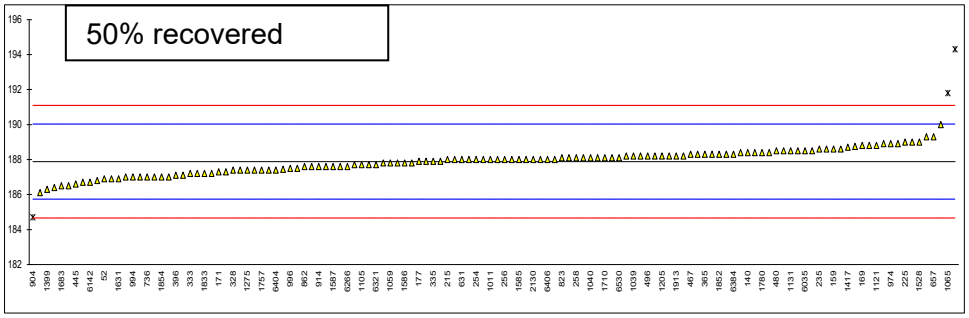
Lab 52 first reported 143.3, 187.6, 226.4, 246.9 and 0.3 respectively
Lab 62 first reported 252.8
Lab 177 first reported 143.7
Lab 228 first reported 255.0
Lab 237 first reported 168.0
Lab 273 first reported 168.4, 193.3 and 252.7 respectively
Lab 372 first reported 181.0
Lab 631 first reported 167.5 and 195.0 respectively
Lab 1065 test result for 90% rec excluded as statistical outliers in related parameters
Lab 1237 first reported 153.2, 173.0, 192.4, 223.3, 246.2, 1.1 and 0.8 respectively
Lab 1683 first reported 185.4
Lab 1710 first reported 151.5, 166.3, 188.5, 231.1, 255.7 and 0.8 respectively
Lab 6519 test result for IBP excluded as statistical outliers in related parameters; fr. 149.2, 164.8, 188.3, 227.6 and 254.4 respectively

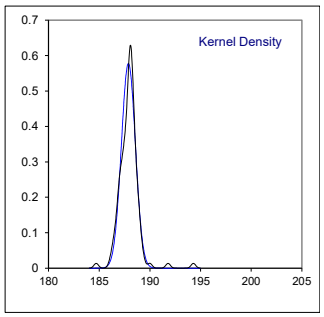

Initial Boiling Point

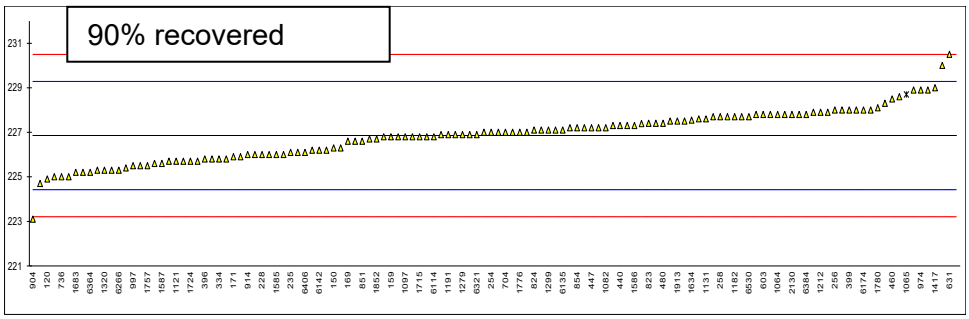

Kernel Density

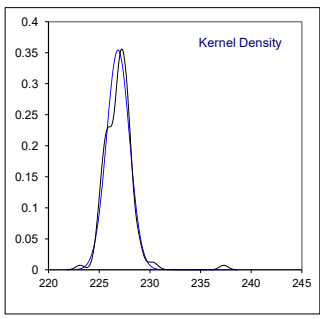

10% recovered

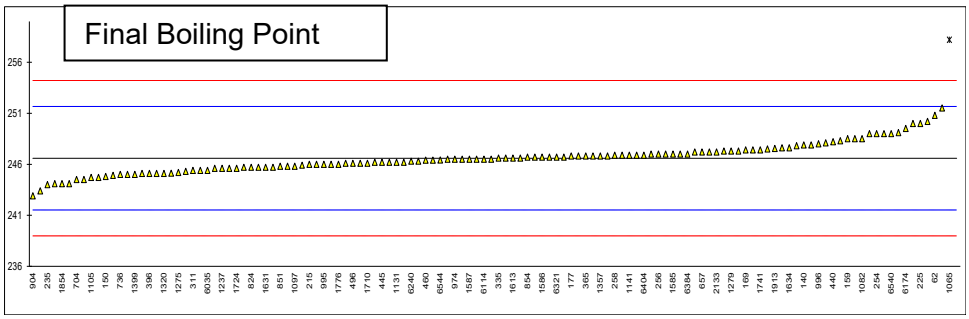

Kernel Density

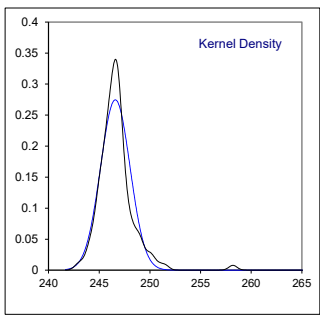

50% recovered


Kernel Density


90% recovered


Kernel Density


Final Boiling Point


Kernel Density

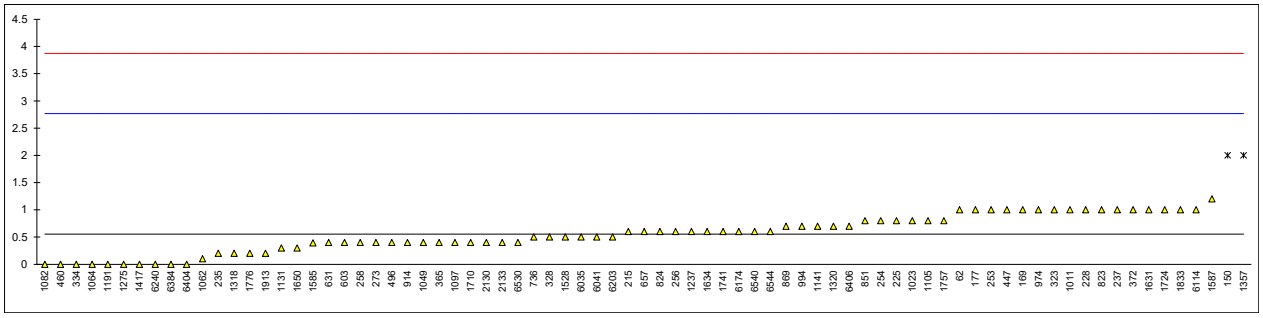
Determination of Existent Gum (unwashed) on sample #23150; results in mg/100 mL

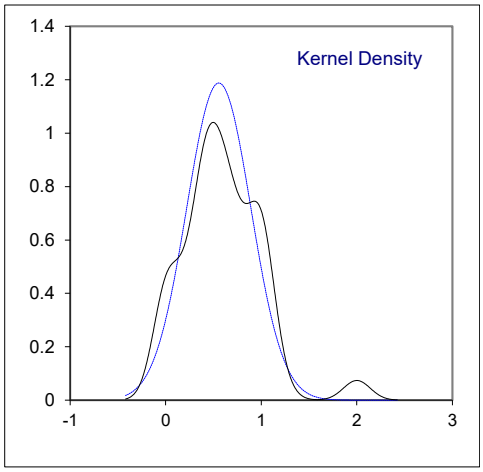
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	IP540	<1		-----	1064	D381	0		-0.50
62	D381	1		0.40	1065		-----		-----
120		-----		-----	1082	IP540	0		-0.50
140		-----		-----	1097	IP540	0.4		-0.14
150	D381	2	R(0.01)	1.31	1105	D381	0.80		0.22
159		-----		-----	1121		-----		-----
169	D381	1	C	0.40	1126		-----		-----
171	D381	<1		-----	1131	IP540	0.3		-0.23
177	D381	1		0.40	1141	D381	0.7		0.13
194		-----		-----	1182		-----		-----
215	D381	0.6		0.04	1191	IP540	0		-0.50
221	D381	<1		-----	1205		-----		-----
224		-----		-----	1212	IP540	<1		-----
225	D381	0.80		0.22	1237	D381	0.6		0.04
228	D381	1.0		0.40	1275	IP540	0.0		-0.50
235	D381	0.2		-0.32	1279	D381	<1		-----
237	D381	1.0		0.40	1299	IP540	<1		-----
238		-----		-----	1318	IP540	0.20		-0.32
253	IP540	1.0		0.40	1320	D381	0.70		0.13
254	D381	0.8		0.22	1357	D381	2.0	R(0.01)	1.31
256	IP540	0.6		0.04	1372		-----		-----
258	D381	0.4		-0.14	1399		-----		-----
273	D381	0.4		-0.14	1417	IP540	0		-0.50
311	IP540	<1		-----	1496	D381	<1		-----
317	IP540	<1		-----	1528	IP540	0.5		-0.05
323	IP540	1		0.40	1585	IP540	0.39		-0.15
328	D381	0.5		-0.05	1586	IP540	<0.50		-----
333		-----		-----	1587	IP540	1.2		0.58
334	D381	0		-0.50	1610		-----		-----
335	IP540	< 1		-----	1613	D381	<1		-----
365	IP540	0.4		-0.14	1631	IP540	1		0.40
372	IP540	1		0.40	1634	D381	0.6		0.04
391		-----		-----	1650	IP540	0.3		-0.23
396		-----		-----	1683	D381	<1		-----
399	D381	<1		-----	1710	IP540	0.4		-0.14
440	IP540	<1		-----	1715		-----		-----
445	D381	<1		-----	1720		-----		-----
447	D381	1		0.40	1724	IP540	1.0		0.40
460	IP540	0		-0.50	1730		-----		-----
467	IP540	<1		-----	1741	D381	0.6		0.04
480		-----		-----	1757	D381	0.8		0.22
496	D381	0.4		-0.14	1776	IP540	0.2		-0.32
603	D381	0.4		-0.14	1780		-----		-----
631	IP540	0.4		-0.14	1833	IP540	1		0.40
657	D381	0.6		0.04	1852	D381	<1		-----
704		-----		-----	1854		-----		-----
736	IP540	0.5		-0.05	1913	D381	0.20		-0.32
823	D381	1.0		0.40	1961		-----		-----
824	D381	0.6		0.04	2130	IP540	0.4		-0.14
851	IP540	0.8		0.22	2133	D381	0.4		-0.14
854	D381	<1		-----	6035	ISO6246	0.5		-0.05
862	D381	<1		-----	6041	D381	0.5		-0.05
869	IP540	0.7		0.13	6054		-----		-----
904		-----		-----	6075		-----		-----
914	D381	0.4		-0.14	6114	IP540	1		0.40
962		-----		-----	6135		-----		-----
963		-----		-----	6142		-----		-----
970		-----		-----	6168		-----		-----
974	D381	1		0.40	6174	D381	0.6		0.04
994	D381	0.7		0.13	6203	D381	0.5		-0.05
995		-----		-----	6238		-----		-----
996		-----		-----	6240	D381	0		-0.50
997		-----		-----	6266		-----		-----
1011	D381	1		0.40	6312		-----		-----
1016	D381	<1		-----	6321	IP540	<1		-----
1023	IP540	0.8		0.22	6324		-----		-----
1039	ISO6246	<1		-----	6331		-----		-----
1040		-----		-----	6344		-----		-----
1049	D381	0.4		-0.14	6346		-----		-----
1059	D381	<1		-----	6364		-----		-----
1062	D381	0.1		-0.41	6384	D381	0		-0.50

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404	D381	0		-0.50	6530	D381	0.4		-0.14
6406	D381	0.7		0.13	6539		-----		-----
6479		-----		-----	6540	IP540	0.6		0.04
6519		-----		-----	6544	D381	0.6		0.04

normality	OK
n	75
outliers	2
mean (n)	0.55
st.dev. (n)	0.336
R(calc.)	0.94
st.dev.(D381:22)	1.106
R(D381:22)	3.10
Compare:	
R(IP540:08R19)	1.76

Lab 169 first reported 8





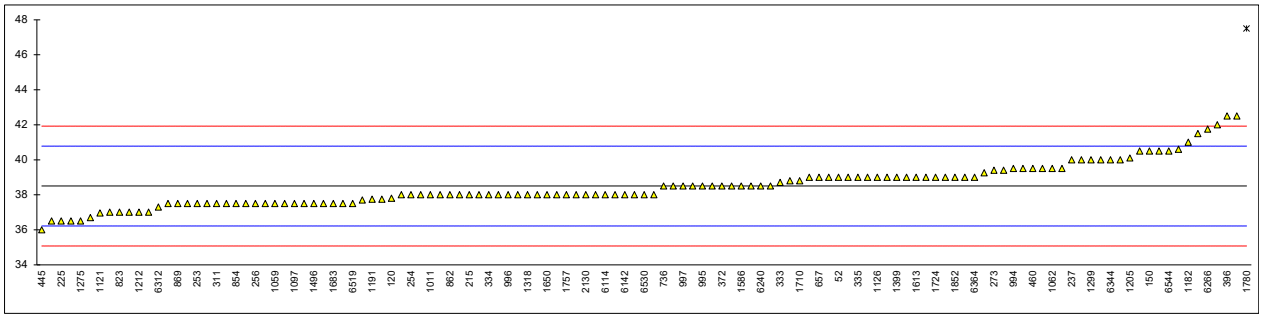
Determination of Flash Point on sample #23150; results in °C

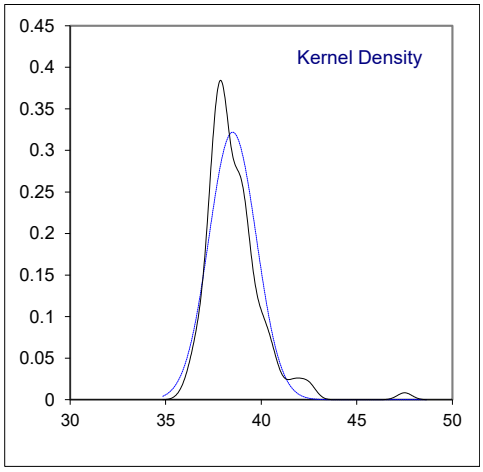
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D56	39.0		0.44	1064	IP170	37.5		-0.88
62	D56	39		0.44	1065		-----		-----
120	D56	37.8		-0.61	1082	ISO13736	39.5		0.87
140	D56	37.0		-1.31	1097	ISO13736	37.5		-0.88
150	D56	40.5		1.75	1105	IP170	36.5		-1.75
159	D56	40.6		1.84	1121	IP170	36.96		-1.35
169	D56	36.7	C	-1.58	1126	D93	39.0		0.44
171	D56	38.5		0.00	1131	D56	37.0		-1.31
177	D56	36.5		-1.75	1141	IP170	38.0		-0.44
194		-----		-----	1182	D93	41	C	2.19
215	IP170	38.0		-0.44	1191	ISO13736	37.75		-0.66
221		-----		-----	1205	D56	40.1		1.40
224	IP170	39.25		0.65	1212	IP170	37.0		-1.31
225	IP170	36.5		-1.75	1237		-----		-----
228	IP170	38.0		-0.44	1275	IP170	36.5		-1.75
235	IP170	38.0		-0.44	1279	IP170	37.5		-0.88
237	IP170	40.0		1.31	1299	IP170	40.0		1.31
238	IP170	42.0		3.06	1318	IP170	38.0		-0.44
253	IP170	37.5		-0.88	1320	D56	39		0.44
254	IP170	38.0		-0.44	1357	IP170	38.0		-0.44
256	IP170	37.5		-0.88	1372		-----		-----
258	IP170	37.5		-0.88	1399	IP170	39.0		0.44
273	IP170	39.4		0.79	1417	IP170	39		0.44
311	IP170	37.5		-0.88	1496	IP170	37.5		-0.88
317	IP170	37.5		-0.88	1528	D56	40		1.31
323	IP170	39.0		0.44	1585	ISO13736	38.8		0.26
328	IP170	37.5		-0.88	1586	IP170	38.5	C	0.00
333	IP170	38.7		0.17	1587	IP170	37.5		-0.88
334	IP170	38.0		-0.44	1610		-----		-----
335	IP170	39.0		0.44	1613	D56	39.0		0.44
365	IP170	39.400		0.79	1631	IP170	39.0		0.44
372	IP170	38.5		0.00	1634	IP170	37.7		-0.70
391		-----		-----	1650	IP170	38		-0.44
396	IP170	42.5		3.50	1683	IP170	37.5		-0.88
399		-----		-----	1710	D56	38.8		0.26
440	D93	38.0		-0.44	1715		-----		-----
445	IP170	36.0		-2.19	1720		-----		-----
447	IP170	38.0		-0.44	1724	IP170	39		0.44
460	IP170	39.5		0.87	1730	D56	38.5		0.00
467	IP170	38.0		-0.44	1741	IP170	38		-0.44
480		-----		-----	1757	D56	38.0		-0.44
496	D3828	40		1.31	1776	IP170	39.0		0.44
603	IP170	38.5		0.00	1780	IP170	47.5	R(0.01)	7.87
631	D56	40.5		1.75	1833	IP170	38		-0.44
657	D56	39.0		0.44	1852	IP170	39.0		0.44
704		-----		-----	1854	ISO2719	39.0		0.44
736	D56	38.5		0.00	1913	IP170	37.75		-0.66
823	IP170	37.0		-1.31	1961		-----		-----
824	IP170	37.5		-0.88	2130	IP170	38.0		-0.44
851	D56	39.5		0.87	2133	D93	42.5		3.50
854	IP170	37.5		-0.88	6035	ISO2719	41.5		2.62
862	IP170	38		-0.44	6041	IP170	38.0		-0.44
869	IP170	37.5		-0.88	6054		-----		-----
904	D56	38.5		0.00	6075		-----		-----
914	IP170	38.5		0.00	6114	IP170	38.0		-0.44
962		-----		-----	6135	ISO13736	38		-0.44
963		-----		-----	6142	ISO13736	38		-0.44
970		-----		-----	6168		-----		-----
974	IP170	37.5		-0.88	6174	IP170	38.0		-0.44
994	D56	39.5		0.87	6203	D56	40.5		1.75
995	IP170	38.5		0.00	6238		-----		-----
996	D56	38.0		-0.44	6240	IP170	38.5		0.00
997	IP170	38.5		0.00	6266	IP170	41.75		2.84
1011	IP170	38.0		-0.44	6312	IP170	37.3		-1.05
1016	IP170	38.0		-0.44	6321	IP170	37.0		-1.31
1023	IP170	39.0		0.44	6324	IP170	38.5		0.00
1039	IP170	37.5		-0.88	6331		-----		-----
1040		-----		-----	6344	ISO2719	40		1.31
1049	ISO13736	39.0		0.44	6346		-----		-----
1059	IP170	37.5		-0.88	6364	IP170	39.0		0.44
1062	IP170	39.5		0.87	6384	IP170	39.5		0.87

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404	D3828	40	C	1.31	6530	IP170	38.0		-0.44
6406	ISO13736	37.5		-0.88	6539		-----		-----
6479		-----		-----	6540	IP170	38.0		-0.44
6519	IP170	37.5		-0.88	6544	D7094	40.5		1.75

normality	suspect
n	124
outliers	1
mean (n)	38.50
st.dev. (n)	1.240
R(calc.)	3.47
st.dev.(IP170:21)	1.143
R(IP170:21)	3.2

Lab 169 first reported 32.8
Lab 1182 first reported 43
Lab 1586 first reported 42.0
Lab 6404 first reported 44





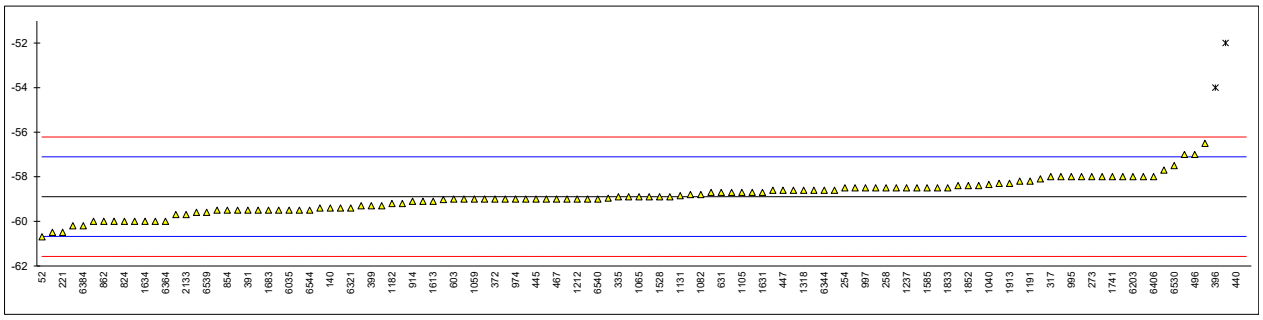
Determination of Freezing Point on sample #23150; results in °C

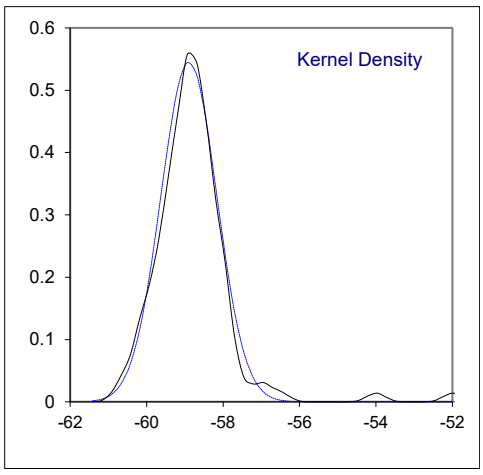
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5972	-60.7		-2.02	1064	D7153	-58.6		0.33
62	D5972	-60.2		-1.46	1065	D7153	-58.9		-0.01
120	D5972	-59.4		-0.57	1082	IP529	-58.8		0.11
140	D5972	-59.4		-0.57	1097	IP529	-58.5		0.44
150	D2386	-59.0		-0.12	1105	D7153	-58.7		0.22
159	D2386	-60.5	C	-1.80	1121	IP16	-58.96		-0.07
169	D2386	-52.0	R(0.01)	7.72	1126		-----		-----
171	D2386	-59.0		-0.12	1131	D7153	-58.85		0.05
177	D2386	-58.0		1.00	1141	D7153	-58.4		0.55
194		-----		-----	1182	D5972	-59.2		-0.34
215	D2386	-59.0		-0.12	1191	IP529	-58.2		0.78
221	D2386	-60.5		-1.80	1205		-----		-----
224		-----		-----	1212	D2386	-59.0		-0.12
225		-----		-----	1237	D2386	-58.5	C	0.44
228	D7153	-59.6		-0.79	1275	IP529	-58.7		0.22
235	D2386	-60		-1.24	1279	D7153	-58.5		0.44
237	D2386	-58.5		0.44	1299	D7153	-58.9		-0.01
238		-----		-----	1318	D7153	-58.6		0.33
253	D7153	-58.9		-0.01	1320	D2386	-59.7		-0.90
254	D2386	-58.5		0.44	1357	D5972	-60.0		-1.24
256	D2386	-59.5		-0.68	1372		-----		-----
258	D2386	-58.5		0.44	1399	D5972	-58.6		0.33
273	D2386	-58.0		1.00	1417		-----		-----
311	D2386	-59.5		-0.68	1496	D2386	-59.5		-0.68
317	D2386	-58.0		1.00	1528	D7153	-58.9		-0.01
323	D2386	-58.0		1.00	1585	D2386	-58.5		0.44
328		-----		-----	1586	D7153	-57.7		1.34
333		-----		-----	1587	IP529	1.2	R(0.01)	67.31
334	D2386	-58.2		0.78	1610		-----		-----
335	IP529	-58.9		-0.01	1613	D7153	-59.1		-0.23
365	IP16	-59.02		-0.14	1631	D7153	-58.7		0.22
372	D2386	-59.0		-0.12	1634	D2386	-60.0		-1.24
391	D2386	-59.5		-0.68	1650	D2386	-60.0		-1.24
396	D2386	-54	R(0.01)	5.48	1683	D2386	-59.5		-0.68
399	D7153	-59.3		-0.45	1710	D7153	-59.0		-0.12
440	IP16	-50.0	R(0.01)	9.96	1715	D5972	-58.9		-0.01
445	D2386	-59.0		-0.12	1720		-----		-----
447	D2386	-58.6		0.33	1724	D5972	-59.5		-0.68
460	IP529	-58.6		0.33	1730	D2386	-58.0		1.00
467	D2386	-59.0		-0.12	1741	D2386	-58		1.00
480		-----		-----	1757		-----		-----
496	D2386	-57		2.12	1776	IP529	-58.5		0.44
603	D2386	-59.0		-0.12	1780	D2386	below -60		-----
631	D5972	-58.7		0.22	1833	D7153	-58.5		0.44
657	D7153	-59.3		-0.45	1852	D7153	-58.4		0.55
704	D2386	-59		-0.12	1854	D2386	-58.3		0.67
736	D2386	-59		-0.12	1913	D7153	-58.30		0.67
823	D5972	-59.4		-0.57	1961		-----		-----
824	D2386	-60.0		-1.24	2130	IP529	-58.4	C	0.55
851	D7153	-58.7		0.22	2133	D7153	-59.7		-0.90
854	D2386	-59.5		-0.68	6035	D7153	-59.5		-0.68
862	D2386	-60		-1.24	6041	D2386	-59.2		-0.34
869	D2386	-59.0		-0.12	6054		-----		-----
904		-----		-----	6075		-----		-----
914	D7153	-59.1		-0.23	6114	D2386	-59.5		-0.68
962		-----		-----	6135	D5972	-59.3		-0.45
963		-----		-----	6142		-----		-----
970		-----		-----	6168		-----		-----
974	D2386	-59.0		-0.12	6174	D2386	-58.0		1.00
994	D2386	-57		2.12	6203	D2386	-58.0		1.00
995	D2386	-58.0	C	1.00	6238		-----		-----
996	D2386	-56.5		2.68	6240	D2386	-58.0	C	1.00
997	D2386	-58.5	C	0.44	6266		-----		-----
1011	D2386	-58.5		0.44	6312		-----		-----
1016	D5972	-60.0		-1.24	6321	D5972	-59.4		-0.57
1023	D7153	-58.1		0.89	6324		-----		-----
1039	IP529	-58.8		0.11	6331		-----		-----
1040	D7153	-58.35		0.61	6344	D2386	-58.6		0.33
1049	D7153	-59.1		-0.23	6346		-----		-----
1059	D2386	-59.0		-0.12	6364	D2386	-60.0		-1.24
1062	D7153	-58.7		0.22	6384	D2386	-60.2		-1.46

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404	D7153	-58.6		0.33	6530	D5972	-57.5		1.56
6406	D2386	-58.0		1.00	6539	D5972	-59.6		-0.79
6479		-----		-----	6540	D2386	-59.0		-0.12
6519		-----		-----	6544	D5972	-59.5		-0.68

normality	OK
n	114
outliers	4
mean (n)	-58.89
st.dev. (n)	0.732
R(calc.)	2.05
st.dev.(D2386:19)	0.893
R(D2386:19)	2.5

Lab 159 first reported -61.77
Lab 995 first reported 58.0
Lab 997 first reported 58.5
Lab 1237 first reported -52.5
Lab 2130 first reported -54.8
Lab 6240 first reported -56.0





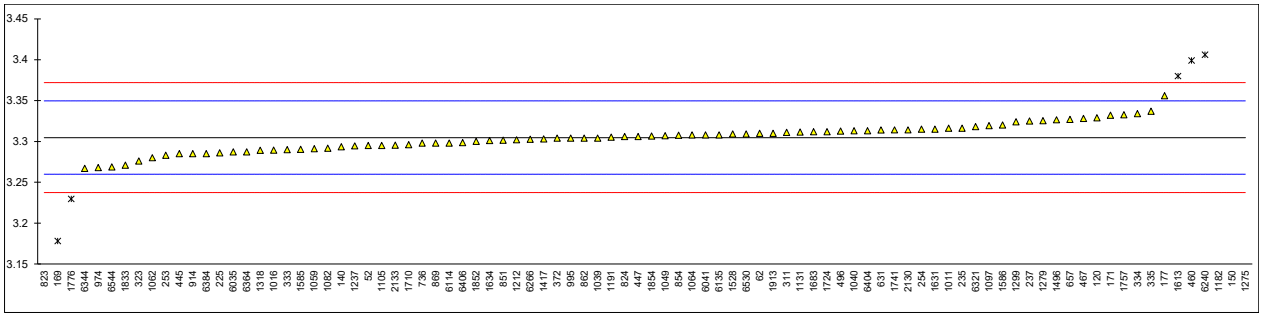
Determination of Kinematic Viscosity at -20 °C on sample #23150; results in mm^2/s

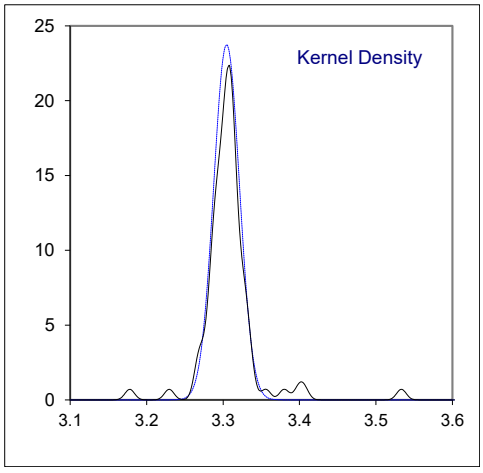
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D445	3.295		-0.43	1064	D445	3.308		0.15
62	D445	3.310		0.24	1065		-----		-----
120	D445	3.3289		1.08	1082	ISO3104	3.2915195		-0.59
140	D7042	3.2934		-0.50	1097	ISO3104	3.3193		0.65
150	D445	3.654	C,R(0.01)	15.58	1105	D445	3.295		-0.43
159		-----		-----	1121		-----		-----
169	D445	3.178	R(0.01)	-5.65	1126		-----		-----
171	D445	3.332		1.22	1131	D445	3.3114		0.30
177	D445	3.356		2.29	1141		-----		-----
194		-----		-----	1182	D7042	3.5334	R(0.01)	10.20
215		-----		-----	1191	ISO3104	3.30511725		0.02
221		-----		-----	1205		-----		-----
224		-----		-----	1212	D7042	3.302		-0.12
225	D445	3.286		-0.83	1237	ISO3104	3.2945		-0.45
228		-----		-----	1275	IP71	3.747	C,R(0.01)	19.72
235	D445	3.316		0.50	1279	D445	3.3254		0.92
237	D445	3.325		0.91	1299	D445	3.324	C	0.86
238		-----		-----	1318	D7042	3.289		-0.70
253	D445	3.283		-0.97	1320		-----		-----
254	D445	3.315		0.46	1357		-----		-----
256		-----		-----	1372		-----		-----
258		-----		-----	1399		-----		-----
273		-----		-----	1417	D445	3.303		-0.08
311	D445	3.311		0.28	1496	D445	3.3265		0.97
317		-----		-----	1528	D445	3.309		0.19
323	D445	3.276		-1.28	1585	ISO3104	3.2904		-0.64
328		-----		-----	1586	D445	3.320		0.68
333	D445	3.290		-0.66	1587		-----		-----
334	D445	3.334		1.31	1610		-----		-----
335	D445	3.337		1.44	1613	D445	3.380	R(0.01)	3.36
365		-----		-----	1631	D7042	3.315		0.46
372	D445	3.304		-0.03	1634	D445	3.301		-0.17
391		-----		-----	1650		-----		-----
396		-----		-----	1683	D445	3.312		0.33
399		-----		-----	1710	D445	3.296		-0.39
440		-----		-----	1715		-----		-----
445	D445	3.285		-0.88	1720		-----		-----
447	D445	3.306		0.06	1724	D445	3.312		0.33
460		3.399	R(0.01)	4.21	1730		-----		-----
467	D7042	3.328		1.04	1741	D445	3.314	C	0.41
480		-----		-----	1757	D7042	3.3325		1.24
496	D445	3.3127		0.36	1776	D445	3.2296	R(0.01)	-3.35
603		-----		-----	1780		-----		-----
631	D445	3.3139		0.41	1833	D445	3.271		-1.50
657	D445	3.327		0.99	1852	D445	3.3001		-0.21
704		-----		-----	1854	ISO3104	3.3065		0.08
736	D445	3.298		-0.30	1913	D445	3.3100		0.24
823	D445	3.037	R(0.01)	-11.94	1961		-----		-----
824	D445	3.306		0.06	2130	IP71	3.314		0.41
851	D445	3.30137		-0.15	2133	D445	3.2954		-0.41
854	D445	3.3076		0.13	6035	ISO3104	3.287		-0.79
862	D445	3.304		-0.03	6041	D445	3.308		0.15
869	D445	3.298		-0.30	6054		-----		-----
904		-----		-----	6075		-----		-----
914	D445	3.285		-0.88	6114	D445	3.298		-0.30
962		-----		-----	6135	D445	3.308		0.15
963		-----		-----	6142		-----		-----
970		-----		-----	6168		-----		-----
974	D445	3.268		-1.64	6174		-----		-----
994		-----		-----	6203		-----		-----
995	D445	3.304		-0.03	6238		-----		-----
996		-----		-----	6240	D445	3.4060	R(0.01)	4.52
997		-----		-----	6266	D7042	3.3027	C	-0.09
1011	D445	3.316		0.50	6312		-----		-----
1016	D445	3.2893		-0.69	6321	IP71	3.318		0.59
1023		-----		-----	6324		-----		-----
1039	D7945	3.304		-0.03	6331		-----		-----
1040	D7042	3.313		0.37	6344	D445	3.267		-1.68
1049	D445	3.307		0.10	6346		-----		-----
1059	D445	3.291		-0.61	6364	D445	3.287		-0.79
1062	D445	3.280		-1.10	6384	D7042	3.285		-0.88

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404	D445	3.313	C	0.37	6530	D445	3.309		0.19
6406	D445	3.2985		-0.28	6539		-----		-----
6479		-----		-----	6540		-----		-----
6519		-----		-----	6544	D7042	3.2688		-1.60

	normality	OK
	n	81
	outliers	9
	mean (n)	3.30470
	st.dev. (n)	0.016798
	R(calc.)	0.04704
	st.dev.(D445:19)	0.022425
	R(D445:19)	0.06279
Compare:		
	R(D445:21e2)	0.01545

Lab 150 first reported 3.212
Lab 1275 first reported 3.358
Lab 1299 first reported 3.372
Lab 1741 first reported 3.156
Lab 6266 first reported 3.208
Lab 6404 first reported 3.25





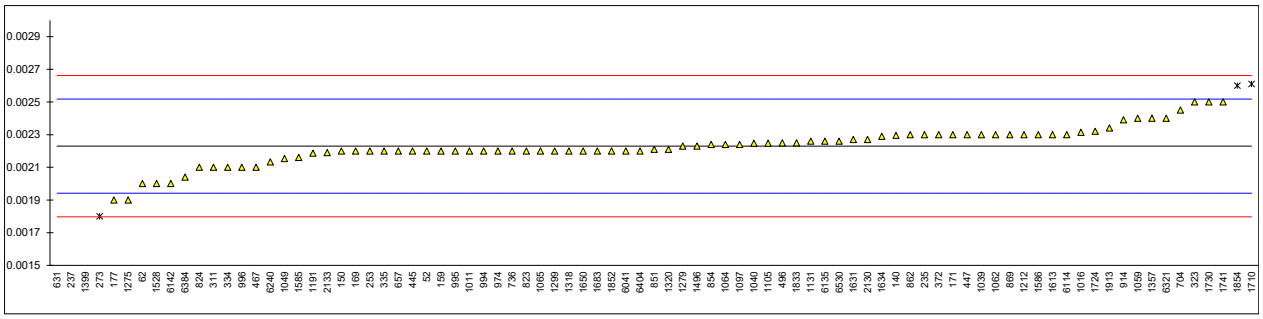
Determination of Mercaptan Sulfur as S on sample #23150; results in %M/M

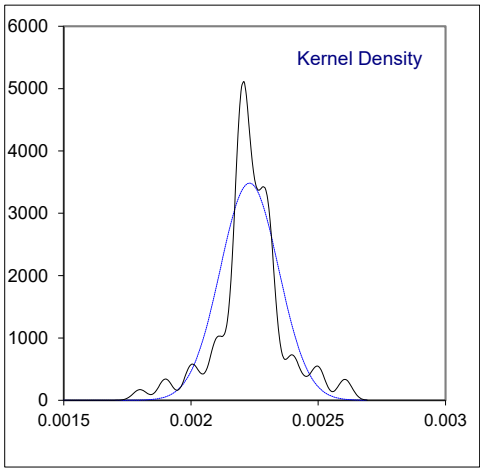
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3227	0.0022		-0.21	1064	D3227	0.00224		0.07
62	D3227	0.0020		-1.60	1065	D3227	0.0022		-0.21
120		-----		-----	1082		-----		-----
140	D3227	0.002295		0.45	1097	ISO3012	0.00224		0.07
150	D3227	0.0022		-0.21	1105	D3227	0.002248		0.12
159	D3227	0.0022		-0.21	1121		-----		-----
169	D3227	0.0022		-0.21	1126		-----		-----
171	D3227	0.0023		0.48	1131	D3227	0.00226		0.21
177	D3227	0.0019	C	-2.29	1141		-----		-----
194		-----		-----	1182		-----		-----
215		-----		-----	1191	ISO3012	0.002186		-0.31
221		-----		-----	1205		-----		-----
224		-----		-----	1212	D3227	0.0023		0.48
225		-----		-----	1237		-----		-----
228		-----		-----	1275	IP342	0.0019		-2.29
235	D3227	0.0023		0.48	1279	D3227	0.00223		0.00
237	D3227	0.00059	C,R(0.01)	-11.38	1299	D3227	0.0022		-0.21
238		-----		-----	1318	D3227	0.0022		-0.21
253	D3227	0.0022		-0.21	1320	D3227	0.00221		-0.14
254		-----		-----	1357	D3227	0.0024	C	1.18
256		-----		-----	1372		-----		-----
258		-----		-----	1399		0.0007725	R(0.01)	-10.11
273	D3227	0.0018	C,R(0.05)	-2.98	1417		-----		-----
311	D3227	0.0021		-0.90	1496	D3227	0.00223		0.00
317		-----		-----	1528	D3227	0.0020		-1.60
323	D3227	0.0025		1.87	1585	D3227	0.00216		-0.49
328		-----		-----	1586	D3227	0.0023		0.48
333		-----		-----	1587		-----		-----
334	D3227	0.0021		-0.90	1610		-----		-----
335	D3227	0.0022		-0.21	1613	D3227	0.0023		0.48
365		-----		-----	1631	D3227	0.00227		0.28
372	D3227	0.0023		0.48	1634	D3227	0.00229		0.42
391		-----		-----	1650	D3227	0.0022		-0.21
396		-----		-----	1683	D3227	0.0022		-0.21
399		-----		-----	1710	D3227	0.00261	R(0.05)	2.64
440		-----		-----	1715		-----		-----
445	D3227	0.0022		-0.21	1720		-----		-----
447	D3227	0.0023		0.48	1724	D3227	0.00232		0.62
460		-----		-----	1730	D3227	0.0025		1.87
467	D3227	0.0021		-0.90	1741	D3227	0.00250		1.87
480		-----		-----	1757		-----		-----
496	D3227	0.00225		0.14	1776		-----		-----
603		-----		-----	1780		-----		-----
631	D3227	0.0004	C,R(0.01)	-12.69	1833	D3227	0.00225		0.14
657	D3227	0.0022		-0.21	1852	D3227	0.0022		-0.21
704	D3227	0.00245		1.53	1854	UOP163	0.00260	R(0.05)	2.57
736	D3227	0.0022		-0.21	1913	D3227	0.00234		0.76
823	D3227	0.0022		-0.21	1961		-----		-----
824	D3227	0.0021		-0.90	2130	IP342	0.00227		0.28
851	D3227	0.00221		-0.14	2133	D3227	0.00219		-0.28
854	D3227	0.00224		0.07	6035		-----		-----
862	D3227	0.0023		0.48	6041	D3227	0.0022		-0.21
869	D3227	0.0023		0.48	6054		-----		-----
904		-----		-----	6075		-----		-----
914	D3227	0.00239		1.11	6114	D3227	0.0023		0.48
962		-----		-----	6135	D3227	0.00226		0.21
963		-----		-----	6142	IP342	0.0020		-1.60
970		-----		-----	6168		-----		-----
974	D3227	0.0022		-0.21	6174		-----		-----
994	D3227	0.0022		-0.21	6203		-----		-----
995	D3227	0.0022		-0.21	6238		-----		-----
996	D3227	0.0021		-0.90	6240	D3227	0.002133		-0.67
997		-----		-----	6266		-----		-----
1011	D3227	0.0022		-0.21	6312		-----		-----
1016	D3227	0.002314		0.58	6321	IP342	0.0024		1.18
1023		-----		-----	6324		-----		-----
1039	IP342	0.0023		0.48	6331		-----		-----
1040	D3227	0.002247		0.12	6344		-----		-----
1049	D3227	0.00215382		-0.53	6346		-----		-----
1059	D3227	0.0024		1.18	6364		-----		-----
1062	D3227	0.0023		0.48	6384	D3227	0.00204		-1.32

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404	D3227	0.0022		-0.21	6530	D3227	0.00226		0.21
6406		-----		-----	6539		-----		-----
6479		-----		-----	6540		-----		-----
6519		-----		-----	6544		-----		-----

normality	suspect
n	79
outliers	6
mean (n)	0.002230
st.dev. (n)	0.0001145
R(calc.)	0.000321
st.dev.(D3227:23)	0.0001442
R(D3227:23)	0.000404

Lab 177 first reported 0.0011
Lab 237 first reported 0.00069
Lab 273 first reported 0.0006
Lab 631 first reported <0.0003
Lab 1357 first reported 0.00024





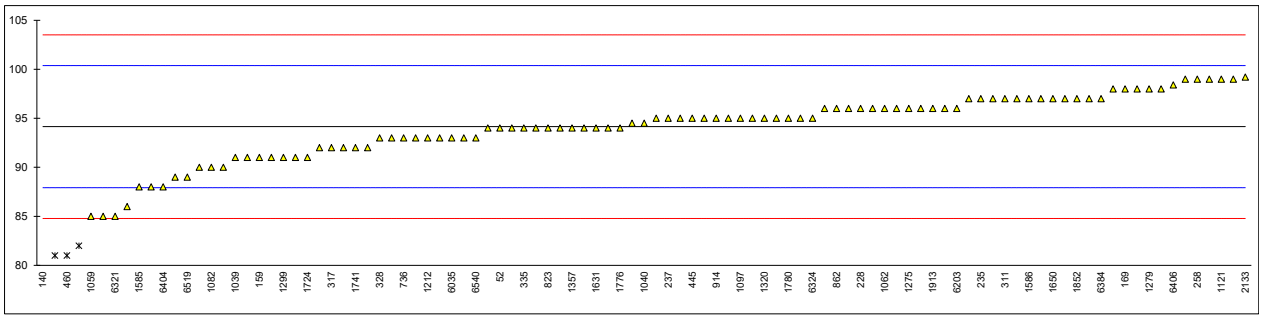
Determination of MSEP on sample #23150;

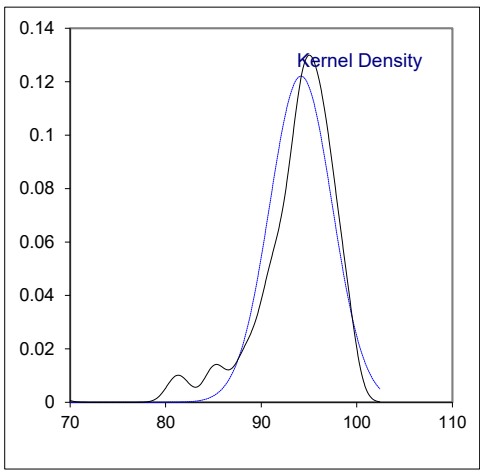
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3948	94		-0.05	1064	D7224	98		1.23
62	D3948	91		-1.01	1065		-----		-----
120	D3948	99		1.55	1082	D3948	90		-1.33
140	D3948	68	C,R(0.01)	-8.38	1097	D3948	95		0.27
150		-----		-----	1105	D3948	95	C	0.27
159	D3948	91		-1.01	1121	D3948	99		1.55
169	D3948	98		1.23	1126		-----		-----
171	D3948	82	R(0.05)	-3.90	1131	D3948	92		-0.69
177	D3948	85		-2.93	1141	D3948	91		-1.01
194		-----		-----	1182		-----		-----
215	D3948	94		-0.05	1191	D3948	96		0.59
221		-----		-----	1205		-----		-----
224		-----		-----	1212	D3948	93		-0.37
225	D3948	93		-0.37	1237		-----		-----
228	D3948	96.0		0.59	1275	D3948	96	C	0.59
235	D3948	97		0.91	1279	D7224	98		1.23
237	D3948	95		0.27	1299	D7224	91		-1.01
238		-----		-----	1318	D7224	96		0.59
253	D3948	97		0.91	1320	D3948	95		0.27
254		-----		-----	1357	D3948	94		-0.05
256	D7224	95		0.27	1372		-----		-----
258	D3948	99		1.55	1399		-----		-----
273		-----		-----	1417		-----		-----
311	D7224	97		0.91	1496	D3948	94		-0.05
317	D7224	92		-0.69	1528	D3948	95		0.27
323	D7224	95		0.27	1585	D3948	88		-1.97
328	D7224	93		-0.37	1586	D3948	97		0.91
333	D7224	94		-0.05	1587	D7224	97		0.91
334	D3948	97		0.91	1610		-----		-----
335	D7224	94		-0.05	1613	D3948	90		-1.33
365	D7224	95		0.27	1631	D3948	94		-0.05
372	D3948	90		-1.33	1634	D3948	91		-1.01
391		-----		-----	1650	D3948	97		0.91
396	D3948	86		-2.61	1683	D3948	94		-0.05
399		-----		-----	1710	D3948	93		-0.37
440		-----		-----	1715		-----		-----
445	D3948	95		0.27	1720		-----		-----
447	D3948	89		-1.65	1724	D3948	91		-1.01
460	D3948	81	R(0.05)	-4.22	1730		-----		-----
467	D3948	81	R(0.05)	-4.22	1741	D3948	92		-0.69
480		-----		-----	1757	D3948	97		0.91
496	D3948	94.5		0.11	1776	D3948	94		-0.05
603		-----		-----	1780	D3948	95		0.27
631	D7224	97		0.91	1833	D3948	92		-0.69
657	D3948	99		1.55	1852	D3948	97		0.91
704		-----		-----	1854		-----		-----
736	D3948	93		-0.37	1913	D3948	96		0.59
823	D3948	94		-0.05	1961	D3948	88		-1.97
824	D3948	94		-0.05	2130	D7224	97		0.91
851	D7224	95		0.27	2133	D8073	99.2		1.62
854	D3948	96		0.59	6035	D3948	93		-0.37
862	D3948	96		0.59	6041	D3948	96		0.59
869	D3948	96		0.59	6054		-----		-----
904	D3948	93		-0.37	6075		-----		-----
914	D3948	95		0.27	6114		-----	W	-----
962		-----		-----	6135	D3948	93		-0.37
963		-----		-----	6142		-----		-----
970		-----		-----	6168		-----		-----
974	D3948	96		0.59	6174	D3948	95		0.27
994		-----		-----	6203	D3948	96		0.59
995		-----		-----	6238		-----		-----
996		-----		-----	6240	D3948	99		1.55
997		-----		-----	6266		-----		-----
1011	D3948	92		-0.69	6312		-----		-----
1016	D3948	98	C	1.23	6321	D3948	85		-2.93
1023		-----		-----	6324	D3948	95		0.27
1039	D3948	91		-1.01	6331		-----		-----
1040	D3948	94.5		0.11	6344		-----		-----
1049	D7224	94		-0.05	6346		-----		-----
1059	D3948	85		-2.93	6364		-----		-----
1062	D3948	96		0.59	6384	D3948	97		0.91

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404	D3948	88		-1.97	6530	D3948	98		1.23
6406	IP624	98.4		1.36	6539		-----		-----
6479		-----		-----	6540	D3948	93		-0.37
6519	D3948	89		-1.65	6544		-----		-----

normality	OK
n	97
outliers	4
mean (n)	94.15
st.dev. (n)	3.267
R(calc.)	9.15
st.dev.(D3948:22)	3.119
R(D3948:22)	8.73

Lab 140 first reported 78
Lab 1016 first reported 78
Lab 1105 first reported 80
Lab 1275 first reported 77
Lab 6114 test result withdrawn, reported 84





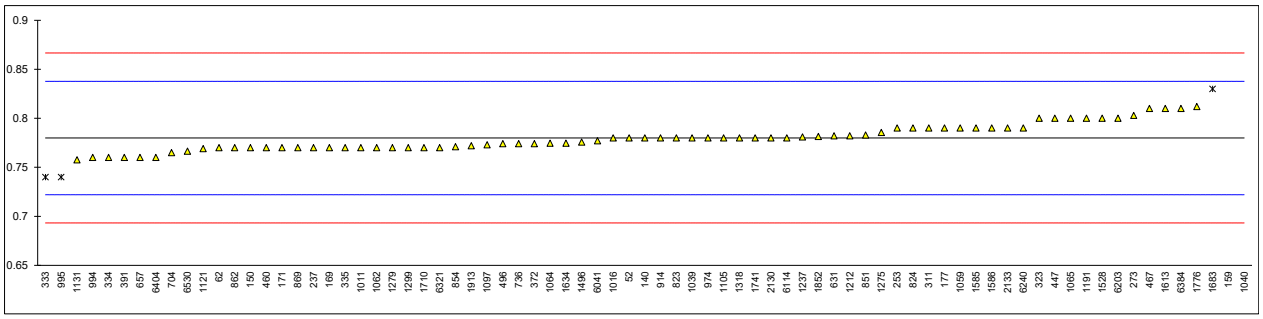
Determination of Naphthalenes on sample #23150; results in %V/V

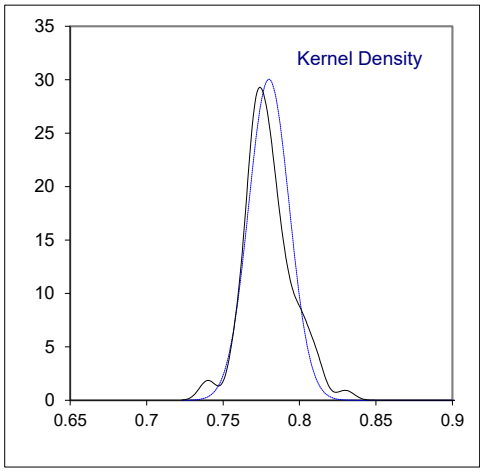
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D1840-B:07R17	0.78		0.00	1064	D1840-A:07R17	0.7746		-0.19
62	D1840-A:07R17	0.77		-0.34	1065	D1840:22	0.80		0.69
120		-----		-----	1082		-----		-----
140	D1840-B:07R17	0.78	C	0.00	1097	D1840:22	0.773		-0.24
150	D1840-B:07R17	0.77		-0.34	1105	D1840:22	0.780		0.00
159	D1840:22	0.97	C,R(0.01)	6.57	1121	D1840:22	0.769		-0.38
169	D1840:22	0.77		-0.34	1126		-----		-----
171	D1840:22	0.77		-0.34	1131	D1840:22	0.7575		-0.78
177	D1840:22	0.79		0.35	1141		-----		-----
194		-----		-----	1182		-----		-----
215		-----		-----	1191	D1840:22	0.800		0.69
221		-----		-----	1205		-----		-----
224		-----		-----	1212	D1840-B:07R17	0.782		0.07
225		-----		-----	1237	D1840-B:07R17	0.781		0.04
228		-----		-----	1275	D1840-A:07R17	0.7855		0.19
235		-----		-----	1279	D1840:22	0.77		-0.34
237	D1840:22	0.77		-0.34	1299	D1840:22	0.77		-0.34
238		-----		-----	1318	D1840:22	0.78		0.00
253	D1840-B:07R17	0.79		0.35	1320		-----		-----
254		-----		-----	1357		-----		-----
256		-----		-----	1372		-----		-----
258		-----		-----	1399		-----		-----
273	D1840:22	0.8029		0.79	1417		-----		-----
311	D1840:22	0.79		0.35	1496	D1840:22	0.7757		-0.15
317		-----		-----	1528	D1840:22	0.8		0.69
323	D1840:22	0.80		0.69	1585	D1840:22	0.79		0.35
328		-----		-----	1586	D1840-A:07R17	0.79		0.35
333	D1840:22	0.74	R(0.05)	-1.38	1587		-----		-----
334	D1840-B:07R17	0.76		-0.69	1610		-----		-----
335	D1840:22	0.77		-0.34	1613	D1840:22	0.81		1.04
365		-----		-----	1631		-----	W	-----
372	D1840:22	0.774		-0.21	1634	D1840:22	0.7746		-0.19
391	D1840:22	0.76		-0.69	1650		-----		-----
396		-----		-----	1683	D1840:22	0.83	R(0.05)	1.73
399		-----		-----	1710	D1840:22	0.77		-0.34
440		-----		-----	1715		-----		-----
445		-----		-----	1720		-----		-----
447	D1840-B:07R17	0.80		0.69	1724		-----		-----
460	D1840	0.77		-0.34	1730		-----		-----
467	D1840-B:07R17	0.81		1.04	1741	D1840:22	0.780		0.00
480		-----		-----	1757		-----		-----
496	D1840:22	0.774		-0.21	1776	D1840:22	0.812		1.11
603		-----		-----	1780		-----		-----
631	D1840:22	0.782		0.07	1833		-----		-----
657	D1840-A:07R17	0.76	C	-0.69	1852	D1840-A:07R17	0.78144		0.05
704	D1840-A:07R17	0.765		-0.52	1854		-----		-----
736	D1840-B:07R17	0.774		-0.21	1913	D1840:22	0.772		-0.28
823	D1840:22	0.78		0.00	1961		-----		-----
824	D1840:22	0.79		0.35	2130	D1840-B:07R17	0.78		0.00
851	D1840-A:07R17	0.783		0.10	2133	D1840-A:07R17	0.79		0.35
854	D1840:22	0.771		-0.31	6035		-----		-----
862	D1840:22	0.77		-0.34	6041	D1840:22	0.777		-0.10
869	D1840:22	0.77		-0.34	6054		-----		-----
904		-----		-----	6075		-----		-----
914	D1840:22	0.78		0.00	6114	D1840:22	0.78		0.00
962		-----		-----	6135		-----		-----
963		-----		-----	6142		-----		-----
970		-----		-----	6168		-----		-----
974	D1840:22	0.78		0.00	6174		-----		-----
994	D1840	0.76		-0.69	6203	D1840:22	0.8		0.69
995	D1840:22	0.74	R(0.05)	-1.38	6238		-----		-----
996		-----		-----	6240	D1840-B:07R17	0.79	C	0.35
997		-----		-----	6266		-----		-----
1011	D1840:22	0.77		-0.34	6312		-----		-----
1016	D1840:22	0.78		0.00	6321	D1840:22	0.77		-0.34
1023		-----		-----	6324		-----		-----
1039	D1840-B:07R17	0.78		0.00	6331		-----		-----
1040	D1840:22	1.015	R(0.01)	8.13	6344		-----		-----
1049		-----		-----	6346		-----		-----
1059	D1840-B:07R17	0.79		0.35	6364		-----		-----
1062	D1840:22	0.77		-0.34	6384	D1840:22	0.81		1.04

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404	D1840:22	0.76		-0.69	6530	D1840:22	0.7665		-0.47
6406		-----		-----	6539		-----		-----
6479		-----		-----	6540		-----		-----
6519		-----		-----	6544		-----		-----

normality	OK
n	72
outliers	5
mean (n)	0.7800
st.dev. (n)	0.01328
R(calc.)	0.0372
st.dev.(D1840:22)	0.02892
R(D1840:22)	0.0810

Lab 140 first reported 0.66
Lab 159 first reported 0.426962
Lab 657 first reported 0.41
Lab 1631 test result withdrawn, reported 0.38
Lab 6240 first reported 0.71



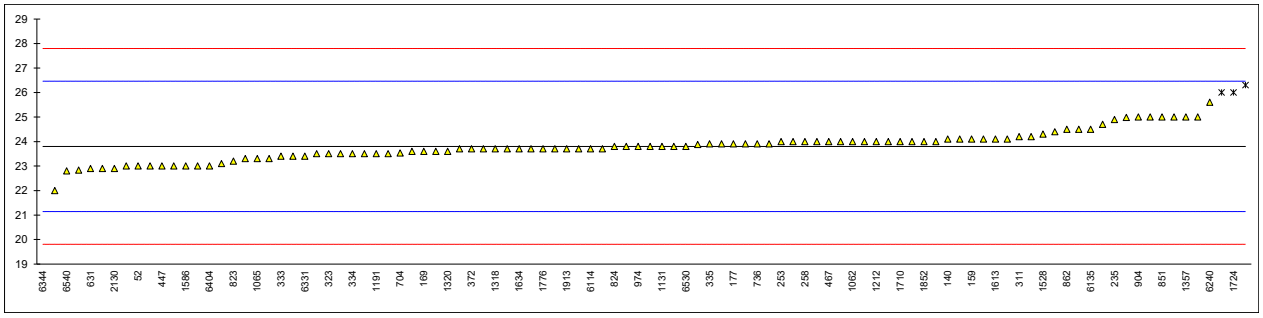


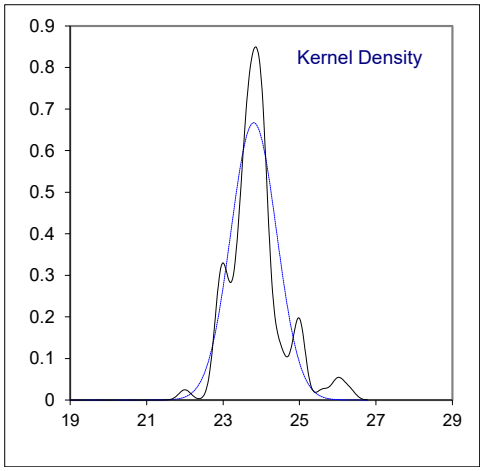
Determination of Smoke Point on sample #23150; results in mm

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D1322-manual	23.0		-0.60	1064	D1322-automated	23.8		0.00
62	D1322-manual	22.0		-1.35	1065	D1322-automated	23.3		-0.38
120	D1322-automated	24.7		0.68	1082	D1322-automated	23.3		-0.38
140	D1322-automated	24.1		0.22	1097	D1322-automated	24.0		0.15
150		-----		-----	1105	D1322-automated	24.1		0.22
159	D1322-automated	24.1		0.22	1121	D1322-manual	22.9		-0.68
169	D1322-automated	23.6		-0.15	1126		-----		-----
171	D1322-automated	23.6		-0.15	1131	D1322-automated	23.8		0.00
177	D1322-automated	23.9		0.07	1141		-----		-----
194		-----		-----	1182		-----		-----
215		-----		-----	1191	D1322-automated	23.5		-0.23
221		-----		-----	1205		-----		-----
224		-----		-----	1212	D1322-manual	24		0.15
225		-----		-----	1237		-----		-----
228		-----		-----	1275	IP598-automated	23.8		0.00
235	D1322-manual	24.9		0.83	1279	D1322-automated	23.5		-0.23
237	D1322-automated	23.8		0.00	1299	D1322-automated	24.2		0.30
238		-----		-----	1318	D1322-automated	23.7		-0.08
253	D1322-manual	24		0.15	1320	D1322-automated	23.6		-0.15
254	D1322-manual	23.0		-0.60	1357	D1322-manual	25		0.90
256	D1322-manual	23.7		-0.08	1372		-----		-----
258	D1322-manual	24.0		0.15	1399	D1322-automated	23		-0.60
273	D1322-manual	24.0		0.15	1417		-----		-----
311	D1322-manual	24.2		0.30	1496	D1322-automated	24.0		0.15
317		-----		-----	1528	D1322-manual	24.3		0.37
323	D1322-manual	23.5		-0.23	1585	D1322-automated	23.7		-0.08
328		-----		-----	1586	D1322-manual	23.0		-0.60
333	D1322-automated	23.4		-0.30	1587	D1322-automated	24.4		0.45
334	D1322-automated	23.5		-0.23	1610		-----		-----
335	D1322-automated	23.9		0.07	1613	D1322-automated	24.1		0.22
365	IP57-manual	24.986		0.89	1631	D1322-automated	26.3	R(0.05)	1.88
372	D1322-automated	23.7		-0.08	1634	D1322-automated	23.7		-0.08
391	D1322-manual	23.9		0.07	1650	D1322-manual	26	R(0.05)	1.65
396		-----		-----	1683	D1322-automated	23.7		-0.08
399		-----		-----	1710	D1322-manual	24		0.15
440		-----		-----	1715	D1322-manual	24		0.15
445	D1322-manual	25.0		0.90	1720		-----		-----
447	D1322-manual	23.0		-0.60	1724	D1322-manual	26	R(0.05)	1.65
460	D1322-manual	25		0.90	1730		-----		-----
467	D1322-manual	24.0		0.15	1741	D1322-automated	23.1		-0.53
480		-----		-----	1757		-----		-----
496	D1322-manual	23.88		0.06	1776	D1322-automated	23.7		-0.08
603		-----		-----	1780	D1322	23.7		-0.08
631	D1322-automated	22.9		-0.68	1833		-----		-----
657	D1322-automated	23.0		-0.60	1852	D1322-automated	24.0		0.15
704	D1322-manual	23.53		-0.20	1854		-----		-----
736	D1322-manual	23.9		0.07	1913	D1322-automated	23.70		-0.08
823	D1322-automated	23.2		-0.45	1961		-----		-----
824	D1322-automated	23.8		0.00	2130	D1322-automated	22.9		-0.68
851	D1322-manual	25.0		0.90	2133	D1322-manual	22.83		-0.73
854	D1322-manual	24.0		0.15	6035	D1322-automated	23.4		-0.30
862	D1322-manual	24.5		0.52	6041	D1322-automated	23.7		-0.08
869	D1322-manual	24.5		0.52	6054		-----		-----
904	D1322-manual	25		0.90	6075		-----		-----
914	D1322-automated	23.5		-0.23	6114	D1322-manual	23.7		-0.08
962		-----		-----	6135	D1322-automated	24.5		0.52
963		-----		-----	6142		-----		-----
970		-----		-----	6168		-----		-----
974	D1322-automated	23.8		0.00	6174		-----		-----
994	D1322	23.5		-0.23	6203	D1322-manual	24.0		0.15
995	D1322-manual	24.0		0.15	6238		-----		-----
996	D1322-manual	23.5		-0.23	6240	D1322-manual	25.6		1.35
997		-----		-----	6266		-----		-----
1011	D1322-automated	24.1		0.22	6312		-----		-----
1016	IP598-automated	23.9		0.07	6321	D1322-automated	23.7		-0.08
1023		-----		-----	6324	D1322-manual	23		-0.60
1039	D1322-automated	23.3		-0.38	6331	D1322-automated	23.4		-0.30
1040		-----		-----	6344	D1322-manual	17.2	R(0.01)	-4.96
1049	D1322-automated	23.7		-0.08	6346		-----		-----
1059	D1322-automated	23.6		-0.15	6364	D1322-manual	25.0		0.90
1062	D1322-manual	24.0		0.15	6384	D1322-automated	24.1		0.22

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404	D1322-manual	23		-0.60	6530	D1322-automated	23.8		0.00
6406	D1322-automated	23.9		0.07	6539		-----		-----
6479		-----		-----	6540	D1322-manual	22.8		-0.75
6519		-----		-----	6544		-----		-----

		D1322 manual only:	D1322 auto only:
	normality	OK	OK
	n	98	41	52
	outliers	4	3	1
	mean (n)	23.80	23.91	23.70
	st.dev. (n)	0.598	0.784	0.386
	R(calc.)	1.67	2.20	1.08
	st.dev.(D1322-M:22)	1.331	1.334	---
	R(D1322-M:22)	3.73	3.74	---
Compare:				
	R(D1322-A:22)	0.89	---	0.89





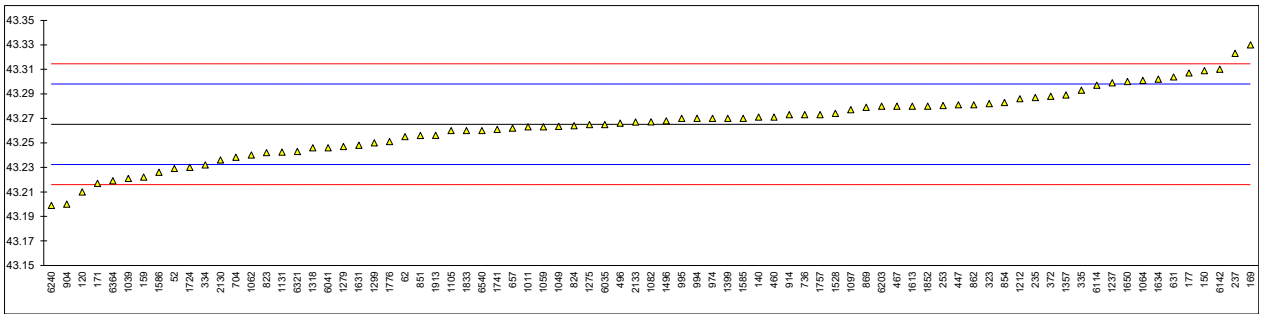
Determination of Specific Energy (Net) on Sulfur free basis on sample #23150; results in MJ/kg

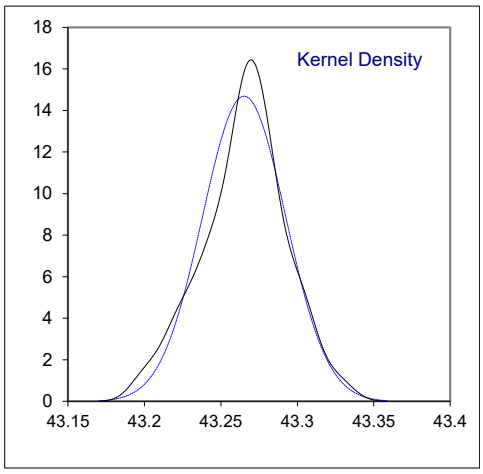
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D3338	43.229		-2.20	1064	D3338	43.301		2.18
62	D3338	43.255		-0.62	1065		-----		-----
120	D3338	43.21		-3.36	1082	D3338	43.2671		0.12
140	D3338	43.271		0.35	1097	D3338	43.277		0.72
150	D3338	43.309		2.67	1105	D3338	43.26		-0.32
159	D3338	43.222		-2.63	1121		-----		-----
169	D3338	43.330	C	3.94	1126		-----		-----
171	D3338	43.217		-2.93	1131	D4529-A	43.2425		-1.38
177	D3338	43.307		2.54	1141		-----		-----
194		-----		-----	1182		-----		-----
215		-----		-----	1191		-----		-----
221		-----		-----	1205		-----		-----
224		-----		-----	1212	D3338	43.286		1.27
225		-----		-----	1237	D3338	43.299		2.06
228		-----		-----	1275	D3338	43.265		-0.01
235	D3338	43.287		1.33	1279	D3338	43.247		-1.11
237	D3338	43.323		3.52	1299	D3338	43.25		-0.92
238		-----		-----	1318	D3338	43.246		-1.17
253	D3338	43.2804		0.93	1320		-----		-----
254		-----		-----	1357	D3338	43.289		1.45
256		-----		-----	1372		-----		-----
258		-----		-----	1399	D3338	43.27		0.29
273		-----		-----	1417		-----		-----
311		-----		-----	1496	D3338	43.268		0.17
317		-----		-----	1528	D3338	43.274		0.54
323	D3338	43.282		1.02	1585	D3338	43.270		0.29
328		-----		-----	1586	D3338	43.226	E	-2.39
333		-----		-----	1587		-----		-----
334	D3338	43.232		-2.02	1610		-----		-----
335	D3338	43.293		1.69	1613	D3338	43.280		0.90
365		-----		-----	1631	D3338	43.248		-1.05
372	D3338	43.288	C	1.39	1634	D3338	43.302		2.24
391		-----		-----	1650	D3338	43.300		2.12
396		-----		-----	1683		-----		-----
399		-----		-----	1710	D4809	-----	W	-----
440		-----		-----	1715		-----		-----
445		-----		-----	1720		-----		-----
447	D3338	43.281		0.96	1724	D3338	43.23		-2.14
460	D3338	43.271		0.35	1730		-----		-----
467	D3338	43.28		0.90	1741	D3338	43.261		-0.26
480		-----		-----	1757	D4529	43.273		0.48
496	D3338	43.266		0.05	1776	D3338	43.251		-0.86
603		-----		-----	1780		-----		-----
631	D3338	43.3037		2.34	1833	D3338	43.26		-0.32
657	D3338	43.262		-0.19	1852	D3338	43.28		0.90
704	D3338	43.2382		-1.64	1854		-----		-----
736	D3338	43.273		0.48	1913	D3338	43.2561		-0.55
823	D3338	43.242		-1.41	1961		-----		-----
824	D3338	43.264		-0.07	2130	D3338	43.236		-1.78
851	D3338	43.256		-0.56	2133	D3338	43.2670		0.11
854	D3338	43.283		1.08	6035	D3338	43.265		-0.01
862	D3338	43.281		0.96	6041	D3338	43.246		-1.17
869	D3338	43.279		0.84	6054		-----		-----
904	D3338	43.2	E	-3.97	6075		-----		-----
914	D3338	43.273		0.48	6114	D3338	43.297		1.94
962		-----		-----	6135		-----		-----
963		-----		-----	6142		43.31		2.73
970		-----		-----	6168		-----		-----
974	D3338	43.270		0.29	6174		-----		-----
994	D3338	43.27		0.29	6203	D3338	43.2799		0.90
995	D3338	43.27		0.29	6238		-----		-----
996		-----		-----	6240	D3338	43.199	C	-4.03
997		-----		-----	6266		-----		-----
1011	D3338	43.263		-0.13	6312		-----		-----
1016		-----		-----	6321	D3338	43.243		-1.35
1023		-----		-----	6324		-----		-----
1039	D3338	43.221		-2.69	6331		-----		-----
1040		-----		-----	6344		-----		-----
1049	D3338	43.26355		-0.10	6346		-----		-----
1059	D3338	43.263		-0.13	6364	D3338	43.219	E	-2.81
1062	D3338	43.24		-1.53	6384		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404		-----		-----	6530		-----		-----
6406		-----		-----	6539		-----		-----
6479		-----		-----	6540	D3338	43.26		-0.32
6519		-----		-----	6544		-----		-----

normality	OK
n	79
outliers	0
mean (n)	43.2652
st.dev. (n)	0.02716
R(calc.)	0.0761
st.dev.(D3338:20a)	0.01643
R(D3338:20a)	0.046

Lab 169 first reported 8872.258
Lab 372 first reported 43.276
Lab 904 calculation difference, iis calculated 43.3
Lab 1586 calculation difference, iis calculated 43.278
Lab 1710 test result withdrawn, reported 43.44
Lab 6240 first reported 43.124
Lab 6364 calculation difference, iis calculated 43.271





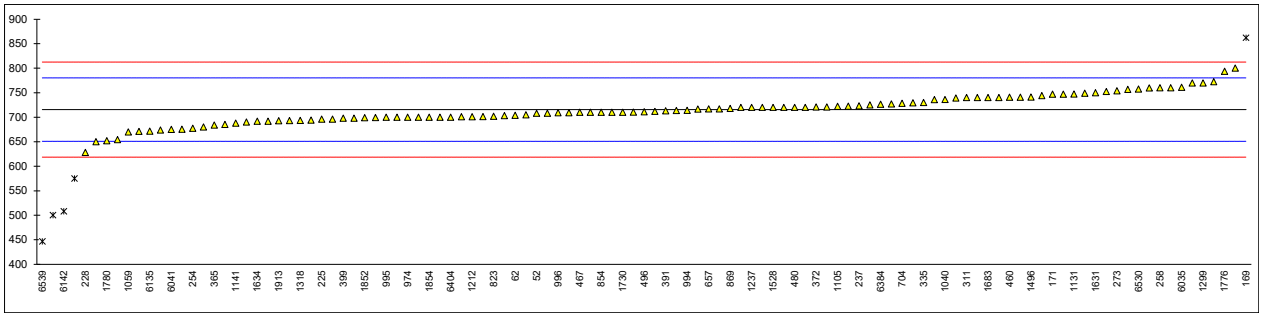
Determination of Total Sulfur on sample #23150; results in mg/kg

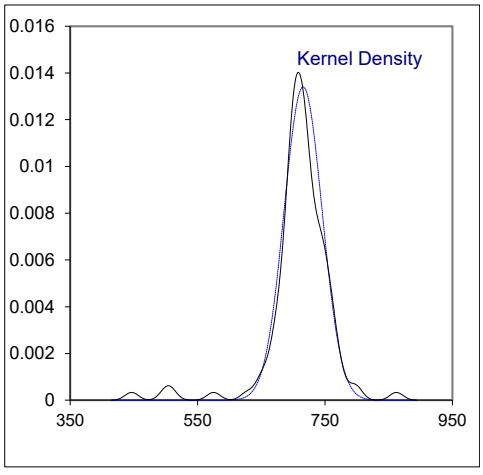
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5453	708		-0.23	1064	D5453	759.47		1.36
62	D5453	704		-0.36	1065	D4294	720		0.14
120	D4294	699.2		-0.50	1082	ISO8754	725.1		0.30
140	D5453	752.38		1.14	1097	D5453	708.18		-0.23
150	D4294	693		-0.70	1105	D4294	722.05		0.20
159	D5453	710.28		-0.16	1121	D4294	756.9		1.28
169	D4294	862	R(0.01)	4.52	1126	ISO20846	735.8		0.63
171	D5453	747		0.97	1131	D4294	747.2		0.98
177	D4294	654		-1.90	1141	D5453	688		-0.85
194		-----		-----	1182		-----		-----
215		-----		-----	1191	ISO8754	720.1		0.14
221		-----		-----	1205		-----		-----
224		-----		-----	1212	D5453	701		-0.45
225	D4294	696.0		-0.60	1237	ISO8754	720		0.14
228	D4294	628	C	-2.70	1275	D4294	772.16		1.75
235	D5453	670.995		-1.37	1279	D4294	713.7		-0.06
237	D4294	723	C	0.23	1299	ISO8754	770	C	1.68
238		-----		-----	1318	D5453	693.4		-0.68
253		700		-0.48	1320		-----		-----
254	D4294	677.5		-1.17	1357	D5453	720		0.14
256		-----		-----	1372		-----		-----
258	D5453	760	C	1.37	1399	D5453	700		-0.48
273	D5453	754		1.19	1417	In house	710		-0.17
311	D2622	740		0.76	1496	D4294	741.3		0.80
317		-----		-----	1528	D4294	720		0.14
323	D2622	575	R(0.01)	-4.34	1585	D4294	675.6		-1.23
328	ISO8754	710		-0.17	1586	ISO20846	720		0.14
333	D4294	701		-0.45	1587		-----		-----
334	D5453	717		0.05	1610		-----		-----
335	D4294	730		0.45	1613	D5453	703		-0.39
365	IP490	684.118		-0.97	1631	D5453	750		1.07
372	D5453	721		0.17	1634	D5453	691.9		-0.73
391	D4294	713		-0.08	1650	D5453	701.4		-0.44
396		-----		-----	1683	D4294	740		0.76
399	D4294	698		-0.54	1710	D5453	747		0.97
440	D5453	770		1.68	1715		-----		-----
445	D5453	680.15		-1.09	1720		-----		-----
447	IP336	696	C	-0.60	1724	ISO8754	740	C	0.76
460	IP336	741	C	0.79	1730	D5453	710		-0.17
467	D4294	710		-0.17	1741	D5453	685.4		-0.93
480	D4294	720.07		0.14	1757		-----		-----
496	D5453	711.0		-0.14	1776	D5453	793.9		2.42
603		-----		-----	1780	D5453	651.976		-1.96
631	D4294	722.4		0.21	1833	IP336	698	C	-0.54
657	D5453	717		0.05	1852	ISO8754	699.0		-0.51
704	D5453	728.4		0.40	1854	ISO20846	700		-0.48
736	ISO20884	716.6		0.03	1913	D4294	692.8		-0.70
823	D5453	702		-0.42	1961		-----		-----
824	D5453	760		1.37	2130	IP336	700	C	-0.48
851	D4294	727		0.35	2133	D4294	748.9		1.03
854	D4294	710		-0.17	6035	ISO20846	761		1.41
862	D5453	692		-0.73	6041	D4294	675		-1.25
869	D5453	718		0.08	6054		-----		-----
904	D4294	500	R(0.01)	-6.66	6075		-----		-----
914	D4294	744		0.88	6114	D5453	712		-0.11
962		-----		-----	6135	D5453	671.8		-1.35
963		-----		-----	6142	ISO20846	508	C,R(0.01)	-6.41
970		-----		-----	6168		-----		-----
974	D4294	700		-0.48	6174		-----		-----
994	D5453	714		-0.05	6203	D2622	694	C	-0.66
995	D5453	700		-0.48	6238		-----		-----
996	D5453	709		-0.20	6240	D5453	704.8		-0.33
997		-----		-----	6266		-----		-----
1011	D4294	709	C	-0.20	6312		-----		-----
1016		-----		-----	6321	IP336	739		0.73
1023	D4294	800		2.61	6324	D4294	690		-0.79
1039	D2622	721		0.17	6331		-----		-----
1040	D5453	736.0		0.63	6344		-----		-----
1049	D5453	741		0.79	6346		-----		-----
1059	ISO14596	670		-1.41	6364	D4294	650		-2.02
1062	D4294	740		0.76	6384	D4294	726.4		0.34

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6404	D5453	700		-0.48	6530	D5453	757.4		1.29
6406		-----		-----	6539	D5453	446.358	R(0.01)	-8.31
6479	In house	729.28		0.43	6540	D4294	673.7	C	-1.29
6519		-----		-----	6544		-----		-----

	normality	OK
	n	108
	outliers	5
	mean (n)	715.51
	st.dev. (n)	29.771
	R(calc.)	83.36
	st.dev.(D5453:19a)	32.377
	R(D5453:19a)	90.65
Compare:		
	R(D4294:21)	132.73
	R(D2622:21)	82.93

Lab 228 first reported 0.0628 mg/kg
Lab 237 first reported 0.0723 mg/kg
Lab 258 first reported 860.74
Lab 447 first reported 0.0696 mg/kg
Lab 460 first reported 0.0741 mg/kg
Lab 1011 first reported 0.0709 mg/kg
Lab 1299 first reported 0.077 mg/kg
Lab 1724 first reported 0.074 mg/kg
Lab 1833 first reported 0.0698 mg/kg
Lab 2130 first reported 0.07 mg/kg
Lab 6142 first reported 329.68
Lab 6203 first reported 0.0694 mg/kg
Lab 6540 first reported 624

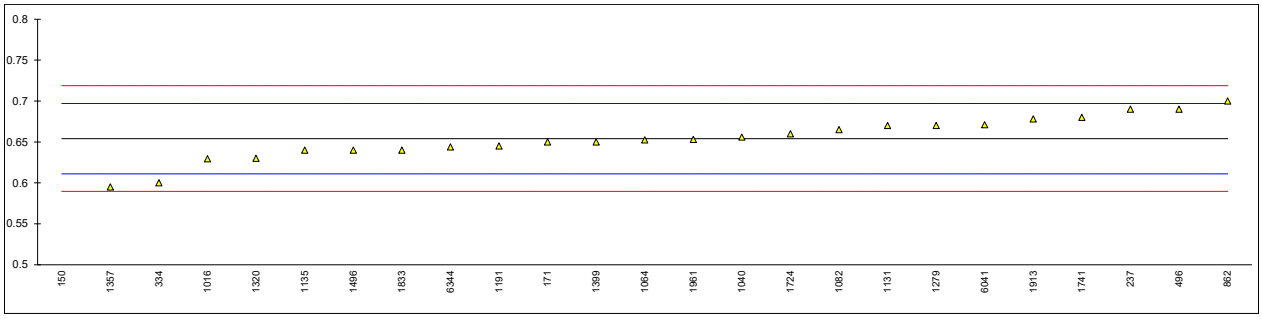


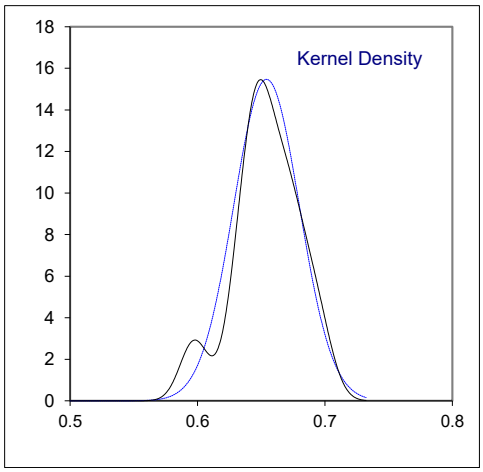


Determination of BOCLE on sample #23151; results in mm

lab	method	value	mark	z(targ)	remarks
150	D5001 full-automated	0.41	R(0.01)	-11.36	
171	D5001 full-automated	0.65		-0.19	
237	D5001 semi-automated	0.69		1.67	
323		-----		-----	
334	D5001 full-automated	0.60		-2.52	
496	D5001 full-automated	0.69		1.67	
862	D5001 semi-automated	0.70		2.14	
963		-----		-----	
1016	D5001 semi-automated	0.6295		-1.15	
1039		-----		-----	
1040	D5001 full-automated	0.656		0.09	
1064	D5001 full-automated	0.6525		-0.08	
1082	D5001 semi-automated	0.665		0.51	
1131	D5001 full-automated	0.67		0.74	
1135	D5001 full-automated	0.64		-0.66	
1191	D5001 semi-automated	0.645		-0.42	
1279	D5001 semi-automated	0.67		0.74	
1320	D5001 semi-automated	0.63		-1.12	
1357	D5001 full-automated	0.595		-2.75	
1399	D5001 full-automated	0.65		-0.19	
1496	D5001 semi-automated	0.64		-0.66	
1631		-----		-----	
1724	D5001 semi-automated	0.66		0.27	
1741	D5001 full-automated	0.680		1.20	
1833	D5001 full-automated	0.64		-0.66	
1913	D5001 full-automated	0.678		1.11	
1961	D5001 full-automated	0.653		-0.05	
6041	D5001 full-automated	0.671		0.79	
6174		-----		-----	
6238		-----		-----	
6344	D5001 full-automated	0.644		-0.47	

			semi-automatic only:	full-automatic only:
	normality	OK	OK	OK
	n	24	9	15
	outliers	1	0	1
	mean (n)	0.6541	0.6588	0.6513
	st.dev. (n)	0.02579	0.02517	0.02661
	R(calc.)	0.0722	0.0705	0.0745
	st.dev.(D5001:19e1 semi-automatic)	0.02149	0.02173	---
	R(D5001:19e1 semi-automatic)	0.0602	0.0608	---
Compare:				
	R(D5001:19e1 full-automatic)	0.0340	---	0.0336

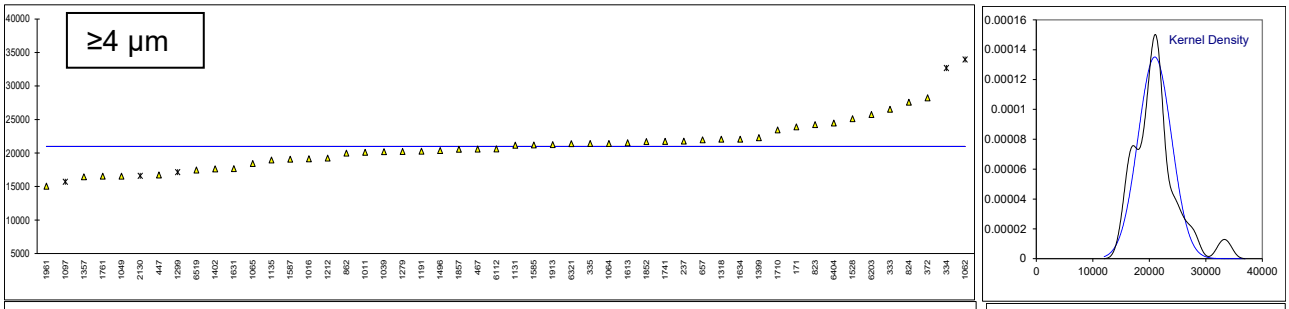


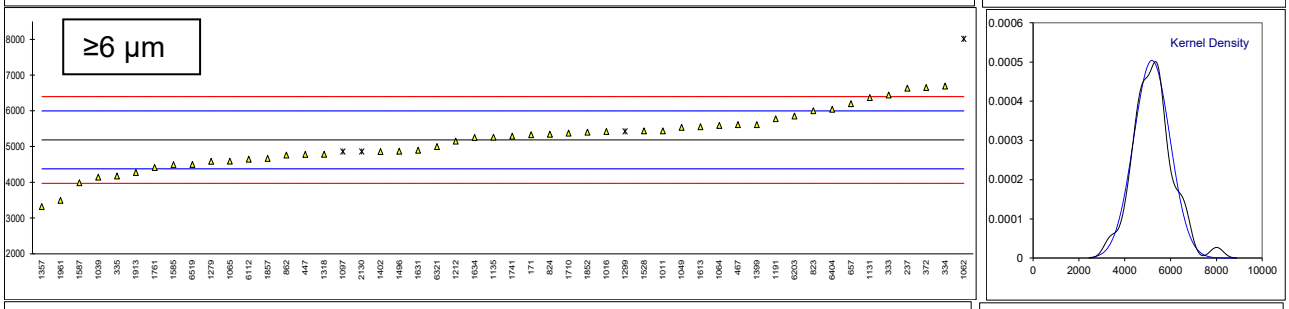


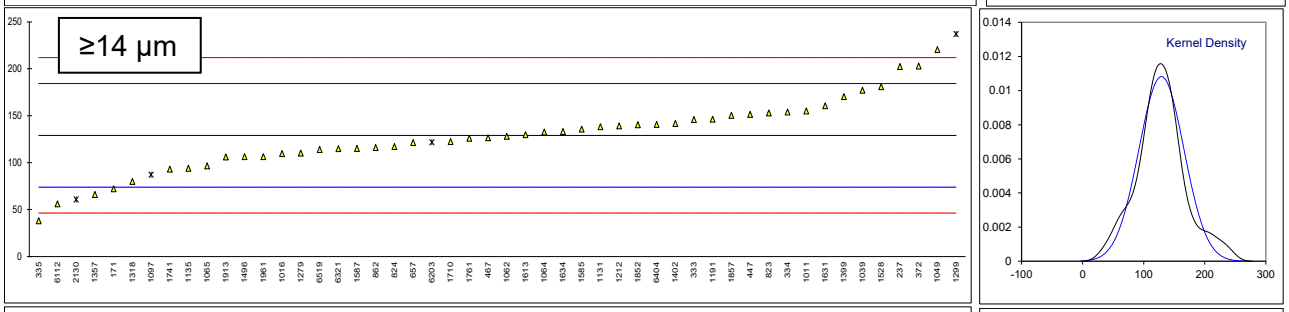
Determination of Particle Size Distribution on sample #23152 acc. to IP565, results in counts/mL

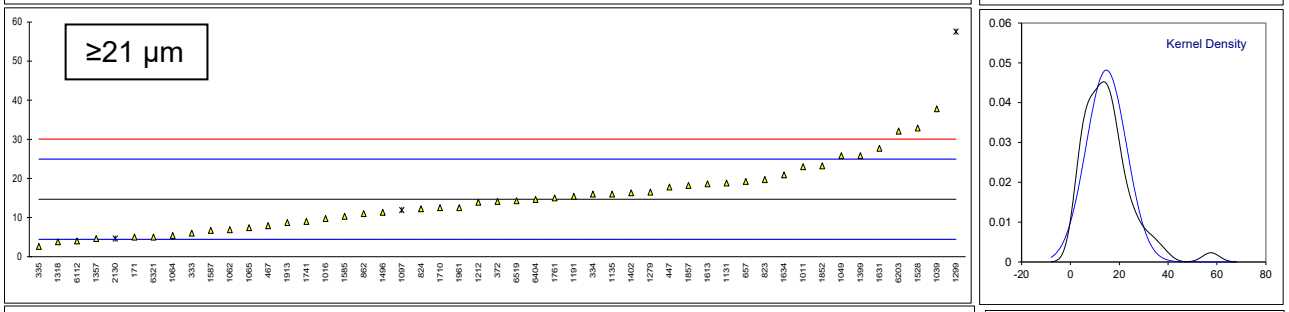
lab	method	≥4 µm (c)	m	≥6 µm(c)	m	≥14 µm (c)	m	≥21 µm (c)	m	≥25 µm (c)	m	≥30 µm (c)	m
140		-----		-----		-----		-----		-----		-----	
150		-----		-----		-----		-----		-----		-----	
171	IP565	23900		5332		72		5		1		0	
225		-----		-----		-----		-----		-----		-----	
237	IP565	21778.4		6632.6		202.3		-----		-----		-----	
311		-----		-----		-----		-----		-----		-----	
323		-----		-----		-----		-----		-----		-----	
333	IP565	26504		6438		146		6		2		1	
334	IP565	32664	R(5)	6689		154		16		4		1	
335	IP565	21406.7		4175.1		38.0		2.6		0.7		0.3	
372	IP565	28216		6652		203		14.1		5.1		1.8	
447	IP565	16727.2		4776.7		151.4		17.8		3.6		0.6	
467	IP565	20597.3		5608.8		126.5		7.9		1.9		0.3	
657	IP565	21956.3	C	6198.6	C	121.3	C	19.2	C	4.1	C	0.4	C
823	IP565	24223		6004		152.9		19.7		5.8		1.1	
824	IP565	27560.5		5341.4		117.1		12.2		2.8		0.6	
862	IP565	19974		4762		116		11		3		1	
963		-----		-----		-----		-----		-----		-----	
974		-----		-----		-----		-----		-----		-----	
1011	IP565	20106		5437		155		23		7		2	
1016	IP565	19128.0		5416.4		109.5		9.7		2.1		0.6	
1039	IP565	20191.6		4143.7		177.1		37.8		15.8	R(1)	5.2	R(1)
1049	IP577	16556.4		5534.1		220.4		25.8		5.1		0.8	
1062	IP565	33932	C,R(5)	8010	C,R(5)	127.9	C	6.9	C	1.9	C	0.6	C
1064	IP565	21420.8		5588.7		132.7		5.4		0.5		0.2	
1065	IP565	18427.3		4590.6		96.5		7.4		1.6		0.3	
1097	IP564	15704.6	ex	4859.7	ex	87.0	ex	11.9	ex	3.9	ex	1.0	ex
1131	IP565	21159.5		6368.4		138.2		18.8		5.5		1.3	
1135	IP565	18950		5261		94		16		3		0	
1191	IP565	20280.4		5775.3		146.3		15.4		2.9		0.3	
1212	IP565	19228.7		5149.4		139.1		13.9		3.8		0.5	
1279	IP565	20206.7		4583.9		110.1		16.5		3.5		0.6	
1299	IP577	17145.6	ex	5424.2	ex	237.0	ex	57.5	R(1)	24.0	R(1)	6.8	R(1)
1318	IP565	22039.1		4786.6		79.9		3.8		1.2		0.3	
1320		-----		-----		-----		-----		-----		-----	
1357	IP565	16435		3319		66		4.6		2.5		2	
1399	IP565	22284.0		5610.7		170.3		25.8		6.7		1.5	
1402	IP565	17626.6		4861.3		141.6		16.3		4.5		0.5	
1496	IP565	20354.7		4867.2		106.3		11.3		2.7		0.6	
1528	IP565	25118.1		5435.4		180.9		32.9		11.1	R(5)	2.5	
1585	IP565	21200.3		4492.8		135.7		10.3		4.0		1.4	
1587	IP565	19072.5		3988.5		115.2		6.7		1.5		0.4	
1610		-----		-----		-----		-----		-----		-----	
1613	IP565	21523.0		5556.1		129.6		18.6		6.4		2.2	
1631	IP565	17662.7		4893.9		160.6		27.7		-----	W	-----	W
1634	IP565	22058.3		5253.1		133.1		20.9		5.2		1.0	
1710	IP565	23436.7		5373.7		122.4		12.5		2.4		0.8	
1720		-----		-----		-----		-----		-----		-----	
1724		-----		-----		-----		-----		-----		-----	
1741	IP565	21727.3		5289.1		93.1		9.0		2.1		0.7	
1761	IP565	16548.0		4411.6		126.0		15.0		4.0		0.64	
1833		-----		-----		-----		-----		-----		-----	
1852	IP565	21695.3		5402.3		140.3		23.2		9.3		3.3	R(5)
1857	IP565	20542.9		4667.1		150.4		18.2		7.5		2.1	
1913	IP565	21239.7		4274.3		106.1		8.7		2.0		0.3	
1961	IP577	15053.0		3493.3		106.4		12.5		2.8		0.5	
2130	IP564	16592.7	ex	4860.8	ex	60.8	ex	4.6	ex	1.5	ex	0.3	ex
6075		-----		-----		-----		-----		-----		-----	
6112	IP565	20604.3		4643.3		56.0		4.0		1.1		0.2	
6168		-----		-----		-----		-----		-----		-----	
6174		-----		-----		-----		-----		-----		-----	
6203		25739.5		5855.2		121.7	ex	32.1		11.6	R(5)	2.2	
6321	IP565	21390.0		4995.9		114.8		5.0		1.2		0.5	
6404	IP565	24465.1		6043.8		140.7		14.6		2.9		0.4	
6406		-----		-----		-----		-----		-----		-----	
6519	IP565	17460.5		4497.9		113.9		14.3		4.4		2.0	
normality		OK		OK		OK		OK		OK		OK	
n		45		46		46		46		42		43	
outliers		2 +3ex		1 +3ex		0 +4ex		1 +2ex		4 +2ex		3 +2ex	
mean (n)		20972.79		5184.15		129.06		14.70		3.46		0.88	
st.dev. (n)		2952.875		791.528		36.868		8.277		2.015		0.681	
R(calc.)		8268.05		2216.28		103.23		23.18		5.64		1.91	
st.dev.(IP565:13)		(817.093)		404.590		27.574		5.116		1.774		0.632	
R(IP565:13)		(2287.86)		1132.85		77.21		14.32		4.97		1.77	

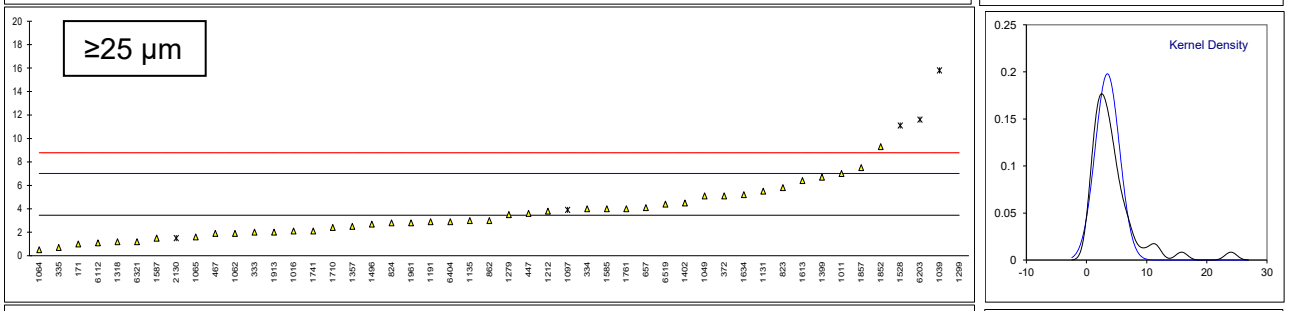
Lab 657 first reported 5059.0, 1667.0, 65.4, 10.9, 2.5 and 0.2 respectively
Lab 1062 first reported 116, 32, 2, 0, 0 and 0 respectively
Lab 1097 test results excluded as test method IP564 was used, see also §4.1
Lab 1299 test results for ≥4 µm, ≥6 µm and ≥14 µm excluded as three or more statistical outliers in related parameters
Lab 1631 test results for ≥25 µm and ≥30 µm withdrawn, reported 10.8 and 3 respectively
Lab 2130 test results excluded as test method IP564 was used, see also §4.1
Lab 6203 test result excluded for ≥14 µm as test result in counts/mL did not match test result in ISO scale number

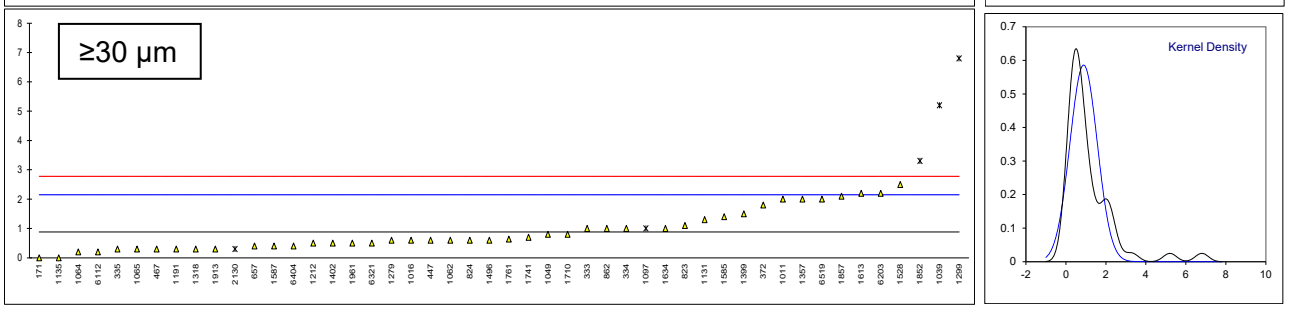








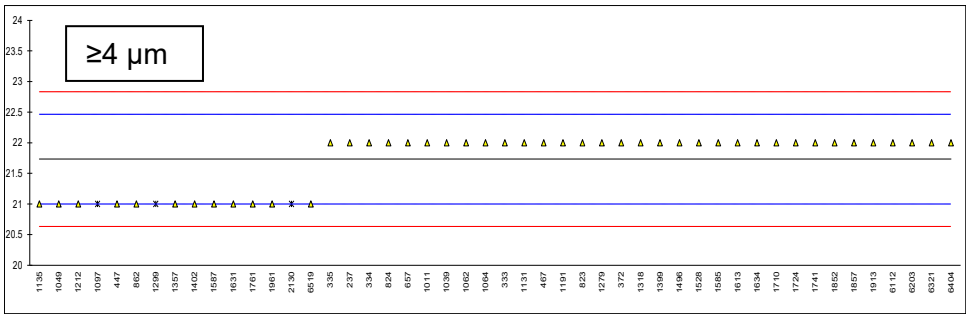


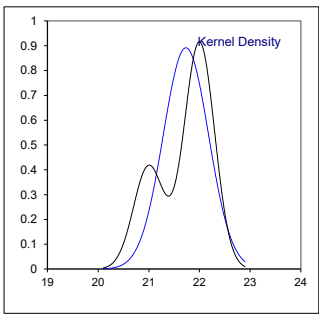


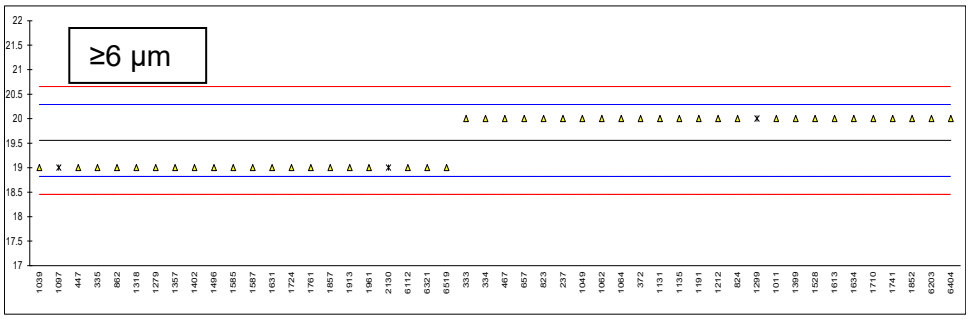
Determination of Particle Size Distribution on sample #23152 acc. to ISO4406 scale

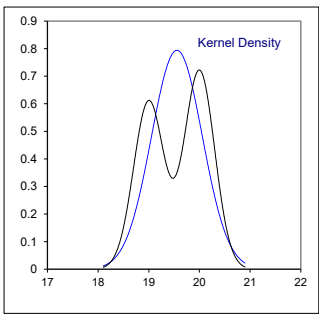
lab	method	≥4µm (c)	mark	z(targ)	≥6µm (c)	mark	z(targ)	≥14 µm (c)	mark	z(targ)
140		-----		-----	-----		-----	-----		-----
150		-----		-----	-----		-----	-----		-----
171		-----		-----	-----		-----	-----		-----
225		-----		-----	-----		-----	-----		-----
237	ISO4406	22		0.73	20		1.21	15		1.85
311		-----		-----	-----		-----	-----		-----
323		-----		-----	-----		-----	-----		-----
333	ISO4406 acc. to IP565	22		0.73	20		1.21	14		-0.19
334	ISO4406 acc. to IP565	22		0.73	20		1.21	14		-0.19
335	ISO4406 acc. to IP565	22		0.73	19		-1.52	12	R(0.01)	-4.27
372	ISO4406 acc. to IP565	22		0.73	20		1.21	15		1.85
447	ISO4406 acc. to IP565	21		-2.00	19		-1.52	14		-0.19
467	ISO4406 acc. to IP565	22		0.73	20		1.21	14		-0.19
657	ISO4406	22	C	0.73	20	C	1.21	14	C	-0.19
823	ISO4406	22		0.73	20		1.21	14		-0.19
824	ISO4406 acc. to IP565	22		0.73	20		1.21	14		-0.19
862	ISO4406 acc. to IP565	21		-2.00	19		-1.52	14		-0.19
963		-----		-----	-----		-----	-----		-----
974		-----		-----	-----		-----	-----		-----
1011	ISO4406 acc. to IP565	22		0.73	20		1.21	14		-0.19
1016		-----		-----	-----		-----	-----		-----
1039	ISO4406 acc. to IP565	22		0.73	19		-1.52	15		1.85
1049	ISO4406 acc. to IP577	21		-2.00	20		1.21	15		1.85
1062	ISO4406 acc. to IP565	22	C	0.73	20	C	1.21	14	C	-0.19
1064	ISO4406 acc. to IP565	22		0.73	20		1.21	14		-0.19
1065		-----		-----	-----		-----	-----		-----
1097	ISO4406 acc. to IP564	21	ex	-2.00	19	ex	-1.52	14	ex	-0.19
1131	ISO4406 acc. to IP565	22		0.73	20		1.21	14		-0.19
1135	ISO4406 acc. to IP565	21		-2.00	20		1.21	14		-0.19
1191	ISO4406 acc. to IP565	22		0.73	20		1.21	14		-0.19
1212	ISO4406 acc. to IP565	21		-2.00	20		1.21	14		-0.19
1279	ISO4406 acc. to IP565	22		0.73	19		-1.52	14		-0.19
1299	ISO4406 acc. to IP577	21	ex	-2.00	20	ex	1.21	15	ex	1.85
1318	ISO4406 acc. to IP565	22		0.73	19		-1.52	13		-2.23
1320		-----		-----	-----		-----	-----		-----
1357	ISO4406 acc. to IP565	21		-2.00	19		-1.52	13		-2.23
1399	ISO4406 acc. to IP565	22		0.73	20		1.21	15		1.85
1402	ISO4406 acc. to IP565	21		-2.00	19		-1.52	14		-0.19
1496	ISO4406 acc. to IP565	22		0.73	19		-1.52	14		-0.19
1528	ISO4406 acc. to IP565	22		0.73	20		1.21	15		1.85
1585	ISO4406 acc. to IP565	22		0.73	19		-1.52	14		-0.19
1587	ISO4406 acc. to IP565	21		-2.00	19		-1.52	14		-0.19
1610		-----		-----	-----		-----	-----		-----
1613	ISO4406 acc. to IP565	22		0.73	20		1.21	14		-0.19
1631	ISO4406 acc. to IP565	21		-2.00	19		-1.52	15		1.85
1634	ISO4406	22		0.73	20		1.21	14		-0.19
1710	ISO4406 acc. to IP565	22		0.73	20		1.21	14		-0.19
1720		-----		-----	-----		-----	-----		-----
1724	ISO4406 acc. to IP565	22		0.73	19		-1.52	14		-0.19
1741	ISO4406	22		0.73	20		1.21	14		-0.19
1761	ISO4406	21		-2.00	19		-1.52	14		-0.19
1833		-----		-----	-----		-----	-----		-----
1852	ISO4406 acc. to IP565	22		0.73	20		1.21	14		-0.19
1857	ISO4406 acc. to IP565	22		0.73	19		-1.52	14		-0.19
1913	ISO4406 acc. to IP565	22		0.73	19		-1.52	14		-0.19
1961	ISO4406 acc. to IP577	21		-2.00	19		-1.52	14		-0.19
2130	ISO4406	21	ex	-2.00	19	ex	-1.52	13	ex	-2.23
6075		-----		-----	-----		-----	-----		-----
6112	ISO4406	22	C	0.73	19	C	-1.52	13	C	-2.23
6168		-----		-----	-----		-----	-----		-----
6174		-----		-----	-----		-----	-----		-----
6203	ISO4406 acc. to IP565	22		0.73	20		1.21	15	ex	1.85
6321	ISO4406 acc. to IP565	22		0.73	19		-1.52	14		-0.19
6404	ISO4406 acc. to IP565	22		0.73	20		1.21	14		-0.19
6406		-----		-----	-----		-----	-----		-----
6519	ISO4406 acc. to IP565	21		-2.00	19		-1.52	14		-0.19
	normality	OK			OK			suspect		
	n	45			45			43		
	outliers	0 +3ex			0 +3ex			1 +4ex		
	mean (n)	21.7			19.6			14.1		
	st.dev. (n)	0.45			0.50			0.48		
	R(calc.)	1.3			1.4			1.3		
	st.dev.(IP565:13)	0.37			0.37			0.49		
	R(IP565:13)	1.0			1.0			1.4		

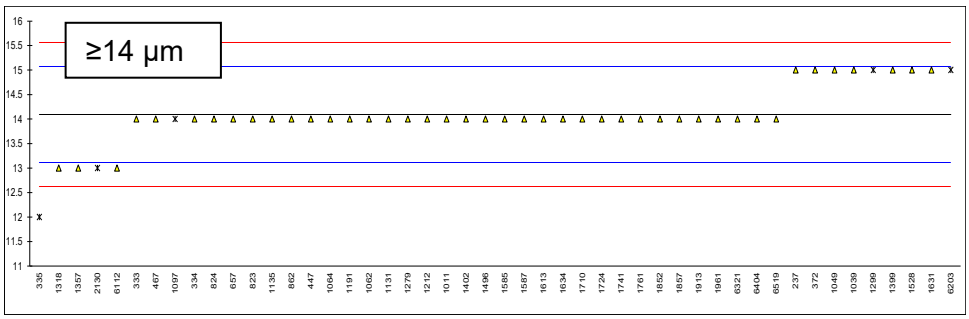
Lab 657 first reported 20, 18 and 13 respectively
Lab 1062 first reported 14, 12 and 8 respectively
Lab 1097 test results excluded as test method IP564 was used, see also §4.1
Lab 1299 test results excluded as three or more statistical outliers in related parameters in counts/mL
Lab 2130 test results excluded as test method IP564 was used, see also §4.1
Lab 6112 first reported 20604.3, 4643.3 and 56 respectively
Lab 6203 test result excluded for ≥14 µm as test result in counts/mL did not match test result in ISO scale number

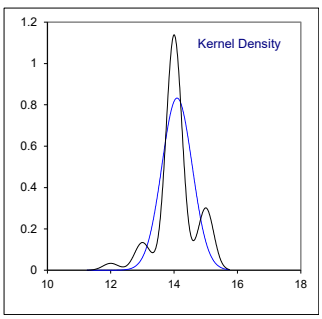










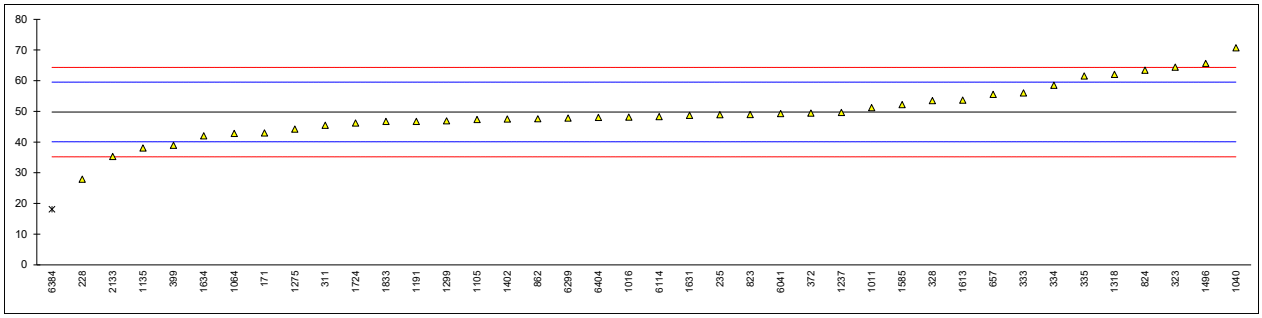


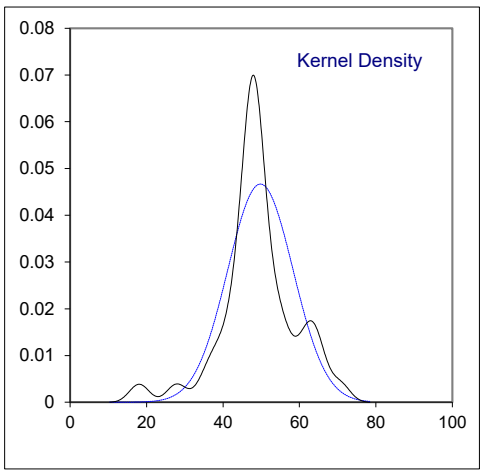
Determination of FAME content – GCMS/HPLC on sample #23153; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
140		-----		-----	
171	IP585	43.0		-1.40	
228	IP585	27.90		-4.50	
235	IP585	48.88		-0.19	
237		-----		-----	
253		-----		-----	
254		-----		-----	
311	IP585	45.46		-0.89	
323	IP585	64.4		3.00	
328	IP585	53.5		0.76	
333	IP585	56		1.28	
334	IP585	58.5		1.79	
335	IP585	61.5		2.41	
372	IP590	49.4		-0.08	
396		-----		-----	
399	IP585	38.97		-2.23	
445		-----		-----	
447		-----		-----	
460		-----		-----	
467		-----		-----	
496		-----		-----	
631		-----		-----	
657	IP585	55.5		1.17	
823	IP585	49		-0.16	
824	IP585	63.38		2.79	
851		-----		-----	
862	IP585	47.6		-0.45	
963		-----		-----	
974		-----		-----	
1011	IP585	51.2		0.29	
1016	IP585	48.10		-0.35	
1023		-----		-----	
1040	IP599	70.6803		4.30	
1049		-----		-----	
1062		-----		-----	
1064	IP585	42.7748		-1.44	
1097		-----		-----	
1105	IP585	47.34		-0.50	
1131		-----		-----	
1135	IP585	38.04		-2.42	
1191	IP585	46.72		-0.63	
1212		-----	W	-----	test result withdrawn, reported 8.3
1237	IP585	49.67		-0.02	
1275	IP585	44.2		-1.15	
1279		-----		-----	
1299	IP585	46.9		-0.59	
1318	IP585	62.02		2.52	
1399		-----		-----	
1402	IP585	47.50		-0.47	
1496	IP585	65.6		3.25	
1585	IP599	52.159		0.49	
1587		-----		-----	
1610		-----		-----	
1613	IP599	53.677		0.80	
1631	IP590	48.7		-0.22	
1634	IP585	42.03		-1.60	
1724	IP590	46.18		-0.74	
1741		-----		-----	
1833	IP590	46.7		-0.64	
2130		-----		-----	
2133	IP585	35.27		-2.99	
6041	IP585	49.27		-0.11	
6064		-----		-----	
6065		-----		-----	
6066		-----		-----	
6075		-----		-----	
6112		-----		-----	
6114	IP590	48.3		-0.31	
6174		-----		-----	
6203		-----		-----	
6238		-----		-----	
6299	IP585	47.8	C	-0.41	first reported 17.9
6321		-----		-----	
6384	IP585	18.08	R(0.05)	-6.52	

lab	method	value	mark	z(targ)	remarks
6404	IP585	48.0		-0.37	
6406		-----		-----	
6519		-----		-----	

			IP585 only:	IP590 only:
	normality	OK	OK	unknown
	n	39	31	5
	outliers	1	1	0
	mean (n)	49.790	49.227	47.856
	st.dev. (n)	8.5488	8.7254	1.3637
	R(calc.)	23.937	24.431	3.818
	st.dev.(IP585:21)	4.8624	4.8104	---
	R(IP585:21)	13.615	13.469	---
Compare:				
	R(IP590:10)	10.876	---	10.485



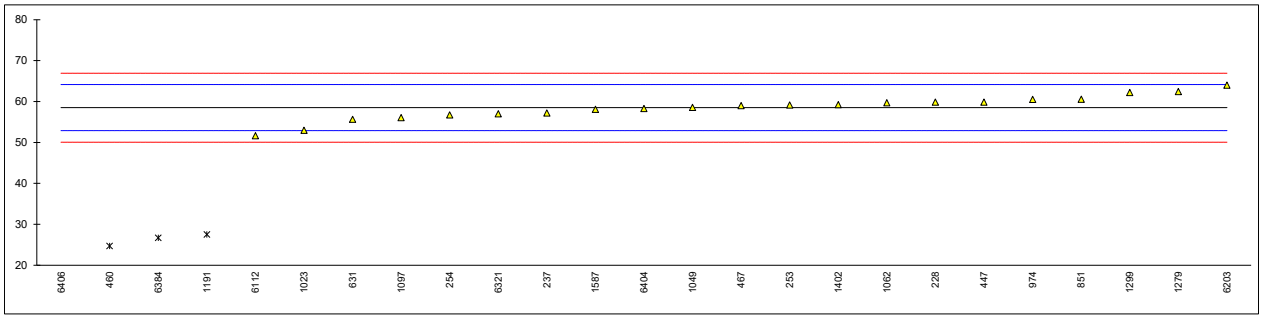


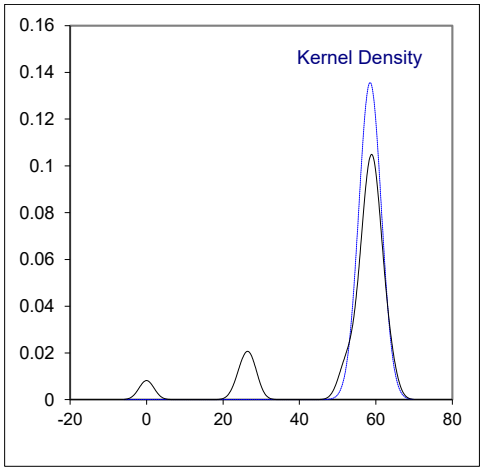
Determination of FAME content – FTIR on sample #23153; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
140		-----		-----	
171		-----		-----	
228	IP583	59.84		0.48	
235		-----		-----	
237	D7797	57.2		-0.46	
253	IP583	59.11		0.22	
254	D7797	56.72		-0.63	
311		-----		-----	
323		-----		-----	
328		-----		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
372		-----		-----	
396		-----		-----	
399		-----		-----	
445		-----		-----	
447	IP583	59.85		0.48	
460		24.72	R(0.05)	-12.01	
467	IP583	59.0		0.18	
496		-----		-----	
631	D7797	55.64		-1.02	
657		-----		-----	
823		-----		-----	
824		-----		-----	
851	D7797	60.56		0.73	
862		-----		-----	
963		-----		-----	
974	IP583	60.5		0.71	
1011		-----		-----	
1016		-----		-----	
1023	D7797	52.95		-1.97	
1040		-----		-----	
1049	IP583	58.55		0.02	
1062	IP583	59.7		0.43	
1064		-----		-----	
1097	IP583	56.04		-0.87	
1105		-----		-----	
1131		-----		-----	
1135		-----		-----	
1191	D7797	27.50	R(0.01)	-11.03	
1212		-----		-----	
1237		-----		-----	
1275		-----		-----	
1279	IP583	62.43		1.40	
1299	IP583	62.2		1.32	
1318		-----		-----	
1399	D7797	<30	f-?	<-10.14	possibly a false negative test result?
1402	IP583	59.23		0.26	
1496		-----		-----	
1585		-----		-----	
1587	IP583	58.08		-0.15	
1610		-----		-----	
1613		-----		-----	
1631		-----		-----	
1634		-----		-----	
1724		-----		-----	
1741		-----		-----	
1833		-----		-----	
2130		-----		-----	
2133		-----		-----	
6041		-----		-----	
6064		-----		-----	
6065		-----		-----	
6066		-----		-----	
6075		-----		-----	
6112	IP583	51.63		-2.44	
6114		-----		-----	
6174		-----		-----	
6203	D7797	63.97		1.95	
6238		-----		-----	
6299		-----		-----	
6321	IP583	57.0		-0.53	
6384	D7797	26.7	R(0.05)	-11.31	

lab	method	value	mark	z(targ)	remarks
6404	IP583	58.3		-0.07	
6406	IP583	0.00	R(0.01)	-20.81	
6519		-----		-----	

normality	OK
n	21
outliers	4
mean (n)	58.500
st.dev. (n)	2.9417
R(calc.)	8.237
st.dev.(IP583:15)	2.8117
R(IP583:15)	7.873



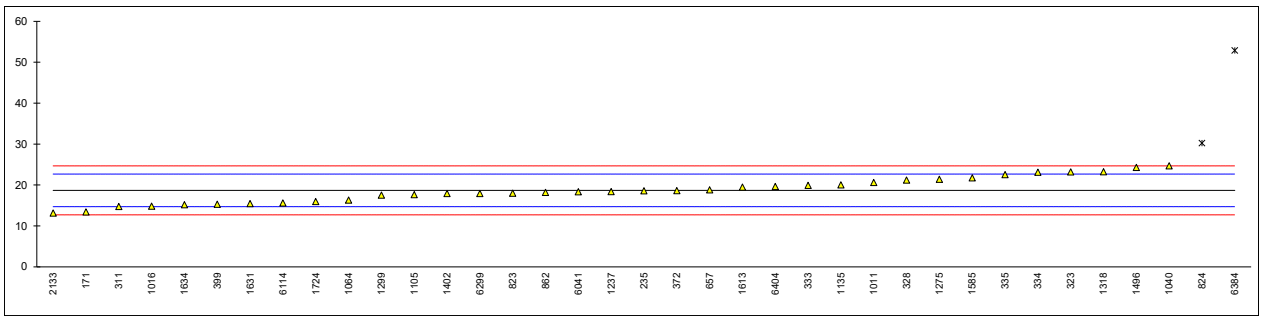


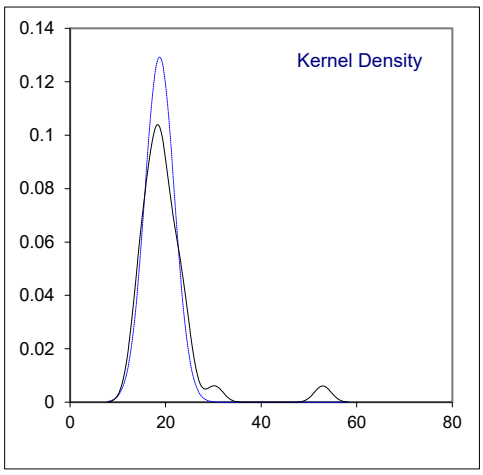
Determination of FAME content – GCMS/HPLC on sample #23154; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
140		-----		-----	
171	IP585	13.4		-2.65	
228		-----		-----	
235	IP585	18.57		-0.07	
237		-----		-----	
253		-----		-----	
254		-----		-----	
311	IP585	14.76		-1.97	
323	IP585	23.2		2.25	
328	IP585	21.2		1.25	
333	IP585	19.9		0.60	
334	IP585	23.1		2.20	
335	IP585	22.5		1.90	
372	IP590	18.6		-0.05	
396		-----		-----	
399	IP585	15.3		-1.70	
445		-----		-----	
447		-----		-----	
460		-----		-----	
467		-----		-----	
496		-----		-----	
631		-----		-----	
657	IP585	18.8		0.05	
823	IP585	18		-0.35	
824	IP585	30.23	R(0.05)	5.76	
851		-----		-----	
862	IP585	18.2		-0.25	
963		-----		-----	
974		-----		-----	
1011	IP585	20.6		0.95	
1016	IP585	14.84		-1.93	
1023		-----		-----	
1040	IP599	24.6929		2.99	
1049		-----		-----	
1062		-----		-----	
1064	IP585	16.3006		-1.20	
1097		-----		-----	
1105	IP585	17.67		-0.52	
1131		-----		-----	
1135	IP585	20.0	C	0.65	first reported 39.69
1191		-----		-----	
1212		-----	W	-----	test result withdrawn, reported 4.8
1237	IP585	18.37		-0.17	
1275	IP585	21.4		1.35	
1279		-----		-----	
1299	IP585	17.5		-0.60	
1318	IP585	23.26		2.28	
1399		-----		-----	
1402	IP585	17.9		-0.40	
1496	IP585	24.3		2.80	
1585	IP599	21.75		1.52	
1587		-----		-----	
1610		-----		-----	
1613	IP599	19.462		0.38	
1631		15.44		-1.63	
1634	IP585	15.19		-1.76	
1724	IP590	15.97		-1.37	
1741		-----		-----	
1833		-----		-----	
2130		-----		-----	
2133	IP585	13.17		-2.77	
6041	IP585	18.34		-0.18	
6064		-----		-----	
6065		-----		-----	
6066		-----		-----	
6075		-----		-----	
6112		-----		-----	
6114	IP590	15.6		-1.55	
6174		-----		-----	
6203		-----		-----	
6238		-----		-----	
6299	IP585	17.9	C	-0.40	first reported 47.8
6321		-----		-----	
6384	IP585	52.88	R(0.01)	17.09	

lab	method	value	mark	z(targ)	remarks
6404	IP585	19.6		0.45	
6406		-----		-----	
6519		-----		-----	

			IP585 only:
	normality	OK	OK
	n	35	28
	outliers	2	2
	mean (n)	18.708	18.688
	st.dev. (n)	3.0884	3.0478
	R(calc.)	8.648	8.534
	st.dev.(IP585:21)	1.9995	1.9976
	R(IP585:21)	5.599	5.593
Compare:			
	R(IP590:10)	4.592	---



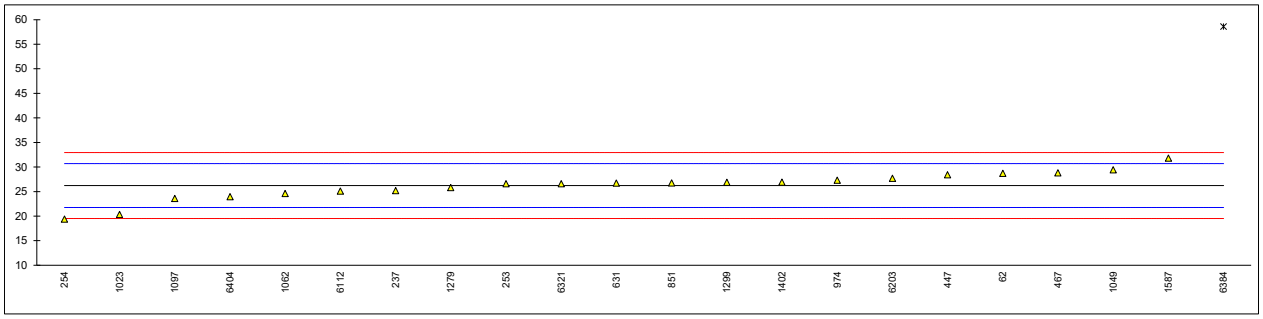


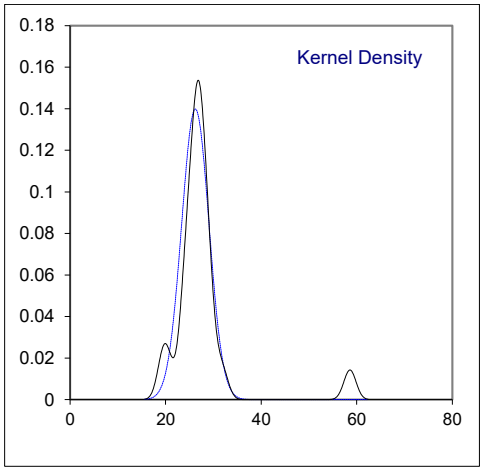
Determination of FAME content – FTIR on sample #23154; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62		28.7	C	1.11	first reported as sample #23153
140		-----		-----	
171		-----		-----	
228		-----		-----	
235		-----		-----	
237	D7797	25.2		-0.46	
253	IP583	26.60		0.17	
254	D7797	19.4	C	-3.05	first reported 4.94
311		-----		-----	
323		-----		-----	
328		-----		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
372		-----		-----	
396		-----		-----	
399		-----		-----	
445		-----		-----	
447	IP583	28.39		0.97	
460		-----		-----	
467	IP583	28.8		1.15	
496		-----		-----	
631	D7797	26.72		0.22	
657		-----		-----	
823		-----		-----	
824		-----		-----	
851	D7797	26.73		0.23	
862		-----		-----	
963		-----		-----	
974	IP583	27.3		0.48	
1011		-----		-----	
1016		-----		-----	
1023	D7797	20.33		-2.63	
1040		-----		-----	
1049	IP583	29.44		1.44	
1062	IP583	24.6		-0.72	
1064		-----		-----	
1097	IP583	23.60		-1.17	
1105		-----		-----	
1131		-----		-----	
1135		-----		-----	
1191		-----		-----	
1212		-----		-----	
1237		-----		-----	
1275		-----		-----	
1279	IP583	25.80		-0.19	
1299	IP583	26.9		0.30	
1318		-----		-----	
1399		-----		-----	
1402	IP583	26.93		0.32	
1496		-----		-----	
1585		-----		-----	
1587	IP583	31.82		2.50	
1610		-----		-----	
1613		-----		-----	
1631		-----		-----	
1634		-----		-----	
1724		-----		-----	
1741		-----		-----	
1833		-----		-----	
2130		-----		-----	
2133		-----		-----	
6041		-----		-----	
6064		-----		-----	
6065		-----		-----	
6066		-----		-----	
6075		-----		-----	
6112	IP583	25.07		-0.51	
6114		-----		-----	
6174		-----		-----	
6203	D7797	27.72		0.67	
6238		-----		-----	
6299		-----		-----	
6321	IP583	26.6		0.17	
6384	D7797	58.6	R(0.01)	14.46	

lab	method	value	mark	z(targ)	remarks
6404	IP583	23.95		-1.01	
6406		-----		-----	
6519		-----		-----	

normality	suspect
n	21
outliers	1
mean (n)	26.219
st.dev. (n)	2.8532
R(calc.)	7.989
st.dev.(IP583:15)	2.2390
R(IP583:15)	6.269





Determination of Copper as Cu on sample #23155; results in µg/kg

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
159		-----		-----	
171		-----		-----	
177		-----		-----	
194		-----		-----	
225		-----		-----	
228		-----		-----	
235		-----		-----	
237		-----		-----	
253		-----		-----	
254		-----		-----	
256		-----		-----	
311		-----		-----	
323		-----		-----	
334		-----		-----	
335		-----		-----	
372		-----		-----	
391		-----		-----	
396		-----		-----	
398		-----		-----	
399		-----		-----	
440		-----		-----	
445		-----		-----	
447		-----		-----	
467	In house	1010		-----	
496		-----		-----	
631		-----		-----	
657		-----		-----	
671		-----		-----	
823		-----		-----	
824		-----		-----	
851		-----		-----	
862	D6732	>500		-----	
869		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
1011		-----		-----	
1016		-----		-----	
1039		-----		-----	
1040		-----		-----	
1049		-----		-----	
1064		-----		-----	
1079		-----		-----	
1097		-----		-----	
1105		-----		-----	
1131		-----		-----	
1135		-----		-----	
1146	In house	1000.3		-----	
1191		-----		-----	
1212	D7111	823.4		-----	
1237		-----		-----	
1279		-----		-----	
1299		-----		-----	
1320		-----		-----	
1357		-----		-----	
1372		-----		-----	
1399		-----		-----	
1412		-----		-----	
1417		-----		-----	
1476		-----		-----	
1496		-----		-----	
1528		-----		-----	
1585		-----		-----	
1586		-----		-----	
1587		-----		-----	
1610		-----		-----	
1613		-----		-----	
1631		-----		-----	
1634		-----		-----	
1650		-----		-----	

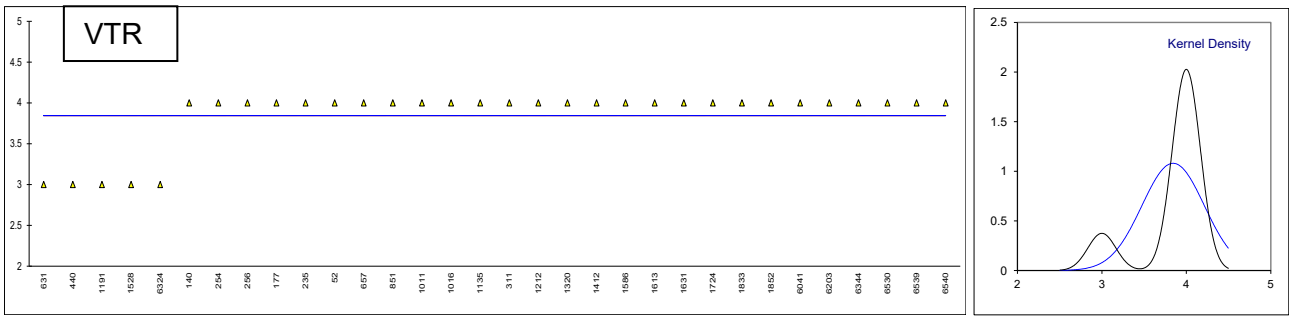
lab	method	value	mark	z(targ)	remarks
1720		-----		-----	
1724		-----		-----	
1730		-----		-----	
1741		-----		-----	
1833		-----		-----	
1852		-----		-----	
1854		-----		-----	
1913		-----		-----	
1961		-----		-----	
2130		-----		-----	
6035		-----		-----	
6041		-----		-----	
6054		-----		-----	
6075		-----		-----	
6114		-----		-----	
6168		-----		-----	
6174		-----		-----	
6203		-----		-----	
6238		-----		-----	
6321		-----		-----	
6324		-----		-----	
6331		-----		-----	
6344		-----		-----	
6384		-----		-----	
6404		-----		-----	
6406		-----		-----	
6519		-----		-----	
6530		-----		-----	
6539		-----		-----	
6540		-----		-----	
	n	4			
	mean (n)	>500			

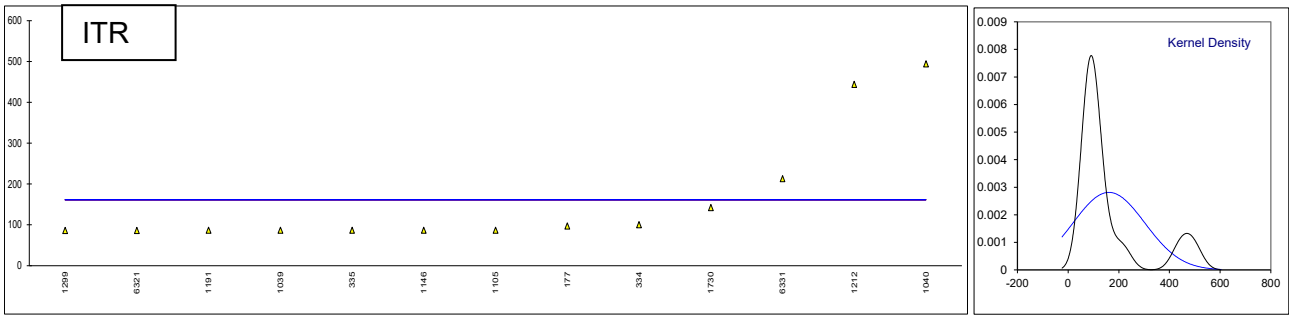
Determination of JFTOT at 260 °C on sample #23155; Visual tube rating (VTR), Interferometric tube rating (ITR) in nm and Ellipsometric tube rating (ETR) in nm, Delta P in mmHg, Evaluation Pass/Fail

lab	method	VTR	ITR	ETR	Delta P	Time to 25 mmHg (min)	Pumped Vol. (mL)	Heater Temp. (°C)	Pass/Fail
52	D3241	4	-----	-----	100	-----	450	260	Fail
120		-----	-----	-----	-----	-----	-----	-----	-----
140	D3241	4	>85	-----	100.1	25	500	275	Fail
150		-----	-----	-----	-----	-----	-----	-----	-----
159		-----	-----	-----	-----	-----	-----	-----	-----
171	D3241	<4	-----	-----	100	150	500	260	Fail
177	D3241	4	97	-----	250	-----	450	260	Fail
194		-----	-----	-----	-----	-----	-----	-----	-----
225		-----	-----	-----	-----	-----	-----	-----	-----
228	D3241	>4	-----	-----	7.9	33	450.0	260.0	Fail
235	D3241	4	-----	-----	-----	42	480	260	Fail
237	D3241	4P	>85	-----	>25	28	450	260	FAIL
253	D3241	> 4	-----	-----	250.1	31.15	450	260	Fail
254	D3241	4	-----	-----	88	37	450	260	Fail
256	D3241	4	-----	-----	>25	10.24	446	260	Fail
311	D3241	4	-----	-----	280	24	270	260	Fail
323	D3241	>4	-----	-----	250.4	28.91	471	260.2	fail
334	D3241	>4.A.P	100	-----	280.0	33	510	268	Fail
335		-----	86.6	-----	280.0	30.14	510	260	-----
372	D3241	4A	-----	-----	250	37.8	425	260	Fail
391		-----	-----	-----	-----	-----	-----	-----	-----
396		-----	-----	-----	-----	-----	-----	-----	-----
398		-----	-----	-----	-----	-----	-----	-----	-----
399	D3241	<4	-----	159.9	280.0	31	510	260	FAIL
440	D3241	3	-----	-----	251	22	500	260	Fail
445	D3241	>4P	-----	-----	280.0	96 mins 9 s	460	260	Fail
447	IP323-B	>4A	-----	-----	280.1	31	510	260	Fail
467		-----	-----	479	251	38	440	260	Fail
496	D3241	>4 A P	-----	-----	280	31.6	510	260	Fail
631	D3241	3	-----	-----	-----	-----	500	260	-----
657	D3241	4	-----	466.12	251.6	35.20	446	261.5	Fail
671	D3241	>4P	-----	256.95	101.1	-----	450	260	Fail
823	D3241	>4	-----	-----	280.1	30	510	260	Fail
824		-----	-----	-----	-----	-----	-----	-----	-----
851	D3241	4	>85	-----	280.1	37:43	450	260	Fail
862	D3241	>4	-----	-----	280.7	-----	-----	260	Fail
869	D3241	>4	-----	424.27	250.3	32.9	437	260	Fail
922		-----	-----	-----	>25	33	-----	260	Fail
962		-----	-----	-----	-----	-----	-----	-----	-----
963		-----	-----	-----	-----	-----	-----	-----	-----
974		-----	-----	-----	250	30	450	260	Fail
1011	D3241	4	-----	-----	250	38	450	260	-----
1016	D3241	4	-----	-----	25	-----	83	260	-----
1039		-----	86.6	-----	250.6	40.38	452.0	260	fail
1040		-----	494	-----	>250	-----	-----	-----	Fail
1049	D3241	4A	-----	480.97	250.7	31	442	260	Fail
1064	D3241	4A	-----	-----	251.1	32.9	462.2	260	Fail
1079	D3241	AP	-----	-----	250.8	27.42	489	260	-----
1097	D3241	>4A	-----	414.07	280.1	31 min 21 s	455	260	Fail
1105	D3241	> 4	86.6	-----	250.8	36.44	440.41	260	FAIL
1131	D3241	>4P	-----	-----	280	33.66	470	260	Fail
1135	D3241	4	-----	-----	280	44.5	510	260	-----
1146	D3241	3P	86.6	-----	250	46.7	453	260	Fail
1191	D3241	3	86.5	-----	>250	39.96	460	260	Fail
1212	D3241	4	444	-----	251	-----	450	260	Fail
1237	D3241	4P	-----	-----	280.0	28	455	260	Fail
1279	D3241	4 Abnormal	-----	433.35	250.3	34.34	460	260	Fail
1299	D3241	>4P	86	-----	140	32.38	450	260	FAIL
1320	D3241	4	-----	-----	250.8	30.24	419	260	Fail
1357	D3241	>2	-----	-----	>25	NA	460	260	Fail
1372		-----	-----	-----	-----	-----	-----	-----	-----
1399		-----	-----	-----	-----	-----	-----	-----	-----
1412	D3241	4	-----	-----	>25	10	-----	260	Fail
1417	IP323-B	>4A	-----	-----	280	-----	450	260	Fail
1476	D3241	4P	-----	450.91	250.2	27.58	454.0	260	Fail C fr. Pass
1496	D3241	>4P	-----	-----	251.2	37min51sec	442	260	Fail
1528	D3241	3	-----	-----	172	-----	126	260	Fail
1585	D3241	4A	-----	-----	250.1	37.48	430.7	260	Fail
1586	IP323-B	4	-----	-----	0.0	34	510	260	Fail
1587	D3241	4a	-----	-----	>25.0	4340	443	260	Fail
1610		-----	-----	-----	-----	-----	-----	-----	-----
1613	D3241	4	-----	-----	280.0	-----	450	260	Fail

lab	method	VTR	ITR	ETR	Delta P	Time to 25 mmHg (min)	Pumped Vol. (mL)	Heater Temp. (°C)	Pass/Fail
1631	D3241	4	-----	-----	>25	-----	-----	-----	Fail
1634	D3241	> 4	-----	-----	250.3	-----	500	260	Fail
1650	D3241	4A	-----	-----	280	55	510	260	Fail
1720		-----	-----	-----	-----	-----	-----	-----	-----
1724	D3241	4	-----	-----	280	24.55	510	260	fail
1730	D3241	>4	142.2	-----	700.3	40	450	260	FAIL
1741	D3241	4P	-----	-----	0	0	449.26	260	fail
1833	D3241	4	-----	-----	34	-----	-----	-----	-----
1852	D3241	4	-----	473.25	250.1	38.26	454.8	260	fail
1854	D3241	>4	-----	-----	251	14	450	260	Fail
1913	D3241	>4P	-----	-----	250.5	34.31	454	260	Fail
1961	D3241	>4AP	-----	-----	280	23	460	260	Fail
2130	IP323-B	<4	-----	-----	250.6	37.30	411.49	260	Fail
6035	D3241	3A	-----	427	280	27:20	510	260	Fail
6041	D3241	4	-----	-----	250.7	31.91	448	260	Fail
6054		-----	-----	-----	-----	-----	-----	-----	-----
6075		-----	-----	-----	-----	-----	-----	-----	-----
6114	D3241	>4A	-----	-----	-----	-----	450	260	Fail
6168		-----	-----	-----	-----	-----	-----	-----	-----
6174	D3241	<4	-----	-----	88.6	-----	450	260.0	Fail
6203	D3241	4	-----	-----	100.6	30	250	260	Fail
6238		-----	-----	-----	-----	-----	-----	-----	-----
6321		-----	86	-----	280	33.37	455	260	Fail
6324	D3241	3.0	-----	-----	0.9	-----	460	260	Fail
6331	D3241	>4a	213	-----	251	60	450	260	Fail
6344	D3241	4	-----	-----	251	26	450	260	fail
6384	D3241	>4	-----	500	250	29	445.9	260	Fail
6404	D3241	abnormal colour	-----	-----	280.2	26	510	260	fail
6406		-----	-----	-----	-----	-----	-----	-----	-----
6519		-----	-----	-----	-----	-----	-----	-----	-----
6530	D3241	4	-----	-----	250.1	36.9	429.5	260	Fail
6539	D3241	4	-----	493.69	250.5	30	437	260	FAIL
6540	D3241	4	-----	-----	100.0	34	500	260	Fail
	n	76	16	13	76				0 Pass / 77 Fail
	mean(n)	≥3	>85	>85	>25				

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

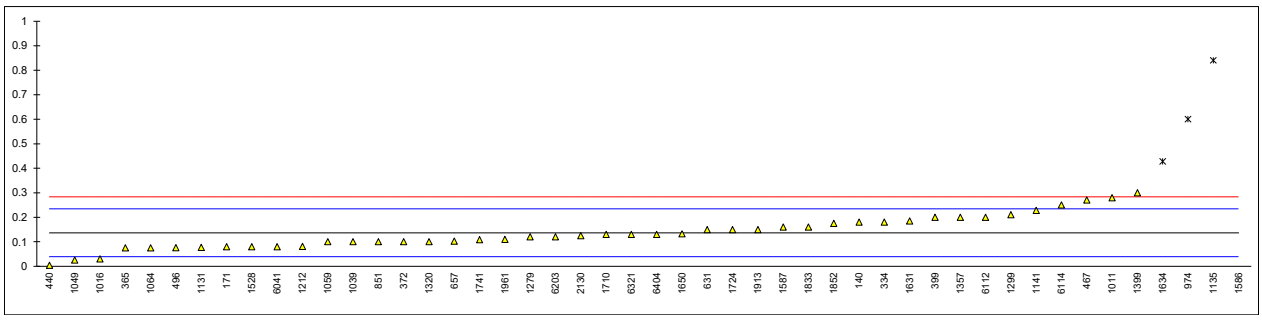


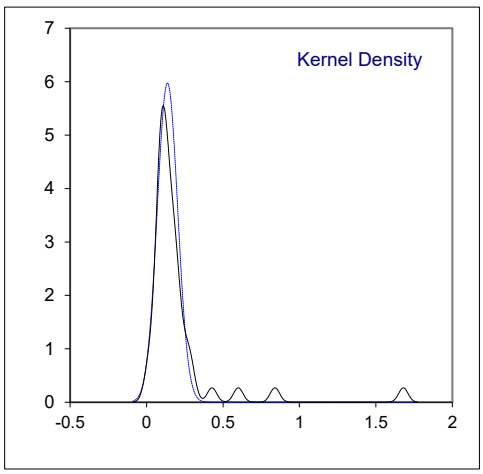


Determination of Particulate Contamination on sample #23156; Particulate matter in mg/L, Filtration time in minutes and Volume of fuel filtered in mL

lab	method	part. matter	mark	z(targ)	filtr. time (min)	vol. filtered (mL)		remarks
140	D5452	0.18		0.88	5	4000		
150		-----		-----	-----	-----		
169		-----		-----	-----	-----		
171	D5452	0.08		-1.16	8	3780	C	first reported 3.78 mL
194		-----		-----	-----	-----		
334	D5452	0.18		0.88	-----	3.8		
335	D5452	< 0.01		-----	-----	-----		
365	IP423	0.075		-1.27	5.5	4000		
372	D5452	0.10		-0.75	9	3950		
398		-----		-----	-----	-----		
399	D5452	0.20		1.29	6.0	3785		
440	D5452	0.0044		-2.71	42	4000		
467	D5452	0.27		2.73	6	3800		
496	D5452	0.076		-1.25	-----	3932.2		
631	D5452	0.150		0.27	8.7135	3988		
657	D5452	0.1028		-0.70	15	3890		
851	D5452	0.1		-0.75	6	4000		
962		-----		-----	-----	-----		
963		-----		-----	-----	-----		
974	D5452	0.6	C,R(0.01)	9.48	5	3800		first reported 0.4
1011	D5452	0.28		2.93	-----	4000		
1016	D5452	0.03		-2.19	-----	3100	C	first reported 3.1 mL
1039	D5452	0.10		-0.75	6	3900		
1049	D5452	0.025		-2.29	-----	4000		
1059	D5452	0.10		-0.75	60	3990		
1064	D5452	0.075		-1.27	5.4	4000		
1131	D5452	0.077		-1.22	20	3900		
1135	D5452	0.84	R(0.01)	14.40	4.4	3919.4		
1141	D5452	0.228		1.87	4	4000		
1212	D5452	0.0809		-1.14	5.4	3710		
1279	D5452	0.12		-0.34	20	4000		
1299	D5452	0.21		1.50	5	3790		
1320	D5452	0.10		-0.75	-----	3960		
1357	D5452	0.2		1.29	-----	3600		
1372		-----		-----	-----	-----		
1399	D5452	0.3		3.34	-----	1000		
1528	D5452	0.08		-1.16	8	4050		
1586	D5452	1.68	R(0.01)	31.59	-----	4000		
1587	D5452	0.16		0.47	-----	3800		
1610		-----		-----	-----	-----		
1631	D5452	0.185		0.99	-----	-----		
1634	D5452	0.428	R(0.01)	5.96	-----	4000	C	first reported 4.0 mL
1650	D5452	0.132		-0.10	-----	3800	C	first reported 3.8 mL
1710	D5452	0.13		-0.14	-----	-----		
1724	D5452	0.15		0.27	-----	-----		
1741	D5452	0.109		-0.57	5	4000		
1833	IP423	0.16		0.47	-----	-----		
1852	D5452	0.175		0.78	5 min 12 s	4000		
1913	D5452	0.15		0.27	-----	4000		
1961	D5452	0.11		-0.55	-----	3960		
2130	D5452	0.125		-0.24	5	4000		
6041	D5452	0.08		-1.16	-----	4000		
6112	D5452	0.20		1.29	2.18	2000		
6114	D5452	0.25		2.32	6	4000		
6168		-----		-----	-----	-----		
6174		-----		-----	-----	-----		
6203	D5452	0.12		-0.34	7.5	4000		
6238		-----		-----	-----	-----		
6321	IP423	0.13		-0.14	-----	3000		
6404	D5452	0.13		-0.14	7.14	3900		
6406		-----		-----	-----	-----		
6530		-----		-----	-----	-----		

normality	OK
n	44
outliers	4
mean (n)	0.137
st.dev. (n)	0.0668
R(calc.)	0.187
st.dev.(D5452:23)	0.0488
R(D5452:23)	0.137


1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
440 1049 1016 365 1064 496 1131 171 1528 6041 1212 1059 1039 851 372 1320 657 1741 1961 1279 6203 2130 1710 6321 6404 1650 631 1724 1913 1587 1833 1852 140 334 1631 399 1357 6112 1299 1141 6114 467 1011 1389 1634 974 1135 1586


Kernel Density
7
6
5
4
3
2
1
0
-0.5 0 0.5 1 1.5 2

APPENDIX 2 z-scores of Distillation at 760 mmHg

lab	IBP	10% rec	50% rec	90% rec	FBP
52	-2.48	-0.51	-0.92	-0.95	-0.51
62	0.22	0.03	0.20	0.37	1.66
120	-----	0.26	-0.26	-1.61	-----
140	0.56	0.57	0.48	-0.04	0.52
150	-1.42	-0.59	-0.92	-0.46	-0.71
159	0.42	0.88	0.67	-0.04	0.75
169	0.42	0.18	0.86	-0.21	0.32
171	-0.98	-0.59	-0.54	-0.79	-----
177	-1.66	-0.20	0.02	-1.28	0.08
194	-----	-----	-----	-----	-----
215	-0.70	-1.05	0.11	-1.53	-0.23
221	0.80	1.19	1.32	0.61	0.12
224	0.19	0.32	-0.41	-1.20	-0.58
225	0.83	1.66	1.04	0.53	1.34
228	-0.36	-1.05	-0.82	-0.70	1.34
235	0.63	1.73	0.67	-0.62	-1.02
237	0.66	-0.28	1.98	2.59	0.95
238	-1.04	-0.28	-0.82	0.12	0.16
253	-0.36	0.11	0.11	0.78	0.00
254	-0.36	-0.28	0.11	0.12	0.95
256	0.32	-0.28	0.11	0.94	0.16
258	0.80	-0.36	0.20	0.70	0.12
273	0.63	0.03	0.39	1.68	0.99
311	0.05	-0.20	0.02	0.28	-0.47
317	1.38	0.80	0.86	0.86	0.40
323	0.22	0.03	0.20	0.78	-0.15
328	-0.36	-0.51	-0.45	-0.87	-0.19
333	-1.08	-0.13	-0.64	-1.77	-0.59
334	-0.05	0.26	-1.10	-0.87	-0.83
335	0.19	-0.43	0.02	0.94	0.00
365	-1.11	-0.13	0.39	1.68	0.08
372	0.08	-0.13	0.11	0.20	-0.19
391	-----	-----	-----	-----	-----
396	-0.67	-0.67	-0.73	-0.87	-0.59
399	0.32	0.49	1.04	0.94	0.36
440	1.76	1.27	0.95	0.37	0.63
445	-1.62	-0.13	-1.20	0.04	-0.15
447	0.08	-0.28	-0.08	0.28	0.24
460	0.83	0.42	0.48	1.35	-0.08
467	0.32	0.18	0.39	0.70	0.08
480	0.32	0.57	0.58	0.45	-0.39
496	-0.22	0.11	0.30	0.70	-0.19
603	0.32	-0.20	0.30	0.78	0.75
631	0.32	0.11	0.11	3.00	1.94
657	0.46	0.88	1.32	1.44	0.24
704	0.32	0.49	0.58	0.12	-0.83
736	-0.36	-1.83	-0.82	-1.53	-0.63
823	-0.50	-0.05	0.20	0.45	0.08
824	0.05	-0.20	-0.45	0.20	-0.35
851	-0.09	0.26	-0.08	-0.21	-0.31
854	0.05	0.34	0.11	0.28	0.04
862	0.19	-0.13	-0.26	-0.04	0.48
869	0.46	0.18	0.30	0.45	-0.35
904	-1.62	-1.67	-2.97	-3.09	-1.46
914	-0.19	-0.28	-0.26	-0.70	0.59
962	-----	-----	-----	-----	-----
963	-----	-----	-----	-----	-----
970	-----	-----	-----	-----	-----
974	-0.02	1.19	0.95	1.68	-0.04
994	0.15	-0.67	-0.82	-1.53	0.95
995	0.32	-0.28	0.11	-1.11	-0.23
996	-0.36	-1.44	-0.36	-0.70	0.55
997	-0.02	0.49	0.11	-1.11	-0.23
1011	-0.50	-0.05	0.11	0.12	-0.31
1016	-----	-----	-----	-----	-----
1023	-----	-----	-----	-----	-----
1039	0.53	0.49	0.30	0.28	-0.15
1040	-0.16	-0.05	0.20	0.28	-0.04
1049	0.49	0.42	0.30	0.78	0.16
1059	0.66	0.11	-0.08	-0.21	-0.63
1062	-0.74	0.49	-0.17	-0.70	-0.59
1064	0.12	0.26	0.67	0.78	0.67
1065	-2.44	-3.15	3.66	1.52	4.58
1082	0.15	1.04	0.95	0.28	0.75
1097	0.60	-0.05	0.20	-0.04	-0.31

lab	IBP	10% rec	50% rec	90% rec	FBP
1105	-0.53	0.03	-0.17	-0.04	-0.75
1121	-1.11	-0.43	0.86	-0.95	0.04
1126	0.22	0.11	-0.17	-0.95	0.52
1131	0.19	0.49	0.58	0.61	-0.15
1141	-0.46	-0.51	-0.36	0.37	0.12
1182	0.42	0.34	0.48	0.70	0.28
1191	-1.18	0.26	0.02	0.04	-0.04
1205	0.36	0.42	0.30	-0.54	0.12
1212	-0.09	-0.13	0.39	0.86	0.32
1237	0.77	-0.13	-0.64	-1.03	-0.39
1275	-0.53	-0.20	-0.45	0.04	-0.55
1279	0.25	0.49	0.30	0.04	0.28
1299	-0.16	-0.51	-0.73	0.20	-0.08
1318	1.21	-0.51	-0.26	-0.13	-0.47
1320	-0.02	-0.20	-0.45	-1.28	-0.59
1357	0.97	0.73	0.58	1.19	0.08
1372	-----	-----	-----	-----	-----
1399	-1.28	-1.36	-1.48	-0.87	-0.63
1417	-0.05	-0.28	0.76	1.77	-0.23
1496	1.21	0.88	-0.54	0.12	-0.35
1528	0.97	0.65	1.04	0.70	0.24
1585	0.15	0.11	0.11	-0.70	0.16
1586	-0.22	-0.05	-0.08	0.37	0.04
1587	-0.16	0.11	-0.26	-1.03	-0.04
1610	-----	-----	-----	-----	-----
1613	0.63	0.42	-0.08	-0.79	0.00
1631	0.12	-0.59	-0.92	-1.28	-0.35
1634	-0.07	0.26	0.81	0.57	0.40
1650	-1.28	-1.05	-0.82	-0.46	0.28
1683	-0.26	-0.74	-1.29	-1.36	-0.98
1710	0.08	0.65	0.20	0.20	-0.19
1715	0.90	-1.13	-1.01	-0.04	-0.39
1720	-----	-----	-----	-----	-----
1724	-0.02	-0.05	-1.66	-0.95	-0.39
1730	-----	-----	-----	-----	-----
1741	-0.22	-0.28	0.20	0.94	0.32
1757	0.19	-0.05	-0.45	-1.11	-1.26
1776	-0.60	-0.28	0.11	0.12	-0.23
1780	-0.33	0.26	0.48	1.03	-0.75
1833	0.01	0.03	-0.64	-0.62	-0.04
1852	-0.40	0.11	0.39	-0.13	1.42
1854	0.32	-0.51	-0.82	-0.95	-0.98
1913	0.32	0.57	0.30	0.53	0.38
1961	-----	-----	-----	-----	-----
2130	-0.09	-0.28	0.11	0.78	0.04
2133	0.63	0.42	0.67	-0.04	0.24
6035	0.39	0.34	0.58	0.53	-0.47
6041	-0.70	0.80	0.48	0.86	0.00
6054	-----	-----	-----	-----	-----
6075	-----	-----	-----	-----	-----
6114	0.56	0.18	-0.26	-0.04	-0.04
6135	-0.57	0.11	-0.45	0.20	-0.15
6142	-1.49	-1.21	-1.10	-0.54	-0.04
6168	-----	-----	-----	-----	-----
6174	0.15	0.49	0.58	0.94	1.15
6203	0.53	-0.05	0.30	0.78	0.08
6238	-----	-----	-----	-----	-----
6240	-0.26	-0.05	0.39	0.04	-0.12
6266	0.12	-0.13	-0.26	-1.28	-0.35
6312	-----	-----	-----	-----	-----
6321	-0.36	-0.28	-0.17	0.04	0.04
6324	-0.53	0.49	0.11	0.12	0.16
6331	-0.12	-0.13	-0.82	-0.54	-0.27
6344	0.05	-0.74	-1.29	-1.36	-0.98
6346	-----	-----	-----	-----	-----
6364	0.36	-1.13	-1.38	-1.36	-0.67
6384	-0.36	0.03	0.39	0.78	0.16
6404	0.73	0.49	-0.45	-0.70	0.12
6406	-0.43	0.26	0.11	-0.62	-0.12
6479	-----	-----	-----	-----	-----
6519	0.80	3.36	5.99	8.60	8.13
6530	-0.36	0.03	0.20	0.70	0.04
6539	-----	-----	-----	-----	-----
6540	-0.36	0.49	0.11	0.94	0.95
6544	1.14	-0.95	-0.64	0.44	-0.07

z-scores of Particle Size Distribution, counts/mL

lab	≥4 µm	≥6 µm	≥14 µm	≥21 µm	≥25 µm	≥30 µm
140	-----	-----	-----	-----	-----	-----
150	-----	-----	-----	-----	-----	-----
171	-----	0.37	-2.07	-1.90	-1.39	-1.40
225	-----	-----	-----	-----	-----	-----
237	-----	3.58	2.66	-----	-----	-----
311	-----	-----	-----	-----	-----	-----
323	-----	-----	-----	-----	-----	-----
333	-----	3.10	0.61	-1.70	-0.82	0.18
334	-----	3.72	0.90	0.25	0.30	0.18
335	-----	-2.49	-3.30	-2.36	-1.56	-0.93
372	-----	3.63	2.68	-0.12	0.92	1.45
447	-----	-1.01	0.81	0.61	0.08	-0.45
467	-----	1.05	-0.09	-1.33	-0.88	-0.93
657	-----	2.51	-0.28	0.88	0.36	-0.77
823	-----	2.03	0.86	0.98	1.32	0.34
824	-----	0.39	-0.43	-0.49	-0.37	-0.45
862	-----	-1.04	-0.47	-0.72	-0.26	0.18
963	-----	-----	-----	-----	-----	-----
974	-----	-----	-----	-----	-----	-----
1011	-----	0.62	0.94	1.62	2.00	1.76
1016	-----	0.57	-0.71	-0.98	-0.77	-0.45
1039	-----	-2.57	1.74	4.52	6.96	6.83
1049	-----	0.86	3.31	2.17	0.92	-0.13
1062	-----	6.98	-0.04	-1.52	-0.88	-0.45
1064	-----	1.00	0.13	-1.82	-1.67	-1.08
1065	-----	-1.47	-1.18	-1.43	-1.05	-0.93
1097	-----	-0.80	-1.53	-0.55	0.25	0.18
1131	-----	2.93	0.33	0.80	1.15	0.66
1135	-----	0.19	-1.27	0.25	-0.26	-1.40
1191	-----	1.46	0.63	0.14	-0.32	-0.93
1212	-----	-0.09	0.36	-0.16	0.19	-0.61
1279	-----	-1.48	-0.69	0.35	0.02	-0.45
1299	-----	0.59	3.91	8.37	11.58	9.36
1318	-----	-0.98	-1.78	-2.13	-1.27	-0.93
1320	-----	-----	-----	-----	-----	-----
1357	-----	-4.61	-2.29	-1.97	-0.54	1.76
1399	-----	1.05	1.50	2.17	1.83	0.97
1402	-----	-0.80	0.45	0.31	0.59	-0.61
1496	-----	-0.78	-0.83	-0.66	-0.43	-0.45
1528	-----	0.62	1.88	3.56	4.31	2.56
1585	-----	-1.71	0.24	-0.86	0.30	0.82
1587	-----	-2.96	-0.50	-1.56	-1.10	-0.77
1610	-----	-----	-----	-----	-----	-----
1613	-----	0.92	0.02	0.76	1.66	2.08
1631	-----	-0.72	1.14	2.54	-----	-----
1634	-----	0.17	0.15	1.21	0.98	0.18
1710	-----	0.47	-0.24	-0.43	-0.60	-0.13
1720	-----	-----	-----	-----	-----	-----
1724	-----	-----	-----	-----	-----	-----
1741	-----	0.26	-1.30	-1.11	-0.77	-0.29
1761	-----	-1.91	-0.11	0.06	0.30	-0.39
1833	-----	-----	-----	-----	-----	-----
1852	-----	0.54	0.41	1.66	3.29	3.82
1857	-----	-1.28	0.77	0.68	2.28	1.92
1913	-----	-2.25	-0.83	-1.17	-0.82	-0.93
1961	-----	-4.18	-0.82	-0.43	-0.37	-0.61
2130	-----	-0.80	-2.48	-1.97	-1.10	-0.93
6075	-----	-----	-----	-----	-----	-----
6112	-----	-1.34	-2.65	-2.09	-1.33	-1.08
6168	-----	-----	-----	-----	-----	-----
6174	-----	-----	-----	-----	-----	-----
6203	-----	1.66	-0.27	3.40	4.59	2.08
6321	-----	-0.47	-0.52	-1.90	-1.27	-0.61
6404	-----	2.12	0.42	-0.02	-0.32	-0.77
6406	-----	-----	-----	-----	-----	-----
6519	-----	-1.70	-0.55	-0.08	0.53	1.76

APPENDIX 3 Equipment used in Particle Size distribution

lab	Equipment	Test method based on equipment	Test method reported	Calibration method reported
140				
150				
171	Stanhope-Seta	IP565	IP565	
225				
237	Stanhope-Seta	IP565	IP565	ISO11171
311				
323				
333	Stanhope-Seta	IP565	IP565	ISO11171
334	Stanhope-Seta	IP565	IP565	ISO11171
335	Stanhope-Seta	IP565	IP565	ISO11171
372	Stanhope-Seta	IP565	IP565	ISO11171
447	Stanhope-Seta	IP565	IP565	ISO11171
467	Stanhope-Seta	IP565	IP565	ISO11171
657	Stanhope-Seta	IP565	IP565	ISO11171
823	Stanhope-Seta	IP565	IP565	
824	Stanhope-Seta	IP565	IP565	ISO11171
862	Pamas	IP577	IP565	ISO11171
963				
974				
1011	Stanhope-Seta	IP565	IP565	ISO11171
1016	Stanhope-Seta	IP565	IP565	
1039	Stanhope-Seta	IP565	IP565	ISO11171
1049	Pamas	IP577	IP577	ISO11171
1062	Stanhope-Seta	IP565	IP565	ISO11171
1064	Stanhope-Seta	IP565	IP565	ISO11171
1065			IP565	
1097	Parker Hannifin	IP564	IP564	ISO11171
1131	Stanhope-Seta	IP565	IP565	ISO11171
1135	Stanhope-Seta	IP565	IP565	ISO11171
1191	Stanhope-Seta	IP565	IP565	ISO11171
1212	Seta Analytics	IP565	IP565	
1279	Stanhope-Seta	IP565	IP565	ISO11171
1299	Pamas	IP577	IP577	ISO11171
1318	Stanhope-Seta	IP565	IP565	ISO11171
1320				
1357	Stanhope-Seta	IP565	IP565	External Calibration
1399	Stanhope-Seta	IP565	IP565	ISO11171
1402	Stanhope-Seta	IP565	IP565	ISO11171
1496	Stanhope-Seta	IP565	IP565	ISO11171
1528	Stanhope-Seta	IP565	IP565	ISO11171
1585	Stanhope-Seta	IP565	IP565	ISO11171
1587	Stanhope-Seta	IP565	IP565	ISO11171
1610				
1613	Stanhope-Seta	IP565	IP565	ISO11171
1631	Stanhope-Seta	IP565	IP565	ISO11171
1634	Stanhope-Seta	IP565	IP565	ISO11171
1710	Stanhope-Seta	IP565	IP565	ISO11171
1720				
1724	Stanhope-Seta	IP565		ISO11171
1741	Stanhope-Seta	IP565	IP565	
1761	Stanhope-Seta	IP565	IP565	ISO11171
1833				
1852	Stanhope-Seta	IP565	IP565	ISO11171
1857	Stanhope-Seta	IP565	IP565	ISO11171
1913	Stanhope-Seta	IP565	IP565	ISO11171
1961	Pamas	IP577	IP577	ISO11171
2130	Parker Hannifin	IP564	IP564	ISO11171
6075				
6112	Stanhope-Seta	IP565	IP565	
6168				
6174				
6203				
6321	Stanhope-Seta	IP565	IP565	ISO11171
6404	Stanhope-Seta	IP565	IP565	ISO11171
6406				
6519	Stanhope-Seta	IP565	IP565	ISO11171

APPENDIX 4

Number of participants per country

1 lab in ALGERIA
1 lab in AUSTRIA
2 labs in AZERBAIJAN
6 labs in BELGIUM
1 lab in BULGARIA
2 labs in CANADA
8 labs in CHINA, People's Republic
3 labs in COLOMBIA
1 lab in CONGO Brazzaville
2 labs in COTE D'IVOIRE
2 labs in DENMARK
1 lab in DJIBOUTI
1 lab in EGYPT
1 lab in ESTONIA
2 labs in FINLAND
7 labs in FRANCE
2 labs in GEORGIA
4 labs in GERMANY
6 labs in GREECE
1 lab in GUAM
1 lab in GUINEA REPUBLIC
1 lab in HONG KONG
2 labs in HUNGARY
1 lab in INDIA
2 labs in IRELAND
1 lab in ISRAEL
4 labs in ITALY
1 lab in JORDAN
1 lab in KAZAKHSTAN
2 labs in KENYA
1 lab in KINGDOM OF BAHRAIN
3 labs in KOREA, Republic of
1 lab in LITHUANIA
1 lab in MALAYSIA
1 lab in MALTA
1 lab in MARTINIQUE
1 lab in MAURITIUS
1 lab in MOZAMBIQUE
9 labs in NETHERLANDS
2 labs in NIGERIA
1 lab in NORTH MACEDONIA, Republic of
2 labs in NORWAY
2 labs in OMAN
2 labs in PAKISTAN
1 lab in PERU
1 lab in PHILIPPINES
3 labs in POLAND
2 labs in PORTUGAL
2 labs in ROMANIA
2 labs in RUSSIAN FEDERATION
2 labs in SAUDI ARABIA
1 lab in SENEGAL
2 labs in SERBIA
1 lab in SINGAPORE
2 labs in SLOVAKIA
2 labs in SLOVENIA
2 labs in SOMALIA
2 labs in SOUTH AFRICA
4 labs in SPAIN
1 lab in SUDAN
4 labs in SWEDEN
3 labs in TANZANIA
1 lab in TOGO
1 lab in TUNISIA
4 labs in TURKEY
1 lab in TURKMENISTAN
1 lab in UKRAINE
2 labs in UNITED ARAB EMIRATES
13 labs in UNITED KINGDOM
8 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) or R(1)	= outlier in Rosner's outlier test
R(0.05) or R(5)	= straggler in Rosner's outlier test
E	= calculation difference between reported test result and result calculated by iis
W	= test result withdrawn on request of participant
ex	= test result excluded from statistical evaluation
n.a.	= not applicable
n.e.	= not evaluated
n.d.	= not detected
fr.	= first reported
f+?	= possibly a false positive test result?
f-?	= possibly a false negative test result?
SDS	= Safety Data Sheet

Literature

1 iis Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, June 2018
2 ISO5725:86
3 ISO5725 parts 1-6:94
4 ISO13528:05
5 M. Thompson and R. Wood, J. AOAC Int, 76, 926, (1993)
6 W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)
7 P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)
8 J.N. Miller, Analyst, 118, 455, (1993)
9 Analytical Methods Committee, Technical Brief, No 4, January 2001
10 P.J. Lowthian and M. Thompson, The Royal Society of Chemistry, Analyst, 127, 1359-1364, (2002)
11 W. Horwitz and R. Albert, J. AOAC Int, 79.3, 589-621, (1996)
12 Bernard Rosner, Percentage Points for a Generalized ESD Many-Outlier Procedure, Technometrics, 25(2), 165-172, (1983)
13 Joel Schmitigal and Jill Bramer, Field Evaluation of Particle Counter Technology for Aviation Fuel Contamination Detection, US Army TARDEC, Technical Report 23966, (June 2013)