Institute for
Interlaboratory Studies

# Results of Proficiency Test
# Jet Fuel A1
# September 2022


**Organized by:** Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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**Report:** iis22J02

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**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 Particle Size Distribution, BOCLE, FAME, JFTOT and Particulate Contamination. During the annual proficiency testing program 2022/2023 it was decided to continue the round robin for the analysis of Jet Fuel A1.

In this interlaboratory study registered for participation:
- 151 laboratories in 63 countries for regular analyzes in Jet Fuel A1 iis22J02
- 27 laboratories in 15 countries on the BOCLE determination iis22J02BOCLE
- 60 laboratories in 33 countries on the Particle Size determination iis22J02PS
- 74 laboratories in 36 countries on the FAME determination iis22J02FAME
- 93 laboratories in 48 countries on the JFTOT determination iis22J02JF
- 54 laboratories in 31 countries on the Particulate Contamination determination iis22J02CP

In total 168 laboratories in 66 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 an ISO/IEC17025 accredited laboratory.
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 |
|---|---|---|---|
| #22150 | iis22J02 | 2x 1 L | Regular analyzes |
| #22151 | iis22J02BOCLE | 1x 250 mL | BOCLE |
| #22152 | iis22J02PS | 1x 0.5 L | Particle Size Distribution |
| #22153 | iis22J02FAME | 1x 100 mL | FAME |
| #22154 | iis22J02FAME | 1x 100 mL | FAME |
| #22155 | iis22J02JF | 1x 1 L, 70% filled | JFTOT |
| #22156 | iis22J02CP | 4x 1 L | Particulate Contamination |

Table 1: Jet Fuel samples used in PT iis22J02

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 500 liters of Jet Fuel A1 was obtained from a third party. After homogenization 350 amber glass bottles of 1 L were filled and labelled #22150.
The homogeneity of the subsamples was checked by the determination of Density at 15 °C in accordance with ASTM D4052 on 10 stratified randomly selected subsamples.

| | Density at 15 °C in kg/m$^3$ |
|---|---|
| sample #22150-1 | 803.40 |
| sample #22150-2 | 803.40 |
| sample #22150-3 | 803.39 |
| sample #22150-4 | 803.40 |
| sample #22150-5 | 803.39 |
| sample #22150-6 | 803.40 |
| sample #22150-7 | 803.39 |
| sample #22150-8 | 803.40 |
| sample #22150-9 | 803.40 |
| sample #22150-10 | 803.39 |

Table 2: homogeneity test results of subsamples #22150

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 3: evaluation of the repeatability of subsamples #22150

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 13 liters of Jet Fuel A1 was obtained from a local refinery. After homogenization 45 amber glass bottles of 250 mL were filled and labelled #22151.
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 #22151-1 | 814.13 |
| sample #22151-2 | 814.13 |
| sample #22151-3 | 814.12 |
| sample #22151-4 | 814.14 |
| sample #22151-5 | 814.13 |
| sample #22151-6 | 814.14 |
| sample #22151-7 | 814.13 |
| sample #22151-8 | 814.13 |

Table 4: homogeneity test results of subsamples #22151

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 5: evaluation of the repeatability of subsamples #22151

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 85 liters of Jet Fuel A1 was obtained from a third party. After homogenization 100 amber glass bottles of 0.5 L were filled and labelled #22152. 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 | > 14 µm (c) counts/mL |
|---|---|---|---|
| sample #22152-1 | 9191 | 3413 | 134 |
| sample #22152-2 | 9436 | 3589 | 156 |
| sample #22152-3 | 9534 | 3583 | 147 |
| sample #22152-4 | 9494 | 3580 | 142 |
| sample #22152-5 | 9726 | 3672 | 126 |
| sample #22152-6 | 9459 | 3496 | 124 |
| sample #22152-7 | 9664 | 3668 | 153 |
| sample #22152-8 | 9677 | 3655 | 153 |

Table 6: homogeneity test results of subsamples #22152

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 seventeen iis PTs of IP565 test data from 2014 - 2022 in agreement with the procedure of ISO13528, Annex B2 in the next table.

| | > 4 µm (c) | > 6 µm (c) | > 14 µm (c) |
|---|---|---|---|
| RSD% (observed) | 2 | 3 | 9 |
| reference method | iis PTs | iis PTs | iis PTs |
| 0.3 x RSD% (reference method) | 5 | 7 | 10 |

Table 7: evaluation of the relative standard deviations of subsamples #22152

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 low(er) and one with a high(er) level of FAME. For the low(er) level of FAME a batch of approximately 20 liters of Jet Fuel A1 was made available from the retain materials from earlier PTs on Jet Fuel A1 FAME. After homogenization 95 amber glass bottles of 100 mL were filled and labelled #22153.
For the high(er) level of FAME a batch of approximately 20 liters of Jet Fuel A1 was made available from the retain materials from earlier PTs on Jet Fuel A1 FAME. After homogenization 95 amber glass bottles of 100 mL were filled and labelled #22154.
The homogeneity of the subsamples #22153 and #22154 was checked by the determination of FAME in accordance with method IP585 on 8 stratified randomly selected subsamples.

| | FAME in mg/kg #22153 | FAME in mg/kg #22154 |
|---|---|---|
| sample 1 | 20.7 | 48.1 |
| sample 2 | 20.3 | 48.3 |
| sample 3 | 19.3 | 46.6 |
| sample 4 | 20.1 | 46.9 |
| sample 5 | 20.6 | 47.3 |
| sample 6 | 20.7 | 46.2 |
| sample 7 | 20.1 | 40.9 D(0.01) |
| sample 8 | 20.3 | 47.6 |

Table 8: homogeneity test results of subsamples #22153 and #22154

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 #22153 | FAME in mg/kg #22154 |
|---|---|---|
| r (observed) | 1.3 | 2.2 |
| reference test method | IP585:10 | IP585:10 |
| 0.3 x R (reference test method) | 1.8 | 3.9 |

Table 9: evaluation of the repeatabilities of subsamples #22153 and #22154

Subsample #22154-7 is a Dixon outlier and therefore excluded for statistical evaluation of the homogeneity.

The calculated repeatabilities are in agreement with 0.3 times the corresponding reproducibility of the reference test methods. 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 140 liters of Jet Fuel was made positive. After homogenization 130 amber glass bottles of 1 L were filled at a level of 70% and labelled #22155.
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 #22155-1 | 803.41 |
| sample #22155-2 | 803.42 |
| sample #22155-3 | 803.41 |
| sample #22155-4 | 803.42 |
| sample #22155-5 | 803.41 |
| sample #22155-6 | 803.41 |
| sample #22155-7 | 803.42 |
| sample #22155-8 | 803.41 |

Table 10: homogeneity test results of subsamples #22155

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 11: evaluation of the repeatability of subsamples #22155

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 #22156.
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 #22156-1 | 791.44 |
| sample #22156-2 | 791.44 |
| sample #22156-3 | 791.44 |
| sample #22156-4 | 791.44 |
| sample #22156-5 | 791.45 |
| sample #22156-6 | 791.44 |
| sample #22156-7 | 791.44 |
| sample #22156-8 | 791.44 |

Table 12: homogeneity test results of subsamples #22156

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 13: evaluation of the repeatability of subsamples #22156

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 17, 2022. 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 #22150: Appearance, Total Acidity, Aromatics by FIA, Mono Aromatics (MAH), Di Aromatics (DAH) and Total Aromatics by HPLC, 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), 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 #22151 it was requested to determine: Wear Scar Diameter.
On sample #22152 it was requested to determine: Particle Size Distribution.
On samples #22153 and #22154 it was requested to determine: FAME content.
On sample #22155 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:

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

## 4 EVALUATION

In this proficiency test some problems were encountered with the dispatch of the samples.
For the regular analyzes Jet Fuel A1 thirteen participants reported test results after the final reporting date and seventeen other participants did not report any test results.
For the BOCLE round eight participants did not report any test results.
For the Particle Size Distribution round three participants reported test results after the final reporting date and sixteen other participants did not report any test results.
For the FAME round nine participants reported test results after the final reporting date and nineteen other participants did not report any test results.
For the JFTOT round six participants reported test results after the final reporting date and twentythree other participants did not report any test results.
For the Particulate Contamination round four participants reported test results after the final reporting date and eleven other participants did not report any test results.
Not all participants were able to report all tests requested.
In total 168 participants reported 2754 numerical test results. Observed were 48 outlying test results, which is 1.7%. 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 6.

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 D1655:22. One must keep in mind that ISO test methods are not mentioned in the “Checklist”.

**sample #22150**

Appearance: This determination was not problematic. All reporting participants agreed about the appearance being Clear and Bright (Pass).

Total Acidity: This determination was problematic. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D3242:11R17.

Aromatics by FIA: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with ASTM D1319:20a.

Mono Aromatics (MAH) by HPLC: This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D6379:21e1.

Di Aromatics (DAH) by HPLC: This determination was very problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not at all in agreement with the requirements of ASTM D6379:21e1.

Total Aromatics by HPLC in %M/M: This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D6379:21e1.

Total Aromatics by HPLC in %V/V: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D6379:21e1.

Color Saybolt (automated): The determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D6045:20.
When the test results were evaluated separately for a 50 mm and 100 mm cell both calculated reproducibilities are in agreement.

Color Saybolt (manual): The determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of of ASTM D156:15.

Copper Corrosion: This determination was not problematic. All reporting participants agreed on a test result of 1 (1a/1b).

Density at 15 °C: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier in agreement with the requirements of ASTM D4052:22.

Distillation at 760 mmHg: This determination may be problematic dependent on the method used. Five statistical outliers were observed over five parameters. The calculated reproducibilities after rejection of the statistical outliers are all in agreement with the requirements of the automated method of ASTM D86:20b.
When compared to the manual method requirements of ASTM D86:20b the calculated reproducibility is only for IBP not in agreement.

Existent Gum (unwashed): This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with ASTM D381:22 and IP540:08R19.

Flash Point: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of IP170:21.

Freezing Point: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D2386:19.

Kinematic Viscosity at -20 °C: This determination was very problematic. Seven statistical outliers were observed. It was decided not to calculate z-scores as the calculated reproducibility was too large compared to the requirements ASTM D445:21e1 and IP71-1:20.
The requirements of ASTM D445 and IP71 were updated and these requirements became very strict compared to previous versions of the requirements ASTM D445:19 and IP71-1:96 respectively.

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

MSEP: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D3948:20.

Naphthalenes: This determination was not problematic. Six statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D1840:07R17 procedure B and A.

Smoke Point: This determination may be problematic depending on the procedure used. No statistical outliers were observed. The calculated reproducibility 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: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D3338:20a.

Total Sulfur: This determination may be problematic depending on the procedure used. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5453:19a nor with ASTM D2622:21 but is in agreement with ASTM D4294:21.

**sample #22151**

BOCLE: This determination may be problematic depending on the procedure used. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D5001:19e1 semi-automated but is not in agreement with ASTM D5001:19e1 full-automated.
When the test results were evaluated separately for semi-automated and full-automated methods, the calculated reproducibility for full-automated is still not in agreement with the requirements of ASTM D5001:19e1 full-automated.

**sample #22152 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. Four participants used IP577 and one participant used IP564 which is not mentioned in the Checklist as test method since 2020. The test results from IP577 and IP564 were excluded from statical evaluation as it was observed in previous iis PTs that IP577 as well as IP564 give deviating results compared to IP565.
It is observed that all of the reporting participants used ISO11171 for the calibration and almost all of the reporting participants used ISO4406 for calculating the scale numbers from the counts per mL.

IP counts: This determination may be problematic depending on the particle size channel used. No statistical outliers were observed but thirty-nine test results were excluded over six parameters. The calculated reproducibilities after rejection of the suspect data are in agreement with the requirements of IP565:13 for ≥6 µm(c) and ≥14 µm(c) but are not in agreement for ≥4 µm(c), ≥21 µm(c), ≥25 µm(c) and ≥30 µm(c).

ISO class: The determination expressed in ISO scale numbers may be problematic. No statistical outliers were observed but twenty-one test results were excluded over three parameters. The calculated reproducibilities after rejection of the suspect data are in agreement with the indicative requirements of IP565:13 Annex C for particle size channels ≥4 µm(c) and ≥6 µm(c) but is not in agreement for particle size channel ≥14 µm(c).

**sample #22153 FAME content determination**

GCMS/HPLC: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of IP585:21 or IP590:10.
When the test results were evaluated separately for IP585 or IP590 the calculated reproducibilities are in agreement with the respective requirements of IP585:21 or IP590:10.

FTIR: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of IP583:15.

**sample #22154 FAME content determination**

GCMS/HPLC: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of IP585:21 or IP590:10.
When the test results were evaluated separately for IP585 and IP590 the calculated reproducibilities are still not in agreement with the respective requirements.

FTIR: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of IP583:15.

**sample #22155 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) almost all laboratories would rate the sample as a fail, while 5 laboratories would rate it as a pass.

**sample #22156**

Particulate Contamination: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of the ASTM D5452:20.

### 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 | | 101 | Cl&Br (Pass) | n.a. | n.a. |
| Total Acidity | mg KOH/g | 83 | 0.0015 | 0.0021 | 0.0016 |
| Aromatics by FIA | %V/V | 58 | 18.9 | 2.2 | 3.1 |
| Mono Aromatics (MAH) by HPLC | %M/M | 34 | 21.4 | 1.7 | 1.3 |
| Di Aromatics (DAH) by HPLC | %M/M | 36 | 1.04 | 0.34 | 0.16 |
| Total Aromatics by HPLC | %M/M | 34 | 22.4 | 2.0 | 1.4 |
| Total Aromatics by HPLC | %V/V | 45 | 20.2 | 1.7 | 1.2 |
| Color Saybolt (automated) | | 41 | 30.0 | 0.6 | 1.2 |
| Color Saybolt (manual) | | 44 | 29.9 | 0.8 | 2 |
| Copper Corrosion 2 hrs at 100 °C | | 104 | 1 (1a/1b) | n.a. | n.a. |
| Density at 15 °C | kg/m$^3$ | 123 | 803.4 | 0.3 | 0.5 |
| Initial Boiling Point | °C | 119 | 150.5 | 6.6 | 8.3 |
| Temp at 10% recovered | °C | 119 | 170.3 | 2.6 | 3.7 |
| Temp at 50% recovered | °C | 120 | 195.7 | 2.2 | 3.0 |
| Temp at 90% recovered | °C | 119 | 232.9 | 2.8 | 3.5 |
| Final Boiling Point | °C | 117 | 252.9 | 4.1 | 7.1 |
| Existent Gum (unwashed) | mg/100mL | 58 | 0.6 | 0.9 | 3.1 |
| Flash Point | °C | 123 | 43.4 | 3.1 | 3.2 |
| Freezing Point | °C | 103 | -55.5 | 1.9 | 2.5 |
| Kinematic Viscosity at -20 °C | mm$^2$/s | 80 | 3.738 | 0.101 | (0.018) |
| Mercaptan Sulfur as S | %M/M | 74 | 0.0004 | 0.0002 | 0.0003 |
| MSEP | | 95 | 95.9 | 6.2 | 7.0 |
| Naphthalenes | %V/V | 59 | 0.72 | 0.05 | 0.08 |
| Smoke Point | mm | 99 | 22.7 | 3.0 | 3.6 |
| Specific Energy (Net) | MJ/kg | 63 | 43.196 | 0.040 | 0.046 |
| Total Sulfur | mg/kg | 99 | 352 | 67 | 47 |
| BOCLE | mm | 18 | 0.65 | 0.05 | 0.06 |

Table 14: reproducibilities of tests on samples #22150 and #22151

For results between brackets no z-scores are calculated.

| Parameter | unit | n | average | 2.8 * sd | R(lit) |
|---|---|---|---|---|---|
| Particle Size ≥4 µm (c) | counts/mL | 37 | 14672 | 3575 | 1660 |
| Particle Size ≥6 µm (c) | counts/mL | 36 | 4405 | 1032 | 978 |
| Particle Size ≥14 µm (c) | counts/mL | 36 | 155 | 89 | 89 |
| Particle Size ≥21 µm (c) | counts/mL | 36 | 20 | 26 | 18 |
| Particle Size ≥25 µm (c) | counts/mL | 36 | 7 | 13 | 8 |
| Particle Size ≥30 µm (c) | counts/mL | 35 | 2 | 5 | 3 |
| Particle Size ≥4 µm (c) | ISO scale | 31 | 21.0 | 0.0 | 1.0 |
| Particle Size ≥6 µm (c) | ISO scale | 31 | 19.1 | 0.7 | 1.0 |
| Particle Size ≥14 µm (c) | ISO scale | 31 | 14.5 | 1.6 | 1.4 |

Table 15: reproducibilities of tests on sample #22152 according to IP565

| Parameter | unit | n | average | 2.8 * sd | R(lit) |
|---|---|---|---|---|---|
| FAME content GCMS/HPLC | mg/kg | 35 | 23.4 | 8.0 | 6.8 |
| FAME content FTIR | mg/kg | 19 | 31.2 | 4.8 | 6.5 |

Table 16: reproducibilities of tests on sample #22153

| Parameter | unit | n | average | 2.8 * sd | R(lit) |
|---|---|---|---|---|---|
| FAME content GCMS/HPLC | mg/kg | 34 | 56.2 | 19.9 | 15.3 |
| FAME content FTIR | mg/kg | 19 | 63.6 | 12.4 | 8.1 |

Table 17: reproducibilities of tests on sample #22154

| Parameter | unit | n | average | 2.8 * sd | R(lit) |
|---|---|---|---|---|---|
| Copper as Cu | µg/kg | 4 | >500 | n.e. | n.e. |
| VTR (visual) | | 44 | >2 | n.a. | n.a. |
| ITR (interferometric) | Nm | 3 | >85 | n.a. | n.a. |
| ETR (elliptometric) | nm | 5 | >85 | n.a. | n.a. |
| Delta P | mmHg | 55 | >25 | n.a. | n.a. |
| JFTOT Evaluation (Pass/Fail) | | 51 | Fail | n.a. | n.a. |
| Particulate Contamination | mg/L | 42 | 0.34 | 0.32 | 0.34 |

Table 18: reproducibilities of tests on sample #22155 and #22156

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 2022 WITH PREVIOUS PTS

| | September 2022 | March 2022 | September 2021 | March 2021 | September 2020 |
|---|---|---|---|---|---|
| Number of reporting laboratories | 168 | 80 | 160 | 91 | 152 |
| Number of test results | 2754 | 1400 | 3091 | 1676 | 2992 |
| Number of statistical outliers | 48 | 28 | 42 | 58 | 94 |
| Percentage of statistical outliers | 1.7% | 2.0% | 1.4% | 3.5% | 3.1% |

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 2022 | March 2022 | September 2021 | March 2021 | September 2020 |
|---|---|---|---|---|---|
| Total Acidity | - | +/- | - | - | - |
| Aromatics by FIA | + | + | + | + | + |
| Aromatics by HPLC | - | - | - | + | + |
| Color Saybolt (automated) | ++ | -- | -- | -- | -- |

| Parameter | September 2022 | March 2022 | September 2021 | March 2021 | September 2020 |
|---|---|---|---|---|---|
| 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 | - | - | - | + | + |
| BOCLE | + | n.a. | - | n.a. | +/- |
| PC | | | | | |
| 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 #22150;

| lab | method | value | z(targ) | lab | method | value | z(targ) |
|---|---|---|---|---|---|---|---|
| 52 | Visual | C & B | ----- | 1062 | | ----- | ----- |
| 62 | Visual | pass | ----- | 1064 | Visual | C&B | ----- |
| 120 | Visual | C&B | ----- | 1065 | | ----- | ----- |
| 140 | Visual | C&B | ----- | 1082 | | ----- | ----- |
| 150 | Visual | Clear, Bright, free from solid matter | ----- | 1097 | Visual | Clair et limpide | ----- |
| 159 | Visual | C&B | ----- | 1105 | Visual | C&B | ----- |
| 169 | Visual | Pass | ----- | 1109 | | ----- | ----- |
| 171 | Visual | Clear & Bright | ----- | 1121 | Visual | Clear & Bright | ----- |
| 175 | D4176 | C+B (Pass) | ----- | 1126 | | ----- | ----- |
| 177 | | ----- | ----- | 1140 | Visual | C&B | ----- |
| 215 | Visual | claire et limpide | ----- | 1182 | | ----- | ----- |
| 221 | Visual | Clear & Brigth | ----- | 1191 | D4176-1 | Pass | ----- |
| 224 | | ----- | ----- | 1205 | | ----- | ----- |
| 225 | Visual | Clear & Bright | ----- | 1237 | Visual | clear and bright | ----- |
| 228 | Visual | clear and bright | ----- | 1275 | Visual | CBFSMW *) | ----- |
| 235 | Visual | C&B | ----- | 1279 | | ----- | ----- |
| 237 | Visual | C&B | ----- | 1299 | Visual | CL&BR | ----- |
| 238 | Visual | Bright & Clear | ----- | 1316 | | ----- | ----- |
| 253 | Visual | Clear & Bright | ----- | 1318 | Visual | Clear and bright | ----- |
| 254 | Visual | Clear & bright | ----- | 1320 | Visual | Clear&Bright | ----- |
| 256 | Visual | Clear & bright | ----- | 1357 | Visual | Clear & Bright | ----- |
| 258 | | ----- | ----- | 1372 | Visual | C&B | ----- |
| 273 | Visual | Clear & Bright | ----- | 1397 | | ----- | ----- |
| 311 | Visual | clear | ----- | 1399 | | ----- | ----- |
| 317 | Visual | Br/Cl | ----- | 1412 | Visual | Clear&Bright | ----- |
| 323 | Visual | ACBFFSOUW | ----- | 1417 | Visual | Clear & Bright | ----- |
| 328 | Visual | C&B | ----- | 1444 | Visual | Clear | ----- |
| 333 | | ----- | ----- | 1455 | Visual | Bright and Clear | ----- |
| 334 | Visual | clear & bright | ----- | 1496 | | ----- | ----- |
| 335 | Visual | CL&B | ----- | 1538 | | ----- | ----- |
| 365 | Visual | C+B | ----- | 1575 | Visual | C&B | ----- |
| 372 | Visual | C & B | ----- | 1585 | Visual | clear & bright | ----- |
| 391 | Visual | C&B | ----- | 1586 | Visual | clear & bright | ----- |
| 396 | Visual | Clear & Bright | ----- | 1587 | | Br&Cl | ----- |
| 399 | Visual | C&B | ----- | 1610 | Visual | Bright & Clear | ----- |
| 440 | Visual | Clear and Bright | ----- | 1613 | Visual | B&C | ----- |
| 445 | Visual | C&B | ----- | 1616 | Visual | Clear & Bright | ----- |
| 447 | Visual | Clear & Bright | ----- | 1631 | | ----- | ----- |
| 460 | | ----- | ----- | 1634 | Visual | C&B | ----- |
| 467 | Visual | Clear & Bright | ----- | 1636 | Visual | C&B | ----- |
| 480 | | ----- | ----- | 1669 | Visual | CyB | ----- |
| 496 | Visual | clear&bright | ----- | 1683 | D6986 | pasa | ----- |
| 603 | | Clear & Bright | ----- | 1688 | Visual | clear | ----- |
| 608 | Visual | C&B and visually free from solid matter | ----- | 1715 | | ----- | ----- |
| 631 | Visual | clear & bright | ----- | 1720 | | ----- | ----- |
| 657 | Visual | Bright & Clear | ----- | 1724 | Visual | Clear and bright | ----- |
| 736 | Visual | clear and bright | ----- | 1730 | | ----- | ----- |
| 823 | Visual | C&B | ----- | 1757 | | ----- | ----- |
| 824 | Visual | Clear & Bright | ----- | 1776 | | ----- | ----- |
| 851 | D4176 | Bright & Clear | ----- | 1833 | In house | C&B | ----- |
| 854 | | ----- | ----- | 1852 | Visual | Bright, clear | ----- |
| 862 | | ----- | ----- | 1913 | | ----- | ----- |
| 869 | | ----- | ----- | 1944 | Visual | clear | ----- |
| 904 | Visual | C&B | ----- | 1961 | | ----- | ----- |
| 914 | Visual | Clear and Bright | ----- | 2130 | Visual | C&B | ----- |
| 962 | Visual | Clear & Bright | ----- | 2133 | Visual | Clear & Bright | ----- |
| 963 | Visual | Bright & Clear | ----- | 6028 | | ----- | ----- |
| 970 | Visual | Clear & Bright | ----- | 6041 | | ----- | ----- |
| 974 | Visual | Clear & Bright | ----- | 6054 | | ----- | ----- |
| 994 | Visual | c & b | ----- | 6075 | Visual | Clear & Bright | ----- |
| 995 | Visual | C&B | ----- | 6114 | Visual | Clear & Bright | ----- |
| 996 | | ----- | ----- | 6135 | | ----- | ----- |
| 997 | Visual | Clear&Bright | ----- | 6142 | Visual | C&B | ----- |
| 1011 | | ----- | ----- | 6203 | Visual | Clear & Bright | ----- |
| 1016 | | ----- | ----- | 6244 | | ----- | ----- |
| 1019 | | ----- | ----- | 6266 | | ----- | ----- |
| 1023 | Visual | Clear and bright | ----- | 6274 | | ----- | ----- |
| 1039 | Visual | Clear & Bright | ----- | 6312 | | ----- | ----- |
| 1040 | | ----- | ----- | 6315 | Visual | clear, bright | ----- |
| 1049 | Visual | Br & Cl | ----- | 6321 | | ----- | ----- |
| 1059 | Visual | clear & bright | ----- | 6324 | Visual | clear and bright | ----- |

| lab | method | value | z(targ) | lab | method | value | z(targ) |
|---|---|---|---|---|---|---|---|
| 6332 | Visual | Clear and Bright | ----- | 6421 | | ----- | ----- |
| 6344 | | ----- | ----- | 6438 | Visual | Clear, bright and free from solid matter | ----- |
| 6346 | | ----- | ----- | 6479 | | ----- | ----- |
| 6364 | Visual | Clear & Bright | ----- | 6487 | | ----- | ----- |
| 6384 | | ----- | ----- | | | | |

| | |
|---|---|
| n | 101 |
| mean (n) | Clear and Bright (Pass) |

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

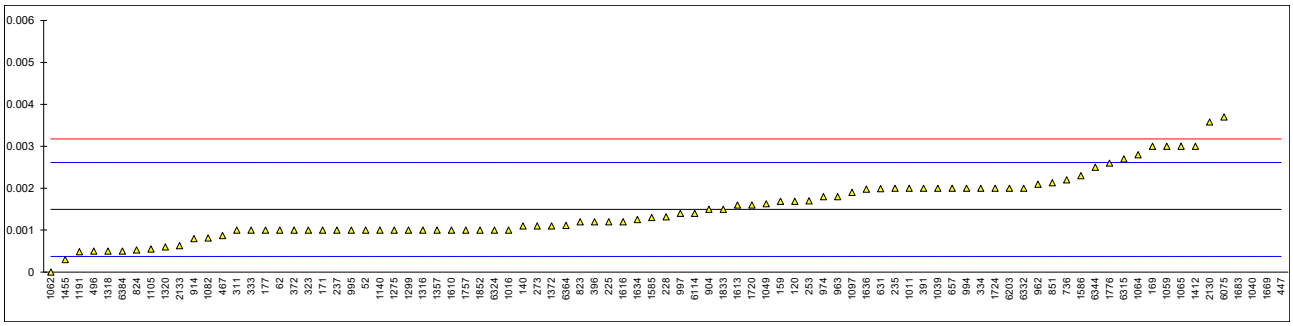
## Determination of Total Acidity on sample #22150; results in mg KOH/g

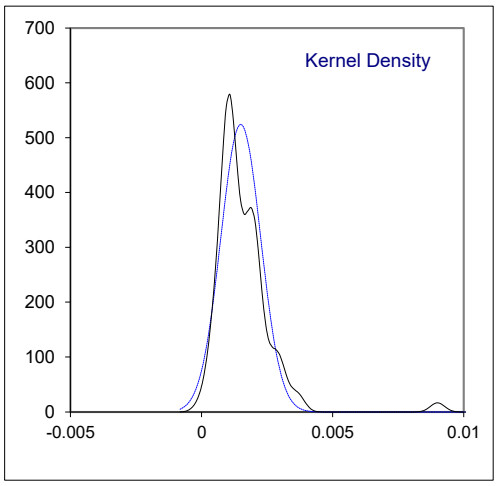
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | D3242 | 0.001 | | -0.88 | 1062 | D3242 | 0 | | -2.67 |
| 62 | D3242 | 0.001 | | -0.88 | 1064 | D3242 | 0.0028 | | 2.33 |
| 120 | D3242 | 0.00169 | C | 0.35 | 1065 | D664-A | 0.003 | | 2.69 |
| 140 | D3242 | 0.0011 | | -0.70 | 1082 | D3242 | 0.000814 | | -1.21 |
| 150 | | ----- | | ----- | 1097 | D3242 | 0.0019 | | 0.73 |
| 159 | D3242 | 0.00169 | C | 0.35 | 1105 | D3242 | 0.00055 | | -1.68 |
| 169 | D3242 | 0.003 | | 2.69 | 1109 | | ----- | | ----- |
| 171 | D3242 | 0.001 | | -0.88 | 1121 | | ----- | | ----- |
| 175 | | ----- | | ----- | 1126 | | ----- | | ----- |
| 177 | D3242 | 0.001 | | -0.88 | 1140 | D3242 | 0.001 | | -0.88 |
| 215 | | ----- | | ----- | 1182 | | ----- | | ----- |
| 221 | | ----- | | ----- | 1191 | D3242 | 0.000488 | | -1.79 |
| 224 | | ----- | | ----- | 1205 | | ----- | | ----- |
| 225 | D3242 | 0.0012 | | -0.52 | 1237 | | ----- | | ----- |
| 228 | D3242 | 0.00132 | | -0.31 | 1275 | IP354 | 0.001 | | -0.88 |
| 235 | D3242 | 0.002 | | 0.90 | 1279 | | ----- | | ----- |
| 237 | D3242 | 0.001 | | -0.88 | 1299 | D3242 | 0.001 | | -0.88 |
| 238 | | ----- | | ----- | 1316 | D3242 | 0.001 | | -0.88 |
| 253 | D3242 | 0.0017 | | 0.37 | 1318 | D3242 | 0.0005 | | -1.77 |
| 254 | | ----- | | ----- | 1320 | D3242 | 0.0006 | | -1.59 |
| 256 | | ----- | | ----- | 1357 | D3242 | 0.001 | | -0.88 |
| 258 | | ----- | | ----- | 1372 | | 0.0011 | | -0.70 |
| 273 | D3242 | 0.0011 | | -0.70 | 1397 | | ----- | | ----- |
| 311 | D3242 | 0.001 | | -0.88 | 1399 | | ----- | | ----- |
| 317 | | ----- | | ----- | 1412 | D3242 | 0.003 | | 2.69 |
| 323 | D3242 | 0.001 | | -0.88 | 1417 | | ----- | | ----- |
| 328 | | ----- | | ----- | 1444 | | ----- | | ----- |
| 333 | D3242 | 0.001 | | -0.88 | 1455 | D3242 | 0.0003 | | -2.13 |
| 334 | D3242 | 0.002 | | 0.90 | 1496 | | ----- | | ----- |
| 335 | | ----- | | ----- | 1538 | | ----- | | ----- |
| 365 | | ----- | | ----- | 1575 | | ----- | | ----- |
| 372 | D3242 | 0.001 | | -0.88 | 1585 | D3242 | 0.0013 | | -0.35 |
| 391 | D3242 | 0.002 | | 0.90 | 1586 | D3242 | 0.0023 | C | 1.44 |
| 396 | D3242 | 0.0012 | | -0.52 | 1587 | | ----- | | ----- |
| 399 | | ----- | | ----- | 1610 | IP354 | 0.001 | | -0.88 |
| 440 | | ----- | | ----- | 1613 | D3242 | 0.0016 | | 0.19 |
| 445 | | ----- | | ----- | 1616 | D3242 | 0.0012 | | -0.52 |
| 447 | D3242 | 0.033 | R(0.01) | 56.23 | 1631 | | ----- | | ----- |
| 460 | | ----- | | ----- | 1634 | D3242 | 0.00125 | | -0.43 |
| 467 | D3242 | 0.00087 | | -1.11 | 1636 | D3242 | 0.00198 | | 0.87 |
| 480 | | ----- | | ----- | 1669 | D3242 | 0.032 | R(0.01) | 54.44 |
| 496 | D3242 | 0.0005 | | -1.77 | 1683 | D3242 | 0.009 | C,R(0.01) | 13.40 |
| 603 | | ----- | | ----- | 1688 | | ----- | | ----- |
| 608 | | ----- | | ----- | 1715 | | ----- | | ----- |
| 631 | D3242 | 0.00199 | | 0.89 | 1720 | D3242 | 0.0016 | | 0.19 |
| 657 | D3242 | 0.002 | | 0.90 | 1724 | D3242 | 0.002 | | 0.90 |
| 736 | D3242 | 0.0022 | | 1.26 | 1730 | | ----- | | ----- |
| 823 | D3242 | 0.0012 | | -0.52 | 1757 | D3242 | 0.001 | | -0.88 |
| 824 | D3242 | 0.00053 | | -1.72 | 1776 | D3242 | 0.0026 | | 1.97 |
| 851 | D3242 | 0.00213 | | 1.14 | 1833 | | 0.0015 | | 0.01 |
| 854 | | ----- | | ----- | 1852 | D3242 | 0.0010 | | -0.88 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | | ----- | | ----- |
| 904 | D3242 | 0.0015 | | 0.01 | 1961 | | ----- | | ----- |
| 914 | D3242 | 0.0008 | | -1.24 | 2130 | IP354 | 0.00358 | | 3.72 |
| 962 | D3242 | 0.0021 | | 1.08 | 2133 | D3242 | 0.00063 | | -1.54 |
| 963 | D3242 | 0.0018 | | 0.55 | 6028 | | ----- | | ----- |
| 970 | | ----- | | ----- | 6041 | | ----- | | ----- |
| 974 | D3242 | 0.0018 | | 0.55 | 6054 | | ----- | | ----- |
| 994 | D3242 | 0.002 | | 0.90 | 6075 | D3242 | 0.0037 | | 3.94 |
| 995 | D3242 | 0.001 | | -0.88 | 6114 | D3242 | 0.0014 | | -0.17 |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | D3242 | 0.0014 | | -0.17 | 6142 | | ----- | | ----- |
| 1011 | D3242 | 0.002 | | 0.90 | 6203 | D3242 | 0.0020 | | 0.90 |
| 1016 | D3242 | 0.0010019 | | -0.88 | 6244 | | ----- | | ----- |
| 1019 | | ----- | | ----- | 6266 | | ----- | | ----- |
| 1023 | | ----- | | ----- | 6274 | | ----- | | ----- |
| 1039 | D3242 | 0.002 | | 0.90 | 6312 | | ----- | | ----- |
| 1040 | D3242 | 0.021 | R(0.01) | 34.81 | 6315 | D3242 | 0.0027 | | 2.15 |
| 1049 | D3242 | 0.00163 | | 0.24 | 6321 | IP354 | <0.001 | | ----- |
| 1059 | D3242 | 0.003 | | 2.69 | 6324 | D3242 | 0.0010 | | -0.88 |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | D3242 | 0.002 | | 0.90 | 6421 | | ----- | | ----- |
| 6344 | D3242 | 0.0025 | | 1.80 | 6438 | | ----- | | ----- |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | D3242 | 0.00111 | | -0.68 | 6487 | | ----- | | ----- |
| 6384 | D3242 | 0.0005 | | -1.77 | | | | | |

| | |
|---|---|
| normality | OK |
| n | 83 |
| outliers | 4 |
| mean (n) | 0.00149 |
| st.dev. (n) | 0.000761 |
| R(calc.) | 0.00213 |
| st.dev.(D3242:11R17) | 0.000560 |
| R(D3242:11R17) | 0.00157 |

Lab 120 first reported 0.008
Lab 159 first reported 0.006
Lab 1586 first reported 0.0053
Lab 1683 first reported 0.007



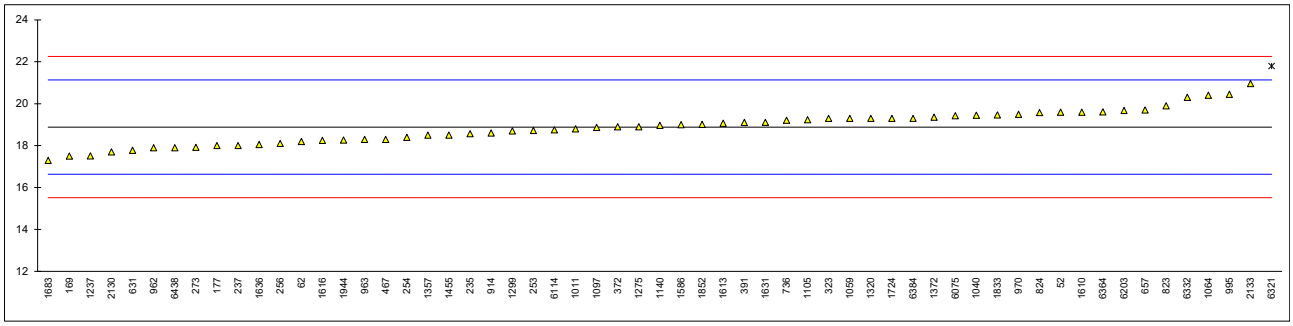



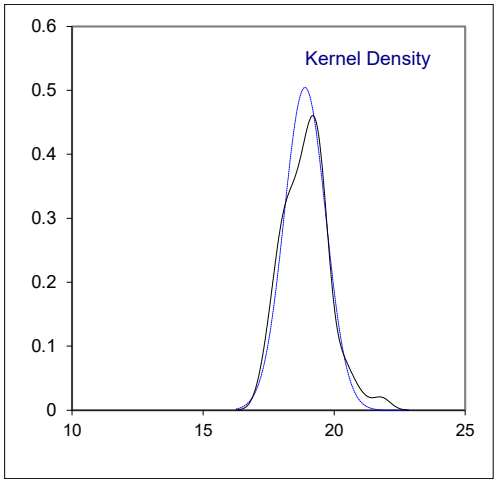
## Determination of Aromatics by FIA on sample #22150; results in %V/V

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | D1319 | 19.6 | | 0.64 | 1062 | | ----- | | ----- |
| 62 | D1319 | 18.2 | | -0.61 | 1064 | D1319 | 20.4 | | 1.35 |
| 120 | | ----- | | ----- | 1065 | | ----- | | ----- |
| 140 | | ----- | | ----- | 1082 | | ----- | | ----- |
| 150 | | ----- | | ----- | 1097 | D1319 | 18.87 | | -0.01 |
| 159 | | ----- | | ----- | 1105 | D1319 | 19.24 | | 0.32 |
| 169 | D1319 | 17.5 | | -1.23 | 1109 | | ----- | | ----- |
| 171 | | ----- | | ----- | 1121 | | ----- | | ----- |
| 175 | | ----- | | ----- | 1126 | | ----- | | ----- |
| 177 | D1319 | 18.0 | | -0.79 | 1140 | D1319 | 18.9655 | | 0.07 |
| 215 | | ----- | | ----- | 1182 | | ----- | | ----- |
| 221 | | ----- | | ----- | 1191 | | ----- | | ----- |
| 224 | | ----- | | ----- | 1205 | | ----- | | ----- |
| 225 | | ----- | | ----- | 1237 | EN15553 | 17.51 | | -1.22 |
| 228 | | ----- | | ----- | 1275 | IP156 | 18.9 | | 0.01 |
| 235 | D1319 | 18.5674 | | -0.28 | 1279 | | ----- | | ----- |
| 237 | D1319 | 18.0 | | -0.79 | 1299 | D1319 | 18.7 | | -0.17 |
| 238 | | ----- | | ----- | 1316 | | ----- | | ----- |
| 253 | D1319 | 18.72 | | -0.15 | 1318 | | ----- | | ----- |
| 254 | D1319 | 18.4 | | -0.43 | 1320 | D1319 | 19.3 | | 0.37 |
| 256 | D1319 | 18.1 | | -0.70 | 1357 | D1319 | 18.5 | | -0.34 |
| 258 | | ----- | | ----- | 1372 | | 19.36 | | 0.42 |
| 273 | D1319 | 17.92 | | -0.86 | 1397 | | ----- | | ----- |
| 311 | | ----- | | ----- | 1399 | | ----- | | ----- |
| 317 | | ----- | | ----- | 1412 | | ----- | | ----- |
| 323 | D1319 | 19.3 | | 0.37 | 1417 | | ----- | | ----- |
| 328 | | ----- | | ----- | 1444 | | ----- | | ----- |
| 333 | | ----- | | ----- | 1455 | D1319 | 18.5 | | -0.34 |
| 334 | | ----- | | ----- | 1496 | | ----- | | ----- |
| 335 | | ----- | | ----- | 1538 | | ----- | | ----- |
| 365 | | ----- | | ----- | 1575 | | ----- | | ----- |
| 372 | D1319 | 18.9 | | 0.01 | 1585 | | ----- | | ----- |
| 391 | D1319 | 19.1 | | 0.19 | 1586 | D1319 | 19.0 | | 0.10 |
| 396 | | ----- | | ----- | 1587 | | ----- | | ----- |
| 399 | | ----- | | ----- | 1610 | IP156 | 19.6 | | 0.64 |
| 440 | | ----- | | ----- | 1613 | D1319 | 19.07 | | 0.16 |
| 445 | | ----- | | ----- | 1616 | D1319 | 18.25 | | -0.57 |
| 447 | | ----- | | ----- | 1631 | D1319 | 19.11 | | 0.20 |
| 460 | | ----- | | ----- | 1634 | | ----- | | ----- |
| 467 | D1319 | 18.3 | | -0.52 | 1636 | D1319 | 18.05 | | -0.74 |
| 480 | | ----- | | ----- | 1669 | | ----- | | ----- |
| 496 | | ----- | | ----- | 1683 | D1319 | 17.30 | | -1.41 |
| 603 | | ----- | | ----- | 1688 | | ----- | | ----- |
| 608 | | ----- | | ----- | 1715 | | ----- | | ----- |
| 631 | D1319 | 17.78 | | -0.98 | 1720 | | ----- | | ----- |
| 657 | D1319 | 19.7 | | 0.72 | 1724 | D1319 | 19.3 | | 0.37 |
| 736 | D1319 | 19.21 | | 0.29 | 1730 | | ----- | | ----- |
| 823 | D1319 | 19.9 | | 0.90 | 1757 | | ----- | | ----- |
| 824 | D1319 | 19.577 | | 0.62 | 1776 | | ----- | | ----- |
| 851 | | ----- | | ----- | 1833 | | 19.46 | | 0.51 |
| 854 | | ----- | | ----- | 1852 | D1319 | 19.008 | | 0.11 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | D1319 | 18.26 | | -0.56 |
| 904 | | ----- | | ----- | 1961 | | ----- | | ----- |
| 914 | D1319 | 18.6 | | -0.25 | 2130 | IP156 | 17.7 | | -1.05 |
| 962 | D1319 | 17.9 | | -0.88 | 2133 | D1319 | 20.96 | | 1.85 |
| 963 | D1319 | 18.3 | | -0.52 | 6028 | | ----- | | ----- |
| 970 | D1319 | 19.5 | | 0.55 | 6041 | | ----- | | ----- |
| 974 | | ----- | | ----- | 6054 | | ----- | | ----- |
| 994 | | ----- | | ----- | 6075 | D1319 | 19.43 | | 0.48 |
| 995 | D1319 | 20.45 | | 1.39 | 6114 | D1319 | 18.75 | | -0.12 |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | | ----- | | ----- | 6142 | | ----- | | ----- |
| 1011 | D1319 | 18.8 | | -0.08 | 6203 | D1319 | 19.68 | | 0.71 |
| 1016 | | ----- | | ----- | 6244 | | ----- | | ----- |
| 1019 | | ----- | | ----- | 6266 | | ----- | | ----- |
| 1023 | | ----- | | ----- | 6274 | | ----- | | ----- |
| 1039 | | ----- | | ----- | 6312 | | ----- | | ----- |
| 1040 | D1319 | 19.45 | | 0.50 | 6315 | | ----- | | ----- |
| 1049 | | ----- | | ----- | 6321 | IP156 | 21.8 | R(0.05) | 2.59 |
| 1059 | D1319 | 19.3 | | 0.37 | 6324 | | ----- | | ----- |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | D1319 | 20.3 | | 1.26 | 6421 | | ----- | | ----- |
| 6344 | | ----- | | ----- | 6438 | D1319 | 17.9 | | -0.88 |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | D1319 | 19.612 | | 0.65 | 6487 | | ----- | | ----- |
| 6384 | D1319 | 19.3 | | 0.37 | | | | | |

| | |
|---|---|
| normality | OK |
| n | 58 |
| outliers | 1 |
| mean (n) | 18.886 |
| st.dev. (n) | 0.7910 |
| R(calc.) | 2.215 |
| st.dev.(D1319:20a) | 1.1241 |
| R(D1319:20a) | 3.148 |



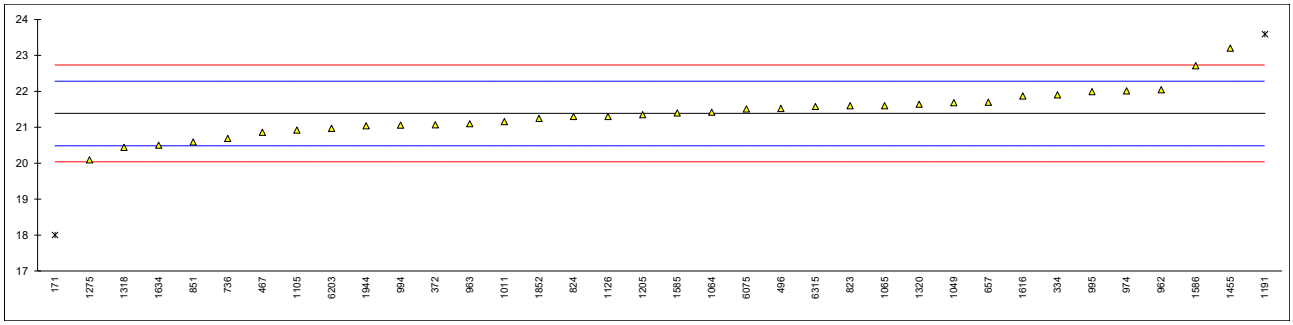
## Determination of Mono Aromatics (MAH) by HPLC on sample #22150; results in %M/M

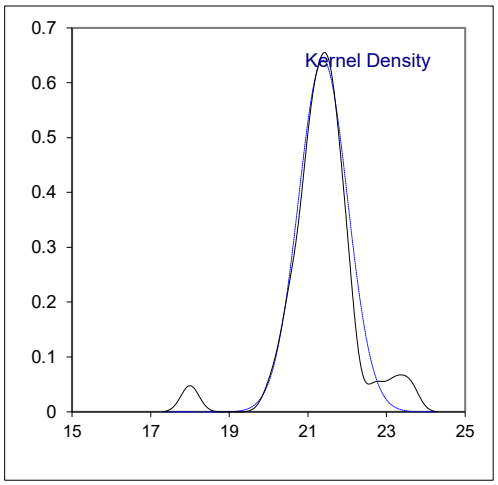
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | | ----- | | ----- | 1062 | | ----- | | ----- |
| 62 | | ----- | | ----- | 1064 | D6379 | 21.42 | | 0.08 |
| 120 | | ----- | | ----- | 1065 | IP436 | 21.6 | | 0.48 |
| 140 | | ----- | | ----- | 1082 | | ----- | | ----- |
| 150 | | ----- | | ----- | 1097 | | ----- | | ----- |
| 159 | | ----- | | ----- | 1105 | D6379 | 20.92 | | -1.04 |
| 169 | | ----- | | ----- | 1109 | | ----- | | ----- |
| 171 | D6379 | 18.0 | R(0.01) | -7.54 | 1121 | | ----- | | ----- |
| 175 | | ----- | | ----- | 1126 | EN12916 | 21.3 | | -0.19 |
| 177 | | ----- | | ----- | 1140 | | ----- | | ----- |
| 215 | | ----- | | ----- | 1182 | | ----- | | ----- |
| 221 | | ----- | | ----- | 1191 | D6379 | 23.592 | R(0.05) | 4.92 |
| 224 | | ----- | | ----- | 1205 | D8267 | 21.349 | | -0.08 |
| 225 | | ----- | | ----- | 1237 | | ----- | | ----- |
| 228 | | ----- | | ----- | 1275 | IP436 | 20.0931 | | -2.88 |
| 235 | | ----- | | ----- | 1279 | | ----- | | ----- |
| 237 | | ----- | | ----- | 1299 | | ----- | | ----- |
| 238 | | ----- | | ----- | 1316 | | ----- | | ----- |
| 253 | | ----- | | ----- | 1318 | D6379 | 20.44 | | -2.10 |
| 254 | | ----- | | ----- | 1320 | D6379 | 21.64 | | 0.57 |
| 256 | | ----- | | ----- | 1357 | D6379 | ----- | | ----- |
| 258 | | ----- | | ----- | 1372 | | ----- | | ----- |
| 273 | | ----- | | ----- | 1397 | | ----- | | ----- |
| 311 | | ----- | | ----- | 1399 | | ----- | | ----- |
| 317 | | ----- | | ----- | 1412 | | ----- | | ----- |
| 323 | | ----- | | ----- | 1417 | | ----- | | ----- |
| 328 | | ----- | | ----- | 1444 | | ----- | | ----- |
| 333 | | ----- | | ----- | 1455 | D6379 | 23.2 | C | 4.04 |
| 334 | D6379 | 21.9 | | 1.15 | 1496 | | ----- | | ----- |
| 335 | | ----- | | ----- | 1538 | | ----- | | ----- |
| 365 | | ----- | | ----- | 1575 | | ----- | | ----- |
| 372 | D6379 | 21.07 | | -0.70 | 1585 | D6379 | 21.4 | | 0.03 |
| 391 | | ----- | | ----- | 1586 | D6379 | 22.71 | | 2.95 |
| 396 | | ----- | | ----- | 1587 | | ----- | | ----- |
| 399 | | ----- | | ----- | 1610 | | ----- | | ----- |
| 440 | | ----- | | ----- | 1613 | | ----- | | ----- |
| 445 | | ----- | | ----- | 1616 | D6379 | 21.873 | | 1.09 |
| 447 | | ----- | | ----- | 1631 | | ----- | | ----- |
| 460 | | ----- | | ----- | 1634 | D6379 | 20.5 | | -1.97 |
| 467 | D6379 | 20.86 | | -1.17 | 1636 | | ----- | | ----- |
| 480 | | ----- | | ----- | 1669 | | ----- | | ----- |
| 496 | D6379 | 21.52 | | 0.30 | 1683 | | ----- | | ----- |
| 603 | | ----- | | ----- | 1688 | | ----- | | ----- |
| 608 | | ----- | | ----- | 1715 | | ----- | | ----- |
| 631 | | ----- | | ----- | 1720 | | ----- | | ----- |
| 657 | IP436 | 21.7 | | 0.70 | 1724 | | ----- | | ----- |
| 736 | D6379 | 20.69121 | | -1.54 | 1730 | | ----- | | ----- |
| 823 | D6379 | 21.6 | | 0.48 | 1757 | | ----- | | ----- |
| 824 | D6379 | 21.3 | | -0.19 | 1776 | | ----- | | ----- |
| 851 | D6379 | 20.59 | | -1.77 | 1833 | | ----- | | ----- |
| 854 | | ----- | | ----- | 1852 | D6379 | 21.248 | | -0.30 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | D6379 | 21.04 | | -0.77 |
| 904 | | ----- | | ----- | 1961 | | ----- | | ----- |
| 914 | | ----- | | ----- | 2130 | | ----- | | ----- |
| 962 | D6379 | 22.045 | | 1.47 | 2133 | | ----- | | ----- |
| 963 | D6379 | 21.10 | | -0.63 | 6028 | | ----- | | ----- |
| 970 | | ----- | | ----- | 6041 | | ----- | | ----- |
| 974 | D6379 | 22.01 | | 1.39 | 6054 | | ----- | | ----- |
| 994 | D6379 | 21.06 | | -0.72 | 6075 | D6379 | 21.51 | C | 0.28 |
| 995 | D6379 | 21.993 | | 1.36 | 6114 | | ----- | | ----- |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | | ----- | | ----- | 6142 | | ----- | | ----- |
| 1011 | D6379 | 21.16 | | -0.50 | 6203 | D6379 | 20.97 | | -0.92 |
| 1016 | | ----- | | ----- | 6244 | | ----- | | ----- |
| 1019 | | ----- | | ----- | 6266 | | ----- | | ----- |
| 1023 | | ----- | | ----- | 6274 | | ----- | | ----- |
| 1039 | | ----- | | ----- | 6312 | | ----- | | ----- |
| 1040 | | ----- | | ----- | 6315 | IP436 | 21.58 | | 0.44 |
| 1049 | D6379 | 21.682 | | 0.66 | 6321 | | ----- | | ----- |
| 1059 | | ----- | | ----- | 6324 | | ----- | | ----- |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | | ----- | | ----- | 6421 | | ----- | | ----- |
| 6344 | | ----- | | ----- | 6438 | | ----- | | ----- |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | | ----- | | ----- | 6487 | | ----- | | ----- |
| 6384 | | ----- | | ----- | | | | | |

| | |
|---|---|
| normality | suspect |
| n | 34 |
| outliers | 2 |
| mean (n) | 21.385 |
| st.dev. (n) | 0.6223 |
| R(calc.) | 1.742 |
| st.dev.(D6379:21e1) | 0.4488 |
| R(D6379:21e1) | 1.257 |

Lab 1455 first reported 18.6 %V/V
Lab 6075 first reported 19.07



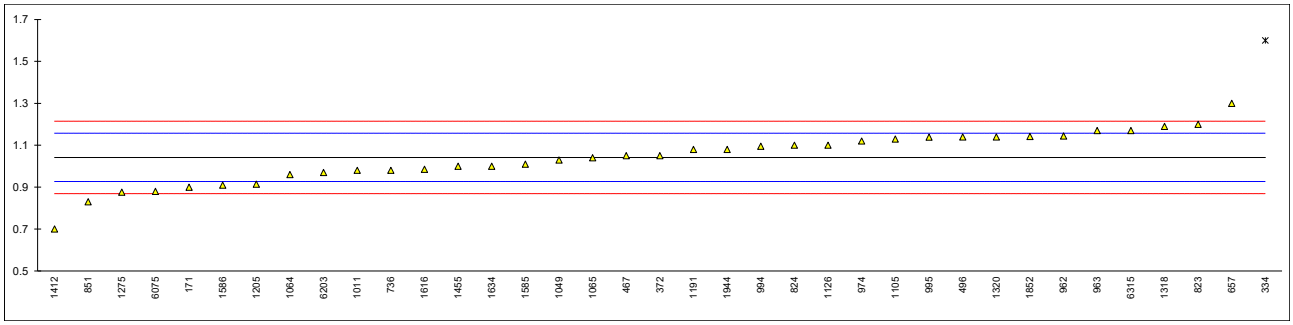
## Determination of Di Aromatics (DAH) by HPLC on sample #22150; results in %M/M

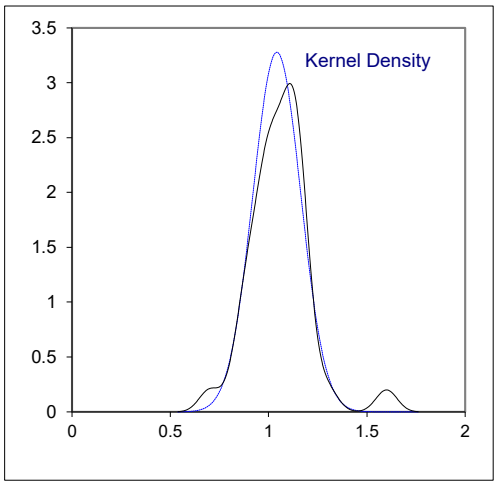
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | | ----- | | ----- | 1062 | | ----- | | ----- |
| 62 | | ----- | | ----- | 1064 | D6379 | 0.96 | | -1.42 |
| 120 | | ----- | | ----- | 1065 | IP436 | 1.04 | | -0.03 |
| 140 | | ----- | | ----- | 1082 | | ----- | | ----- |
| 150 | | ----- | | ----- | 1097 | | ----- | | ----- |
| 159 | | ----- | | ----- | 1105 | D6379 | 1.13 | | 1.53 |
| 169 | | ----- | | ----- | 1109 | | ----- | | ----- |
| 171 | D6379 | 0.9 | | -2.46 | 1121 | | ----- | | ----- |
| 175 | | ----- | | ----- | 1126 | EN12916 | 1.1 | | 1.01 |
| 177 | | ----- | | ----- | 1140 | | ----- | | ----- |
| 215 | | ----- | | ----- | 1182 | | ----- | | ----- |
| 221 | | ----- | | ----- | 1191 | D6379 | 1.080 | | 0.66 |
| 224 | | ----- | | ----- | 1205 | D8267 | 0.914 | | -2.22 |
| 225 | | ----- | | ----- | 1237 | | ----- | | ----- |
| 228 | | ----- | | ----- | 1275 | IP436 | 0.8760 | | -2.87 |
| 235 | | ----- | | ----- | 1279 | | ----- | | ----- |
| 237 | | ----- | | ----- | 1299 | | ----- | | ----- |
| 238 | | ----- | | ----- | 1316 | | ----- | | ----- |
| 253 | | ----- | | ----- | 1318 | D6379 | 1.19 | | 2.57 |
| 254 | | ----- | | ----- | 1320 | D6379 | 1.14 | | 1.70 |
| 256 | | ----- | | ----- | 1357 | D1319 | ----- | | ----- |
| 258 | | ----- | | ----- | 1372 | | ----- | | ----- |
| 273 | | ----- | | ----- | 1397 | | ----- | | ----- |
| 311 | | ----- | | ----- | 1399 | | ----- | | ----- |
| 317 | | ----- | | ----- | 1412 | D6379 | 0.7 | | -5.93 |
| 323 | | ----- | | ----- | 1417 | | ----- | | ----- |
| 328 | | ----- | | ----- | 1444 | | ----- | | ----- |
| 333 | | ----- | | ----- | 1455 | D6379 | 1.0 | C | -0.73 |
| 334 | D6379 | 1.6 | R(0.01) | 9.68 | 1496 | | ----- | | ----- |
| 335 | | ----- | | ----- | 1538 | | ----- | | ----- |
| 365 | | ----- | | ----- | 1575 | | ----- | | ----- |
| 372 | D6379 | 1.05 | | 0.14 | 1585 | D6379 | 1.01 | | -0.55 |
| 391 | | ----- | | ----- | 1586 | D6379 | 0.91 | | -2.29 |
| 396 | | ----- | | ----- | 1587 | | ----- | | ----- |
| 399 | | ----- | | ----- | 1610 | | ----- | | ----- |
| 440 | | ----- | | ----- | 1613 | | ----- | | ----- |
| 445 | | ----- | | ----- | 1616 | D6379 | 0.985 | | -0.99 |
| 447 | | ----- | | ----- | 1631 | | ----- | | ----- |
| 460 | | ----- | | ----- | 1634 | D6379 | 1.0 | | -0.73 |
| 467 | D6379 | 1.05 | | 0.14 | 1636 | | ----- | | ----- |
| 480 | | ----- | | ----- | 1669 | | ----- | | ----- |
| 496 | D6379 | 1.14 | | 1.70 | 1683 | | ----- | | ----- |
| 603 | | ----- | | ----- | 1688 | | ----- | | ----- |
| 608 | | ----- | | ----- | 1715 | | ----- | | ----- |
| 631 | | ----- | | ----- | 1720 | | ----- | | ----- |
| 657 | IP436 | 1.3 | | 4.48 | 1724 | | ----- | | ----- |
| 736 | D6379 | 0.98060 | | -1.06 | 1730 | | ----- | | ----- |
| 823 | D6379 | 1.2 | | 2.74 | 1757 | | ----- | | ----- |
| 824 | D6379 | 1.1 | | 1.01 | 1776 | | ----- | | ----- |
| 851 | D6379 | 0.83 | | -3.67 | 1833 | | ----- | | ----- |
| 854 | | ----- | | ----- | 1852 | D6379 | 1.142 | | 1.74 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | D6379 | 1.08 | | 0.66 |
| 904 | | ----- | | ----- | 1961 | | ----- | | ----- |
| 914 | | ----- | | ----- | 2130 | | ----- | | ----- |
| 962 | D6379 | 1.144 | | 1.77 | 2133 | | ----- | | ----- |
| 963 | D6379 | 1.17 | | 2.22 | 6028 | | ----- | | ----- |
| 970 | | ----- | | ----- | 6041 | | ----- | | ----- |
| 974 | D6379 | 1.12 | | 1.36 | 6054 | | ----- | | ----- |
| 994 | D6379 | 1.095 | | 0.92 | 6075 | D6591 | 0.88 | C | -2.81 |
| 995 | D6379 | 1.139 | | 1.68 | 6114 | | ----- | | ----- |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | | ----- | | ----- | 6142 | | ----- | | ----- |
| 1011 | D6379 | 0.98 | | -1.07 | 6203 | D6379 | 0.97 | | -1.25 |
| 1016 | | ----- | | ----- | 6244 | | ----- | | ----- |
| 1019 | | ----- | | ----- | 6266 | | ----- | | ----- |
| 1023 | | ----- | | ----- | 6274 | | ----- | | ----- |
| 1039 | | ----- | | ----- | 6312 | | ----- | | ----- |
| 1040 | | ----- | | ----- | 6315 | IP436 | 1.17 | | 2.22 |
| 1049 | D6379 | 1.030 | | -0.20 | 6321 | | ----- | | ----- |
| 1059 | | ----- | | ----- | 6324 | | ----- | | ----- |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | | ----- | | ----- | 6421 | | ----- | | ----- |
| 6344 | | ----- | | ----- | 6438 | | ----- | | ----- |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | | ----- | | ----- | 6487 | | ----- | | ----- |
| 6384 | | ----- | | ----- | | | | | |

| | |
|---|---|
| normality | OK |
| n | 36 |
| outliers | 1 |
| mean (n) | 1.042 |
| st.dev. (n) | 0.1217 |
| R(calc.) | 0.341 |
| st.dev.(D6379:21e1) | 0.0577 |
| R(D6379:21e1) | 0.162 |

Lab 1455 first reported 0.8 %V/V
Lab 6075 first reported 0.63



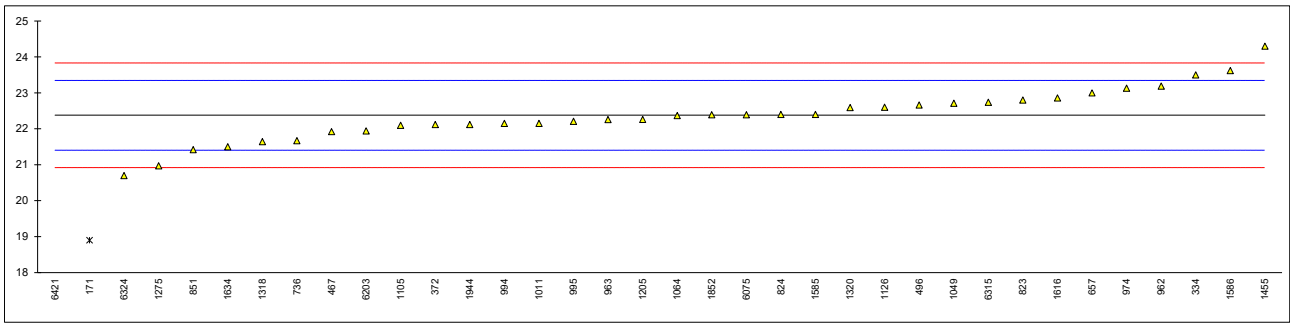
## Determination of Total Aromatics by HPLC on sample #22150; results in %M/M

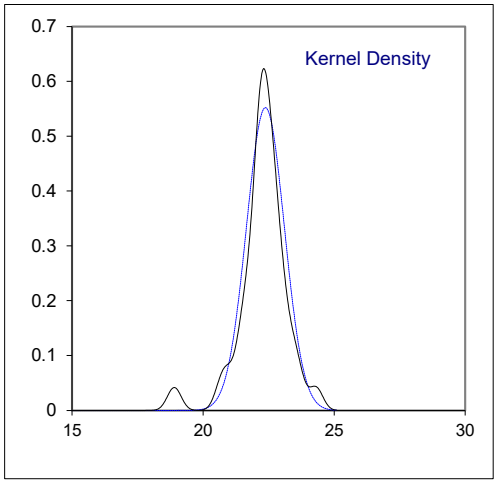
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | | ----- | | ----- | 1062 | | ----- | | ----- |
| 62 | | ----- | | ----- | 1064 | D6379 | 22.37 | | -0.01 |
| 120 | | ----- | | ----- | 1065 | | ----- | | ----- |
| 140 | | ----- | | ----- | 1082 | | ----- | | ----- |
| 150 | | ----- | | ----- | 1097 | | ----- | | ----- |
| 159 | | ----- | | ----- | 1105 | D6379 | 22.10 | | -0.57 |
| 169 | | ----- | | ----- | 1109 | | ----- | | ----- |
| 171 | D6379 | 18.9 | R(0.01) | -7.17 | 1121 | | ----- | | ----- |
| 175 | | ----- | | ----- | 1126 | EN12916 | 22.6 | | 0.46 |
| 177 | | ----- | | ----- | 1140 | | ----- | | ----- |
| 215 | | ----- | | ----- | 1182 | | ----- | | ----- |
| 221 | | ----- | | ----- | 1191 | | ----- | | ----- |
| 224 | | ----- | | ----- | 1205 | D8267 | 22.263 | | -0.23 |
| 225 | | ----- | | ----- | 1237 | | ----- | | ----- |
| 228 | | ----- | | ----- | 1275 | IP436 | 20.9691 | | -2.90 |
| 235 | | ----- | | ----- | 1279 | | ----- | | ----- |
| 237 | | ----- | | ----- | 1299 | | ----- | | ----- |
| 238 | | ----- | | ----- | 1316 | | ----- | | ----- |
| 253 | | ----- | | ----- | 1318 | D6379 | 21.64 | | -1.52 |
| 254 | | ----- | | ----- | 1320 | D6379 | 22.59 | | 0.44 |
| 256 | | ----- | | ----- | 1357 | | ----- | | ----- |
| 258 | | ----- | | ----- | 1372 | | ----- | | ----- |
| 273 | | ----- | | ----- | 1397 | | ----- | | ----- |
| 311 | | ----- | | ----- | 1399 | | ----- | | ----- |
| 317 | | ----- | | ----- | 1412 | | ----- | | ----- |
| 323 | | ----- | | ----- | 1417 | | ----- | | ----- |
| 328 | | ----- | | ----- | 1444 | | ----- | | ----- |
| 333 | | ----- | | ----- | 1455 | D6379 | 24.3 | C | 3.97 |
| 334 | D6379 | 23.5 | | 2.32 | 1496 | | ----- | | ----- |
| 335 | | ----- | | ----- | 1538 | | ----- | | ----- |
| 365 | | ----- | | ----- | 1575 | | ----- | | ----- |
| 372 | D6379 | 22.12 | | -0.53 | 1585 | D6379 | 22.4 | | 0.05 |
| 391 | | ----- | | ----- | 1586 | D6379 | 23.62 | | 2.56 |
| 396 | | ----- | | ----- | 1587 | | ----- | | ----- |
| 399 | | ----- | | ----- | 1610 | | ----- | | ----- |
| 440 | | ----- | | ----- | 1613 | | ----- | | ----- |
| 445 | | ----- | | ----- | 1616 | D6379 | 22.858 | | 0.99 |
| 447 | | ----- | | ----- | 1631 | | ----- | | ----- |
| 460 | | ----- | | ----- | 1634 | D6379 | 21.5 | | -1.81 |
| 467 | D6379 | 21.92 | | -0.94 | 1636 | | ----- | | ----- |
| 480 | | ----- | | ----- | 1669 | | ----- | | ----- |
| 496 | D6379 | 22.66 | | 0.59 | 1683 | | ----- | | ----- |
| 603 | | ----- | | ----- | 1688 | | ----- | | ----- |
| 608 | | ----- | | ----- | 1715 | | ----- | | ----- |
| 631 | | ----- | | ----- | 1720 | | ----- | | ----- |
| 657 | IP436 | 23.0 | | 1.29 | 1724 | | ----- | | ----- |
| 736 | D6379 | 21.67181 | | -1.45 | 1730 | | ----- | | ----- |
| 823 | D6379 | 22.8 | | 0.87 | 1757 | | ----- | | ----- |
| 824 | D6379 | 22.4 | | 0.05 | 1776 | | ----- | | ----- |
| 851 | D6379 | 21.42 | | -1.97 | 1833 | | ----- | | ----- |
| 854 | | ----- | | ----- | 1852 | D6379 | 22.390 | | 0.03 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | D6379 | 22.12 | | -0.53 |
| 904 | | ----- | | ----- | 1961 | | ----- | | ----- |
| 914 | | ----- | | ----- | 2130 | | ----- | | ----- |
| 962 | D6379 | 23.19 | | 1.68 | 2133 | | ----- | | ----- |
| 963 | D6379 | 22.26 | | -0.24 | 6028 | | ----- | | ----- |
| 970 | | ----- | | ----- | 6041 | | ----- | | ----- |
| 974 | D6379 | 23.13 | | 1.55 | 6054 | | ----- | | ----- |
| 994 | D6379 | 22.15 | | -0.47 | 6075 | D6379 | 22.39 | C | 0.03 |
| 995 | D6379 | 22.21 | | -0.34 | 6114 | | ----- | | ----- |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | | ----- | | ----- | 6142 | | ----- | | ----- |
| 1011 | D6379 | 22.15 | | -0.47 | 6203 | D6379 | 21.94 | | -0.90 |
| 1016 | | ----- | | ----- | 6244 | | ----- | | ----- |
| 1019 | | ----- | | ----- | 6266 | | ----- | | ----- |
| 1023 | | ----- | | ----- | 6274 | | ----- | | ----- |
| 1039 | | ----- | | ----- | 6312 | | ----- | | ----- |
| 1040 | | ----- | | ----- | 6315 | IP436 | 22.74 | | 0.75 |
| 1049 | D6379 | 22.712 | | 0.69 | 6321 | | ----- | | ----- |
| 1059 | | ----- | | ----- | 6324 | D6379 | 20.70 | C | -3.46 |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | | ----- | | ----- | 6421 | D6379 | 13.0 | R(0.01) | -19.33 |
| 6344 | | ----- | | ----- | 6438 | | ----- | | ----- |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | | ----- | | ----- | 6487 | | ----- | | ----- |
| 6384 | | ----- | | ----- | | | | | |

| | |
|---|---|
| normality | suspect |
| n | 34 |
| outliers | 2 |
| mean (n) | 22.376 |
| st.dev. (n) | 0.7227 |
| R(calc.) | 2.024 |
| st.dev.(D6379:21e1) | 0.4850 |
| R(D6379:21e1) | 1.358 |

Lab 1455 first reported 19.5 %V/V
Lab 6075 first reported 19.70
Lab 6324 first reported 20.07



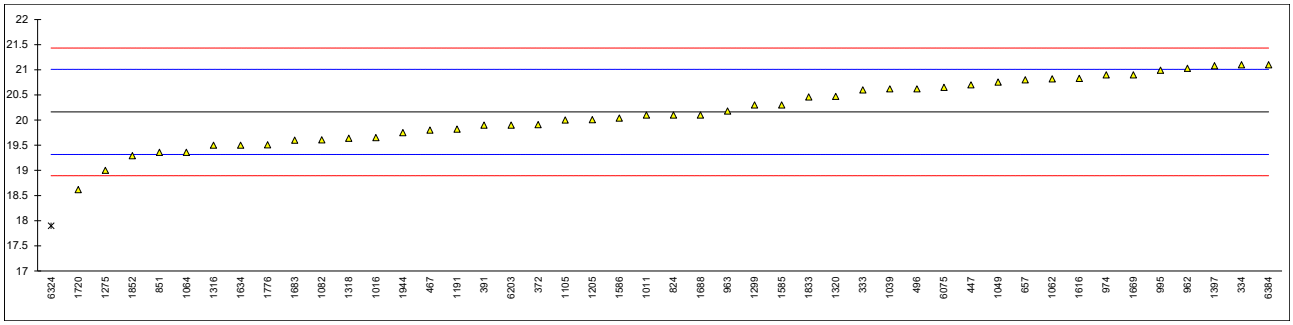
## Determination of Total Aromatics by HPLC on sample #22150; results in %V/V

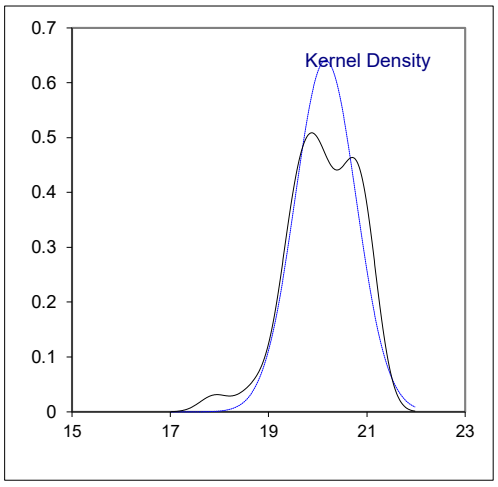
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | | ----- | | ----- | 1062 | D6379 | 20.82 | | 1.55 |
| 62 | | ----- | | ----- | 1064 | D6379 | 19.36 | | -1.89 |
| 120 | | ----- | | ----- | 1065 | | ----- | | ----- |
| 140 | | ----- | | ----- | 1082 | D6379 | 19.607 | | -1.31 |
| 150 | | ----- | | ----- | 1097 | | ----- | | ----- |
| 159 | | ----- | | ----- | 1105 | D6379 | 20.0 | | -0.38 |
| 169 | | ----- | | ----- | 1109 | | ----- | | ----- |
| 171 | | ----- | | ----- | 1121 | | ----- | | ----- |
| 175 | | ----- | | ----- | 1126 | | ----- | | ----- |
| 177 | | ----- | | ----- | 1140 | | ----- | | ----- |
| 215 | | ----- | | ----- | 1182 | | ----- | | ----- |
| 221 | | ----- | | ----- | 1191 | D6379 | 19.82 | | -0.81 |
| 224 | | ----- | | ----- | 1205 | D8267 | 20.011 | | -0.36 |
| 225 | | ----- | | ----- | 1237 | | ----- | | ----- |
| 228 | | ----- | | ----- | 1275 | IP436 | 19.0 | | -2.74 |
| 235 | | ----- | | ----- | 1279 | | ----- | | ----- |
| 237 | | ----- | | ----- | 1299 | IP436 | 20.3 | | 0.33 |
| 238 | | ----- | | ----- | 1316 | D6379 | 19.5 | | -1.56 |
| 253 | | ----- | | ----- | 1318 | D6379 | 19.64 | | -1.23 |
| 254 | | ----- | | ----- | 1320 | D6379 | 20.47 | | 0.73 |
| 256 | | ----- | | ----- | 1357 | | ----- | | ----- |
| 258 | | ----- | | ----- | 1372 | | ----- | | ----- |
| 273 | | ----- | | ----- | 1397 | D6379 | 21.08 | | 2.17 |
| 311 | | ----- | | ----- | 1399 | | ----- | | ----- |
| 317 | | ----- | | ----- | 1412 | | ----- | | ----- |
| 323 | | ----- | | ----- | 1417 | | ----- | | ----- |
| 328 | | ----- | | ----- | 1444 | | ----- | | ----- |
| 333 | D6379 | 20.6 | | 1.03 | 1455 | | ----- | | ----- |
| 334 | D6379 | 21.1 | | 2.22 | 1496 | | ----- | | ----- |
| 335 | | ----- | | ----- | 1538 | | ----- | | ----- |
| 365 | | ----- | | ----- | 1575 | | ----- | | ----- |
| 372 | D6379 | 19.91 | | -0.59 | 1585 | D6379 | 20.3 | | 0.33 |
| 391 | D6379 | 19.9 | | -0.62 | 1586 | D6379 | 20.04 | | -0.29 |
| 396 | | ----- | | ----- | 1587 | | ----- | | ----- |
| 399 | | ----- | | ----- | 1610 | | ----- | | ----- |
| 440 | | ----- | | ----- | 1613 | | ----- | | ----- |
| 445 | | ----- | | ----- | 1616 | D6379 | 20.830 | | 1.58 |
| 447 | IP436 | 20.7 | | 1.27 | 1631 | | ----- | | ----- |
| 460 | | ----- | | ----- | 1634 | D6379 | 19.5 | | -1.56 |
| 467 | D6379 | 19.80 | | -0.85 | 1636 | | ----- | | ----- |
| 480 | | ----- | | ----- | 1669 | D6379 | 20.9 | | 1.74 |
| 496 | D6379 | 20.62 | | 1.08 | 1683 | D6379 | 19.6 | | -1.33 |
| 603 | | ----- | | ----- | 1688 | D6379 | 20.1 | | -0.15 |
| 608 | | ----- | | ----- | 1715 | | ----- | | ----- |
| 631 | | ----- | | ----- | 1720 | | 18.62 | | -3.64 |
| 657 | IP436 | 20.8 | | 1.51 | 1724 | | ----- | W | ----- |
| 736 | | ----- | | ----- | 1730 | | ----- | | ----- |
| 823 | | ----- | | ----- | 1757 | | ----- | | ----- |
| 824 | D6379 | 20.1 | | -0.15 | 1776 | D6379 | 19.51 | | -1.54 |
| 851 | D6379 | 19.36 | | -1.89 | 1833 | | 20.46 | | 0.70 |
| 854 | | ----- | | ----- | 1852 | D6379 | 19.291 | | -2.06 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | D6379 | 19.75 | | -0.97 |
| 904 | | ----- | | ----- | 1961 | | ----- | | ----- |
| 914 | | ----- | | ----- | 2130 | | ----- | | ----- |
| 962 | D6379 | 21.03 | | 2.05 | 2133 | | ----- | | ----- |
| 963 | D6379 | 20.18 | | 0.04 | 6028 | | ----- | | ----- |
| 970 | | ----- | | ----- | 6041 | | ----- | | ----- |
| 974 | D6379 | 20.90 | | 1.74 | 6054 | | ----- | | ----- |
| 994 | | ----- | | ----- | 6075 | D6379 | 20.65 | C | 1.15 |
| 995 | D6379 | 20.99 | | 1.96 | 6114 | | ----- | | ----- |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | | ----- | | ----- | 6142 | | ----- | | ----- |
| 1011 | D6379 | 20.1 | | -0.15 | 6203 | D6379 | 19.90 | | -0.62 |
| 1016 | IP436 | 19.652 | | -1.20 | 6244 | | ----- | | ----- |
| 1019 | | ----- | | ----- | 6266 | | ----- | | ----- |
| 1023 | | ----- | | ----- | 6274 | | ----- | | ----- |
| 1039 | D6379 | 20.62 | | 1.08 | 6312 | | ----- | | ----- |
| 1040 | | ----- | | ----- | 6315 | | ----- | | ----- |
| 1049 | D6379 | 20.756 | | 1.40 | 6321 | | ----- | | ----- |
| 1059 | | ----- | | ----- | 6324 | D6379 | 17.90 | R(0.05) | -5.34 |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | | ----- | | ----- | 6421 | | ----- | | ----- |
| 6344 | | ----- | | ----- | 6438 | | ----- | | ----- |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | | ----- | | ----- | 6487 | | ----- | | ----- |
| 6384 | D6379 | 21.1 | | 2.22 | | | | | |

| | |
|---|---|
| normality | OK |
| n | 45 |
| outliers | 1 |
| mean (n) | 20.162 |
| st.dev. (n) | 0.6226 |
| R(calc.) | 1.743 |
| st.dev.(D6379:21e1) | 0.4235 |
| R(D6379:21e1) | 1.186 |

Lab 1724 test results withdrawn, reported 21.4
Lab 6075 first reported 17.16



## Determination of Color Saybolt (automated) on sample #22150;

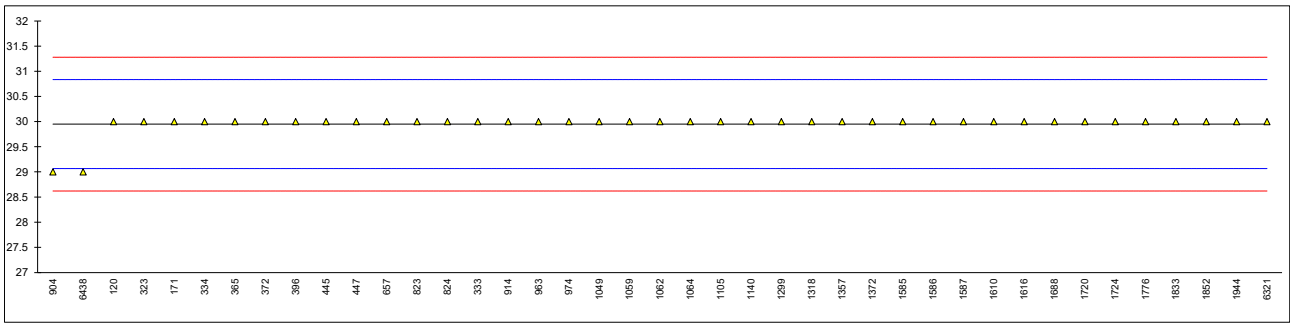
| lab | method | cell size | value | mark | z(targ) | lab | method | cell size | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 52 | D6045 | 100 mm | >30 | | ----- | 1062 | D6045 | 50 mm | 30 | | 0.11 |
| 62 | | | ----- | | ----- | 1064 | D6045 | 50 mm | 30 | | 0.11 |
| 120 | D6045 | 50 mm | 30 | | 0.11 | 1065 | | | ----- | | ----- |
| 140 | | | ----- | | ----- | 1082 | D6045 | | >30 | | ----- |
| 150 | D6045 | | >30 | | ----- | 1097 | | | ----- | | ----- |
| 159 | | | ----- | | ----- | 1105 | D6045 | 50 mm | 30 | | 0.11 |
| 169 | | | ----- | | ----- | 1109 | | | ----- | | ----- |
| 171 | D6045 | | 30 | | 0.11 | 1121 | D6045 | 100 mm | > 30 | | ----- |
| 175 | | | ----- | | ----- | 1126 | | | ----- | | ----- |
| 177 | | | ----- | | ----- | 1140 | D6045 | 50 mm | 30 | | 0.11 |
| 215 | | | ----- | | ----- | 1182 | | | ----- | | ----- |
| 221 | | | ----- | | ----- | 1191 | D6045 | 100 mm | >30 | | ----- |
| 224 | | | ----- | | ----- | 1205 | | | ----- | | ----- |
| 225 | | | ----- | | ----- | 1237 | D6045 | 50 mm | >30 | | ----- |
| 228 | | | ----- | | ----- | 1275 | | | ----- | | ----- |
| 235 | | | ----- | | ----- | 1279 | | | ----- | | ----- |
| 237 | | | ----- | | ----- | 1299 | D6045 | 100 mm | 30 | | 0.11 |
| 238 | | | ----- | | ----- | 1316 | | | ----- | | ----- |
| 253 | | | ----- | | ----- | 1318 | D6045 | 100 mm | 30 | | 0.11 |
| 254 | | | ----- | | ----- | 1320 | D6045 | 50 mm | >30 | | ----- |
| 256 | | | ----- | | ----- | 1357 | D6045 | 50 mm | 30 | | 0.11 |
| 258 | | | ----- | | ----- | 1372 | | 100 mm | 30 | | 0.11 |
| 273 | | | ----- | | ----- | 1397 | | | ----- | | ----- |
| 311 | | | ----- | | ----- | 1399 | | | ----- | | ----- |
| 317 | | | ----- | | ----- | 1412 | | | ----- | | ----- |
| 323 | D6045 | 50 mm | 30 | | 0.11 | 1417 | | | ----- | | ----- |
| 328 | | | ----- | | ----- | 1444 | | | ----- | | ----- |
| 333 | D6045 | 100 mm | 30 | | 0.11 | 1455 | | | ----- | | ----- |
| 334 | D6045 | | 30 | | 0.11 | 1496 | | | ----- | | ----- |
| 335 | | | ----- | | ----- | 1538 | | | ----- | | ----- |
| 365 | D6045 | 50 mm | 30 | | 0.11 | 1575 | | | ----- | | ----- |
| 372 | D6045 | 50 mm | 30 | | 0.11 | 1585 | | 100 mm | 30 | | 0.11 |
| 391 | | | ----- | | ----- | 1586 | D6045 | 50 mm | 30 | | 0.11 |
| 396 | D6045 | 50 mm | 30 | | 0.11 | 1587 | D6045 | 50 mm | 30 | | 0.11 |
| 399 | | | ----- | | ----- | 1610 | D6045 | 50 mm | 30 | | 0.11 |
| 440 | | | ----- | | ----- | 1613 | D6045 | | >30 | | ----- |
| 445 | D6045 | 50 mm | 30 | | 0.11 | 1616 | D6045 | 100 mm | 30 | | 0.11 |
| 447 | D6045 | 100 mm | 30 | | 0.11 | 1631 | | | ----- | | ----- |
| 460 | | | ----- | | ----- | 1634 | | | ----- | | ----- |
| 467 | | | ----- | | ----- | 1636 | | | ----- | | ----- |
| 480 | | | ----- | | ----- | 1669 | D6045 | | >30 | | ----- |
| 496 | D6045 | | >30 | | ----- | 1683 | D6045 | 50 mm | >30 | | ----- |
| 603 | | | ----- | | ----- | 1688 | D6045 | | 30 | | 0.11 |
| 608 | | | ----- | | ----- | 1715 | | | ----- | | ----- |
| 631 | D6045 | 50 mm | >30 | | ----- | 1720 | | 50 mm | 30 | | 0.11 |
| 657 | D6045 | 100 mm | 30 | | 0.11 | 1724 | D6045 | | 30 | C | 0.11 |
| 736 | | | ----- | | ----- | 1730 | | | ----- | | ----- |
| 823 | D6045 | 50 mm | 30 | | 0.11 | 1757 | | | ----- | | ----- |
| 824 | D6045 | 50 mm | 30 | | 0.11 | 1776 | D6045 | | 30 | | 0.11 |
| 851 | | | ----- | | ----- | 1833 | | | 30 | | 0.11 |
| 854 | | | ----- | | ----- | 1852 | D6045 | 10 mm | 30 | | 0.11 |
| 862 | | | ----- | | ----- | 1913 | | | ----- | | ----- |
| 869 | | | ----- | | ----- | 1944 | D6045 | 50 mm | 30 | | 0.11 |
| 904 | D6045 | | 29 | | -2.15 | 1961 | | | ----- | | ----- |
| 914 | D6045 | 10 mm | 30 | | 0.11 | 2130 | | | ----- | | ----- |
| 962 | D6045 | 50 mm | >30 | | ----- | 2133 | | | ----- | | ----- |
| 963 | D6045 | | 30 | | 0.11 | 6028 | | | ----- | | ----- |
| 970 | | | ----- | | ----- | 6041 | | | ----- | | ----- |
| 974 | D6045 | 100 mm | 30 | | 0.11 | 6054 | | | ----- | | ----- |
| 994 | | | ----- | | ----- | 6075 | | | ----- | | ----- |
| 995 | | | ----- | | ----- | 6114 | | | ----- | | ----- |
| 996 | | | ----- | | ----- | 6135 | | | ----- | | ----- |
| 997 | | | ----- | | ----- | 6142 | | | ----- | | ----- |
| 1011 | D6054 | 100 mm | >30 | | ----- | 6203 | D6045 | 50 mm | >30 | | ----- |
| 1016 | D6045 | 100 mm | >30 | | ----- | 6244 | | | ----- | | ----- |
| 1019 | | | ----- | | ----- | 6266 | D6045 | | >30 | C | ----- |
| 1023 | D6045 | 50 mm | >30 | | ----- | 6274 | | | ----- | | ----- |
| 1039 | | | ----- | | ----- | 6312 | | | ----- | | ----- |
| 1040 | | | ----- | | ----- | 6315 | D6045 | 50 mm | >30 | | ----- |
| 1049 | D6045 | 50 mm | 30 | | 0.11 | 6321 | D6045 | 50 mm | 30 | | 0.11 |
| 1059 | D6045 | 50 mm | 30 | | 0.11 | 6324 | | | ----- | | ----- |

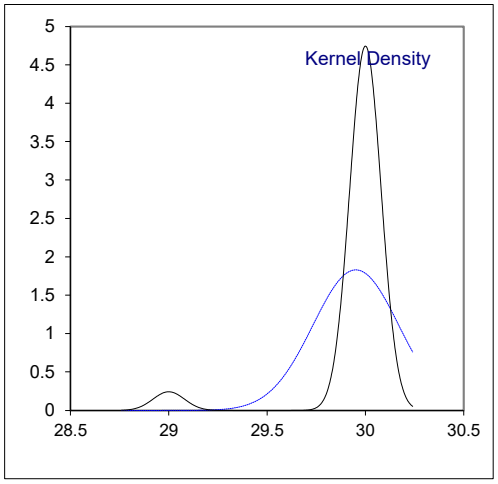
| lab | method | cell size | value | mark | z(targ) |
|---|---|---|---|---|---|
| 6332 | | | ----- | | ----- |
| 6344 | | | ----- | | ----- |
| 6346 | | | ----- | | ----- |
| 6364 | | | ----- | | ----- |
| 6384 | D6045 | 33 mm | >30 | | ----- |

| lab | method | cell size | value | mark | z(targ) |
|---|---|---|---|---|---|
| 6421 | | | ----- | | ----- |
| 6438 | D6045 | 10 mm | 29 | | -2.15 |
| 6479 | | | ----- | | ----- |
| 6487 | | | ----- | | ----- |

| | only 50 mm cell | only 100 mm cell |
|---|---|---|
| normality | unknown | unknown |
| n | 21 | 9 |
| outliers | 0 | 0 |
| mean (n) | 30.00 | 30.00 |
| st.dev. (n) | 0.000 | 0.000 |
| R(calc.) | 0.00 | 0.00 |
| st.dev.(D6045:20) | 0.443 | 0.443 |
| R(D6045:20) | 1.24 | 1.24 |

Lab 1724 first reported 25+
Lab 6266 first reported <0.5



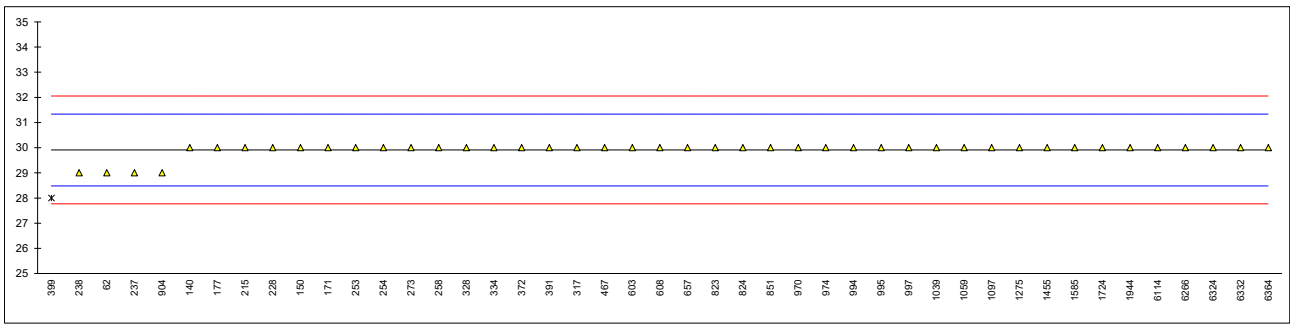
## Determination of Color Saybolt (manual) on sample #22150;

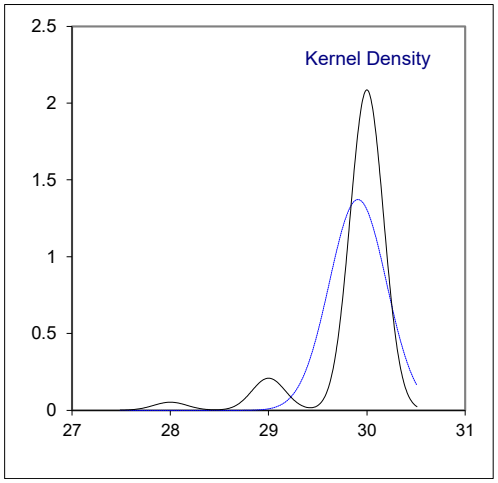
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | | ----- | | ----- | 1062 | | ----- | | ----- |
| 62 | D156 | 29 | | -1.27 | 1064 | | ----- | | ----- |
| 120 | | ----- | | ----- | 1065 | | ----- | | ----- |
| 140 | D156 | 30 | | 0.13 | 1082 | | ----- | | ----- |
| 150 | D156 | 30 | | 0.13 | 1097 | NF M 07-003 | 30 | | 0.13 |
| 159 | | ----- | | ----- | 1105 | | ----- | | ----- |
| 169 | | ----- | | ----- | 1109 | | ----- | | ----- |
| 171 | D156 | 30 | | 0.13 | 1121 | D156 | > 30 | | ----- |
| 175 | | ----- | | ----- | 1126 | | ----- | | ----- |
| 177 | D156 | 30 | C | 0.13 | 1140 | | ----- | | ----- |
| 215 | D156 | 30 | | 0.13 | 1182 | | ----- | | ----- |
| 221 | | ----- | | ----- | 1191 | | ----- | | ----- |
| 224 | | ----- | | ----- | 1205 | | ----- | | ----- |
| 225 | | ----- | | ----- | 1237 | | ----- | | ----- |
| 228 | D156 | 30 | | 0.13 | 1275 | D156 | 30 | | 0.13 |
| 235 | D156 | <30 | | ----- | 1279 | | ----- | | ----- |
| 237 | D156 | 29 | | -1.27 | 1299 | | ----- | | ----- |
| 238 | D156 | 29 | | -1.27 | 1316 | D156 | >30 | | ----- |
| 253 | D156 | 30 | | 0.13 | 1318 | | ----- | | ----- |
| 254 | D156 | 30 | | 0.13 | 1320 | D156 | >30 | | ----- |
| 256 | D156 | <30 | | ----- | 1357 | | ----- | | ----- |
| 258 | D156 | 30 | | 0.13 | 1372 | | ----- | | ----- |
| 273 | D156 | 30 | | 0.13 | 1397 | | ----- | | ----- |
| 311 | | ----- | | ----- | 1399 | | ----- | | ----- |
| 317 | D156 | 30 | | 0.13 | 1412 | | ----- | | ----- |
| 323 | | ----- | | ----- | 1417 | | ----- | | ----- |
| 328 | D156 | 30 | | 0.13 | 1444 | | ----- | | ----- |
| 333 | | ----- | | ----- | 1455 | D156 | 30 | | 0.13 |
| 334 | D156 | 30 | | 0.13 | 1496 | | ----- | | ----- |
| 335 | | ----- | | ----- | 1538 | | ----- | | ----- |
| 365 | | ----- | | ----- | 1575 | | ----- | | ----- |
| 372 | D156 | 30 | | 0.13 | 1585 | | 30 | | 0.13 |
| 391 | D156 | 30 | | 0.13 | 1586 | | ----- | | ----- |
| 396 | | ----- | | ----- | 1587 | | ----- | | ----- |
| 399 | D156 | 28 | G(0.01) | -2.67 | 1610 | | ----- | | ----- |
| 440 | D156 | >30 | | ----- | 1613 | | ----- | | ----- |
| 445 | | ----- | | ----- | 1616 | | ----- | | ----- |
| 447 | | ----- | | ----- | 1631 | | ----- | | ----- |
| 460 | | ----- | | ----- | 1634 | D156 | > 30 | | ----- |
| 467 | D156 | 30 | | 0.13 | 1636 | D156 | >30 | | ----- |
| 480 | | ----- | | ----- | 1669 | | ----- | | ----- |
| 496 | | ----- | | ----- | 1683 | | ----- | | ----- |
| 603 | D156 | 30 | | 0.13 | 1688 | | ----- | | ----- |
| 608 | D156 | 30 | | 0.13 | 1715 | | ----- | | ----- |
| 631 | | ----- | | ----- | 1720 | | ----- | | ----- |
| 657 | D156 | 30 | | 0.13 | 1724 | D156 | 30 | C | 0.13 |
| 736 | D156 | >30 | | ----- | 1730 | | ----- | | ----- |
| 823 | D156 | 30 | | 0.13 | 1757 | | ----- | | ----- |
| 824 | D156 | 30 | | 0.13 | 1776 | | ----- | | ----- |
| 851 | D156 | 30 | | 0.13 | 1833 | | ----- | | ----- |
| 854 | | ----- | | ----- | 1852 | | ----- | | ----- |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | D156 | 30 | | 0.13 |
| 904 | D156 | 29 | | -1.27 | 1961 | | ----- | | ----- |
| 914 | | ----- | | ----- | 2130 | | ----- | | ----- |
| 962 | D156 | >30 | | ----- | 2133 | | ----- | | ----- |
| 963 | | ----- | | ----- | 6028 | | ----- | | ----- |
| 970 | D156 | 30 | | 0.13 | 6041 | | ----- | | ----- |
| 974 | D156 | 30 | | 0.13 | 6054 | | ----- | | ----- |
| 994 | D156 | 30 | | 0.13 | 6075 | D156 | >30 | | ----- |
| 995 | D156 | 30 | | 0.13 | 6114 | D156 | 30 | | 0.13 |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | D156 | 30 | | 0.13 | 6142 | | ----- | | ----- |
| 1011 | | ----- | | ----- | 6203 | | ----- | | ----- |
| 1016 | | ----- | | ----- | 6244 | | ----- | | ----- |
| 1019 | | ----- | | ----- | 6266 | D156 | 30.0 | | 0.13 |
| 1023 | | ----- | | ----- | 6274 | | ----- | | ----- |
| 1039 | D156 | 30 | | 0.13 | 6312 | | ----- | | ----- |
| 1040 | | ----- | | ----- | 6315 | | ----- | | ----- |
| 1049 | | ----- | | ----- | 6321 | | ----- | | ----- |
| 1059 | D156 | 30 | | 0.13 | 6324 | D156 | 30 | | 0.13 |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | D156 | 30 | | 0.13 | 6421 | | ----- | | ----- |
| 6344 | D156 | >30 | | ----- | 6438 | | ----- | | ----- |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | D156 | 30 | | 0.13 | 6487 | | ----- | | ----- |

| | |
|---|---|
| normality | not OK |
| n | 44 |
| outliers | 1 |
| mean (n) | 29.91 |
| st.dev. (n) | 0.291 |
| R(calc.) | 0.81 |
| st.dev.(D156:15) | 0.714 |
| R(D156:15) | 2 |

Lab 177 first reported 26
Lab 1724 first reported 25+



## Determination of Copper Corrosion 2 hrs at 100 °C on sample #22150;

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | D130 | 1a | | ----- | 1062 | D130 | 1A | | ----- |
| 62 | D130 | 1a | | ----- | 1064 | D130 | 1a | | ----- |
| 120 | | ----- | | ----- | 1065 | | ----- | | ----- |
| 140 | | ----- | | ----- | 1082 | | ----- | | ----- |
| 150 | | ----- | | ----- | 1097 | ISO2160 | 1a | | ----- |
| 159 | D130 | 1a | | ----- | 1105 | D130 | 1a | | ----- |
| 169 | D130 | 1A | | ----- | 1109 | | ----- | | ----- |
| 171 | D130 | 1a | | ----- | 1121 | D130 | 1a | | ----- |
| 175 | | ----- | | ----- | 1126 | | ----- | | ----- |
| 177 | D130 | 1a | | ----- | 1140 | IP154 | 1A | | ----- |
| 215 | D130 | 1A | | ----- | 1182 | | ----- | | ----- |
| 221 | D130 | 1 | | ----- | 1191 | | ----- | | ----- |
| 224 | | ----- | | ----- | 1205 | | ----- | | ----- |
| 225 | D130 | 1a | | ----- | 1237 | | ----- | | ----- |
| 228 | D130 | 1A | | ----- | 1275 | IP154 | 1A | | ----- |
| 235 | D130 | 1a | | ----- | 1279 | | ----- | | ----- |
| 237 | D130 | 1A | | ----- | 1299 | D130 | 1A | | ----- |
| 238 | D130 | 1a | | ----- | 1316 | D130 | 1a | | ----- |
| 253 | D130 | 1A | | ----- | 1318 | D130 | 1a | | ----- |
| 254 | D130 | 1a | | ----- | 1320 | D130 | 1a | | ----- |
| 256 | D130 | 1A | | ----- | 1357 | D130 | 1a | | ----- |
| 258 | | 1a | | ----- | 1372 | D130 | 1b | | ----- |
| 273 | D130 | 1a | | ----- | 1397 | | ----- | | ----- |
| 311 | D130 | 1A | | ----- | 1399 | | ----- | | ----- |
| 317 | D130 | 1a | | ----- | 1412 | D130 | 1a | | ----- |
| 323 | D130 | 1A | | ----- | 1417 | D130 | 1B | | ----- |
| 328 | D130 | 1 | | ----- | 1444 | | ----- | | ----- |
| 333 | D130 | 1a | | ----- | 1455 | D130 | 1A | | ----- |
| 334 | D130 | 1b | | ----- | 1496 | | ----- | | ----- |
| 335 | D130 | 1 | | ----- | 1538 | | ----- | | ----- |
| 365 | IP154 | 1a | | ----- | 1575 | D130 | 1a | | ----- |
| 372 | D130 | 1a | | ----- | 1585 | D130 | 1a | | ----- |
| 391 | D130 | 1A | | ----- | 1586 | D130 | 1A | | ----- |
| 396 | D130 | 1A | | ----- | 1587 | D130 | 1a | | ----- |
| 399 | D130 | 1A | | ----- | 1610 | D130 | 1a | | ----- |
| 440 | | ----- | | ----- | 1613 | D130 | 1a | | ----- |
| 445 | IP154 | 1a | | ----- | 1616 | D130 | 1a | | ----- |
| 447 | IP154 | 1a | | ----- | 1631 | | ----- | | ----- |
| 460 | | ----- | | ----- | 1634 | D130 | 1a | | ----- |
| 467 | D130 | 1a | | ----- | 1636 | D130 | 1a | | ----- |
| 480 | | ----- | | ----- | 1669 | D130 | 1a | | ----- |
| 496 | ISO2160 | 1a | | ----- | 1683 | D130 | 1a | | ----- |
| 603 | D130 | 1A | | ----- | 1688 | D130 | 1A | | ----- |
| 608 | D130 | 1a | | ----- | 1715 | | ----- | | ----- |
| 631 | D130 | 1a | | ----- | 1720 | D130 | 1a | | ----- |
| 657 | D130 | 1a | | ----- | 1724 | D130 | 1a | | ----- |
| 736 | D130 | 1a | | ----- | 1730 | | ----- | | ----- |
| 823 | D130 | 1b | | ----- | 1757 | D130 | 1a | | ----- |
| 824 | D130 | 1a | | ----- | 1776 | | ----- | | ----- |
| 851 | D130 | 1b | | ----- | 1833 | | 1a | | ----- |
| 854 | | ----- | | ----- | 1852 | D130 | 1A | | ----- |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | D130 | 1a | | ----- |
| 904 | ISO2160 | 1a | | ----- | 1961 | D130 | 1a | | ----- |
| 914 | D130 | 1a | | ----- | 2130 | IP154 | 1a | | ----- |
| 962 | D130 | 1a | | ----- | 2133 | D130 | 1a | | ----- |
| 963 | D130 | 1a | | ----- | 6028 | | ----- | | ----- |
| 970 | D130 | 1a | | ----- | 6041 | | ----- | | ----- |
| 974 | D130 | 1a | | ----- | 6054 | | ----- | | ----- |
| 994 | D130 | 1a | | ----- | 6075 | D130 | 1a | | ----- |
| 995 | D130 | 1a | | ----- | 6114 | D130 | 1a | | ----- |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | | ----- | | ----- | 6142 | | ----- | | ----- |
| 1011 | D130 | 1a | | ----- | 6203 | D130 | 1A | | ----- |
| 1016 | | ----- | | ----- | 6244 | | ----- | | ----- |
| 1019 | | ----- | | ----- | 6266 | | ----- | | ----- |
| 1023 | IP154 | 1a | | ----- | 6274 | | ----- | | ----- |
| 1039 | ISO2160 | 1A | | ----- | 6312 | | ----- | | ----- |
| 1040 | | ----- | | ----- | 6315 | D130 | 1 | | ----- |
| 1049 | D130 | 1A | | ----- | 6321 | IP154 | 1A | | ----- |
| 1059 | D130 | 1a | | ----- | 6324 | D130 | 1a | | ----- |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | D130 | 1a | | ----- | 6421 | D130 | 1 | | ----- |
| 6344 | ISO2160 | 1A | | ----- | 6438 | D130 | 1a | | ----- |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | D130 | 1A | | ----- | 6487 | | ----- | | ----- |
| 6384 | D130 | 1a | | ----- | | | | | |
| | | | | | | | | | |
| | n | 104 | | | | | | | |
| | mean (n) | 1 (1a/1b) | | | | | | | |

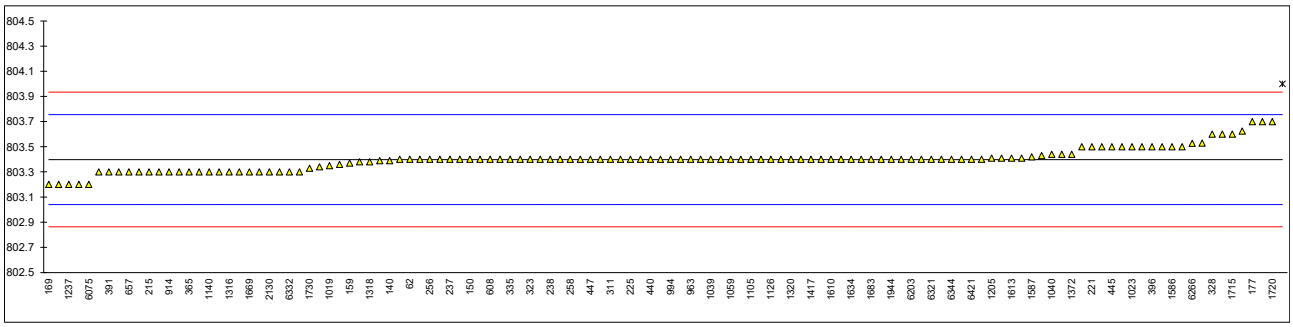
## Determination of Density at 15 °C on sample #22150; results in kg/m$^3$

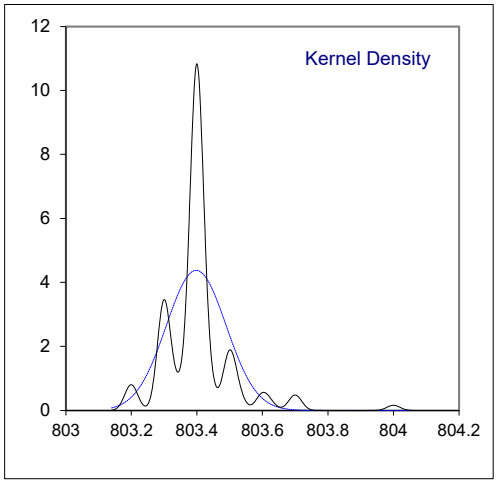
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | D4052 | 803.4 | | 0.01 | 1062 | D4052 | 803.4 | | 0.01 |
| 62 | D4052 | 803.4 | | 0.01 | 1064 | D4052 | 803.3 | | -0.55 |
| 120 | D4052 | 803.4 | | 0.01 | 1065 | D4052 | 803.6 | | 1.13 |
| 140 | D4052 | 803.39 | | -0.05 | 1082 | ISO12185 | 803.7 | | 1.69 |
| 150 | D4052 | 803.4 | | 0.01 | 1097 | ISO12185 | 803.38 | | -0.10 |
| 159 | D4052 | 803.37 | | -0.16 | 1105 | D4052 | 803.40 | | 0.01 |
| 169 | D4052 | 803.2 | C | -1.11 | 1109 | | ----- | | ----- |
| 171 | D4052 | 803.5 | | 0.57 | 1121 | D4052 | 803.4 | | 0.01 |
| 175 | D4052 | 803.4 | | 0.01 | 1126 | D4052 | 803.40 | | 0.01 |
| 177 | D4052 | 803.7 | C | 1.69 | 1140 | IP365 | 803.3 | | -0.55 |
| 215 | D1298 | 803.3 | | -0.55 | 1182 | ISO12185 | 803.625 | | 1.27 |
| 221 | D4052 | 803.5 | | 0.57 | 1191 | ISO12185 | 803.44 | | 0.23 |
| 224 | | ----- | | ----- | 1205 | ISO12185 | 803.41 | | 0.07 |
| 225 | D4052 | 803.4 | | 0.01 | 1237 | ISO12185 | 803.2 | | -1.11 |
| 228 | D4052 | 803.4 | | 0.01 | 1275 | IP365 | 803.4 | | 0.01 |
| 235 | D4052 | 803.4 | | 0.01 | 1279 | | ----- | | ----- |
| 237 | D4052 | 803.4 | | 0.01 | 1299 | D4052 | 803.3 | | -0.55 |
| 238 | D4052 | 803.4 | | 0.01 | 1316 | D4052 | 803.3 | | -0.55 |
| 253 | D4052 | 803.3 | | -0.55 | 1318 | D4052 | 803.38 | | -0.10 |
| 254 | D4052 | 803.3 | | -0.55 | 1320 | D4052 | 803.4 | | 0.01 |
| 256 | D4052 | 803.4 | | 0.01 | 1357 | D4052 | 803.5 | | 0.57 |
| 258 | | 803.4 | | 0.01 | 1372 | | 803.44 | | 0.23 |
| 273 | D4052 | 803.2 | | -1.11 | 1397 | | ----- | | ----- |
| 311 | D4052 | 803.4 | | 0.01 | 1399 | | ----- | | ----- |
| 317 | D4052 | 803.4 | | 0.01 | 1412 | D4052 | 803.4 | | 0.01 |
| 323 | D4052 | 803.4 | | 0.01 | 1417 | IP365 | 803.4 | | 0.01 |
| 328 | D4052 | 803.6 | | 1.13 | 1444 | | ----- | | ----- |
| 333 | D4052 | 803.5 | | 0.57 | 1455 | D4052 | 803.4 | | 0.01 |
| 334 | D4052 | 803.4 | | 0.01 | 1496 | | ----- | | ----- |
| 335 | D4052 | 803.4 | | 0.01 | 1538 | | ----- | | ----- |
| 365 | IP365 | 803.3 | | -0.55 | 1575 | | ----- | | ----- |
| 372 | D4052 | 803.4 | | 0.01 | 1585 | ISO12185 | 803.41 | | 0.07 |
| 391 | D4052 | 803.3 | | -0.55 | 1586 | D4052 | 803.5 | | 0.57 |
| 396 | D4052 | 803.5 | | 0.57 | 1587 | D4052 | 803.42 | | 0.12 |
| 399 | D4052 | 803.4 | | 0.01 | 1610 | IP365 | 803.4 | | 0.01 |
| 440 | | 803.4 | | 0.01 | 1613 | D4052 | 803.41 | | 0.07 |
| 445 | D4052 | 803.5 | | 0.57 | 1616 | D4052 | 803.3 | | -0.55 |
| 447 | D4052 | 803.4 | | 0.01 | 1631 | D4052 | 803.4 | | 0.01 |
| 460 | | ----- | | ----- | 1634 | D4052 | 803.4 | | 0.01 |
| 467 | D4052 | 803.36 | | -0.21 | 1636 | D4052 | 803.4 | | 0.01 |
| 480 | D4052 | 803.4 | | 0.01 | 1669 | D4052 | 803.3 | | -0.55 |
| 496 | D4052 | 803.39 | | -0.05 | 1683 | D4052 | 803.4 | | 0.01 |
| 603 | D4052 | 803.4 | | 0.01 | 1688 | D4052 | 804.0 | R(0.01) | 3.37 |
| 608 | D4052 | 803.4 | | 0.01 | 1715 | ISO12185 | 803.6 | | 1.13 |
| 631 | D4052 | 803.53 | | 0.74 | 1720 | D4052 | 803.7 | | 1.69 |
| 657 | D4052 | 803.3 | | -0.55 | 1724 | D1298 | 803.2 | | -1.11 |
| 736 | D4052 | 803.4 | | 0.01 | 1730 | D4052 | 803.33 | | -0.38 |
| 823 | D4052 | 803.4 | | 0.01 | 1757 | D7777 | 803.3 | | -0.55 |
| 824 | D4052 | 803.4 | | 0.01 | 1776 | ISO12185 | 803.5 | | 0.57 |
| 851 | D4052 | 803.3 | | -0.55 | 1833 | | 803.4 | | 0.01 |
| 854 | | ----- | | ----- | 1852 | D4052 | 803.41 | | 0.07 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | D4052 | 803.40 | | 0.01 |
| 904 | D4052 | 803.5 | | 0.57 | 1961 | | ----- | | ----- |
| 914 | D4052 | 803.3 | | -0.55 | 2130 | D4052 | 803.3 | | -0.55 |
| 962 | D4052 | 803.4 | | 0.01 | 2133 | D4052 | 803.43 | | 0.18 |
| 963 | D4052 | 803.4 | | 0.01 | 6028 | | ----- | | ----- |
| 970 | D4052 | 803.3 | | -0.55 | 6041 | | ----- | | ----- |
| 974 | D4052 | 803.3 | | -0.55 | 6054 | | ----- | | ----- |
| 994 | D4052 | 803.4 | | 0.01 | 6075 | D4052 | 803.2 | | -1.11 |
| 995 | D4052 | 803.5 | | 0.57 | 6114 | D4052 | 803.3 | | -0.55 |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | D4052 | 803.4 | | 0.01 | 6142 | ISO12185 | 803.4 | | 0.01 |
| 1011 | D4052 | 803.4 | | 0.01 | 6203 | D4052 | 803.4 | | 0.01 |
| 1016 | | ----- | | ----- | 6244 | | ----- | | ----- |
| 1019 | D4052 | 803.35 | | -0.27 | 6266 | D4052 | 803.528 | | 0.73 |
| 1023 | D4052 | 803.5 | C | 0.57 | 6274 | | ----- | | ----- |
| 1039 | ISO12185 | 803.4 | | 0.01 | 6312 | | ----- | | ----- |
| 1040 | D4052 | 803.44 | | 0.23 | 6315 | D4052 | 803.4 | | 0.01 |
| 1049 | D4052 | 803.34 | | -0.33 | 6321 | IP365 | 803.4 | | 0.01 |
| 1059 | D4052 | 803.4 | | 0.01 | 6324 | D4052 | 803.4 | | 0.01 |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | D4052 | 803.3 | | -0.55 | 6421 | D4052 | 803.4 | | 0.01 |
| 6344 | ISO12185 | 803.4 | | 0.01 | 6438 | D4052 | 803.4 | | 0.01 |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | D4052 | 803.3 | | -0.55 | 6487 | | ----- | | ----- |
| 6384 | D4052 | 803.4 | | 0.01 | | | | | |

| | |
|---|---|
| normality | not OK |
| n | 123 |
| outliers | 1 |
| mean (n) | 803.398 |
| st.dev. (n) | 0.0912 |
| R(calc.) | 0.255 |
| st.dev.(D4052:22) | 0.1786 |
| R(D4052:22) | 0.50 |

Lab 169 first reported 804.0
Lab 177 first reported 804.1
Lab 1023 first reported 0.8035 kg/m$^3$



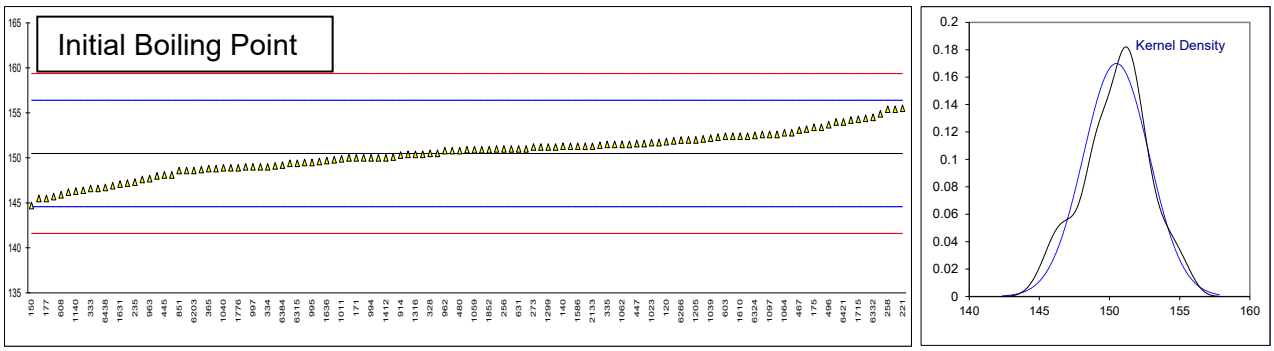
## Determination of Distillation at 760 mmHg on sample #22150; results in °C

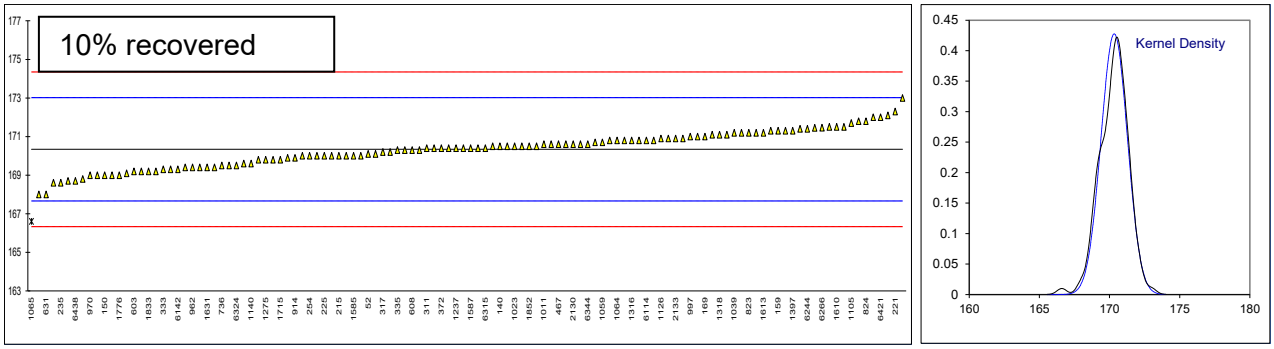
| lab | method | IBP | mark | 10% rec | mark | 50% rec | mark | 90% rec | mark | FBP | mark | Res. | Loss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52 | D86-automated | 145.5 | | 170.1 | | 195.3 | | 232.4 | | 253.1 | | 1.2 | 0.3 |
| 62 | D86-automated | 151.7 | | 171.3 | | 196.0 | | 233.3 | | 253.8 | C | 1.0 | 0.3 |
| 120 | D86-automated | 151.8 | | 169.9 | | 194.9 | | 233.6 | | 251.3 | | 1.2 | 2.8 |
| 140 | D86-automated | 151.3 | | 170.5 | | 195.3 | | 231.9 | | 253.5 | | 1.2 | 0.1 |
| 150 | D86-automated | 144.7 | | 169.0 | | 195.9 | | 235.4 | | 251.0 | | 1.2 | 2.2 |
| 159 | D86-automated | 151.2 | | 171.3 | | 196.7 | | 233.6 | | 254.9 | | 1.2 | 0.8 |
| 169 | D86-automated | 149.5 | | 171.0 | | 195.8 | | 232.7 | | 253.2 | | 1.2 | 0.4 |
| 171 | D86-automated | 150.0 | | 170.5 | | 195.8 | | 232.4 | | 253.8 | | 0.8 | 0.6 |
| 175 | D86-automated | 153.4 | | 170.6 | | 198.0 | | 236.7 | R5 | 257.2 | | 1.0 | 1.2 |
| 177 | D86-automated | 145.5 | | 169.8 | | 195.3 | | 231.9 | | 251.5 | C | 1.3 | 0.3 |
| 215 | D86-manual | 149.0 | | 170.0 | | 197.0 | | 233.0 | | 251.0 | | 1.2 | 0.8 |
| 221 | D86-automated | 155.5 | | 172.3 | | 196.7 | | 233.6 | | 254.4 | | 1.2 | 0.5 |
| 224 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | ----- |
| 225 | D86-manual | 151.0 | | 170.0 | | 196.0 | | 234.0 | | 254.0 | | 1.4 | 0.6 |
| 228 | D86-manual | 152.0 | | 172.0 | | 196.0 | | 232.0 | | 255.0 | | 0.7 | 0.3 |
| 235 | D86-automated | 147.3 | | 168.6 | | 194.1 | | 231.7 | | 249.5 | | 1.2 | 0.8 |
| 237 | D86-manual | 154.0 | | 173.0 | | 196.0 | | 233.0 | | 252.0 | | 1.0 | 0.5 |
| 238 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | ----- |
| 253 | D86-manual | 148.0 | | 168.0 | | 196.0 | | 232.0 | | 251.0 | | 1.0 | 0.7 |
| 254 | D86-manual | 151.0 | | 170.0 | | 195.0 | | 234.0 | | 254.0 | | ----- | ----- |
| 256 | D86-manual | 151.0 | | 170.0 | | 196.0 | | 233.0 | | 253.0 | | ----- | ----- |
| 258 | D86-automated | 155.4 | | 171.1 | | 195.4 | | 230.7 | | 252.9 | | 1.2 | 0.6 |
| 273 | D86-automated | 151.2 | | 171.0 | | 196.9 | | 233.5 | | 256.4 | | 1.0 | 0.6 |
| 311 | D86-automated | 152.1 | | 170.4 | | 196.1 | | 233.8 | | 253.4 | | 1.2 | 0.6 |
| 317 | D86-automated | 153.2 | | 170.2 | | 196.0 | | 233.7 | | 255.4 | | 0.3 | 1.3 |
| 323 | D86-automated | 150.5 | | 171.2 | | 195.7 | | 233.2 | | 252.2 | | 1.1 | 0.4 |
| 328 | D86-automated | 150.5 | | 170.0 | | 195.4 | | 232.1 | | 252.1 | | 1.3 | 0.1 |
| 333 | D86-automated | 146.6 | | 169.3 | | 194.4 | | 231.2 | | 251.0 | | 1.0 | 0.4 |
| 334 | D86-automated | 149.0 | | 170.4 | | 195.9 | | 233.3 | | 252.2 | | 1.1 | 1.0 |
| 335 | D86-automated | 151.5 | | 170.3 | | 196.5 | | 234.3 | | 251.9 | | 1.1 | 1.2 |
| 365 | IP123-automated | 148.8 | | 169.3 | | 195.3 | | 233.6 | | 252.8 | | 1.4 | 0.9 |
| 372 | D86 | 150.9 | | 170.4 | | 195.7 | | 232.8 | | 252.9 | | 1.3 | 0.3 |
| 391 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | ----- |
| 396 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | ----- |
| 399 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | ----- |
| 440 | D86-automated | 150.8 | | 170.7 | | 196.1 | | 234.5 | | 254.2 | | 1.3 | 0.5 |
| 445 | D86-automated | 148.1 | C | 168.6 | | 194.6 | | 232.7 | | 250.4 | | 1.2 | 0.9 |
| 447 | | 151.6 | | 170.2 | | 195.4 | | 233.8 | | 252.7 | | 1.2 | 0.9 |
| 460 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | ----- |
| 467 | D86-automated | 153.1 | | 170.6 | | 195.9 | | 232.8 | | 252.4 | | 1.3 | 0.5 |
| 480 | D86-automated | 150.8 | | 171.45 | | 196.0 | | 232.6 | | 251.85 | | 1.15 | 0.45 |
| 496 | D86-automated | 153.7 | | 171.8 | | 195.4 | | 233.4 | | 253.6 | | 1.2 | 1.0 |
| 603 | D86-automated | 152.4 | | 169.2 | | 193.9 | | 232.0 | | 250.0 | | 1.2 | 1.3 |
| 608 | D86-automated | 145.9 | | 170.3 | | 196.5 | | 233.3 | | 252.3 | | 1.2 | 0.6 |
| 631 | D86-manual | 151.0 | | 168.0 | | 194.0 | C | 231.0 | | 249.5 | | 1.0 | 1.2 |
| 657 | D86-automated | 154.4 | | 170.8 | | 196.6 | | 233.2 | | 254.0 | | 1.0 | 0.6 |
| 736 | D86-manual | 150.0 | | 169.5 | | 195.0 | | 233.0 | | 250.0 | | 1.2 | 0.8 |
| 823 | D86-automated | 151.5 | | 171.2 | | 196.7 | | 233.8 | | 255.1 | | 0.8 | 0.7 |
| 824 | D86-automated | 150.0 | | 171.8 | | 196.1 | | 233.7 | | 253.8 | | 1.2 | 0.5 |
| 851 | D86-automated | 148.6 | | 170.3 | | 195.2 | | 232.4 | | 251.8 | | 1.2 | 0.6 |
| 854 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | ----- |
| 862 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | ----- |
| 869 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | ----- |
| 904 | D86-automated | 150.1 | | 169.4 | | 196.4 | C | 233.4 | | 253.5 | | ----- | ----- |
| 914 | D86-automated | 150.3 | | 169.9 | | 195.5 | | 233.3 | | 257.2 | | 1.2 | 0.8 |
| 962 | D86-automated | 150.8 | | 169.4 | | 194.3 | | 231.0 | | 251.0 | | 1.2 | 0.7 |
| 963 | D86-automated | 147.7 | | 170.3 | | 195.3 | | 231.5 | | 251.7 | | 1.0 | 1.0 |
| 970 | D86-manual | 150.0 | | 169.0 | | 195.0 | | 231.0 | | 252.0 | | 1.0 | 1.0 |
| 974 | D86-automated | 149.0 | | 169.1 | | 195.0 | | 232.1 | | 252.0 | | 1.0 | 1.0 |
| 994 | D86-manual | 150.0 | | 170.0 | | 195.0 | | 232.0 | | 255.0 | | 1.0 | 0.2 |
| 995 | D86-manual | 149.5 | | 170.5 | | 195.5 | | 235.0 | | 255.5 | | 1.3 | 0.3 |
| 996 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | ----- |
| 997 | D86-manual | 149.0 | | 171.0 | | 196.0 | | 235.0 | | 255.5 | | 1.3 | 0.2 |
| 1011 | D86-automated | 149.9 | | 170.6 | | 195.5 | | 234.2 | | 253.4 | | ----- | ----- |
| 1016 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | ----- |
| 1019 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | ----- |
| 1023 | | 151.7 | | 170.5 | | 194.7 | | 232.6 | | 252.7 | | 1.1 | 0.8 |
| 1039 | D86-automated | 152.2 | | 171.2 | | 196.3 | | 233.1 | | 251.8 | | 1.2 | 0.7 |
| 1040 | D86-automated | 148.9 | | 169.0 | | 195.3 | | 233.3 | | 253.2 | | 1.2 | 0.7 |
| 1049 | D86-automated | 152.6 | | 171.3 | | 196.4 | | 234.3 | | 253.5 | | 1.2 | 0.8 |
| 1059 | D86-automated | 150.9 | | 170.7 | | 195.8 | | 232.6 | | 253.6 | | 1.2 | 0.3 |
| 1062 | D86-automated | 151.5 | | 170.1 | | 196.1 | | 233.1 | | 253.7 | | 1.2 | 0.5 |

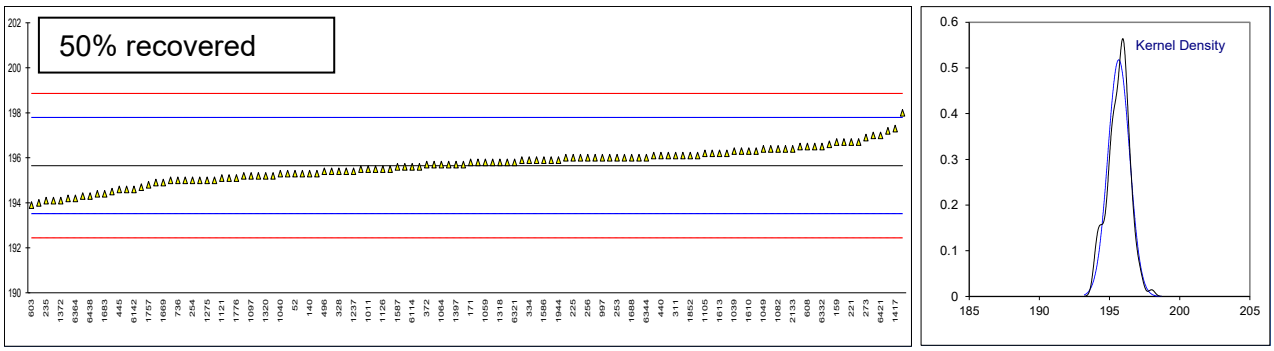
| lab | method | IBP | mark | 10% rec | mark | 50% rec | mark | 90% rec | mark | FBP | mark | Res. | | Loss | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1064 | D86-automated | 152.8 | | 170.8 | | 195.7 | | 233.4 | | 254.8 | | 1.3 | | 0.4 | |
| 1065 | | 146.6 | | 166.6 | R5 | 195.7 | | 233.8 | | 275.4 | R1 | 1.4 | | 0.6 | |
| 1082 | ISO3405-automated | 150.4 | | 171.4 | | 196.4 | | 233.8 | | 254.2 | | 1.3 | C | 0.3 | C |
| 1097 | ISO3405-automated | 152.6 | | 169.6 | | 195.2 | | 233.4 | | 252.6 | | 1.2 | | 0.5 | |
| 1105 | D86-automated | 148.6 | | 171.7 | | 196.2 | | 232.9 | | 252.3 | | 1.1 | | 0.1 | |
| 1109 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1121 | D86-automated | 145.7 | | 170.4 | | 195.1 | | 232.1 | | 252.0 | | 1.2 | | 0.5 | |
| 1126 | ISO3405-automated | 152.4 | | 170.9 | | 195.5 | | 231.4 | | 251.7 | | 1.1 | | 0.5 | |
| 1140 | D86-automated | 146.3 | | 169.6 | | 195.2 | | 232.4 | | 253.5 | | 0.4 | | 0.5 | |
| 1182 | | 155.4 | C | 172.1 | | 197.2 | | 234.9 | | 254.3 | C | 0.8 | | 1.1 | |
| 1191 | ISO3405-automated | 146.4 | | 171.5 | | 195.8 | | 232.9 | | 252.7 | | 1.3 | | 0 | |
| 1205 | D86-automated | 152.0 | | 170.8 | | 196.3 | | 232.5 | | 252.4 | | 1.2 | | 0.2 | |
| 1237 | ISO3405-automated | 149.8 | | 170.4 | | 195.4 | | 232.0 | | 252.3 | | 1.2 | | 0.5 | |
| 1275 | IP123-automated | 149.4 | | 169.8 | | 195.0 | | 232.4 | | 251.8 | | 1.2 | | 0.5 | |
| 1279 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1299 | D86-automated | 151.2 | | 170.9 | | 196.4 | | 234.3 | | 254.5 | | 1.2 | | 0.7 | |
| 1316 | D86-automated | 150.4 | | 170.8 | | 196.2 | | 233.1 | | 253.6 | | 1.2 | | 0.2 | |
| 1318 | D86-automated | 154.9 | | 171.1 | | 195.8 | | 233.4 | | 253.8 | | 1.2 | | 0.5 | |
| 1320 | D86-automated | 147.2 | C | 169.5 | | 195.2 | | 231.5 | | 252.0 | | 1.2 | | 0.1 | |
| 1357 | D86-automated | 151.3 | | 169.8 | | 194.1 | | 232.9 | | 253.8 | | 1.2 | | 1.5 | |
| 1372 | D86-automated | 151.9 | | 168.8 | | 194.1 | | 231.2 | | 253.9 | | 1.1 | | 0.9 | |
| 1397 | | 152.6 | | 171.3 | | 195.7 | | 231.9 | | 251.4 | | 1.2 | | 0.4 | |
| 1399 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1412 | D86-manual | 150.0 | | 170.0 | | 195.5 | | 233.0 | | 253.0 | | ----- | | ----- | |
| 1417 | IP123-automated | 152.3 | | 170.8 | | 197.3 | | 235.7 | | 253.0 | | 1.5 | | 1.5 | |
| 1444 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1455 | D86-automated | 151.0 | | 171.2 | | 196.1 | | 233.0 | | 253.2 | | 1.2 | | 0.4 | |
| 1496 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1538 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1575 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1585 | D86-automated | 148.1 | | 170.0 | | 195.1 | | 231.8 | | 251.5 | | 1.2 | | 0.5 | |
| 1586 | D86-automated | 151.3 | | 170.4 | | 195.9 | | 233.2 | | 252.9 | | 1.3 | | 0.6 | |
| 1587 | D86-automated | 150.4 | | 170.4 | | 195.6 | | 232.3 | | 252.3 | | 1.2 | | 0.2 | |
| 1610 | IP123-automated | 152.4 | | 171.5 | | 196.3 | | 233.6 | | 254.0 | | 1.2 | | 0.1 | |
| 1613 | D86-automated | 152.8 | | 171.2 | | 196.2 | | 232.7 | | 253.9 | | 1.2 | | 0.3 | |
| 1616 | D86-automated | 148.8 | | 169.4 | | 194.2 | | 231.3 | | 252.1 | | 1.2 | | 0.4 | |
| 1631 | D86-automated | 147.1 | | 169.4 | | 195.2 | | 232.7 | | 253.4 | | 1.2 | | 0.4 | |
| 1634 | | 150.9 | | 170.5 | | 195.6 | | 232.8 | | 253.3 | | 1.2 | | 0.1 | |
| 1636 | D86-automated | 149.7 | | 171.1 | | 196.5 | | 234.2 | | 251.8 | | 1.2 | | 0.7 | |
| 1669 | D86-automated | 146.2 | | 168.7 | | 194.9 | | 232.1 | | 253.1 | | 1.2 | | 0.2 | |
| 1683 | D86-automated | 151.2 | | 169.2 | | 194.4 | | 232.0 | | 250.1 | | 1.2 | | 1.1 | |
| 1688 | | ----- | | 169.0 | | 196.0 | | 231.0 | | 252.0 | | ----- | | ----- | |
| 1715 | ISO3405-automated | 154.3 | | 169.8 | | 195 | | 234 | | 253.7 | | 1 | | 0.6 | |
| 1720 | D86-automated | 149.1 | | 170.6 | | 195.9 | | 232.9 | | 258.9 | C,R1 | 0.9 | | 0.2 | |
| 1724 | D86-automated | 148.9 | | 169.4 | | 194.5 | | 231 | | 252.5 | | 1.2 | | 0.6 | |
| 1730 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1757 | D86-automated | 151.3 | | 170.4 | | 194.8 | | 231.9 | | 250.4 | | 1.2 | | 1 | |
| 1776 | ISO3405-automated | 148.9 | | 169.0 | | 195.1 | | 232.8 | | 251.8 | | 1.1 | | 1.2 | |
| 1833 | | 146.9 | | 169.2 | | 194.6 | | 232 | | 252.2 | | 1.2 | | 0.4 | |
| 1852 | D86-automated | 150.9 | | 170.5 | | 196.1 | | 233.0 | | 253.7 | | 1.2 | | 0.7 | |
| 1913 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1944 | D86-automated | 149.6 | | 170.5 | | 195.9 | | 233.0 | | 253.5 | | 1.2 | | 0.5 | |
| 1961 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 2130 | | 151.5 | | 170.6 | | 196.3 | | 234.0 | | 253.5 | | 1.2 | | 0.9 | |
| 2133 | D86-automated | 151.3 | | 170.9 | | 196.4 | | 233.6 | | 254.1 | | 1.2 | | 0.9 | |
| 6028 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 6041 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 6054 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 6075 | D86-automated | 147.6 | | 170.9 | | 196.7 | | 234.0 | | 252.9 | | 1.2 | | 0.8 | |
| 6114 | D86-automated | 153.4 | | 170.8 | | 195.6 | | 233.2 | | 252.9 | | 1.3 | | 0.6 | |
| 6135 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 6142 | ISO3405-automated | 148.7 | | 169.3 | | 194.6 | | 231.6 | | 250.6 | | 1..2 | | 0.8 | |
| 6203 | D86-automated | 148.6 | | 170.0 | | 195.8 | | 233.2 | | 252.6 | | 1.2 | | 0.9 | |
| 6244 | D86-manual | 154.2 | | 171.4 | | 196.2 | | 232.4 | C | 262.2 | C,R1 | 1.4 | | 0.6 | |
| 6266 | D86-automated | 151.98 | | 171.46 | | 195.6 | | 232.2 | | 252.35 | C | 1.4 | | 0.199 | |
| 6274 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 6312 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 6315 | D86-automated | 149.4 | | 170.4 | | 195.7 | | 233.1 | | 253.4 | | 1.0 | | 0.8 | |
| 6321 | IP123-automated | 151.6 | | 170.6 | | 195.8 | | 233.0 | | 252.8 | | 1.4 | | 0.2 | |
| 6324 | D86-manual | 152.5 | | 169.5 | | 196.0 | C | 233.0 | | 254.1 | | 1.0 | | 0.5 | |
| 6332 | D86-manual | 154.5 | | 171.5 | | 196.5 | | 234 | | 253.5 | | 1.2 | | 0.8 | |
| 6344 | D86-automated | 151.4 | | 170.6 | | 196.0 | | 232.8 | | 253.3 | | 1.2 | | 0.6 | |
| 6346 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 6364 | D86-automated | 152.4 | | 169.2 | | 194.2 | | 231.6 | | 252.3 | | 1.4 | | 1.2 | |

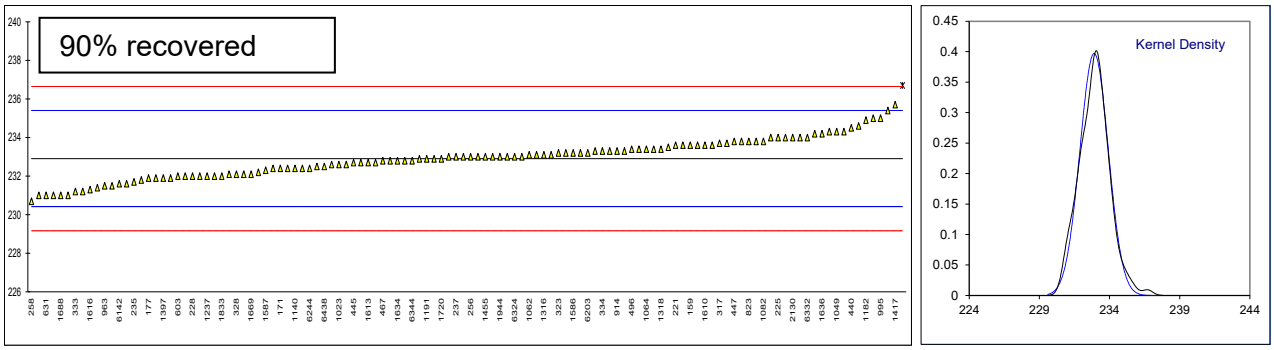
| lab | method | IBP | mark | 10% rec | mark | 50% rec | mark | 90% rec | mark | FBP | mark | Res. | Loss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6384 | D86-automated | 149.2 | | 170.8 | | 196.1 | | 234.6 | | 254.4 | | 1.2 | 0.9 |
| 6421 | D86 | 154 | | 172 | | 197 | | 233 | | 255 | | ----- | ----- |
| 6438 | D86-automated | 146.7 | | 168.7 | | 194.3 | | 232.5 | | 250.9 | | 1.2 | 0.9 |
| 6479 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | ----- |
| 6487 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | ----- |
| | normality | OK | | OK | | OK | | OK | | OK | | | |
| | n | 119 | | 119 | | 120 | | 119 | | 117 | | | |
| | outliers | 0 | | 1 | | 0 | | 1 | | 3 | | | |
| | mean (n) | 150.49 | | 170.34 | | 195.65 | | 232.90 | | 252.91 | | | |
| | st.dev. (n) | 2.347 | | 0.933 | | 0.770 | | 1.005 | | 1.458 | | | |
| | R(calc.) | 6.57 | | 2.61 | | 2.16 | | 2.81 | | 4.08 | | | |
| | st.dev.(D86-A:20b) | 2.956 | | 1.338 | | 1.071 | | 1.248 | | 2.536 | | | |
| | R(D86-A:20b) | 8.28 | | 3.75 | | 3.0 | | 3.49 | | 7.1 | | | |
| | compare | | | | | | | | | | | | |
| | R(D86-M:20b) | 4.65 | | 3.00 | | 2.84 | | 3.32 | | 3.94 | | | |

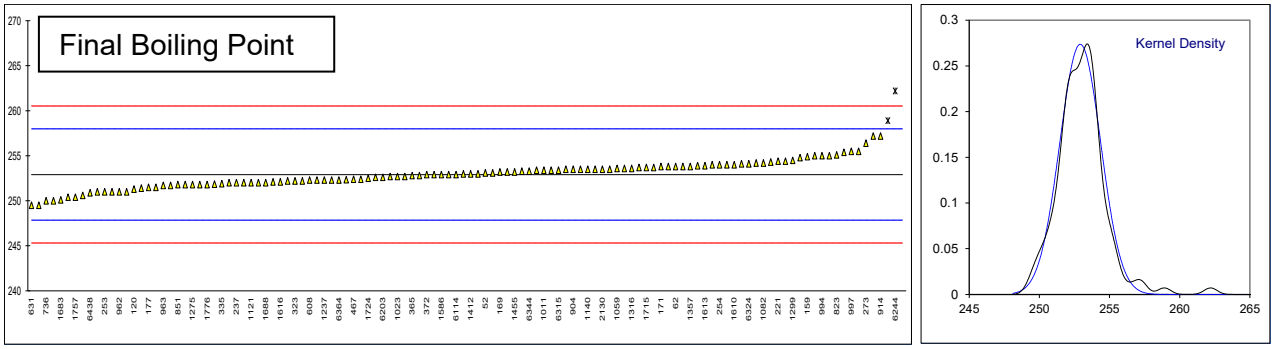
Lab 62 first reported 257.8
Lab 177 first reported 351.5
Lab 445 first reported 141.8
Lab 631 first reported 192.5
Lab 904 first reported 198.4
Lab 1082 first reported 98.4 and 1.3 respectively
Lab 1182 first reported 157.1 and 257.6 respectively
Lab 1320 first reported 142.7
Lab 1720 first reported 259.8
Lab 6244 first reported 236.5 and 265.4 respectively
Lab 6266 first reported 182.566
Lab 6324 first reported 193.0


Initial Boiling Point
Kernel Density


10% recovered
Kernel Density


50% recovered
Kernel Density


90% recovered
Kernel Density

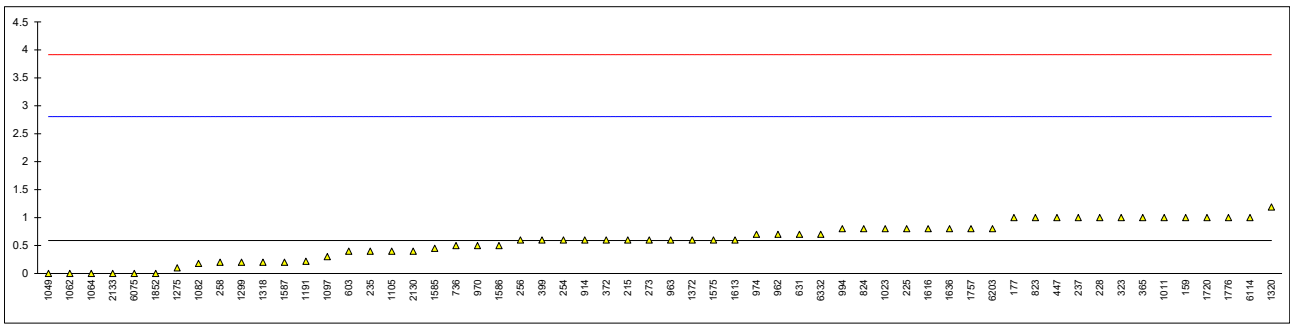

Final Boiling Point
Kernel Density

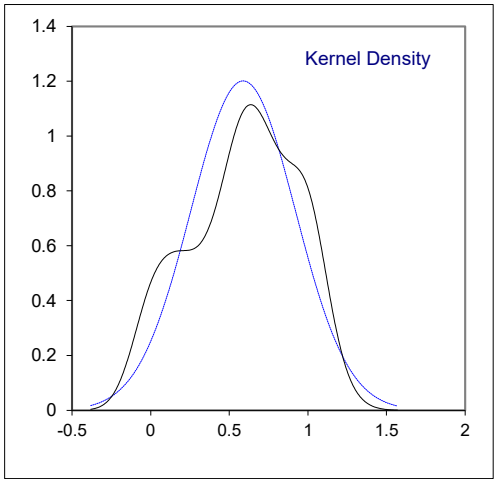
## Determination of Existent Gum (unwashed) on sample #22150; results in mg/100 mL

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | D381 | <1 | | ----- | 1062 | D381 | 0 | | -0.53 |
| 62 | D381 | <1 | | ----- | 1064 | D381 | 0 | | -0.53 |
| 120 | | ----- | | ----- | 1065 | | ----- | | ----- |
| 140 | | ----- | | ----- | 1082 | IP540 | 0.18 | | -0.37 |
| 150 | D381 | <1 | | ----- | 1097 | IP540 | 0.3 | | -0.26 |
| 159 | D381 | 1.0 | | 0.37 | 1105 | D381 | 0.40 | | -0.17 |
| 169 | D381 | <1 | | ----- | 1109 | | ----- | | ----- |
| 171 | | ----- | | ----- | 1121 | | ----- | | ----- |
| 175 | | ----- | | ----- | 1126 | | ----- | | ----- |
| 177 | D381 | 1 | | 0.37 | 1140 | IP540 | <1 | | ----- |
| 215 | D381 | 0.6 | | 0.01 | 1182 | | ----- | | ----- |
| 221 | D381 | <1 | | ----- | 1191 | IP541 | 0.22 | | -0.33 |
| 224 | | ----- | | ----- | 1205 | | ----- | | ----- |
| 225 | D381 | 0.8 | | 0.19 | 1237 | | ----- | | ----- |
| 228 | D381 | 1.0 | | 0.37 | 1275 | IP540 | 0.1 | | -0.44 |
| 235 | D381 | 0.4 | | -0.17 | 1279 | | ----- | | ----- |
| 237 | D381 | 1.0 | | 0.37 | 1299 | IP540 | 0.2 | | -0.35 |
| 238 | | ----- | | ----- | 1316 | D381 | <1 | | ----- |
| 253 | IP540 | <1.0 | | ----- | 1318 | IP540 | 0.2 | | -0.35 |
| 254 | D381 | 0.6 | | 0.01 | 1320 | D381 | 1.19 | | 0.54 |
| 256 | IP540 | 0.6 | | 0.01 | 1357 | D381 | <0.5 | | ----- |
| 258 | D381 | 0.2 | | -0.35 | 1372 | IP540 | 0.6 | | 0.01 |
| 273 | D381 | 0.6 | | 0.01 | 1397 | | ----- | | ----- |
| 311 | IP540 | <1 | | ----- | 1399 | | ----- | | ----- |
| 317 | D381 | <1 | | ----- | 1412 | D381 | <1 | | ----- |
| 323 | D381 | 1.0 | | 0.37 | 1417 | | ----- | | ----- |
| 328 | | ----- | | ----- | 1444 | | ----- | | ----- |
| 333 | | ----- | | ----- | 1455 | D381 | < 1 | | ----- |
| 334 | D381 | <0.5 | | ----- | 1496 | | ----- | | ----- |
| 335 | | ----- | | ----- | 1538 | IP540 | <1 | | ----- |
| 365 | IP540 | 1.0 | | 0.37 | 1575 | D381 | 0.6 | | 0.01 |
| 372 | IP540 | 0.6 | | 0.01 | 1585 | D381 | 0.45 | | -0.12 |
| 391 | | ----- | | ----- | 1586 | IP540 | 0.5 | | -0.08 |
| 396 | IP540 | <1,0 | | ----- | 1587 | IP540 | 0.2 | | -0.35 |
| 399 | D381 | 0.6 | | 0.01 | 1610 | IP540 | <1 | | ----- |
| 440 | | ----- | | ----- | 1613 | D381 | 0.6 | | 0.01 |
| 445 | | ----- | | ----- | 1616 | IP540 | 0.8 | | 0.19 |
| 447 | D381 | 1 | | 0.37 | 1631 | | ----- | | ----- |
| 460 | | ----- | | ----- | 1634 | D381 | < 1 | | ----- |
| 467 | IP540 | <1 | | ----- | 1636 | IP540 | 0.8 | | 0.19 |
| 480 | | ----- | | ----- | 1669 | | ----- | | ----- |
| 496 | | ----- | | ----- | 1683 | D381 | <1 | | ----- |
| 603 | D381 | 0.4 | | -0.17 | 1688 | | ----- | | ----- |
| 608 | D381 | <1 | | ----- | 1715 | | ----- | | ----- |
| 631 | D381 | 0.7 | | 0.10 | 1720 | D381 | 1.0 | | 0.37 |
| 657 | D381 | <1 | | ----- | 1724 | IP540 | <1 | | ----- |
| 736 | D381 | 0.5 | | -0.08 | 1730 | | ----- | | ----- |
| 823 | D381 | 1.0 | | 0.37 | 1757 | D381 | 0.8 | | 0.19 |
| 824 | D381 | 0.8 | | 0.19 | 1776 | IP540 | 1 | | 0.37 |
| 851 | IP540 | <1 | | ----- | 1833 | IP540 | <1 | | ----- |
| 854 | | ----- | | ----- | 1852 | D381 | 0.0001 | | -0.53 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | | ----- | | ----- |
| 904 | | ----- | | ----- | 1961 | | ----- | | ----- |
| 914 | D381 | 0.6 | | 0.01 | 2130 | IP540 | 0.4 | | -0.17 |
| 962 | IP540 | 0.7 | | 0.10 | 2133 | D381 | 0.0 | | -0.53 |
| 963 | D381 | 0.6 | | 0.01 | 6028 | | ----- | | ----- |
| 970 | D381 | 0.5 | | -0.08 | 6041 | | ----- | | ----- |
| 974 | IP540 | 0.7 | | 0.10 | 6054 | | ----- | | ----- |
| 994 | D381 | 0.8 | | 0.19 | 6075 | IP540 | 0.0 | | -0.53 |
| 995 | | ----- | | ----- | 6114 | IP540 | 1 | | 0.37 |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | | ----- | | ----- | 6142 | | ----- | | ----- |
| 1011 | D381 | 1 | | 0.37 | 6203 | D381 | 0.8 | | 0.19 |
| 1016 | D381 | <1 | | ----- | 6244 | | ----- | | ----- |
| 1019 | | ----- | | ----- | 6266 | | ----- | | ----- |
| 1023 | IP540 | 0.8 | | 0.19 | 6274 | | ----- | | ----- |
| 1039 | ISO6246 | <1 | | ----- | 6312 | | ----- | | ----- |
| 1040 | | ----- | | ----- | 6315 | IP540 | <1 | | ----- |
| 1049 | D381 | 0 | | -0.53 | 6321 | IP540 | <1 | | ----- |
| 1059 | D381 | <1 | | ----- | 6324 | | ----- | | ----- |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | IP540 | 0.7 | | 0.10 | 6421 | | ----- | | ----- |
| 6344 | | ----- | | ----- | 6438 | | ----- | | ----- |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | | ----- | | ----- | 6487 | | ----- | | ----- |
| 6384 | D381 | <1 | | ----- | | | | | |

| | |
|---|---|
| normality | OK |
| n | 58 |
| outliers | 0 |
| mean (n) | 0.59 |
| st.dev. (n) | 0.332 |
| R(calc.) | 0.93 |
| st.dev.(D381:22) | 1.109 |
| R(D381:22) | 3.11 |
| compare | |
| R(IP540:08R19) | 1.82 |



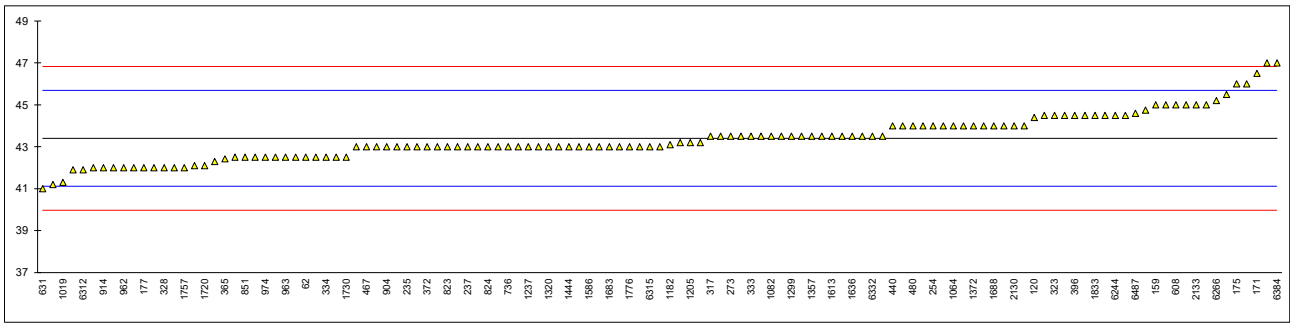
## Determination of Flash Point on sample #22150; results in °C

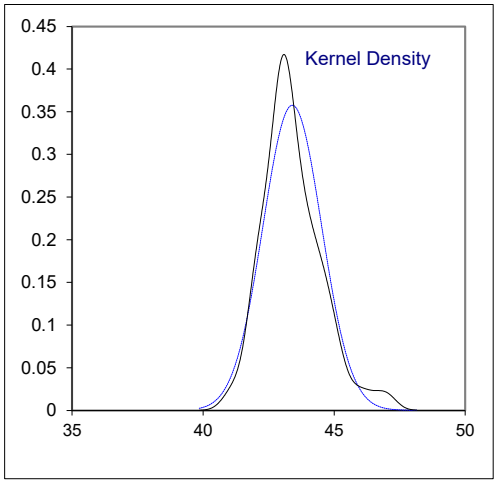
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | D56 | 44.5 | | 0.96 | 1062 | IP170 | 43.0 | | -0.35 |
| 62 | D56 | 42.5 | C | -0.79 | 1064 | IP170 | 44.0 | | 0.52 |
| 120 | D56 | 44.4 | | 0.87 | 1065 | | ----- | | ----- |
| 140 | | ----- | | ----- | 1082 | ISO13736 | 43.5 | | 0.09 |
| 150 | D56 | 44.0 | | 0.52 | 1097 | ISO13736 | 42.1 | | -1.14 |
| 159 | D56 | 45.0 | | 1.40 | 1105 | IP170 | 44.0 | | 0.52 |
| 169 | D56 | 43.0 | | -0.35 | 1109 | | ----- | | ----- |
| 171 | D56 | 46.5 | | 2.71 | 1121 | IP170 | 41.9 | | -1.31 |
| 175 | D93 | 46 | | 2.27 | 1126 | D93 | 47.0 | | 3.15 |
| 177 | D56 | 42.0 | | -1.23 | 1140 | IP170 | 43.5 | | 0.09 |
| 215 | IP170 | 43.0 | | -0.35 | 1182 | D93 | 43.1 | C | -0.26 |
| 221 | | ----- | | ----- | 1191 | ISO13736 | 44.75 | | 1.18 |
| 224 | | ----- | | ----- | 1205 | D56 | 43.2 | | -0.18 |
| 225 | IP170 | 42.0 | | -1.23 | 1237 | D56 | 43.0 | | -0.35 |
| 228 | IP170 | 43.0 | | -0.35 | 1275 | IP170 | 42.0 | | -1.23 |
| 235 | IP170 | 43.0 | | -0.35 | 1279 | | ----- | | ----- |
| 237 | IP170 | 43.0 | | -0.35 | 1299 | IP170 | 43.5 | | 0.09 |
| 238 | IP170 | 44.0 | | 0.52 | 1316 | IP170 | 43.5 | | 0.09 |
| 253 | IP170 | 42.5 | | -0.79 | 1318 | IP170 | 43.0 | | -0.35 |
| 254 | IP170 | 44.0 | | 0.52 | 1320 | D56 | 43.0 | | -0.35 |
| 256 | IP170 | 43.0 | | -0.35 | 1357 | IP170 | 43.5 | | 0.09 |
| 258 | IP170 | 42.5 | | -0.79 | 1372 | | 44 | | 0.52 |
| 273 | IP170 | 43.5 | | 0.09 | 1397 | | ----- | | ----- |
| 311 | IP170 | 43.5 | | 0.09 | 1399 | | ----- | | ----- |
| 317 | IP170 | 43.5 | | 0.09 | 1412 | D93 | 43.0 | | -0.35 |
| 323 | IP170 | 44.5 | | 0.96 | 1417 | IP170 | 43.5 | | 0.09 |
| 328 | IP170 | 42.0 | | -1.23 | 1444 | D93 | 43.0 | | -0.35 |
| 333 | IP170 | 43.5 | | 0.09 | 1455 | IP170 | 43.0 | | -0.35 |
| 334 | IP170 | 42.5 | | -0.79 | 1496 | | ----- | | ----- |
| 335 | IP170 | 42.5 | | -0.79 | 1538 | | ----- | | ----- |
| 365 | IP170 | 42.425 | | -0.85 | 1575 | D56 | 42.3 | | -0.96 |
| 372 | IP170 | 43.0 | | -0.35 | 1585 | ISO13736 | 45.0 | | 1.40 |
| 391 | IP170 | 42 | | -1.23 | 1586 | IP170 | 43.0 | | -0.35 |
| 396 | IP170 | 44.5 | | 0.96 | 1587 | IP170 | 43.0 | | -0.35 |
| 399 | IP170 | 43 | | -0.35 | 1610 | IP170 | 44.0 | | 0.52 |
| 440 | D93 | 44.0 | | 0.52 | 1613 | D56 | 43.5 | | 0.09 |
| 445 | IP170 | 42.0 | | -1.23 | 1616 | IP170 | 43.5 | | 0.09 |
| 447 | IP170 | 43.0 | | -0.35 | 1631 | | ----- | | ----- |
| 460 | | ----- | | ----- | 1634 | IP170 | 43.2 | | -0.18 |
| 467 | IP170 | 43.0 | | -0.35 | 1636 | IP170 | 43.5 | | 0.09 |
| 480 | D56 | 44.0 | | 0.52 | 1669 | IP170 | 44.5 | | 0.96 |
| 496 | D3828 | 43.2 | | -0.18 | 1683 | IP170 | 43.0 | | -0.35 |
| 603 | | ----- | | ----- | 1688 | D56 | 44.0 | | 0.52 |
| 608 | IP170 | 45.0 | | 1.40 | 1715 | D56 | 43 | | -0.35 |
| 631 | D56 | 41.0 | | -2.10 | 1720 | D3828 | 42.1 | | -1.14 |
| 657 | IP170 | 42.0 | | -1.23 | 1724 | IP170 | 44 | | 0.52 |
| 736 | D56 | 43.0 | | -0.35 | 1730 | D56 | 42.5 | | -0.79 |
| 823 | IP170 | 43.0 | | -0.35 | 1757 | D56 | 42.0 | | -1.23 |
| 824 | IP170 | 43.0 | | -0.35 | 1776 | IP170 | 43.0 | | -0.35 |
| 851 | IP170 | 42.5 | | -0.79 | 1833 | | 44.5 | | 0.96 |
| 854 | | ----- | | ----- | 1852 | IP170 | 44.5 | | 0.96 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | ISO13736 | 43.0 | | -0.35 |
| 904 | D56 | 43.0 | | -0.35 | 1961 | | ----- | | ----- |
| 914 | IP170 | 42.0 | | -1.23 | 2130 | IP170 | 44.0 | | 0.52 |
| 962 | IP170 | 42.0 | | -1.23 | 2133 | D93 | 45.0 | | 1.40 |
| 963 | IP170 | 42.5 | | -0.79 | 6028 | | ----- | | ----- |
| 970 | IP170 | 42.5 | | -0.79 | 6041 | | ----- | | ----- |
| 974 | IP170 | 42.5 | | -0.79 | 6054 | | ----- | | ----- |
| 994 | D56 | 43.5 | | 0.09 | 6075 | IP170 | 41.2 | | -1.93 |
| 995 | IP170 | 43.5 | | 0.09 | 6114 | IP170 | 43.5 | | 0.09 |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | IP170 | 44.0 | | 0.52 | 6142 | ISO13736 | 44 | | 0.52 |
| 1011 | IP170 | 42.5 | | -0.79 | 6203 | D56 | 45.5 | | 1.84 |
| 1016 | IP170 | 42.5 | | -0.79 | 6244 | D56 | 44.5 | | 0.96 |
| 1019 | ISO3679 | 41.3 | | -1.84 | 6266 | IP170 | 45.2 | | 1.57 |
| 1023 | IP170 | 45.0 | | 1.40 | 6274 | | ----- | | ----- |
| 1039 | IP170 | 44.5 | | 0.96 | 6312 | IP170 | 41.9 | | -1.31 |
| 1040 | | ----- | | ----- | 6315 | IP170 | 43.0 | | -0.35 |
| 1049 | ISO13736 | 43.0 | | -0.35 | 6321 | IP170 | 43.0 | | -0.35 |
| 1059 | IP170 | 43.0 | | -0.35 | 6324 | D93 | 44.5 | | 0.96 |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | IP170 | 43.5 | | 0.09 | 6421 | IP170 | 46 | | 2.27 |
| 6344 | ISO2719 | 45 | | 1.40 | 6438 | | ----- | | ----- |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | IP170 | 43.5 | C | 0.09 | 6487 | ISO13736 | 44.6 | | 1.05 |
| 6384 | IP170 | 47.0 | | 3.15 | | | | | |

| | |
|---|---|
| normality | suspect |
| n | 123 |
| outliers | 0 |
| mean (n) | 43.40 |
| st.dev. (n) | 1.116 |
| R(calc.) | 3.13 |
| st.dev.(IP170:21) | 1.143 |
| R(IP170:21) | 3.2 |

Lab 62 first reported 48.0
Lab 1182 first reported 46
Lab 6364 first reported 39.5



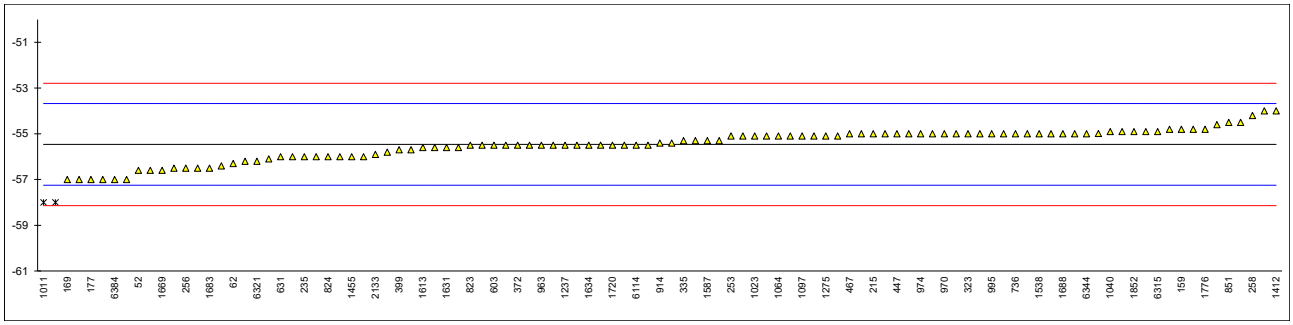
## Determination of Freezing Point on sample #22150; results in °C

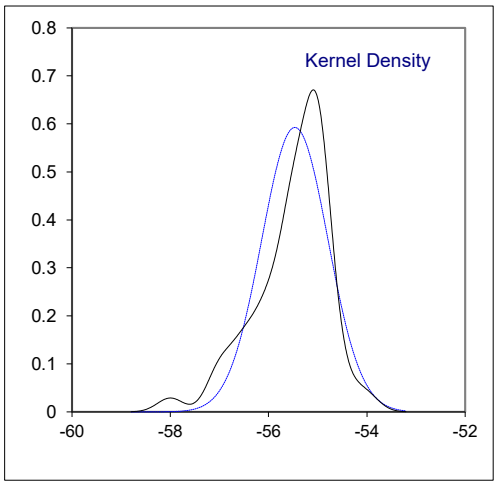
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | D5972 | -56.6 | | -1.27 | 1062 | D7153 | -55.4 | | 0.07 |
| 62 | D5972 | -56.3 | | -0.93 | 1064 | D7153 | -55.1 | | 0.41 |
| 120 | D5972 | -58.0 | R(0.05) | -2.84 | 1065 | | ----- | | ----- |
| 140 | | ----- | | ----- | 1082 | IP529 | -55.1 | | 0.41 |
| 150 | | ----- | | ----- | 1097 | IP529 | -55.1 | | 0.41 |
| 159 | D2386 | -54.8 | | 0.75 | 1105 | D7153 | -55.5 | | -0.04 |
| 169 | D2386 | -57.0 | C | -1.72 | 1109 | | ----- | | ----- |
| 171 | D2386 | -55.0 | | 0.52 | 1121 | D2386 | -54.99 | | 0.53 |
| 175 | | ----- | | ----- | 1126 | | ----- | | ----- |
| 177 | D2386 | -57 | | -1.72 | 1140 | D7153 | -54.9 | | 0.63 |
| 215 | D2386 | -55.0 | | 0.52 | 1182 | D5972 | -55.1 | | 0.41 |
| 221 | D2386 | -56 | | -0.60 | 1191 | IP529 | -55.3 | | 0.19 |
| 224 | | ----- | | ----- | 1205 | | ----- | | ----- |
| 225 | | ----- | | ----- | 1237 | D2386 | -55.5 | | -0.04 |
| 228 | D2386 | -55.5 | | -0.04 | 1275 | IP529 | -55.1 | | 0.41 |
| 235 | D2386 | -56 | | -0.60 | 1279 | | ----- | | ----- |
| 237 | D2386 | -55.0 | | 0.52 | 1299 | D2386 | -54.0 | | 1.64 |
| 238 | | ----- | | ----- | 1316 | D7153 | -55.5 | | -0.04 |
| 253 | D7153 | -55.1 | | 0.41 | 1318 | D7153 | -55.1 | | 0.41 |
| 254 | D2386 | -56.0 | | -0.60 | 1320 | D5972 | -56.2 | | -0.82 |
| 256 | D2386 | -56.5 | | -1.16 | 1357 | D5972 | -56.5 | | -1.16 |
| 258 | D2386 | -54.2 | | 1.42 | 1372 | D7153 | -55.7 | | -0.26 |
| 273 | D2386 | -57 | | -1.72 | 1397 | D5972 | -55.0 | | 0.52 |
| 311 | D2386 | -55.5 | | -0.04 | 1399 | | ----- | | ----- |
| 317 | D2386 | -55.0 | | 0.52 | 1412 | D2386 | -54 | | 1.64 |
| 323 | D2386 | -55.0 | | 0.52 | 1417 | | ----- | | ----- |
| 328 | | ----- | | ----- | 1444 | | ----- | | ----- |
| 333 | | ----- | | ----- | 1455 | D7153 | -56.0 | | -0.60 |
| 334 | D7153 | -55.1 | | 0.41 | 1496 | | ----- | | ----- |
| 335 | IP529 | -55.3 | | 0.19 | 1538 | D5972 | -55.0 | | 0.52 |
| 365 | IP16 | -56.6 | | -1.27 | 1575 | | ----- | | ----- |
| 372 | D2386 | -55.5 | | -0.04 | 1585 | D2386 | -55.0 | | 0.52 |
| 391 | D2386 | -56.5 | | -1.16 | 1586 | D7153 | -54.5 | | 1.08 |
| 396 | D2386 | -55.0 | | 0.52 | 1587 | IP529 | -55.3 | | 0.19 |
| 399 | D7153 | -55.7 | | -0.26 | 1610 | | ----- | | ----- |
| 440 | | ----- | | ----- | 1613 | D7153 | -55.6 | | -0.15 |
| 445 | D2386 | -55.5 | | -0.04 | 1616 | D7153 | -55.6 | | -0.15 |
| 447 | D2386 | -55.0 | | 0.52 | 1631 | D7153 | -55.6 | | -0.15 |
| 460 | | ----- | | ----- | 1634 | D2386 | -55.5 | | -0.04 |
| 467 | D2386 | -55.0 | | 0.52 | 1636 | D2386 | -55.5 | | -0.04 |
| 480 | | ----- | | ----- | 1669 | D2386 | -56.6 | | -1.27 |
| 496 | | ----- | | ----- | 1683 | D2386 | -56.5 | | -1.16 |
| 603 | D2386 | -55.5 | | -0.04 | 1688 | D2386 | -55.0 | | 0.52 |
| 608 | | ----- | | ----- | 1715 | D5972 | -54.8 | | 0.75 |
| 631 | D5972 | -56.0 | | -0.60 | 1720 | D7153 | -55.5 | | -0.04 |
| 657 | D7153 | -55.8 | | -0.37 | 1724 | D2386 | -55.6 | | -0.15 |
| 736 | D2386 | -55.0 | | 0.52 | 1730 | D2386 | -55.5 | | -0.04 |
| 823 | D2386 | -55.5 | | -0.04 | 1757 | | ----- | | ----- |
| 824 | D2386 | -56.0 | | -0.60 | 1776 | IP529 | -54.8 | | 0.75 |
| 851 | D2386 | -54.5 | | 1.08 | 1833 | D7153 | -55.3 | | 0.19 |
| 854 | | ----- | | ----- | 1852 | D7153 | -54.9 | | 0.63 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | | ----- | | ----- |
| 904 | | ----- | | ----- | 1961 | | ----- | | ----- |
| 914 | D7153 | -55.4 | | 0.07 | 2130 | IP529 | -54.9 | | 0.63 |
| 962 | D2386 | -56 | | -0.60 | 2133 | D7153 | -55.9 | | -0.49 |
| 963 | D2386 | -55.5 | | -0.04 | 6028 | | ----- | | ----- |
| 970 | D2386 | -55.0 | | 0.52 | 6041 | | ----- | | ----- |
| 974 | D2386 | -55.0 | | 0.52 | 6054 | | ----- | | ----- |
| 994 | D2386 | -55 | | 0.52 | 6075 | IP529 | -54.6 | | 0.97 |
| 995 | D2386 | -55.0 | | 0.52 | 6114 | D2386 | -55.5 | | -0.04 |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | D2386 | -55.0 | | 0.52 | 6142 | | ----- | | ----- |
| 1011 | D2386 | -58.0 | R(0.05) | -2.84 | 6203 | D2386 | -55.0 | | 0.52 |
| 1016 | D5972 | -56.1 | | -0.71 | 6244 | D2386 | -56.4 | | -1.05 |
| 1019 | | ----- | | ----- | 6266 | | ----- | | ----- |
| 1023 | D7153 | -55.1 | | 0.41 | 6274 | | ----- | | ----- |
| 1039 | IP529 | -55.1 | | 0.41 | 6312 | | ----- | | ----- |
| 1040 | D7153 | -54.9 | | 0.63 | 6315 | D7153 | -54.9 | | 0.63 |
| 1049 | D7153 | -54.8 | | 0.75 | 6321 | D5972 | -56.2 | | -0.82 |
| 1059 | D2386 | -55.0 | | 0.52 | 6324 | D2386 | -56.0 | | -0.60 |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | D2386 | -57 | | -1.72 | 6421 | D2386 | -57 | C | -1.72 |
| 6344 | D2386 | -55 | | 0.52 | 6438 | | ----- | | ----- |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | D2386 | -55.5 | | -0.04 | 6487 | | ----- | | ----- |
| 6384 | D2386 | -57.0 | | -1.72 | | | | | |

| | |
|---|---|
| normality | OK |
| n | 103 |
| outliers | 2 |
| mean (n) | -55.47 |
| st.dev. (n) | 0.673 |
| R(calc.) | 1.88 |
| st.dev.(D2386:19) | 0.893 |
| R(D2386:19) | 2.5 |

Lab 169 first reported -46.0
Lab 6421 reported 57



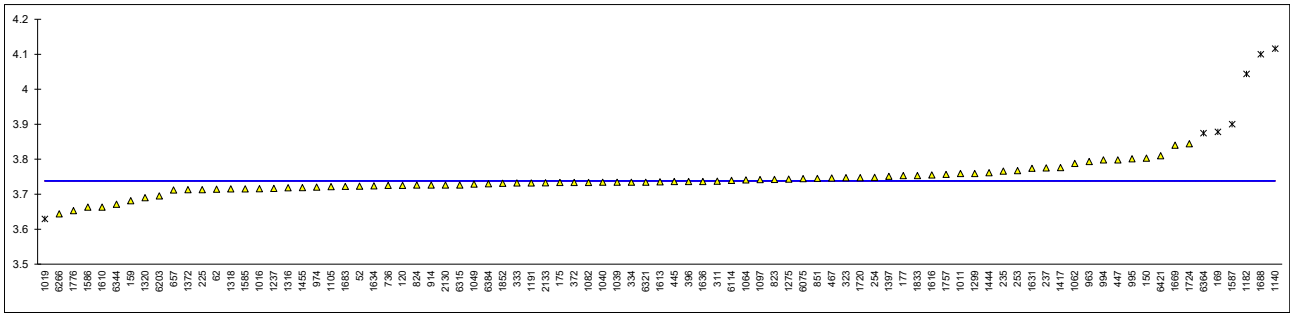
## Determination of Kinematic Viscosity at -20 °C on sample #22150; results in mm²/s

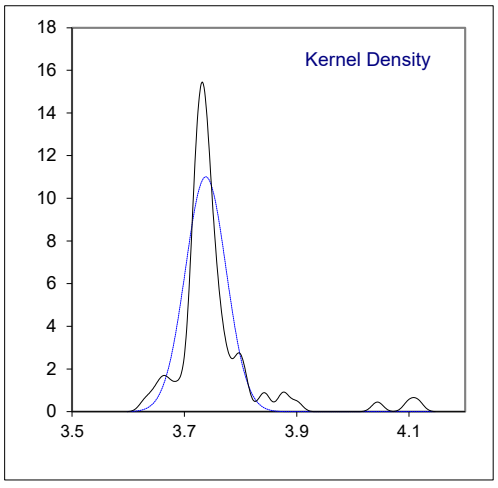
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | D445 | 3.723 | | ----- | 1062 | D445 | 3.788 | | ----- |
| 62 | D445 | 3.714 | | ----- | 1064 | D445 | 3.741 | | ----- |
| 120 | D445 | 3.725 | | ----- | 1065 | | ----- | | ----- |
| 140 | | ----- | | ----- | 1082 | ISO3104 | 3.73311631 | | ----- |
| 150 | D445 | 3.803 | | ----- | 1097 | ISO3104 | 3.7416 | | ----- |
| 159 | D445 | 3.681 | | ----- | 1105 | D445 | 3.7214 | | ----- |
| 169 | D445 | 3.878 | C,R(0.05) | ----- | 1109 | | ----- | | ----- |
| 171 | | ----- | | ----- | 1121 | | ----- | | ----- |
| 175 | D445 | 3.733 | | ----- | 1126 | | ----- | | ----- |
| 177 | D445 | 3.753 | | ----- | 1140 | D445 | 4.116 | R(0.01) | ----- |
| 215 | | ----- | | ----- | 1182 | D7042 | 4.0437 | C,R(0.01) | ----- |
| 221 | | ----- | | ----- | 1191 | ISO3104 | 3.732102656 | | ----- |
| 224 | | ----- | | ----- | 1205 | | ----- | | ----- |
| 225 | D445 | 3.713 | | ----- | 1237 | ISO3104 | 3.7162 | | ----- |
| 228 | | ----- | | ----- | 1275 | IP71 | 3.743 | | ----- |
| 235 | D445 | 3.766 | | ----- | 1279 | | ----- | | ----- |
| 237 | D445 | 3.775 | | ----- | 1299 | D445 | 3.759 | | ----- |
| 238 | | ----- | | ----- | 1316 | ISO3104 | 3.7185 | | ----- |
| 253 | D445 | 3.7669 | | ----- | 1318 | D7042 | 3.715 | | ----- |
| 254 | D445 | 3.748 | C | ----- | 1320 | D445 | 3.690 | | ----- |
| 256 | | ----- | | ----- | 1357 | | ----- | | ----- |
| 258 | | ----- | | ----- | 1372 | D7042 | 3.7129 | | ----- |
| 273 | | ----- | | ----- | 1397 | D7042 | 3.751 | | ----- |
| 311 | D445 | 3.737 | | ----- | 1399 | | ----- | | ----- |
| 317 | | ----- | | ----- | 1412 | | ----- | | ----- |
| 323 | D445 | 3.747 | | ----- | 1417 | D445 | 3.776 | | ----- |
| 328 | | ----- | | ----- | 1444 | D445 | 3.761 | | ----- |
| 333 | D445 | 3.732 | | ----- | 1455 | D7042 | 3.719 | | ----- |
| 334 | D445 | 3.734 | | ----- | 1496 | | ----- | | ----- |
| 335 | | ----- | | ----- | 1538 | | ----- | | ----- |
| 365 | | ----- | | ----- | 1575 | | ----- | | ----- |
| 372 | D445 | 3.733 | | ----- | 1585 | D445 | 3.715 | | ----- |
| 391 | | ----- | | ----- | 1586 | D445 | 3.663 | | ----- |
| 396 | D445 | 3.736 | | ----- | 1587 | D445 | 3.9000 | R(0.05) | ----- |
| 399 | | ----- | | ----- | 1610 | D7042 | 3.6631 | | ----- |
| 440 | | ----- | | ----- | 1613 | D445 | 3.7353 | | ----- |
| 445 | D445 | 3.736 | | ----- | 1616 | D445 | 3.755 | | ----- |
| 447 | D445 | 3.798 | | ----- | 1631 | D7042 | 3.7737 | | ----- |
| 460 | | ----- | | ----- | 1634 | D445 | 3.724 | | ----- |
| 467 | D7042 | 3.7462 | | ----- | 1636 | D445 | 3.736 | | ----- |
| 480 | | ----- | | ----- | 1669 | D445 | 3.840 | | ----- |
| 496 | | ----- | | ----- | 1683 | D445 | 3.722 | | ----- |
| 603 | | ----- | | ----- | 1688 | D445 | 4.1 | R(0.01) | ----- |
| 608 | | ----- | | ----- | 1715 | | ----- | | ----- |
| 631 | | ----- | | ----- | 1720 | D445 | 3.747 | | ----- |
| 657 | D445 | 3.712 | | ----- | 1724 | D445 | 3.844 | | ----- |
| 736 | D445 | 3.725 | | ----- | 1730 | | ----- | | ----- |
| 823 | D445 | 3.742 | | ----- | 1757 | D7042 | 3.7566 | | ----- |
| 824 | D445 | 3.726 | | ----- | 1776 | D445 | 3.6528 | | ----- |
| 851 | D445 | 3.745 | | ----- | 1833 | | 3.753 | | ----- |
| 854 | | ----- | | ----- | 1852 | D7945 | 3.731 | | ----- |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | | ----- | | ----- |
| 904 | | ----- | | ----- | 1961 | | ----- | | ----- |
| 914 | D445 | 3.726 | | ----- | 2130 | IP71 | 3.726 | | ----- |
| 962 | | ----- | | ----- | 2133 | D445 | 3.7323 | | ----- |
| 963 | D445 | 3.7932 | C | ----- | 6028 | | ----- | | ----- |
| 970 | | ----- | | ----- | 6041 | | ----- | | ----- |
| 974 | D445 | 3.720 | | ----- | 6054 | | ----- | | ----- |
| 994 | D445 | 3.798 | C | ----- | 6075 | D445 | 3.7444 | | ----- |
| 995 | D445 | 3.801 | C | ----- | 6114 | D445 | 3.739 | | ----- |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | | ----- | | ----- | 6142 | | ----- | | ----- |
| 1011 | D445 | 3.759 | | ----- | 6203 | D445 | 3.6952 | | ----- |
| 1016 | D445 | 3.7155 | | ----- | 6244 | | ----- | | ----- |
| 1019 | EN16896 | 3.629 | R(0.05) | ----- | 6266 | D7042 | 3.644 | | ----- |
| 1023 | | ----- | | ----- | 6274 | | ----- | | ----- |
| 1039 | D7945 | 3.734 | | ----- | 6312 | | ----- | | ----- |
| 1040 | D7042 | 3.734 | | ----- | 6315 | D7042 | 3.726 | | ----- |
| 1049 | D445 | 3.729 | | ----- | 6321 | IP71 | 3.734 | | ----- |
| 1059 | | ----- | | ----- | 6324 | | ----- | | ----- |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | | ----- | | ----- | 6421 | D445 | 3.810 | | ----- |
| 6344 | ISO3104 | 3.671 | | ----- | 6438 | | ----- | | ----- |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | D445 | 3.8742 | R(0.05) | ----- | 6487 | | ----- | | ----- |
| 6384 | D445 | 3.730 | | ----- | | | | | |

| | |
|---|---|
| normality | suspect |
| n | 80 |
| outliers | 7 |
| mean (n) | 3.73803 |
| st.dev. (n) | 0.036241 |
| R(calc.) | 0.10147 |
| st.dev.( D445:21e1) | (0.006558) |
| R(D445:21e1) | (0.01836) |
| compare | |
| R (IP71-1:20) | (0.01836) procedure A |
| R(D445:19) | (0.07102) |
| R (IP71-1:96) | (0.07102) |

Lab 169 first reported 3.619
Lab 254 first reported 3.981
Lab 963 first reported 3.627
Lab 994 first reported 4.057
Lab 995 first reported 3.998
Lab 1182 first reported 3.5339



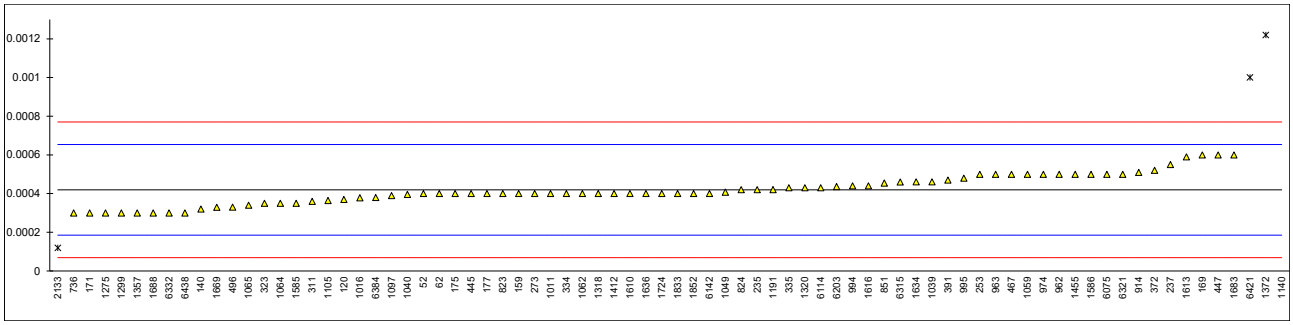
## Determination of Mercaptan Sulfur as S on sample #22150; results in %M/M

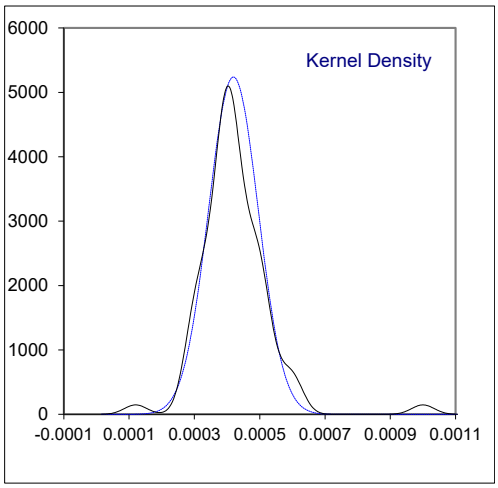
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | D3227 | 0.0004 | | -0.17 | 1062 | D3227 | 0.0004 | | -0.17 |
| 62 | D3227 | 0.0004 | | -0.17 | 1064 | D3227 | 0.00035 | | -0.59 |
| 120 | D3227 | 0.00037 | | -0.42 | 1065 | D3227 | 0.00034 | | -0.68 |
| 140 | D3227 | 0.00032 | C | -0.85 | 1082 | | ----- | | ----- |
| 150 | | ----- | | ----- | 1097 | ISO3012 | 0.00039 | | -0.25 |
| 159 | D3227 | 0.0004 | | -0.17 | 1105 | D3227 | 0.000364 | | -0.47 |
| 169 | D3227 | 0.0006 | | 1.54 | 1109 | | ----- | | ----- |
| 171 | D3227 | 0.0003 | | -1.02 | 1121 | | ----- | | ----- |
| 175 | D3227 | 0.0004 | | -0.17 | 1126 | | ----- | | ----- |
| 177 | D3227 | 0.0004 | | -0.17 | 1140 | IP342 | 0.00196 | R(0.01) | 13.17 |
| 215 | | ----- | | ----- | 1182 | | ----- | | ----- |
| 221 | | ----- | | ----- | 1191 | ISO3012 | 0.000421 | C | 0.01 |
| 224 | | ----- | | ----- | 1205 | | ----- | | ----- |
| 225 | | ----- | | ----- | 1237 | | ----- | | ----- |
| 228 | | ----- | | ----- | 1275 | IP342 | 0.0003 | | -1.02 |
| 235 | D3227 | 0.00042 | | 0.00 | 1279 | | ----- | | ----- |
| 237 | D3227 | 0.00055 | | 1.12 | 1299 | D3227 | 0.0003 | | -1.02 |
| 238 | | ----- | | ----- | 1316 | | ----- | | ----- |
| 253 | D3227 | 0.0005 | | 0.69 | 1318 | D3227 | 0.0004 | | -0.17 |
| 254 | | ----- | | ----- | 1320 | D3227 | 0.00043 | | 0.09 |
| 256 | | ----- | | ----- | 1357 | D3227 | 0.0003 | | -1.02 |
| 258 | | ----- | | ----- | 1372 | | 0.00122 | R(0.01) | 6.84 |
| 273 | D3227 | 0.0004 | | -0.17 | 1397 | | ----- | | ----- |
| 311 | D3227 | 0.00036 | | -0.51 | 1399 | | ----- | | ----- |
| 317 | | ----- | | ----- | 1412 | UOP163 | 0.0004 | | -0.17 |
| 323 | D3227 | 0.00035 | | -0.59 | 1417 | | ----- | | ----- |
| 328 | | ----- | | ----- | 1444 | | ----- | | ----- |
| 333 | | ----- | | ----- | 1455 | D3227 | 0.0005 | | 0.69 |
| 334 | D3227 | 0.0004 | | -0.17 | 1496 | | ----- | | ----- |
| 335 | D3227 | 0.00043 | | 0.09 | 1538 | | ----- | | ----- |
| 365 | | ----- | | ----- | 1575 | | ----- | | ----- |
| 372 | D3227 | 0.00052 | | 0.86 | 1585 | UOP163 | 0.00035 | | -0.59 |
| 391 | D3227 | 0.00047 | | 0.43 | 1586 | D3227 | 0.0005 | | 0.69 |
| 396 | | ----- | | ----- | 1587 | | ----- | | ----- |
| 399 | | ----- | | ----- | 1610 | IP342 | 0.0004 | | -0.17 |
| 440 | | ----- | | ----- | 1613 | D3227 | 0.00059 | | 1.46 |
| 445 | D3227 | 0.0004 | | -0.17 | 1616 | D3227 | 0.00044 | | 0.18 |
| 447 | D3227 | 0.0006 | | 1.54 | 1631 | | ----- | | ----- |
| 460 | | ----- | | ----- | 1634 | D3227 | 0.0004605 | | 0.35 |
| 467 | D3227 | 0.00050 | | 0.69 | 1636 | D3227 | 0.00040 | | -0.17 |
| 480 | | ----- | | ----- | 1669 | D3227 | 0.000329 | | -0.77 |
| 496 | D3227 | 0.00033 | | -0.76 | 1683 | D3227 | 0.0006 | | 1.54 |
| 603 | | ----- | | ----- | 1688 | D3227 | 0.0003 | | -1.02 |
| 608 | | ----- | | ----- | 1715 | | ----- | | ----- |
| 631 | | ----- | | ----- | 1720 | | ----- | | ----- |
| 657 | D3227 | <0.0003 | | ----- | 1724 | D3227 | 0.0004 | | -0.17 |
| 736 | D3227 | 0.0003 | | -1.02 | 1730 | | ----- | | ----- |
| 823 | D3227 | 0.0004 | | -0.17 | 1757 | | ----- | | ----- |
| 824 | D3227 | 0.00042 | | 0.00 | 1776 | | ----- | | ----- |
| 851 | D3227 | 0.000455 | | 0.30 | 1833 | | 0.0004 | | -0.17 |
| 854 | | ----- | | ----- | 1852 | D3227 | 0.0004 | | -0.17 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | | ----- | | ----- |
| 904 | | ----- | | ----- | 1961 | | ----- | | ----- |
| 914 | D3227 | 0.00051 | | 0.77 | 2130 | | ----- | | ----- |
| 962 | D3227 | 0.0005 | | 0.69 | 2133 | D3227 | 0.00012 | R(0.05) | -2.56 |
| 963 | D3227 | 0.0005 | | 0.69 | 6028 | | ----- | | ----- |
| 970 | | ----- | | ----- | 6041 | | ----- | | ----- |
| 974 | D3227 | 0.0005 | | 0.69 | 6054 | | ----- | | ----- |
| 994 | D3227 | 0.00044 | | 0.18 | 6075 | D3227 | 0.0005 | | 0.69 |
| 995 | D3227 | 0.00048 | | 0.52 | 6114 | D3227 | 0.00043 | | 0.09 |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | | ----- | | ----- | 6142 | IP342 | 0.0004 | | -0.17 |
| 1011 | D3227 | 0.0004 | | -0.17 | 6203 | D3227 | 0.000436 | | 0.14 |
| 1016 | D3227 | 0.000378 | | -0.35 | 6244 | | ----- | | ----- |
| 1019 | | ----- | | ----- | 6266 | | ----- | | ----- |
| 1023 | | ----- | | ----- | 6274 | | ----- | | ----- |
| 1039 | IP342 | 0.000461 | | 0.36 | 6312 | | ----- | | ----- |
| 1040 | D3227 | 0.000396 | | -0.20 | 6315 | D3227 | 0.00046 | | 0.35 |
| 1049 | D3227 | 0.00040742 | | -0.10 | 6321 | IP342 | 0.0005 | | 0.69 |
| 1059 | D3227 | 0.0005 | | 0.69 | 6324 | | ----- | | ----- |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | D3227 | 0.0003 | | -1.02 | 6421 | D3227 | 0.001 | R(0.01) | 4.96 |
| 6344 | | ----- | | ----- | 6438 | UOP163 | 0.00030 | | -1.02 |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | | ----- | | ----- | 6487 | | ----- | | ----- |
| 6384 | D3227 | 0.00038 | | -0.34 | | | | | |

| | |
|---|---|
| normality | OK |
| n | 74 |
| outliers | 4 |
| mean (n) | 0.000419 |
| st.dev. (n) | 0.0000761 |
| R(calc.) | 0.000213 |
| st.dev.(D3227:16) | 0.0001170 |
| R(D3227:16) | 0.000328 |

Lab 140 first reported 0.0011
Lab 1191 reported 4.21 %M/M



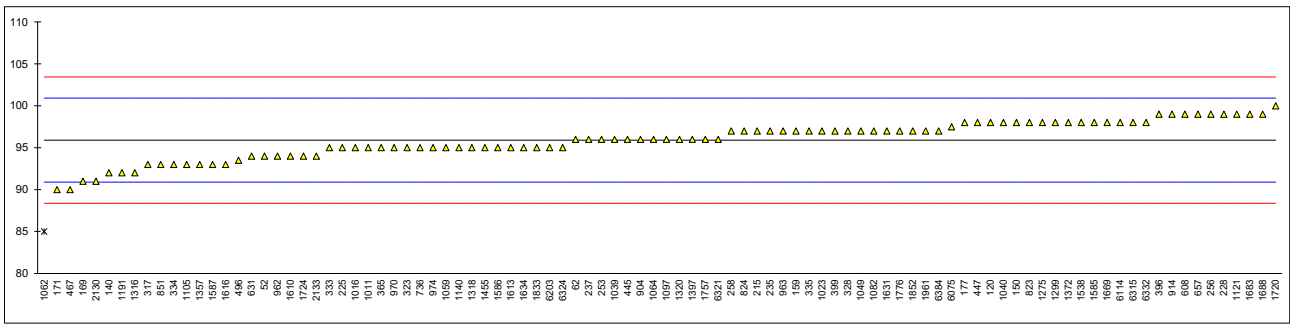
## Determination of MSEP on sample #22150;

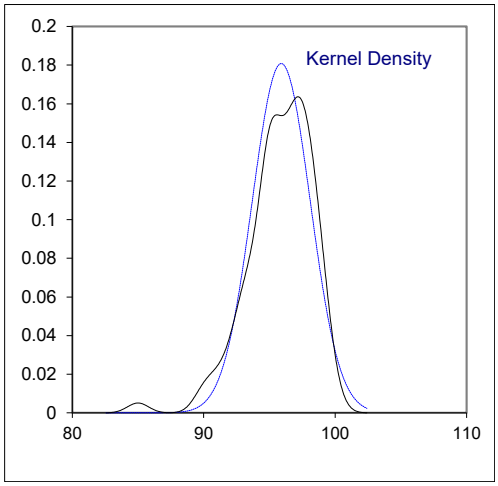
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | D3948 | 94 | | -0.76 | 1062 | D3948 | 85 | R(0.01) | -4.35 |
| 62 | D3948 | 96 | | 0.04 | 1064 | D7224 | 96 | | 0.04 |
| 120 | D3948 | 98 | | 0.84 | 1065 | | ----- | | ----- |
| 140 | D3948 | 92 | | -1.56 | 1082 | D3948 | 97 | | 0.44 |
| 150 | D3948 | 98 | | 0.84 | 1097 | D3948 | 96 | | 0.04 |
| 159 | D3948 | 97 | | 0.44 | 1105 | D3948 | 93 | | -1.16 |
| 169 | D3948 | 91 | | -1.96 | 1109 | | ----- | | ----- |
| 171 | D3948 | 90 | | -2.35 | 1121 | D3948 | 99 | | 1.23 |
| 175 | | ----- | | ----- | 1126 | | ----- | | ----- |
| 177 | D7224 | 98 | | 0.84 | 1140 | D3948 | 95 | | -0.36 |
| 215 | D3948 | 97 | | 0.44 | 1182 | | ----- | | ----- |
| 221 | | ----- | | ----- | 1191 | D3948 | 92 | | -1.56 |
| 224 | | ----- | | ----- | 1205 | | ----- | | ----- |
| 225 | D3948 | 95 | | -0.36 | 1237 | | ----- | | ----- |
| 228 | D3948 | 99.0 | | 1.23 | 1275 | D3948 | 98 | | 0.84 |
| 235 | D7224 | 97 | | 0.44 | 1279 | | ----- | | ----- |
| 237 | D3948 | 96 | | 0.04 | 1299 | D3948 | 98 | | 0.84 |
| 238 | | ----- | | ----- | 1316 | D3948 | 92 | | -1.56 |
| 253 | D3948 | 96 | | 0.04 | 1318 | D3948 | 95 | | -0.36 |
| 254 | | ----- | | ----- | 1320 | D3948 | 96 | | 0.04 |
| 256 | D7224 | 99 | | 1.23 | 1357 | D3948 | 93 | | -1.16 |
| 258 | D3948 | 97 | | 0.44 | 1372 | | 98 | | 0.84 |
| 273 | | ----- | | ----- | 1397 | D7224 | 96 | | 0.04 |
| 311 | | ----- | | ----- | 1399 | | ----- | | ----- |
| 317 | D7224 | 93 | | -1.16 | 1412 | | ----- | | ----- |
| 323 | D3948 | 95 | | -0.36 | 1417 | | ----- | | ----- |
| 328 | D7224 | 97 | | 0.44 | 1444 | | ----- | | ----- |
| 333 | D3948 | 95 | | -0.36 | 1455 | D7224 | 95 | | -0.36 |
| 334 | D3948 | 93 | | -1.16 | 1496 | | ----- | | ----- |
| 335 | D7224 | 97 | | 0.44 | 1538 | D7224 | 98 | | 0.84 |
| 365 | D7224 | 95 | | -0.36 | 1575 | | ----- | | ----- |
| 372 | | ----- | | ----- | 1585 | D3948 | 98 | | 0.84 |
| 391 | | ----- | | ----- | 1586 | D3948 | 95 | | -0.36 |
| 396 | D3948 | 99 | | 1.23 | 1587 | D7224 | 93 | | -1.16 |
| 399 | D3948 | 97 | | 0.44 | 1610 | D3948 | 94 | | -0.76 |
| 440 | | ----- | | ----- | 1613 | D3948 | 95 | | -0.36 |
| 445 | D7224 | 96 | | 0.04 | 1616 | D3948 | 93 | | -1.16 |
| 447 | D3948 | 98 | | 0.84 | 1631 | D7224 | 97 | | 0.44 |
| 460 | | ----- | | ----- | 1634 | D7224 | 95 | | -0.36 |
| 467 | D3948 | 90 | C | -2.35 | 1636 | | ----- | | ----- |
| 480 | | ----- | | ----- | 1669 | D3948 | 98 | | 0.84 |
| 496 | D3948 | 93.5 | | -0.96 | 1683 | D3948 | 99 | | 1.23 |
| 603 | | ----- | | ----- | 1688 | D3948 | 99 | | 1.23 |
| 608 | D3948 | 99 | | 1.23 | 1715 | | ----- | | ----- |
| 631 | D7224 | 94 | | -0.76 | 1720 | D3948 | 100 | | 1.63 |
| 657 | D3948 | 99 | | 1.23 | 1724 | D3948 | 94 | | -0.76 |
| 736 | D3948 | 95 | | -0.36 | 1730 | | ----- | | ----- |
| 823 | D3948 | 98 | | 0.84 | 1757 | D3948 | 96 | | 0.04 |
| 824 | D3948 | 97 | | 0.44 | 1776 | D3948 | 97 | | 0.44 |
| 851 | D3948 | 93 | | -1.16 | 1833 | | 95 | | -0.36 |
| 854 | | ----- | | ----- | 1852 | D3948 | 97 | | 0.44 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | | ----- | | ----- |
| 904 | D3948 | 96 | | 0.04 | 1961 | D3948 | 97 | | 0.44 |
| 914 | D3948 | 99 | | 1.23 | 2130 | D7224 | 91 | | -1.96 |
| 962 | D3948 | 94 | | -0.76 | 2133 | D3948 | 94 | | -0.76 |
| 963 | D3948 | 97 | | 0.44 | 6028 | | ----- | | ----- |
| 970 | D3948 | 95 | | -0.36 | 6041 | | ----- | | ----- |
| 974 | D7224 | 95 | | -0.36 | 6054 | | ----- | | ----- |
| 994 | | ----- | | ----- | 6075 | D7224 | 97.5 | | 0.64 |
| 995 | | ----- | | ----- | 6114 | D7224 | 98 | | 0.84 |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | | ----- | | ----- | 6142 | | ----- | | ----- |
| 1011 | D3948 | 95 | | -0.36 | 6203 | D3948 | 95 | | -0.36 |
| 1016 | D3948 | 95 | | -0.36 | 6244 | | ----- | | ----- |
| 1019 | | ----- | | ----- | 6266 | | ----- | | ----- |
| 1023 | D3948 | 97 | | 0.44 | 6274 | | ----- | | ----- |
| 1039 | D3948 | 96 | | 0.04 | 6312 | | ----- | | ----- |
| 1040 | D3948 | 98 | | 0.84 | 6315 | D3948 | 98 | | 0.84 |
| 1049 | D7224 | 97 | | 0.44 | 6321 | D3948 | 96 | | 0.04 |
| 1059 | D3948 | 95 | | -0.36 | 6324 | D3948 | 95 | | -0.36 |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | D3948 | 98 | | 0.84 | 6421 | | ----- | | ----- |
| 6344 | | ----- | | ----- | 6438 | | ----- | | ----- |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | | ----- | | ----- | 6487 | | ----- | | ----- |
| 6384 | D3948 | 97 | | 0.44 | | | | | |

| | |
|---|---|
| normality | OK |
| n | 95 |
| outliers | 1 |
| mean (n) | 95.91 |
| st.dev. (n) | 2.206 |
| R(calc.) | 6.18 |
| st.dev.(D3948:20) | 2.508 |
| R(D3948:20) | 7.02 |

Lab 467 first reported 87



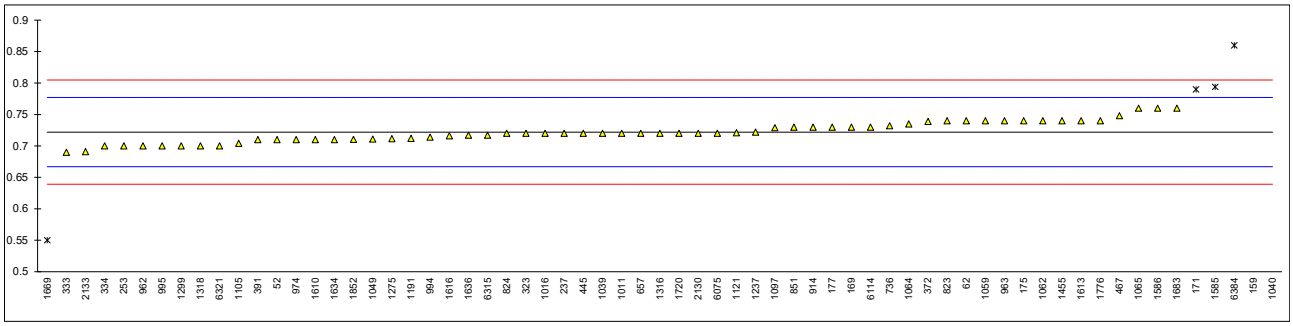
## Determination of Naphthalenes on sample #22150; results in %V/V

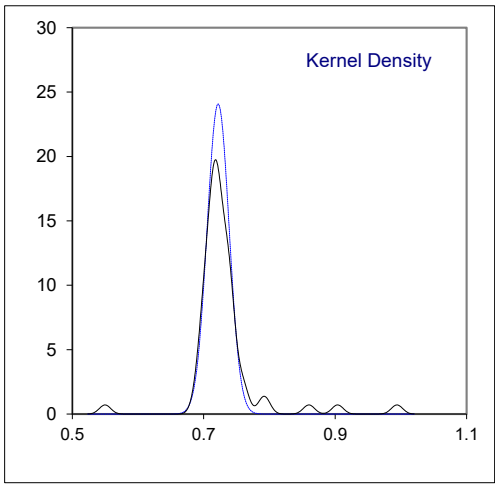
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | D1840-A | 0.71 | | -0.44 | 1062 | D1840-A | 0.74 | | 0.65 |
| 62 | D1840-A | 0.74 | C | 0.65 | 1064 | D1840-A | 0.735 | | 0.47 |
| 120 | | ----- | | ----- | 1065 | D1840-A | 0.76 | | 1.37 |
| 140 | | ----- | | ----- | 1082 | | ----- | | ----- |
| 150 | | ----- | | ----- | 1097 | D1840-A | 0.729 | | 0.25 |
| 159 | D1840-B | 0.9038 | C,R(0.01) | 6.58 | 1105 | D1840-A | 0.704 | | -0.65 |
| 169 | D1840-B | 0.73 | | 0.29 | 1109 | | ----- | | ----- |
| 171 | D1840-B | 0.79 | R(0.01) | 2.46 | 1121 | D1840-B | 0.721 | | -0.04 |
| 175 | D1840-B | 0.74 | | 0.65 | 1126 | | ----- | | ----- |
| 177 | D1840-B | 0.73 | C | 0.29 | 1140 | | ----- | | ----- |
| 215 | | ----- | | ----- | 1182 | | ----- | | ----- |
| 221 | | ----- | | ----- | 1191 | D1840 | 0.7120737 | | -0.36 |
| 224 | | ----- | | ----- | 1205 | | ----- | | ----- |
| 225 | | ----- | | ----- | 1237 | D1840-B | 0.722 | | 0.00 |
| 228 | | ----- | | ----- | 1275 | D1840-A | 0.7117 | | -0.37 |
| 235 | | ----- | | ----- | 1279 | | ----- | | ----- |
| 237 | D1840-B | 0.72 | | -0.07 | 1299 | D1840-B | 0.70 | | -0.80 |
| 238 | | ----- | | ----- | 1316 | D1840-B | 0.72 | | -0.07 |
| 253 | D1840-B | 0.70 | | -0.80 | 1318 | D1840-A | 0.70 | | -0.80 |
| 254 | | ----- | | ----- | 1320 | | ----- | | ----- |
| 256 | | ----- | | ----- | 1357 | | ----- | | ----- |
| 258 | | ----- | | ----- | 1372 | | ----- | | ----- |
| 273 | | ----- | | ----- | 1397 | | ----- | | ----- |
| 311 | | ----- | | ----- | 1399 | | ----- | | ----- |
| 317 | | ----- | | ----- | 1412 | | ----- | | ----- |
| 323 | D1840-A | 0.72 | | -0.07 | 1417 | | ----- | | ----- |
| 328 | | ----- | | ----- | 1444 | | ----- | | ----- |
| 333 | D1840-B | 0.69 | | -1.16 | 1455 | D1840-B | 0.74 | | 0.65 |
| 334 | D1840-B | 0.70 | C | -0.80 | 1496 | | ----- | | ----- |
| 335 | | ----- | | ----- | 1538 | | ----- | | ----- |
| 365 | | ----- | | ----- | 1575 | | ----- | | ----- |
| 372 | D1840-B | 0.739 | | 0.61 | 1585 | D1840-B | 0.794 | R(0.01) | 2.61 |
| 391 | D1840-A | 0.71 | | -0.44 | 1586 | D1840-A | 0.76 | | 1.37 |
| 396 | | ----- | | ----- | 1587 | | ----- | | ----- |
| 399 | | ----- | | ----- | 1610 | D1840-B | 0.71 | | -0.44 |
| 440 | | ----- | | ----- | 1613 | D1840-A | 0.74 | | 0.65 |
| 445 | D1840-A | 0.72 | | -0.07 | 1616 | D1840-B | 0.716 | | -0.22 |
| 447 | | ----- | | ----- | 1631 | | ----- | | ----- |
| 460 | | ----- | | ----- | 1634 | D1840-A | 0.71 | | -0.44 |
| 467 | D1840-B | 0.748 | | 0.94 | 1636 | D1840-B | 0.717 | | -0.18 |
| 480 | | ----- | | ----- | 1669 | D1840-B | 0.55 | R(0.01) | -6.23 |
| 496 | | ----- | | ----- | 1683 | D1840-B | 0.76 | C | 1.37 |
| 603 | | ----- | | ----- | 1688 | | ----- | | ----- |
| 608 | | ----- | | ----- | 1715 | | ----- | | ----- |
| 631 | | ----- | | ----- | 1720 | D1840-B | 0.72 | | -0.07 |
| 657 | D1840-A | 0.72 | | -0.07 | 1724 | | ----- | | ----- |
| 736 | D1840-B | 0.732 | | 0.36 | 1730 | | ----- | | ----- |
| 823 | D1840-A | 0.74 | | 0.65 | 1757 | | ----- | | ----- |
| 824 | D1840-B | 0.72 | | -0.07 | 1776 | D1840-A | 0.74 | | 0.65 |
| 851 | D1840 | 0.73 | | 0.29 | 1833 | | ----- | | ----- |
| 854 | | ----- | | ----- | 1852 | D1840-A | 0.7105 | | -0.42 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | | ----- | | ----- |
| 904 | | ----- | | ----- | 1961 | | ----- | | ----- |
| 914 | D1840-A | 0.73 | | 0.29 | 2130 | D1840-A | 0.72 | | -0.07 |
| 962 | D1840-A | 0.70 | | -0.80 | 2133 | D1840-A | 0.691 | | -1.12 |
| 963 | D1840-A | 0.74 | | 0.65 | 6028 | | ----- | | ----- |
| 970 | | ----- | | ----- | 6041 | | ----- | | ----- |
| 974 | D1840-A | 0.71 | | -0.44 | 6054 | | ----- | | ----- |
| 994 | D1840-A | 0.714 | | -0.29 | 6075 | D1840-A | 0.72 | | -0.07 |
| 995 | D1840-B | 0.70 | | -0.80 | 6114 | D1840-A | 0.73 | | 0.29 |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | | ----- | | ----- | 6142 | | ----- | | ----- |
| 1011 | D1840-B | 0.72 | | -0.07 | 6203 | | ----- | | ----- |
| 1016 | D1840-A | 0.72 | | -0.07 | 6244 | | ----- | | ----- |
| 1019 | | ----- | | ----- | 6266 | | ----- | | ----- |
| 1023 | | ----- | | ----- | 6274 | | ----- | | ----- |
| 1039 | D1840-B | 0.72 | | -0.07 | 6312 | | ----- | | ----- |
| 1040 | D1840-A | 0.994 | R(0.01) | 9.85 | 6315 | D1840-A | 0.717 | | -0.18 |
| 1049 | D1840-A | 0.711 | | -0.40 | 6321 | D1840-B | 0.70 | | -0.80 |
| 1059 | D1840-B | 0.74 | | 0.65 | 6324 | | ----- | | ----- |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | | ----- | | ----- | 6421 | | ----- | | ----- |
| 6344 | | ----- | | ----- | 6438 | | ----- | | ----- |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | | ----- | | ----- | 6487 | | ----- | | ----- |
| 6384 | D1840-B | 0.86 | R(0.01) | 5.00 | | | | | |

| | |
|---|---|
| normality | OK |
| n | 59 |
| outliers | 6 |
| mean (n) | 0.7220 |
| st.dev. (n) | 0.01657 |
| R(calc.) | 0.0464 |
| st.dev.(D1840-B:07R17) | 0.02761 |
| R(D1840-B:07R17) | 0.0773 |
| compare | |
| R(D1840-A:07R17) | 0.0515 |

Lab 62 first reported 0.94
Lab 159 first reported 0.658
Lab 177 first reported 0.89
Lab 334 first reported 1.13
Lab 1683 first reported 0.8013



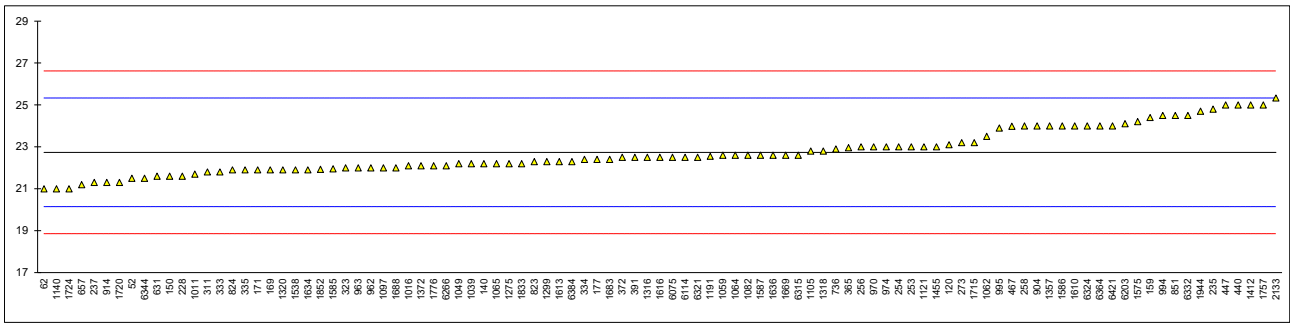
## Determination of Smoke Point on sample #22150; results in mm

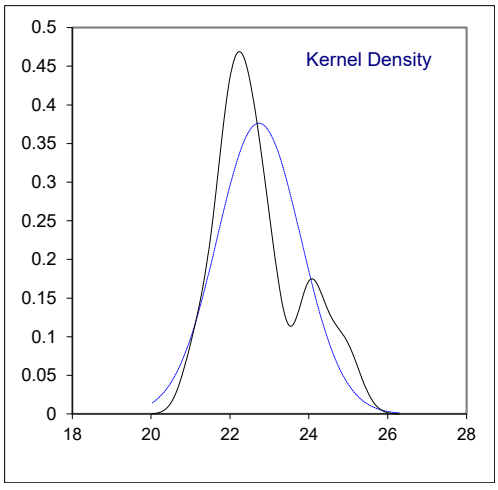
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | D1322-manual | 21.5 | | -0.96 | 1062 | D1322-manual | 23.5 | | 0.59 |
| 62 | D1322-manual | 21.0 | | -1.34 | 1064 | D1322-automated | 22.6 | | -0.11 |
| 120 | D1322-automated | 23.1 | | 0.28 | 1065 | D1322-automated | 22.2 | | -0.41 |
| 140 | D1322-automated | 22.2 | | -0.41 | 1082 | D1322-automated | 22.6 | | -0.11 |
| 150 | D1322-automated | 21.6 | | -0.88 | 1097 | D1322-automated | 22.0 | | -0.57 |
| 159 | D1322-automated | 24.4 | | 1.28 | 1105 | D1322-automated | 22.80 | | 0.05 |
| 169 | D1322-automated | 21.9 | | -0.65 | 1109 | | ----- | | ----- |
| 171 | D1322-automated | 21.9 | | -0.65 | 1121 | D1322-manual | 23.0 | | 0.20 |
| 175 | | ----- | | ----- | 1126 | | ----- | | ----- |
| 177 | D1322-automated | 22.4 | | -0.26 | 1140 | D1322-manual | 21.0 | | -1.34 |
| 215 | | ----- | | ----- | 1182 | | ----- | | ----- |
| 221 | | ----- | | ----- | 1191 | D1322 | 22.55 | | -0.14 |
| 224 | | ----- | | ----- | 1205 | | ----- | | ----- |
| 225 | | ----- | | ----- | 1237 | | ----- | | ----- |
| 228 | D1322-automated | 21.6 | | -0.88 | 1275 | IP598-automated | 22.2 | | -0.41 |
| 235 | D1322-manual | 24.8 | | 1.59 | 1279 | | ----- | | ----- |
| 237 | D1322-automated | 21.3 | | -1.11 | 1299 | D1322-automated | 22.3 | | -0.34 |
| 238 | | ----- | | ----- | 1316 | D1322-automated | 22.5 | | -0.18 |
| 253 | D1322-manual | 23 | | 0.20 | 1318 | D1322-automated | 22.8 | | 0.05 |
| 254 | D1322-manual | 23 | | 0.20 | 1320 | D1322-automated | 21.9 | | -0.65 |
| 256 | D1322-manual | 23 | | 0.20 | 1357 | D1322-manual | 24 | | 0.97 |
| 258 | | 24 | | 0.97 | 1372 | D1322-automated | 22.1 | | -0.49 |
| 273 | D1322-manual | 23.2 | | 0.36 | 1397 | | ----- | | ----- |
| 311 | D1322-manual | 21.8 | | -0.72 | 1399 | | ----- | | ----- |
| 317 | | ----- | | ----- | 1412 | D1322-manual | 25.0 | | 1.75 |
| 323 | D1322-automated | 22.0 | | -0.57 | 1417 | | ----- | | ----- |
| 328 | | ----- | | ----- | 1444 | | ----- | | ----- |
| 333 | D1322-automated | 21.8 | | -0.72 | 1455 | D1322-automated | 23.0 | | 0.20 |
| 334 | D1322-automated | 22.4 | | -0.26 | 1496 | | ----- | | ----- |
| 335 | D1322-automated | 21.9 | | -0.65 | 1538 | D1322-automated | 21.9 | | -0.65 |
| 365 | IP57-manual | 22.96 | | 0.17 | 1575 | D1322-manual | 24.2 | | 1.13 |
| 372 | D1322-automated | 22.5 | | -0.18 | 1585 | D1322-automated | 21.95 | | -0.61 |
| 391 | D1322-manual | 22.5 | | -0.18 | 1586 | D1322-manual | 24 | | 0.97 |
| 396 | | ----- | | ----- | 1587 | D1322-automated | 22.6 | | -0.11 |
| 399 | | ----- | | ----- | 1610 | IP598-manual | 24 | | 0.97 |
| 440 | D1322-manual | 25.0 | | 1.75 | 1613 | D1322-automated | 22.3 | | -0.34 |
| 445 | | ----- | | ----- | 1616 | D1322-automated | 22.5 | | -0.18 |
| 447 | D1322-manual | 25 | | 1.75 | 1631 | | ----- | | ----- |
| 460 | | ----- | | ----- | 1634 | D1322-automated | 21.9 | | -0.65 |
| 467 | D1322-manual | 23.98 | | 0.96 | 1636 | D1322-automated | 22.6 | | -0.11 |
| 480 | | ----- | | ----- | 1669 | D1322-automated | 22.6 | | -0.11 |
| 496 | | ----- | | ----- | 1683 | D1322-automated | 22.4 | | -0.26 |
| 603 | | ----- | | ----- | 1688 | D1322-automated | 22 | | -0.57 |
| 608 | | ----- | | ----- | 1715 | D1322-manual | 23.2 | | 0.36 |
| 631 | D1322-automated | 21.6 | | -0.88 | 1720 | D1322-automated | 21.3 | | -1.11 |
| 657 | D1322-automated | 21.2 | | -1.19 | 1724 | D1322-manual | 21 | | -1.34 |
| 736 | D1322-manual | 22.9 | | 0.13 | 1730 | | ----- | | ----- |
| 823 | D1322-automated | 22.3 | | -0.34 | 1757 | D1322-manual | 25.0 | | 1.75 |
| 824 | D1322-automated | 21.9 | | -0.65 | 1776 | D1322-automated | 22.1 | | -0.49 |
| 851 | D1322-manual | 24.5 | | 1.36 | 1833 | | 22.2 | | -0.41 |
| 854 | | ----- | | ----- | 1852 | D1322-automated | 21.931 | | -0.62 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | D1322-manual | 24.7 | | 1.52 |
| 904 | D1322-manual | 24 | | 0.97 | 1961 | | ----- | | ----- |
| 914 | D1322-automated | 21.3 | | -1.11 | 2130 | | ----- | | ----- |
| 962 | D1322-manual | 22 | | -0.57 | 2133 | D1322-manual | 25.33 | | 2.00 |
| 963 | D1322-manual | 22.0 | | -0.57 | 6028 | | ----- | | ----- |
| 970 | D1322-manual | 23 | | 0.20 | 6041 | | ----- | | ----- |
| 974 | D1322-automated | 23.0 | | 0.20 | 6054 | | ----- | | ----- |
| 994 | D1322-manual | 24.5 | | 1.36 | 6075 | D1322-automated | 22.5 | | -0.18 |
| 995 | D1322-manual | 23.9 | | 0.90 | 6114 | D1322-manual | 22.5 | | -0.18 |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | | ----- | | ----- | 6142 | | ----- | | ----- |
| 1011 | D1322-automated | 21.7 | | -0.80 | 6203 | D1322-manual | 24.1 | | 1.05 |
| 1016 | IP598-automated | 22.1 | | -0.49 | 6244 | | ----- | | ----- |
| 1019 | | ----- | | ----- | 6266 | D1322-automated | 22.1 | | -0.49 |
| 1023 | | ----- | | ----- | 6274 | | ----- | | ----- |
| 1039 | D1322-automated | 22.2 | | -0.41 | 6312 | | ----- | | ----- |
| 1040 | | ----- | | ----- | 6315 | D1322-automated | 22.6 | | -0.11 |
| 1049 | D1322-automated | 22.2 | | -0.41 | 6321 | D1322-automated | 22.5 | | -0.18 |
| 1059 | D1322-automated | 22.6 | | -0.11 | 6324 | D1322-manual | 24.0 | | 0.97 |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | D1322-manual | 24.5 | C | 1.36 | 6421 | D1322 | 24 | | 0.97 |
| 6344 | D1322-manual | 21.5 | C | -0.96 | 6438 | | ----- | | ----- |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | D1322-manual | 24.0 | | 0.97 | 6487 | | ----- | | ----- |
| 6384 | D1322-automated | 22.3 | | -0.34 | | | | | |

| | | only D1322-manual | only D1322-auto |
|---|---|---|---|
| | normality | OK | not OK |
| | n | 38 | 53 |
| | outliers | 0 | 0 |
| | mean (n) | 23.40 | 22.22 |
| | st.dev. (n) | 1.257 | 0.540 |
| | R(calc.) | 3.52 | 1.51 |
| | st.dev.(D1322-M:22) | 1.317 | --- |
| | R(D1322-M:22) | 3.69 | --- |
| | compare | | |
| | R(D1322-A:22) | --- | 0.86 |

Lab 6332 first reported 25.5
Lab 6344 first reported 25.4



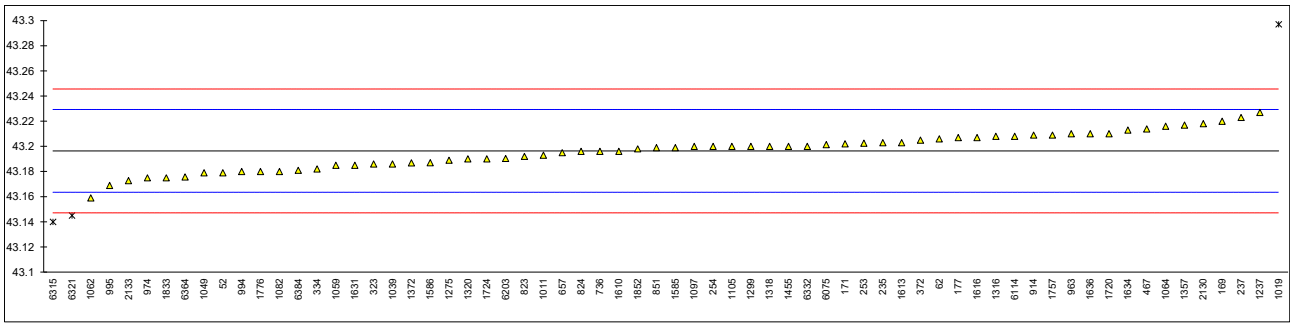
# Determination of Specific Energy (Net) on Sulfur free basis on sample #22150; results in MJ/kg

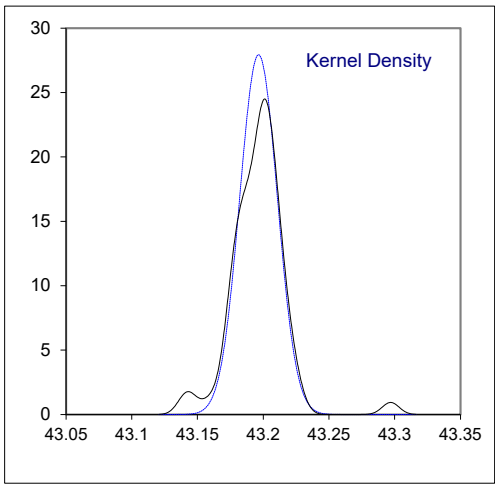
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | D3338 | 43.179 | | -1.06 | 1062 | D3338 | 43.159 | | -2.28 |
| 62 | D3338 | 43.206 | | 0.58 | 1064 | D3338 | 43.216 | | 1.19 |
| 120 | | ----- | | ----- | 1065 | | ----- | | ----- |
| 140 | | ----- | | ----- | 1082 | D3338 | 43.18004 | | -1.00 |
| 150 | | ----- | | ----- | 1097 | D3338 | 43.200 | | 0.22 |
| 159 | | ----- | | ----- | 1105 | D3338 | 43.20 | | 0.22 |
| 169 | D3338 | 43.220 | | 1.43 | 1109 | | ----- | | ----- |
| 171 | D3338 | 43.202 | | 0.34 | 1121 | | ----- | | ----- |
| 175 | | ----- | | ----- | 1126 | | ----- | | ----- |
| 177 | D3338 | 43.207 | | 0.64 | 1140 | | ----- | | ----- |
| 215 | | ----- | | ----- | 1182 | | ----- | | ----- |
| 221 | | ----- | | ----- | 1191 | | ----- | | ----- |
| 224 | | ----- | | ----- | 1205 | | ----- | | ----- |
| 225 | | ----- | | ----- | 1237 | D3338 | 43.227 | C | 1.86 |
| 228 | | ----- | | ----- | 1275 | D3338 | 43.189 | | -0.45 |
| 235 | D3338 | 43.203 | | 0.40 | 1279 | | ----- | | ----- |
| 237 | D3338 | 43.223 | | 1.62 | 1299 | D3338 | 43.2 | C | 0.22 |
| 238 | | ----- | | ----- | 1316 | D3338 | 43.208 | | 0.70 |
| 253 | D3338 | 43.2025 | | 0.37 | 1318 | D3338 | 43.200 | | 0.22 |
| 254 | D3338 | 43.20 | | 0.22 | 1320 | D3338 | 43.19 | | -0.39 |
| 256 | | ----- | | ----- | 1357 | D3338 | 43.217 | | 1.25 |
| 258 | | ----- | | ----- | 1372 | | 43.1869 | | -0.58 |
| 273 | | ----- | | ----- | 1397 | | ----- | | ----- |
| 311 | | ----- | | ----- | 1399 | | ----- | | ----- |
| 317 | | ----- | | ----- | 1412 | | ----- | | ----- |
| 323 | D3338 | 43.186 | | -0.63 | 1417 | | ----- | | ----- |
| 328 | | ----- | | ----- | 1444 | | ----- | | ----- |
| 333 | | ----- | | ----- | 1455 | D3338 | 43.200 | C | 0.22 |
| 334 | D3338 | 43.182 | | -0.88 | 1496 | | ----- | | ----- |
| 335 | | ----- | | ----- | 1538 | | ----- | | ----- |
| 365 | | ----- | | ----- | 1575 | | ----- | | ----- |
| 372 | D3338 | 43.205 | | 0.52 | 1585 | D3338 | 43.199 | | 0.16 |
| 391 | | ----- | | ----- | 1586 | D3338 | 43.187 | C | -0.57 |
| 396 | | ----- | | ----- | 1587 | | ----- | | ----- |
| 399 | | ----- | | ----- | 1610 | D3338 | 43.196 | | -0.03 |
| 440 | | ----- | | ----- | 1613 | D3338 | 43.203 | | 0.40 |
| 445 | | ----- | | ----- | 1616 | D3338 | 43.207 | | 0.64 |
| 447 | | ----- | | ----- | 1631 | D3338 | 43.185 | | -0.70 |
| 460 | | ----- | | ----- | 1634 | D3338 | 43.213 | | 1.01 |
| 467 | D3338 | 43.2139 | | 1.06 | 1636 | D3338 | 43.210 | | 0.83 |
| 480 | | ----- | | ----- | 1669 | | ----- | | ----- |
| 496 | | ----- | | ----- | 1683 | | ----- | | ----- |
| 603 | | ----- | | ----- | 1688 | | ----- | | ----- |
| 608 | | ----- | | ----- | 1715 | | ----- | | ----- |
| 631 | | ----- | | ----- | 1720 | D3338 | 43.21 | | 0.83 |
| 657 | D3338 | 43.195 | | -0.09 | 1724 | D3338 | 43.19 | C | -0.39 |
| 736 | D3338 | 43.196 | | -0.03 | 1730 | | ----- | | ----- |
| 823 | D3338 | 43.192 | | -0.27 | 1757 | D4529 | 43.209 | | 0.77 |
| 824 | D3338 | 43.196 | | -0.03 | 1776 | D3338 | 43.18 | | -1.00 |
| 851 | D3338 | 43.199 | | 0.16 | 1833 | | 43.175 | C | -1.30 |
| 854 | | ----- | | ----- | 1852 | D3338 | 43.1980 | | 0.10 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | | ----- | | ----- |
| 904 | | ----- | | ----- | 1961 | | ----- | | ----- |
| 914 | D3338 | 43.209 | | 0.77 | 2130 | D3338 | 43.218 | | 1.31 |
| 962 | | ----- | | ----- | 2133 | D3338 | 43.1728 | | -1.44 |
| 963 | D3338 | 43.21 | | 0.83 | 6028 | | ----- | | ----- |
| 970 | | ----- | | ----- | 6041 | | ----- | | ----- |
| 974 | D3338 | 43.175 | | -1.30 | 6054 | | ----- | | ----- |
| 994 | D3338 | 43.18 | | -1.00 | 6075 | D3338 | 43.2014 | | 0.30 |
| 995 | D3338 | 43.169 | | -1.67 | 6114 | D3338 | 43.208 | | 0.70 |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | | ----- | | ----- | 6142 | | ----- | | ----- |
| 1011 | D3338 | 43.193 | | -0.21 | 6203 | D3338 | 43.1904 | | -0.37 |
| 1016 | | ----- | | ----- | 6244 | | ----- | | ----- |
| 1019 | D4809 | 43.297 | R(0.01) | 6.12 | 6266 | | ----- | | ----- |
| 1023 | | ----- | | ----- | 6274 | | ----- | | ----- |
| 1039 | D3338 | 43.186 | | -0.63 | 6312 | | ----- | | ----- |
| 1040 | | ----- | | ----- | 6315 | D3338 | 43.14 | R(0.05) | -3.43 |
| 1049 | D3338 | 43.17897 | | -1.06 | 6321 | D3338 | 43.145 | R(0.05) | -3.13 |
| 1059 | D3338 | 43.185 | | -0.70 | 6324 | | ----- | | ----- |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | D3338 | 43.2 | | 0.22 | 6421 | | ----- | | ----- |
| 6344 | | ----- | | ----- | 6438 | | ----- | | ----- |
| 6346 | | ----- | | ----- | 6479 | | ----- | | ----- |
| 6364 | D3338 | 43.1757 | | -1.26 | 6487 | | ----- | | ----- |
| 6384 | D3338 | 43.181 | | -0.94 | | | | | |

| | |
|---|---|
| normality | OK |
| n | 63 |
| outliers | 3 |
| mean (n) | 43.1964 |
| st.dev. (n) | 0.01428 |
| R(calc.) | 0.0400 |
| st.dev.(D3338:20a) | 0.01643 |
| R(D3338:20a) | 0.046 |

Lab 1237 first reported 43.282
Lab 1299 first reported 46.76
Lab 1455 first reported 43200 MJ/kg
Lab 1586 first reported 43187 MJ/kg
Lab 1724 first reported 42.9
Lab 1833 reported 43175 MJ/kg



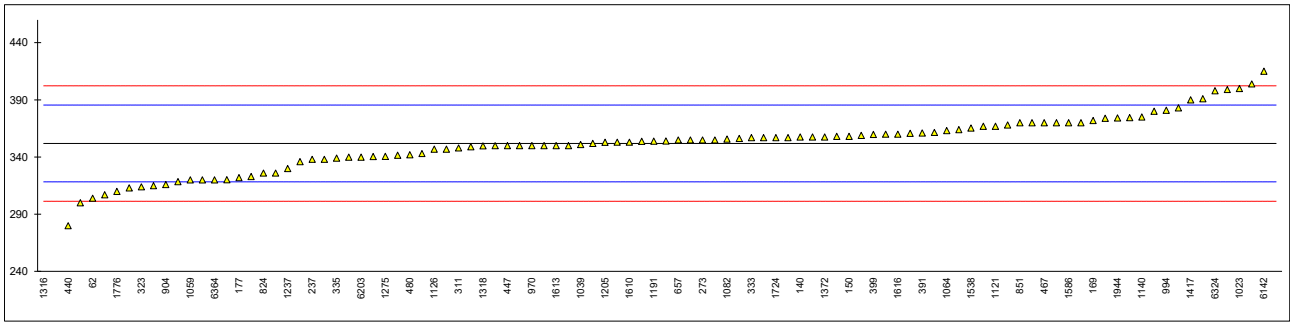
## Determination of Total Sulfur on sample #22150; results in mg/kg

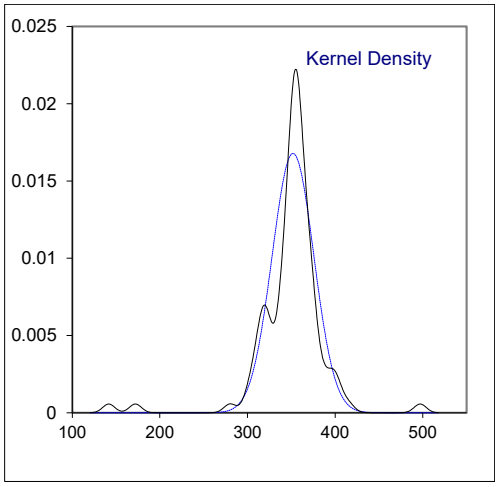
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 52 | D5453 | 326 | | -1.54 | 1062 | D4294 | 399 | | 2.80 |
| 62 | D5453 | 304 | | -2.85 | 1064 | D5453 | 363.1 | | 0.67 |
| 120 | | ----- | | ----- | 1065 | D5453 | 340 | | -0.71 |
| 140 | D2622 | 357.49 | | 0.33 | 1082 | ISO8754 | 355.7 | | 0.23 |
| 150 | D5453 | 358 | | 0.37 | 1097 | D5453 | 357.03 | | 0.31 |
| 159 | | ----- | | ----- | 1105 | D4294 | 341.70 | | -0.60 |
| 169 | D4294 | 372 | C | 1.20 | 1109 | | ----- | | ----- |
| 171 | D2622 | 364 | | 0.72 | 1121 | IP336 | 367 | | 0.90 |
| 175 | | ----- | | ----- | 1126 | ISO20846 | 347.0 | | -0.29 |
| 177 | D4294 | 322 | | -1.78 | 1140 | IP336 | 375 | | 1.38 |
| 215 | | ----- | | ----- | 1182 | | ----- | | ----- |
| 221 | | ----- | | ----- | 1191 | ISO8754 | 353.9 | | 0.12 |
| 224 | | ----- | | ----- | 1205 | ISO14596 | 352.9 | | 0.06 |
| 225 | | ----- | | ----- | 1237 | ISO8754 | 330 | | -1.30 |
| 228 | | ----- | | ----- | 1275 | D4294 | 340.58 | | -0.67 |
| 235 | D5453 | 320.2 | | -1.88 | 1279 | | ----- | | ----- |
| 237 | D4294 | 338 | | -0.82 | 1299 | ISO8754 | 360 | C | 0.48 |
| 238 | | ----- | | ----- | 1316 | D4294 | 141.6 | C,R(0.01) | -12.50 |
| 253 | | ----- | | ----- | 1318 | D5453 | 349.8 | | -0.12 |
| 254 | D4294 | 353.8 | | 0.12 | 1320 | | ----- | | ----- |
| 256 | | ----- | | ----- | 1357 | D5453 | 370 | | 1.08 |
| 258 | | 172 | R(0.01) | -10.69 | 1372 | D4294 | 357.6 | | 0.34 |
| 273 | D5453 | 355 | | 0.19 | 1397 | D2622 | 350 | | -0.11 |
| 311 | D2622 | 348 | | -0.23 | 1399 | | ----- | | ----- |
| 317 | | ----- | | ----- | 1412 | D4294 | 391 | | 2.33 |
| 323 | D5453 | 314 | | -2.25 | 1417 | In house | 390 | | 2.27 |
| 328 | ISO20847 | 354 | | 0.13 | 1444 | | ----- | | ----- |
| 333 | D4294 | 357 | | 0.31 | 1455 | D2622 | 357 | | 0.31 |
| 334 | D5453 | 368 | | 0.96 | 1496 | | ----- | | ----- |
| 335 | D4294 | 339 | C | -0.76 | 1538 | D5453 | 365.45 | | 0.81 |
| 365 | | ----- | | ----- | 1575 | D4294 | 380 | | 1.67 |
| 372 | D5453 | 358 | | 0.37 | 1585 | D4294 | 361.5 | | 0.57 |
| 391 | D4294 | 361 | | 0.54 | 1586 | ISO20846 | 370 | | 1.08 |
| 396 | | ----- | | ----- | 1587 | | ----- | | ----- |
| 399 | D4294 | 359.8 | | 0.47 | 1610 | IP336 | 353 | | 0.07 |
| 440 | D5453 | 280 | | -4.27 | 1613 | D4294 | 350.0 | | -0.11 |
| 445 | D5453 | 340.49 | | -0.68 | 1616 | D4294 | 360 | | 0.48 |
| 447 | IP336 | 350 | C | -0.11 | 1631 | | ----- | | ----- |
| 460 | | ----- | | ----- | 1634 | D5453 | 307 | | -2.67 |
| 467 | D4294 | 370 | | 1.08 | 1636 | D4294 | 355 | | 0.19 |
| 480 | D4294 | 342.07 | | -0.58 | 1669 | D4294 | 343 | | -0.53 |
| 496 | D2622 | 349.9 | | -0.12 | 1683 | D4294 | 350 | | -0.11 |
| 603 | | ----- | | ----- | 1688 | D4294 | 370 | | 1.08 |
| 608 | D4294 | 374.50 | | 1.35 | 1715 | | ----- | | ----- |
| 631 | D4294 | 357.5 | | 0.34 | 1720 | D5453 | 322.96 | | -1.72 |
| 657 | D5453 | 355 | | 0.19 | 1724 | IP336 | 357 | C | 0.31 |
| 736 | ISO20884 | 355 | | 0.19 | 1730 | | ----- | | ----- |
| 823 | D5453 | 338 | | -0.82 | 1757 | | ----- | | ----- |
| 824 | D4294 | 326 | | -1.54 | 1776 | ISO20846 | 310 | | -2.49 |
| 851 | D4294 | 370 | | 1.08 | 1833 | | 352 | | 0.01 |
| 854 | | ----- | | ----- | 1852 | D5453 | 336 | | -0.94 |
| 862 | | ----- | | ----- | 1913 | | ----- | | ----- |
| 869 | | ----- | | ----- | 1944 | D5453 | 374.21 | | 1.33 |
| 904 | D4294 | 316 | | -2.13 | 1961 | | ----- | | ----- |
| 914 | D4294 | 374 | | 1.32 | 2130 | IP336 | 300 | | -3.08 |
| 962 | | ----- | | ----- | 2133 | D4294 | 313.1 | | -2.30 |
| 963 | D4294 | 367 | | 0.90 | 6028 | | ----- | | ----- |
| 970 | D4294 | 350 | | -0.11 | 6041 | | ----- | | ----- |
| 974 | D4294 | 350 | | -0.11 | 6054 | | ----- | | ----- |
| 994 | D5453 | 381 | | 1.73 | 6075 | D5453 | 383 | | 1.85 |
| 995 | D5453 | 353 | | 0.07 | 6114 | D4294 | 347 | | -0.29 |
| 996 | | ----- | | ----- | 6135 | | ----- | | ----- |
| 997 | | ----- | | ----- | 6142 | ISO20846 | 415.08 | | 3.76 |
| 1011 | D4294 | 370 | C | 1.08 | 6203 | D2622 | 340 | | -0.71 |
| 1016 | | ----- | | ----- | 6244 | | ----- | | ----- |
| 1019 | D1552 | 497 | R(0.01) | 8.63 | 6266 | | ----- | | ----- |
| 1023 | D4294 | 400 | C | 2.86 | 6274 | | ----- | | ----- |
| 1039 | D2622 | 351 | | -0.05 | 6312 | | ----- | | ----- |
| 1040 | | 318.5 | | -1.98 | 6315 | D2622 | 359 | | 0.42 |
| 1049 | D5453 | 356.3 | | 0.26 | 6321 | IP336 | 404 | | 3.10 |
| 1059 | ISO14596 | 320 | | -1.89 | 6324 | D4294 | 398.0 | | 2.74 |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 6332 | D4294 | 320 | C | -1.89 | 6421 | D5453 | 315 | | -2.19 |
| 6344 | | ----- | | ----- | 6438 | | ----- | | ----- |
| 6346 | | ----- | | ----- | 6479 | IP600 | 360.8 | | 0.53 |
| 6364 | D4294 | 320 | | -1.89 | 6487 | | ----- | | ----- |
| 6384 | D4294 | 349 | | -0.17 | | | | | |

| | |
|---|---|
| normality | OK |
| n | 99 |
| outliers | 3 |
| mean (n) | 351.86 |
| st.dev. (n) | 23.767 |
| R(calc.) | 66.55 |
| st.dev.(D5453:19a) | 16.820 |
| R(D5453:19a) | 47.10 |
| compare | |
| R(D4294:21) | 84.00 |
| R(D2622:21) | 46.95 |

Lab 169 first reported 275
Lab 335 first reported 0.0339 mg/kg
Lab 447 reported 0.035 mg/kg
Lab 1011 reported 0.0370 mg/kg
Lab 1023 first reported 0.04 mg/kg
Lab 1299 first reported 0.036 mg/kg
Lab 1316 reported 0.01416 mg/kg
Lab 1724 first reported 0.042 mg/kg
Lab 6332 first reported 0.032 mg/kg

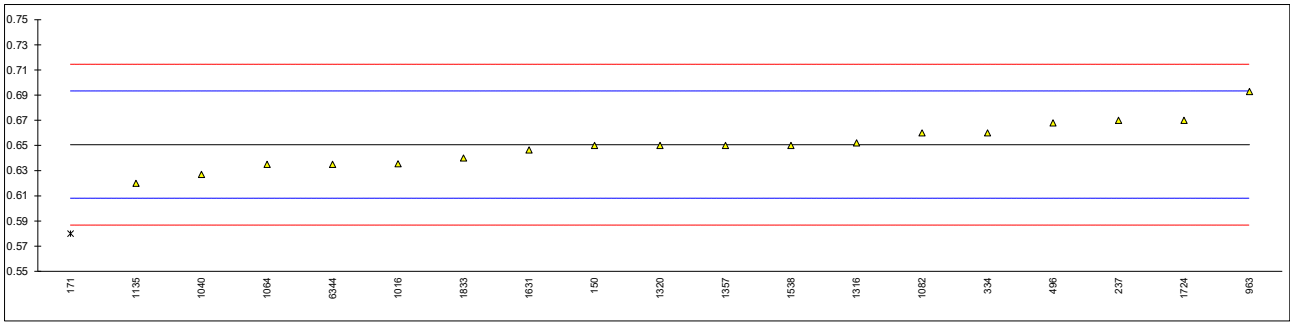


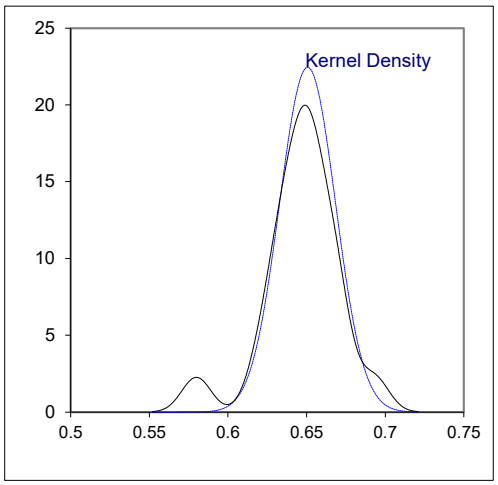



## Determination of BOCLE on sample #22151; results in mm

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 150 | D5001 full-automated | 0.65 | | -0.03 | |
| 171 | D5001 semi-automated | 0.58 | G(0.05) | -3.32 | |
| 237 | D5001 semi-automated | 0.67 | | 0.91 | |
| 323 | | ----- | | ----- | |
| 334 | D5001 semi-automated | 0.66 | | 0.44 | |
| 496 | D5001 full-automated | 0.668 | | 0.81 | |
| 862 | | ----- | | ----- | |
| 963 | D5001 full-automated | 0.693 | | 1.99 | |
| 1016 | D5001 semi-automated | 0.6355 | | -0.71 | |
| 1040 | D5001 semi-automated | 0.627 | | -1.11 | |
| 1064 | D5001 full-automated | 0.635 | | -0.74 | |
| 1082 | D5001 semi-automated | 0.66 | | 0.44 | |
| 1135 | D5001 full-automated | 0.62 | | -1.44 | |
| 1279 | | ----- | | ----- | |
| 1316 | D5001 semi-automated | 0.652 | | 0.06 | |
| 1320 | D5001 semi-automated | 0.65 | | -0.03 | |
| 1357 | D5001 full-automated | 0.65 | | -0.03 | |
| 1399 | | ----- | | ----- | |
| 1496 | | ----- | | ----- | |
| 1538 | D5001 full-automated | 0.65 | | -0.03 | |
| 1631 | D5001 semi-automated | 0.6465 | | -0.20 | |
| 1724 | D5001 full-automated | 0.67 | | 0.91 | |
| 1833 | D5001 semi-automated | 0.64 | | -0.50 | |
| 1913 | | ----- | | ----- | |
| 6041 | | ----- | | ----- | |
| 6274 | | ----- | | ----- | |
| 6344 | D5001 semi-automated | 0.635 | | -0.74 | |

| | | only semi-automated | only full-automated |
|---|---|---|---|
| normality | OK | OK | OK |
| n | 18 | 10 | 8 |
| outliers | 1 | 1 | 0 |
| mean (n) | 0.6507 | 0.6476 | 0.6545 |
| st.dev. (n) | 0.0178 | 0.01343 | 0.02248 |
| R(calc.) | 0.0498 | 0.0376 | 0.0629 |
| st.dev.(D5001:19e1 (semi-automated)) | 0.0213 | 0.02115 | --- |
| R(D5001:19e1 (semi-automated)) | 0.0597 | 0.0592 | --- |
| compare | | | |
| R(D5001:19e1 (full-automated)) | 0.0335 | --- | 0.0340 |

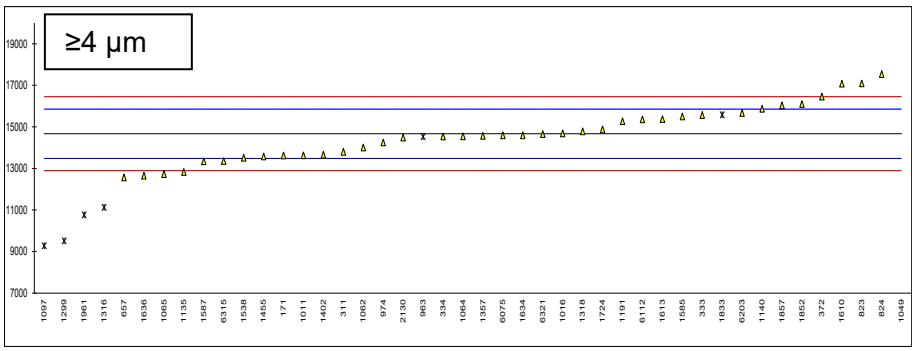


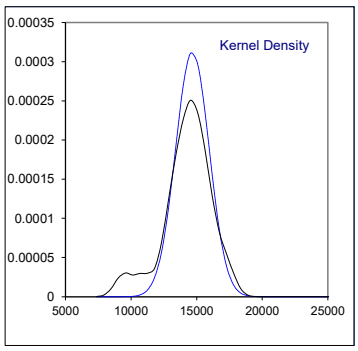



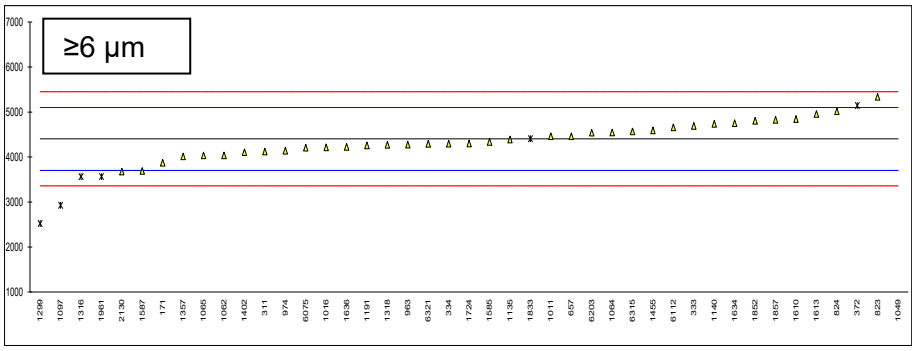
Determination of Particle Size Distribution on sample #22152 acc. to IP565, results in counts/mL

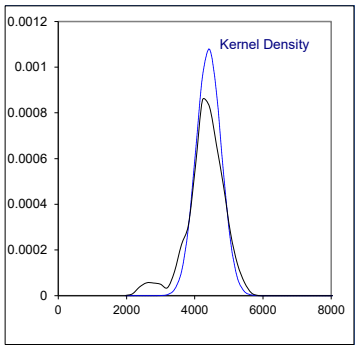
| lab | method | ≥4 µm (c) | m | ≥6 µm(c) | m | ≥14 µm (c) | m | ≥21 µm (c) | m | ≥25 µm (c) | m | ≥30 µm (c) | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 140 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 150 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 171 | IP565 | 13626 | | 3873 | | 155 | | 23 | | 8 | | 4 | |
| 225 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 237 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 311 | IP565 | 13800 | | 4121 | | 115 | | 12 | | 2 | | <1 | |
| 323 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 333 | IP565 | 15571 | | 4691 | | 176 | | 21 | | 5 | | 2 | |
| 334 | IP565 | 14541 | | 4296 | | 177 | | 26 | | 9 | | 3 | |
| 335 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 372 | IP565 | 16462 | | 5144 | ex | 218 | | 41.6 | | 17.2 | | 5.8 | |
| 447 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 657 | IP565 | 12568.4 | | 4464.3 | | 186.6 | | 37.0 | | 15.1 | | 3.7 | |
| 823 | IP565 | 17091.4 | | 5336.5 | | 226.9 | | 41.3 | C | 16.6 | C | 7.1 | |
| 824 | IP565 | 17542.7 | | 5018.4 | | 214.4 | | 39.5 | | 15.6 | | 5.5 | |
| 862 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 963 | IP565 | 14533 | ex,C | 4275 | | 134 | | 17.3 | | 5.6 | | 1.0 | |
| 974 | IP565 | 14250 | | 4140 | | 120 | | 15 | | 5 | | 2 | |
| 1011 | IP565 | 13629 | | 4462 | | 148 | | 24 | | 8 | | 3 | |
| 1016 | IP565 | 14684.0 | | 4215.8 | | 124.7 | | 10.6 | | 2.3 | | 0.9 | |
| 1049 | IP577 | 146016 | ex | 53725.7 | ex | 2436 | ex | 461.7 | ex | 166.0 | ex | 45.3 | ex |
| 1062 | IP565 | 14008.5 | | 4037.2 | C | 118.7 | | 7.7 | | 1.2 | | 0.2 | |
| 1064 | IP565 | 14545.9 | | 4544.7 | | 109.1 | | 3.4 | | 0.5 | | 0.2 | |
| 1065 | IP565 | 12733 | | 4034.8 | | 132.7 | | 19.5 | | 6.2 | | 1.3 | |
| 1097 | IP564 | 9279.9 | ex | 2929.7 | ex | 57.1 | ex | 22.5 | ex | 19.3 | ex | 18.0 | ex |
| 1109 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1135 | IP565 | 12831 | | 4390 | | 79 | | 10 | | 2 | | 0 | |
| 1140 | IP565 | 15874.5 | | 4740.1 | | 158.0 | | 15.9 | | 3.4 | | 0.9 | |
| 1191 | | 15278.2 | | 4257.8 | | 170.4 | | 16.5 | | 4.9 | | 0.9 | |
| 1279 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1299 | IP577 | 9514.7 | ex | 2523.2 | ex | 40.9 | ex | 6.8 | ex | 2.7 | ex | 0.9 | ex |
| 1316 | IP577 | 11123.6 | ex | 3562.4 | ex | 135.4 | ex | 25.1 | ex | 13.8 | ex | 5.2 | ex |
| 1318 | IP565 | 14789.5 | | 4273.4 | | 188.8 | | 28.1 | | 11.2 | | 4.0 | |
| 1320 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1357 | IP565 | 14576 | | 4014 | | 161 | ex | 11.2 | | 3.5 | | 1.3 | |
| 1397 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1399 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1402 | IP565 | 13664.7 | | 4106.4 | | 133.1 | | 24.2 | | 11.3 | | 5.5 | |
| 1455 | IP565 | 13577 | | 4594 | | 145 | | 15 | | 3 | | 0 | |
| 1496 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1538 | IP565 | 13514.6 | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1585 | IP565 | 15507.8 | | 4336.5 | | 138.8 | | 14.2 | | 5.0 | | 1.5 | |
| 1587 | IP565 | 13344.5 | | 3691.8 | | 183.5 | | 25.2 | | 9.1 | | 3.2 | |
| 1610 | IP565 | 17080.4 | | 4843.3 | | 149.3 | | 16.4 | | 3.9 | | 0.7 | |
| 1613 | IP565 | 15371.4 | | 4958.7 | | 164.2 | | 28.9 | | 11.1 | | 3.4 | |
| 1634 | IP565 | 14598 | | 4754 | | 143 | | 23 | | 10 | | 3 | |
| 1636 | IP565 | 12655.4 | | 4227.6 | | 148.7 | | 15.7 | | 4.0 | | 0.4 | |
| 1724 | IP565 | 14880.5 | | 4302 | | 193.8 | | 24.7 | | 11.3 | | 4.2 | |
| 1833 | IP565 | 15585 | ex | 4406 | ex | 193.5 | ex | 39 | ex | 15 | ex | 5.4 | ex |
| 1852 | IP565 | 16104.5 | | 4804.0 | | 154.1 | | 21.7 | | 6.9 | | 2.1 | |
| 1857 | IP565 | 16036 | | 4825 | | 168 | | ----- | | ----- | | ----- | |
| 1913 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1961 | IP577 | 10765.2 | ex | 3568.0 | ex | 113.8 | ex | 14.3 | ex | 3.6 | ex | 0.7 | ex |
| 2130 | IP565 | 14489.1 | | 3675.6 | | 165.6 | | 21.0 | | 7.3 | | 1.9 | |
| 6075 | IP565 | 14597.7 | | 4208.3 | | 127.3 | | 15.5 | | 3.8 | | 1.2 | |
| 6112 | IP565 | 15359.7 | | 4661.9 | | 131.6 | | 15.3 | | 2.9 | | 0.2 | |
| 6203 | IP565 | 15670.4 | | 4539.8 | | 146.9 | | 15.5 | | 4.4 | | 1.1 | |
| 6274 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 6315 | IP565 | 13354 | | 4569 | | 169 | | 23 | | 7 | | 1 | |
| 6321 | IP565 | 14653.6 | | 4293.2 | | 174.6 | | 12.1 | | 3.6 | | 0.9 | |
| normality | | OK | | OK | | OK | | OK | | OK | | OK | |
| n | | 37 | | 36 | | 36 | | 36 | | 36 | | 35 | |
| outliers | | 0 + 7ex | | 0 + 7ex | | 0 + 7ex | | 0 + 6ex | | 0 + 6ex | | 0 + 6ex | |
| mean (n) | | 14671.93 | | 4404.89 | | 155.24 | | 20.33 | | 6.86 | | 2.20 | |
| st.dev. (n) | | 1276.815 | | 368.700 | | 31.898 | | 9.125 | | 4.466 | | 1.856 | |
| R(calc.) | | 3575.08 | | 1032.36 | | 89.31 | | 25.55 | | 12.51 | | 5.20 | |
| st.dev.(IP565:13) | | 592.985 | | 349.123 | | 31.846 | | 6.579 | | 2.878 | | 1.234 | |
| R(IP565:13) | | 1660.36 | | 977.54 | | 89.17 | | 18.42 | | 8.06 | | 3.45 | |

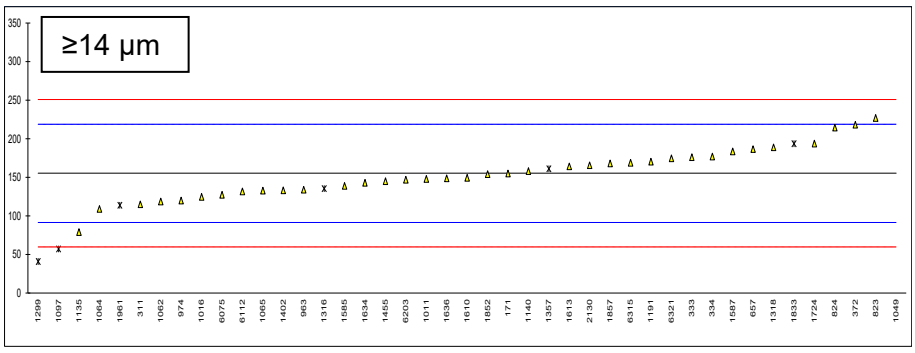
Lab 372 test result excluded as test result in counts/mL didn't match test result in ISO scale number
Lab 823 first reported 49.2 and 20.2 respectively
Lab 963 test result excluded as test result in counts/mL didn't match test result in ISO scale number, first reported 8433
Lab 1049 test results excluded as test method IP577 was used and test results in counts/mL didn't match test results in ISO scale number, see also §4.1
Lab 1062 first reported 40037.2
Lab 1097 test results excluded as test method IP564 was used, see also §4.1
Lab 1299 test results excluded as test method IP577 was used, see also §4.1
Lab 1316 test results excluded as test method IP577 was used, see also §4.1
Lab 1357 test result excluded as test result in counts/mL didn't match test result in ISO scale number
Lab 1833 test results excluded as test results in counts/mL didn't match test results in ISO scale number
Lab 1961 test results excluded as test method IP577 was used, see also §4.1

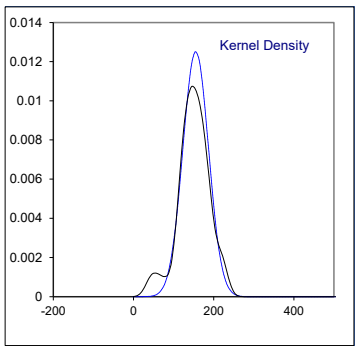


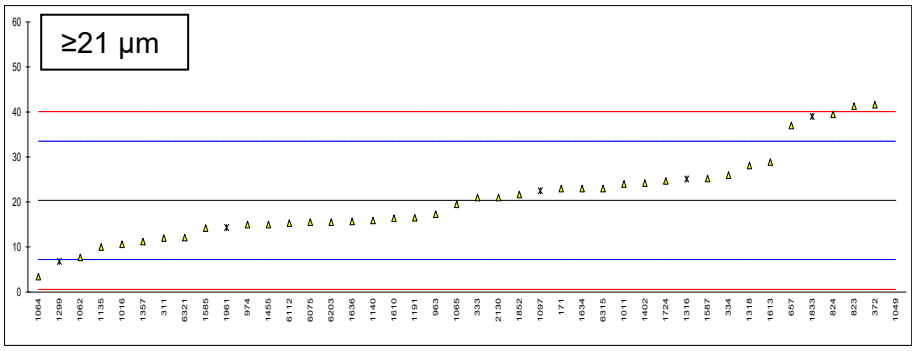



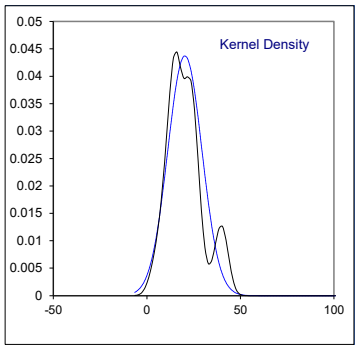



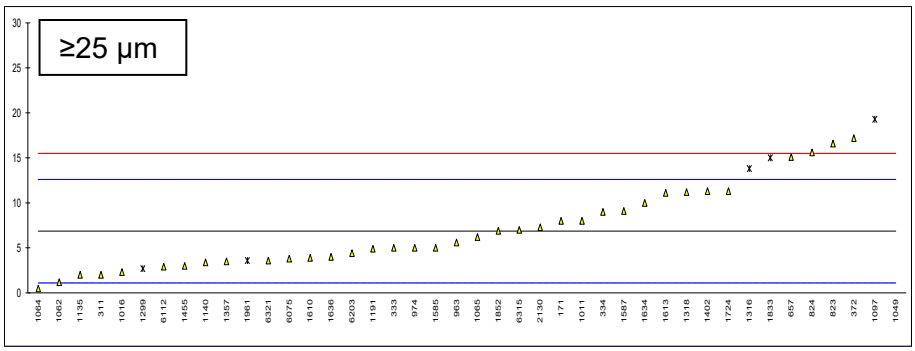



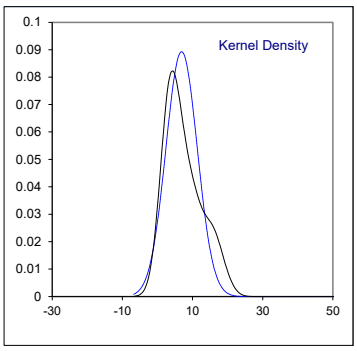



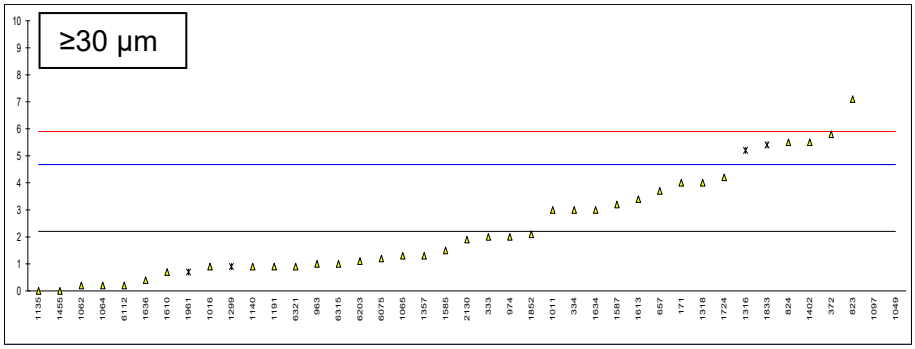



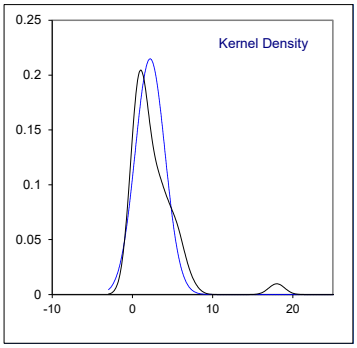




≥25 µm


Kernel Density

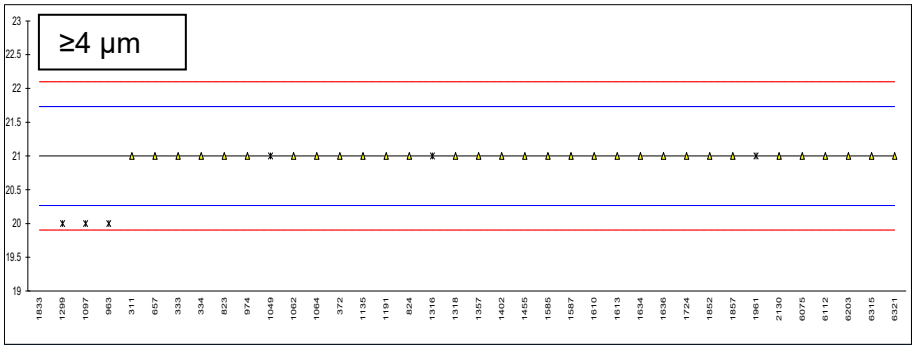

≥30 µm

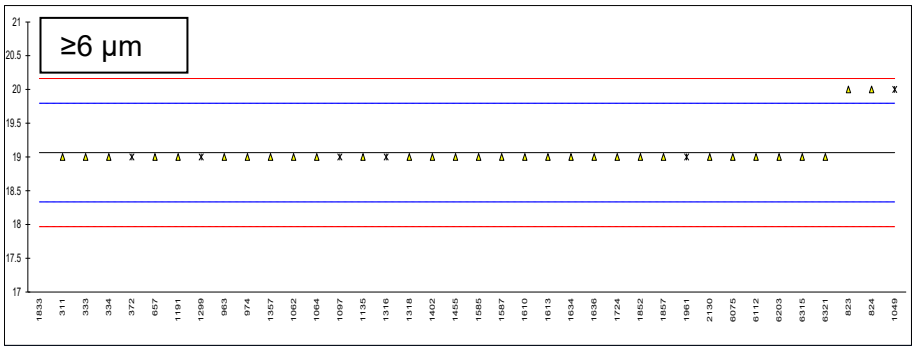

Kernel Density

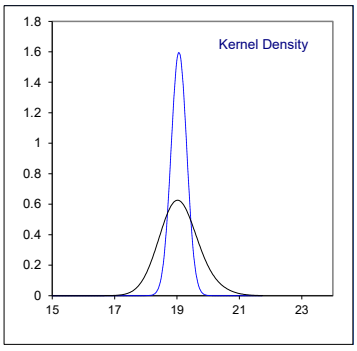
## Determination of Particle Size Distribution on sample #22152 acc. to IP565, in ISO scale numbers

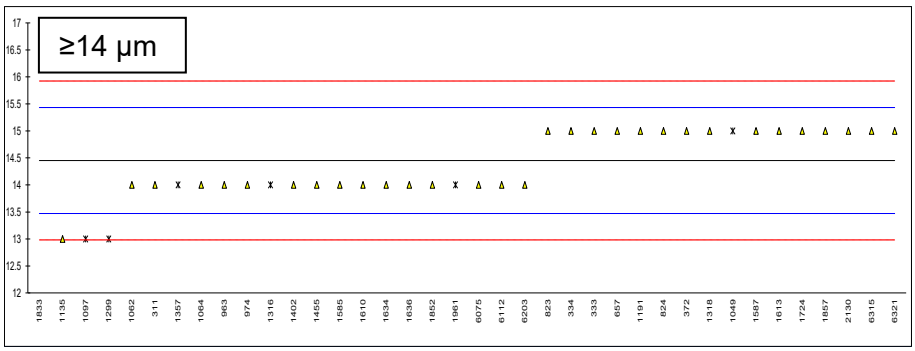
| lab | method | ≥4µm (c) | mark | z(targ) | ≥6µm (c) | mark | z(targ) | ≥14 µm (c) | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|---|
| 140 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 150 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 171 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 225 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 237 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 311 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 14 | | -0.92 |
| 323 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 333 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 15 | | 1.12 |
| 334 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 15 | | 1.12 |
| 335 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 372 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | ex | -0.18 | 15 | | 1.12 |
| 447 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 657 | ISO4406 | 21 | | 0.00 | 19 | | -0.18 | 15 | | 1.12 |
| 823 | ISO4406 acc. to IP565 | 21 | | 0.00 | 20 | | 2.56 | 15 | | 1.12 |
| 824 | ISO4406 | 21 | | 0.00 | 20 | | 2.56 | 15 | | 1.12 |
| 862 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 963 | ISO4406 | 20 | ex | -2.73 | 19 | | -0.18 | 14 | | -0.92 |
| 974 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 14 | | -0.92 |
| 1011 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1016 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1049 | ISO4406 acc. to IP577 | 21 | ex | 0.00 | 20 | ex | 2.56 | 15 | ex | 1.12 |
| 1062 | | 21 | | 0.00 | 19 | | -0.18 | 14 | | -0.92 |
| 1064 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 14 | | -0.92 |
| 1065 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1097 | ISO4406 acc. to IP564 | 20 | ex | -2.73 | 19 | ex | -0.18 | 13 | ex | -2.96 |
| 1109 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1135 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 13 | | -2.96 |
| 1140 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1191 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 15 | | 1.12 |
| 1279 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1299 | ISO4406 acc. to IP577 | 20 | ex | -2.73 | 19 | ex | -0.18 | 13 | ex | -2.96 |
| 1316 | ISO4406 acc. to IP577 | 21 | ex | 0.00 | 19 | ex | -0.18 | 14 | ex | -0.92 |
| 1318 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 15 | | 1.12 |
| 1320 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1357 | ISO4406 | 21 | | 0.00 | 19 | | -0.18 | 14 | ex | -0.92 |
| 1397 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1399 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1402 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 14 | | -0.92 |
| 1455 | | 21 | | 0.00 | 19 | | -0.18 | 14 | | -0.92 |
| 1496 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1538 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1585 | IP565 | 21 | | 0.00 | 19 | | -0.18 | 14 | | -0.92 |
| 1587 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 15 | | 1.12 |
| 1610 | | 21 | | 0.00 | 19 | | -0.18 | 14 | | -0.92 |
| 1613 | IP565 | 21 | | 0.00 | 19 | | -0.18 | 15 | | 1.12 |
| 1634 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 14 | | -0.92 |
| 1636 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 14 | | -0.92 |
| 1724 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 15 | | 1.12 |
| 1833 | ISO4406 acc. to IP565 | 12 | ex | -24.59 | 11 | ex | -22.03 | 10 | ex | -9.08 |
| 1852 | | 21 | | 0.00 | 19 | | -0.18 | 14 | | -0.92 |
| 1857 | IP565 | 21 | | 0.00 | 19 | | -0.18 | 15 | | 1.12 |
| 1913 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1961 | ISO4406 acc. to IP577 | 21 | ex | 0.00 | 19 | ex | -0.18 | 14 | ex | -0.92 |
| 2130 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 15 | | 1.12 |
| 6075 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 14 | | -0.92 |
| 6112 | ISO4406 | 21 | C | 0.00 | 19 | C | -0.18 | 14 | C | -0.92 |
| 6203 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 14 | | -0.92 |
| 6274 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6315 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 15 | | 1.12 |
| 6321 | ISO4406 acc. to IP565 | 21 | | 0.00 | 19 | | -0.18 | 15 | | 1.12 |
| | normality | unknown | | | not OK | | | OK | | |
| | n | 31 | | | 31 | | | 31 | | |
| | outliers | 0 + 7ex | | | 0 + 7ex | | | 0 + 7ex | | |
| | mean (n) | 21.00 | | | 19.06 | | | 14.45 | | |
| | st.dev. (n) | 0.000 | | | 0.250 | | | 0.568 | | |
| | R(calc.) | 0.00 | | | 0.70 | | | 1.59 | | |
| | st.dev.(IP565:13) | 0.366 | | | 0.366 | | | 0.490 | | |
| | R(IP565:13) | 1.03 | | | 1.03 | | | 1.37 | | |

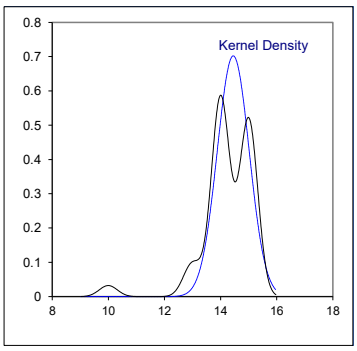
Lab 372 test result excluded as test result in counts/mL didn't match test result in ISO scale number
Lab 963 test result excluded as test result in counts/mL didn't match test result in ISO scale number
Lab 1049 test results excluded as test method IP577 was used and test results in counts/mL didn't match test results in ISO scale number, see also §4.1
Lab 1097 test results excluded as test method IP564 was used, see also §4.1
Lab 1299 test results excluded as test method IP577 was used, see also §4.1
Lab 1316 test results excluded as test method IP577 was used, see also §4.1
Lab 1833 test results excluded as test results in counts/mL didn't match test results in ISO scale number
Lab 1961 test results excluded as test method IP577 was used, see also §4.1
Lab 6112 first reported 15359.7, 4661.9 and 131.6 respectively



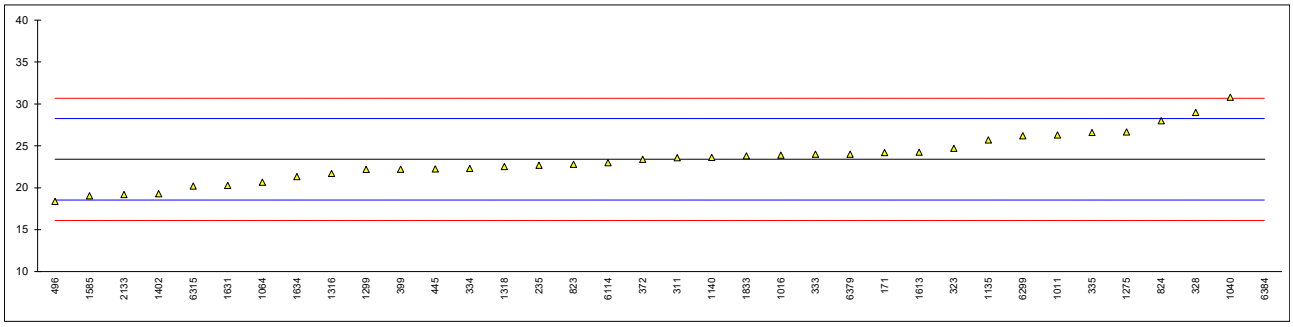



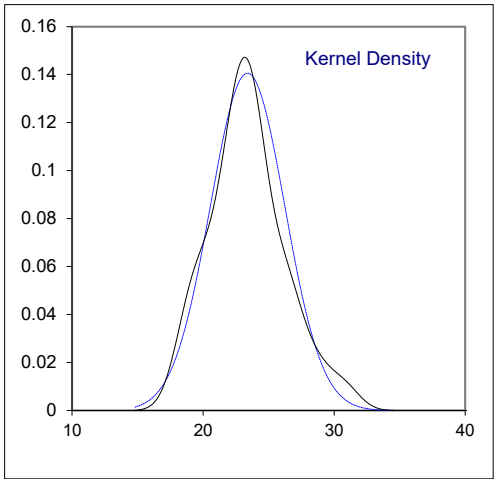



## Determination of FAME content – GCMS/HPLC on sample #22153; results in mg/kg

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 52 | | ----- | | ----- | |
| 62 | | ----- | | ----- | |
| 140 | | ----- | | ----- | |
| 171 | IP585 | 24.2 | | 0.33 | |
| 228 | | ----- | | ----- | |
| 235 | IP585 | 22.69 | | -0.29 | |
| 237 | | ----- | | ----- | |
| 253 | | ----- | | ----- | |
| 254 | | ----- | | ----- | |
| 311 | IP585 | 23.6 | | 0.08 | |
| 317 | | ----- | | ----- | |
| 323 | IP585 | 24.7 | | 0.54 | |
| 328 | IP585 | 29.0 | | 2.30 | |
| 333 | IP585 | 24 | | 0.25 | |
| 334 | IP585 | 22.3 | | -0.45 | |
| 335 | IP585 | 26.6 | | 1.32 | |
| 372 | IP590 | 23.4 | | 0.00 | |
| 399 | IP585 | 22.22 | | -0.48 | |
| 445 | IP585 | 22.25 | | -0.47 | |
| 447 | | ----- | | ----- | |
| 460 | | ----- | | ----- | |
| 467 | | ----- | | ----- | |
| 496 | IP585 | 18.38 | | -2.06 | |
| 631 | | ----- | | ----- | |
| 657 | | ----- | | ----- | |
| 823 | IP585 | 22.8 | | -0.25 | |
| 824 | IP585 | 28 | C | 1.89 | first reported 35.78 |
| 851 | | ----- | | ----- | |
| 862 | | ----- | | ----- | |
| 974 | | ----- | | ----- | |
| 1011 | IP585 | 26.3 | | 1.19 | |
| 1016 | IP585 | 23.89 | | 0.20 | |
| 1023 | | ----- | | ----- | |
| 1040 | IP599 | 30.8 | | 3.04 | |
| 1049 | | ----- | | ----- | |
| 1062 | | ----- | | ----- | |
| 1064 | IP585 | 20.67 | | -1.12 | |
| 1097 | | ----- | | ----- | |
| 1135 | IP585 | 25.704 | | 0.95 | |
| 1140 | IP585 | 23.63 | | 0.10 | |
| 1275 | IP585 | 26.67 | | 1.35 | |
| 1279 | | ----- | | ----- | |
| 1299 | IP585 | 22.2 | | -0.49 | |
| 1316 | IP585 | 21.71 | | -0.69 | |
| 1318 | IP585 | 22.54 | | -0.35 | |
| 1399 | | ----- | | ----- | |
| 1402 | IP585 | 19.3 | | -1.69 | |
| 1496 | | ----- | | ----- | |
| 1538 | | ----- | | ----- | |
| 1585 | IP599 | 19.05 | | -1.79 | |
| 1587 | | ----- | | ----- | |
| 1610 | | ----- | | ----- | |
| 1613 | IP599 | 24.255 | | 0.35 | |
| 1631 | IP590 | 20.28 | | -1.28 | |
| 1634 | IP585 | 21.34 | | -0.85 | |
| 1724 | | ----- | | ----- | |
| 1833 | IP590 | 23.80 | | 0.17 | |
| 2130 | | ----- | W | ----- | test result withdrawn, reported 11.23 |
| 2133 | IP585 | 19.21 | | -1.72 | |
| 6041 | | ----- | | ----- | |
| 6064 | | ----- | | ----- | |
| 6065 | | ----- | | ----- | |
| 6066 | | ----- | | ----- | |
| 6075 | | ----- | | ----- | |
| 6103 | | ----- | | ----- | |
| 6112 | | ----- | | ----- | |
| 6114 | IP590 | 23.0 | | -0.16 | |
| 6203 | | ----- | | ----- | |
| 6274 | | ----- | | ----- | |
| 6299 | IP585 | 26.2 | | 1.15 | |
| 6315 | IP585 | 20.216 | | -1.31 | |
| 6321 | | ----- | | ----- | |
| 6379 | IP585 | 24.0 | | 0.25 | |
| 6384 | IP585 | 54.8 | R(0.01) | 12.92 | |

| | | only IP585 | only IP590 |
|---|---|---|---|
| normality | OK | OK | not OK |
| n | 35 | 28 | 4 |
| outliers | 1 | 1 | 0 |
| mean (n) | 23.397 | 23.369 | 22.620 |
| st.dev. (n) | 2.8393 | 2.6499 | 1.5938 |
| R(calc.) | 7.950 | 7.420 | 4.463 |
| st.dev.(IP585:21) | 2.4314 | 2.4287 | --- |
| R(IP585:21) | 6.808 | 6.800 | --- |
| compare | | | |
| R(IP590:10) | 5.540 | --- | 5.383 |

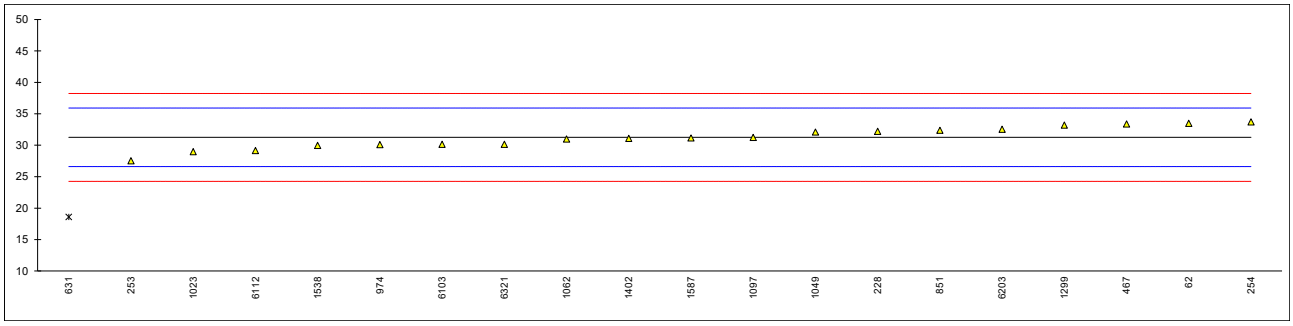


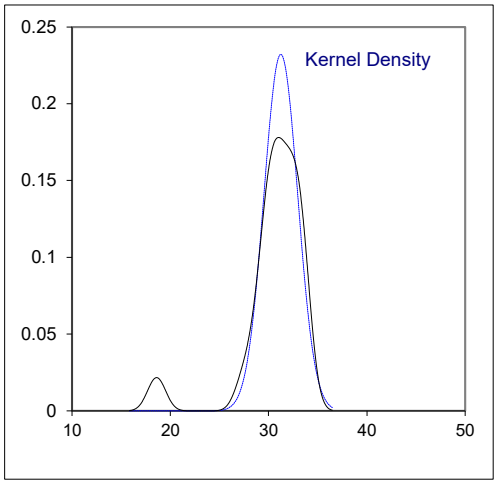



## Determination of FAME content – FTIR on sample #22153; results in mg/kg

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 52 | | ----- | | ----- | |
| 62 | D7797 | 33.5 | | 0.97 | |
| 140 | | ----- | | ----- | |
| 171 | | ----- | | ----- | |
| 228 | D7797 | 32.23 | | 0.42 | |
| 235 | | ----- | | ----- | |
| 237 | | ----- | | ----- | |
| 253 | IP583 | 27.53 | | -1.60 | |
| 254 | D7797 | 33.73 | | 1.07 | |
| 311 | | ----- | | ----- | |
| 317 | | ----- | | ----- | |
| 323 | | ----- | | ----- | |
| 328 | | ----- | | ----- | |
| 333 | | ----- | | ----- | |
| 334 | | ----- | | ----- | |
| 335 | | ----- | | ----- | |
| 372 | | ----- | | ----- | |
| 399 | | ----- | | ----- | |
| 445 | | ----- | | ----- | |
| 447 | | ----- | | ----- | |
| 460 | | ----- | | ----- | |
| 467 | IP583 | 33.40 | | 0.93 | |
| 496 | | ----- | | ----- | |
| 631 | D7797 | 18.61 | R(0.01) | -5.43 | |
| 657 | | ----- | | ----- | |
| 823 | | ----- | | ----- | |
| 824 | | ----- | | ----- | |
| 851 | D7797 | 32.39 | | 0.49 | |
| 862 | | ----- | | ----- | |
| 974 | IP583 | 30.1 | | -0.49 | |
| 1011 | | ----- | | ----- | |
| 1016 | | ----- | | ----- | |
| 1023 | D7797 | 28.98 | | -0.97 | |
| 1040 | | ----- | | ----- | |
| 1049 | IP583 | 32.11 | | 0.37 | |
| 1062 | IP583 | 31 | | -0.11 | |
| 1064 | | ----- | | ----- | |
| 1097 | IP583 | 31.25 | | 0.00 | |
| 1135 | | ----- | | ----- | |
| 1140 | | ----- | | ----- | |
| 1275 | | ----- | | ----- | |
| 1279 | | ----- | | ----- | |
| 1299 | IP583 | 33.2 | | 0.84 | |
| 1316 | | ----- | | ----- | |
| 1318 | | ----- | | ----- | |
| 1399 | | ----- | | ----- | |
| 1402 | IP583 | 31.1 | | -0.06 | |
| 1496 | | ----- | | ----- | |
| 1538 | D7797 | 29.98 | | -0.54 | |
| 1585 | | ----- | | ----- | |
| 1587 | IP583 | 31.17 | | -0.03 | |
| 1610 | | ----- | | ----- | |
| 1613 | | ----- | | ----- | |
| 1631 | | ----- | | ----- | |
| 1634 | | ----- | | ----- | |
| 1724 | | ----- | | ----- | |
| 1833 | | ----- | | ----- | |
| 2130 | | ----- | | ----- | |
| 2133 | | ----- | | ----- | |
| 6041 | | ----- | | ----- | |
| 6064 | | ----- | | ----- | |
| 6065 | | ----- | | ----- | |
| 6066 | | ----- | | ----- | |
| 6075 | | ----- | | ----- | |
| 6103 | D7797 | 30.145 | | -0.47 | |
| 6112 | IP583 | 29.15 | | -0.90 | |
| 6114 | | ----- | | ----- | |
| 6203 | D7797 | 32.54 | | 0.56 | |
| 6274 | | ----- | | ----- | |
| 6299 | | ----- | | ----- | |
| 6315 | | ----- | | ----- | |
| 6321 | IP583 | 30.15 | | -0.47 | |
| 6379 | | ----- | | ----- | |
| 6384 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 19 |
| outliers | 1 |
| mean (n) | 31.245 |
| st.dev. (n) | 1.7185 |
| R(calc.) | 4.812 |
| st.dev.(IP583:15) | 2.3282 |
| R(IP583:15) | 6.519 |

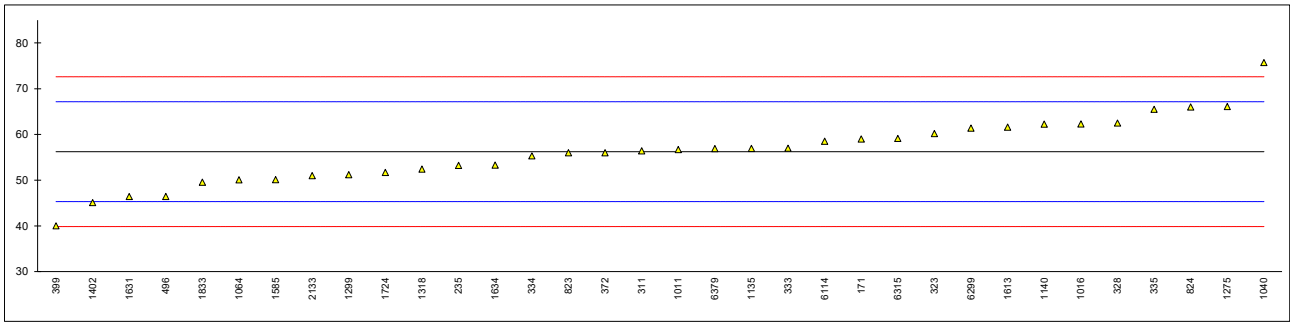


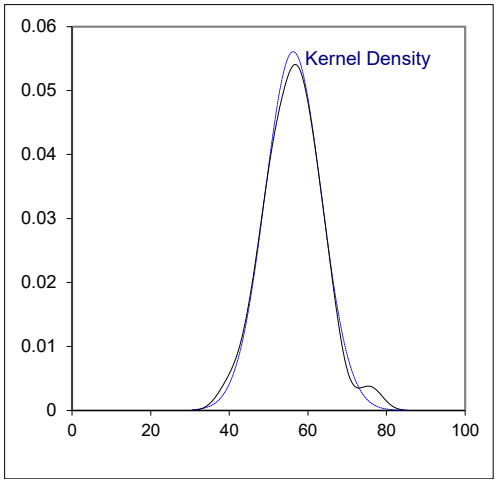



## Determination of FAME content – GCMS/HPLC on sample #22154; results in mg/kg

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 52 | | ----- | | ----- | |
| 62 | | ----- | | ----- | |
| 140 | | ----- | | ----- | |
| 171 | IP585 | 59.0 | | 0.51 | |
| 228 | | ----- | | ----- | |
| 235 | IP585 | 53.23 | | -0.55 | |
| 237 | | ----- | | ----- | |
| 253 | | ----- | | ----- | |
| 254 | | ----- | | ----- | |
| 311 | IP585 | 56.4 | | 0.03 | |
| 317 | | ----- | | ----- | |
| 323 | IP585 | 60.2 | | 0.73 | |
| 328 | IP585 | 62.5 | | 1.15 | |
| 333 | IP585 | 57 | | 0.14 | |
| 334 | IP585 | 55.3 | | -0.17 | |
| 335 | IP585 | 65.5 | | 1.70 | |
| 372 | IP590 | 56.0 | | -0.04 | |
| 399 | IP585 | 40.01 | | -2.97 | |
| 445 | | ----- | | ----- | |
| 447 | | ----- | | ----- | |
| 460 | | ----- | | ----- | |
| 467 | | ----- | | ----- | |
| 496 | IP585 | 46.45 | | -1.79 | |
| 631 | | ----- | | ----- | |
| 657 | | ----- | | ----- | |
| 823 | IP585 | 56.0 | | -0.04 | |
| 824 | IP585 | 66 | C | 1.79 | first reported 64.74 |
| 851 | | ----- | | ----- | |
| 862 | | ----- | | ----- | |
| 974 | | ----- | | ----- | |
| 1011 | IP585 | 56.7 | | 0.09 | |
| 1016 | IP585 | 62.30 | | 1.11 | |
| 1023 | | ----- | | ----- | |
| 1040 | IP599 | 75.7 | | 3.57 | |
| 1049 | | ----- | | ----- | |
| 1062 | | ----- | | ----- | |
| 1064 | IP585 | 50.06 | | -1.13 | |
| 1097 | | ----- | | ----- | |
| 1135 | IP585 | 56.92 | | 0.13 | |
| 1140 | IP585 | 62.26 | | 1.10 | |
| 1275 | IP585 | 66.12 | | 1.81 | |
| 1279 | | ----- | | ----- | |
| 1299 | IP585 | 51.2 | | -0.92 | |
| 1316 | | ----- | | ----- | |
| 1318 | IP585 | 52.43 | | -0.70 | |
| 1399 | | ----- | | ----- | |
| 1402 | IP585 | 45.1 | | -2.04 | |
| 1496 | | ----- | | ----- | |
| 1538 | | ----- | | ----- | |
| 1585 | IP599 | 50.1 | | -1.12 | |
| 1587 | | ----- | | ----- | |
| 1610 | | ----- | | ----- | |
| 1613 | IP599 | 61.576 | | 0.98 | |
| 1631 | IP590 | 46.43 | | -1.80 | |
| 1634 | IP585 | 53.3 | | -0.54 | |
| 1724 | IP590 | 51.69 | | -0.83 | |
| 1833 | IP590 | 49.57 | | -1.22 | |
| 2130 | | ----- | W | ----- | test result withdrawn, reported 22.72 |
| 2133 | IP585 | 50.98 | | -0.96 | |
| 6041 | | ----- | | ----- | |
| 6064 | | ----- | | ----- | |
| 6065 | | ----- | | ----- | |
| 6066 | | ----- | | ----- | |
| 6075 | | ----- | | ----- | |
| 6103 | | ----- | | ----- | |
| 6112 | | ----- | | ----- | |
| 6114 | IP590 | 58.5 | | 0.42 | |
| 6203 | | ----- | | ----- | |
| 6274 | | ----- | | ----- | |
| 6299 | IP585 | 61.4 | | 0.95 | |
| 6315 | IP585 | 59.113 | | 0.53 | |
| 6321 | | ----- | | ----- | |
| 6379 | IP585 | 56.9 | | 0.12 | |
| 6384 | | ----- | | ----- | |

| | | only IP585 | only IP590 |
|---|---|---|---|
| normality | OK | OK | OK |
| n | 34 | 25 | 5 |
| outliers | 0 | 0 | 29 |
| mean (n) | 56.234 | 56.219 | 52.438 |
| st.dev. (n) | 7.1136 | 6.6395 | 4.8558 |
| R(calc.) | 19.918 | 18.591 | 13.596 |
| st.dev.(IP585:21) | 5.4558 | 5.4545 | --- |
| R(IP585:21) | 15.276 | 15.273 | --- |
| compare | | | |
| R(IP590:10) | 12.179 | --- | 11.412 |

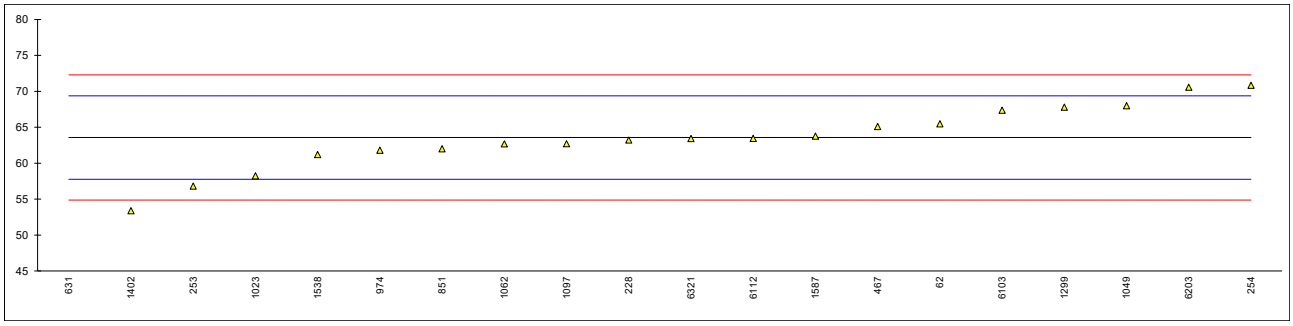


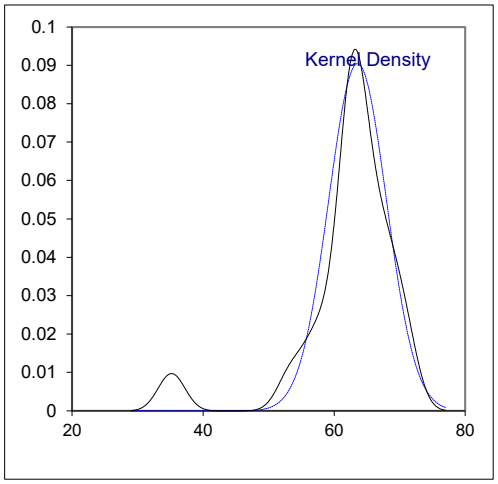



## Determination of FAME content – FTIR on sample #22154; results in mg/kg

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 52 | | ----- | | ----- | |
| 62 | D7797 | 65.5 | | 0.66 | |
| 140 | | ----- | | ----- | |
| 171 | | ----- | | ----- | |
| 228 | D7797 | 63.22 | | -0.12 | |
| 235 | | ----- | | ----- | |
| 237 | | ----- | | ----- | |
| 253 | IP583 | 56.82 | | -2.33 | |
| 254 | D7797 | 70.84 | | 2.50 | |
| 311 | | ----- | | ----- | |
| 317 | | ----- | | ----- | |
| 323 | | ----- | | ----- | |
| 328 | | ----- | | ----- | |
| 333 | | ----- | | ----- | |
| 334 | | ----- | | ----- | |
| 335 | | ----- | | ----- | |
| 372 | | ----- | | ----- | |
| 399 | | ----- | | ----- | |
| 445 | | ----- | | ----- | |
| 447 | | ----- | | ----- | |
| 460 | | ----- | | ----- | |
| 467 | IP583 | 65.09 | | 0.52 | |
| 496 | | ----- | | ----- | |
| 631 | D7797 | 35.20 | R(0.01) | -9.78 | |
| 657 | | ----- | | ----- | |
| 823 | | ----- | | ----- | |
| 824 | | ----- | | ----- | |
| 851 | D7797 | 62.01 | | -0.54 | |
| 862 | | ----- | | ----- | |
| 974 | IP583 | 61.8 | | -0.61 | |
| 1011 | | ----- | | ----- | |
| 1016 | | ----- | | ----- | |
| 1023 | D7797 | 58.24 | | -1.84 | |
| 1040 | | ----- | | ----- | |
| 1049 | IP583 | 68.0 | | 1.52 | |
| 1062 | IP583 | 62.7 | | -0.30 | |
| 1064 | | ----- | | ----- | |
| 1097 | IP583 | 62.71 | | -0.30 | |
| 1135 | | ----- | | ----- | |
| 1140 | | ----- | | ----- | |
| 1275 | | ----- | | ----- | |
| 1279 | | ----- | | ----- | |
| 1299 | IP583 | 67.8 | | 1.46 | |
| 1316 | | ----- | | ----- | |
| 1318 | | ----- | | ----- | |
| 1399 | | ----- | | ----- | |
| 1402 | IP583 | 53.4 | | -3.51 | |
| 1496 | | ----- | | ----- | |
| 1538 | D7797 | 61.21 | | -0.82 | |
| 1585 | | ----- | | ----- | |
| 1587 | IP583 | 63.76 | | 0.06 | |
| 1610 | | ----- | | ----- | |
| 1613 | | ----- | | ----- | |
| 1631 | | ----- | | ----- | |
| 1634 | | ----- | | ----- | |
| 1724 | | ----- | | ----- | |
| 1833 | | ----- | | ----- | |
| 2130 | | ----- | | ----- | |
| 2133 | | ----- | | ----- | |
| 6041 | | ----- | | ----- | |
| 6064 | | ----- | | ----- | |
| 6065 | | ----- | | ----- | |
| 6066 | | ----- | | ----- | |
| 6075 | | ----- | | ----- | |
| 6103 | D7797 | 67.38 | | 1.31 | |
| 6112 | IP583 | 63.46 | | -0.04 | |
| 6114 | | ----- | | ----- | |
| 6203 | D7797 | 70.58 | | 2.41 | |
| 6274 | | ----- | | ----- | |
| 6299 | | ----- | | ----- | |
| 6315 | | ----- | | ----- | |
| 6321 | IP583 | 63.44 | | -0.05 | |
| 6379 | | ----- | | ----- | |
| 6384 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 19 |
| outliers | 1 |
| mean (n) | 63.577 |
| st.dev. (n) | 4.4114 |
| R(calc.) | 12.352 |
| st.dev.(IP583:15) | 2.9017 |
| R(IP583:15) | 8.125 |



Determination of Copper as Cu on sample #22155; results in µg/kg

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 52 | | ----- | | ----- | |
| 120 | | ----- | | ----- | |
| 140 | | ----- | | ----- | |
| 150 | | ----- | | ----- | |
| 159 | | ----- | | ----- | |
| 171 | | ----- | | ----- | |
| 175 | | ----- | | ----- | |
| 177 | | ----- | | ----- | |
| 225 | | ----- | | ----- | |
| 228 | | ----- | | ----- | |
| 235 | | ----- | | ----- | |
| 237 | | ----- | | ----- | |
| 253 | | ----- | | ----- | |
| 254 | | ----- | | ----- | |
| 256 | | ----- | | ----- | |
| 311 | | ----- | | ----- | |
| 323 | | ----- | | ----- | |
| 334 | | ----- | | ----- | |
| 335 | | ----- | | ----- | |
| 372 | | ----- | | ----- | |
| 391 | | ----- | | ----- | |
| 398 | | ----- | | ----- | |
| 399 | | ----- | | ----- | |
| 440 | | ----- | | ----- | |
| 445 | | ----- | | ----- | |
| 447 | | ----- | | ----- | |
| 467 | INH-7111 | 616 | | ----- | |
| 496 | | ----- | | ----- | |
| 631 | | ----- | | ----- | |
| 657 | | ----- | | ----- | |
| 671 | | ----- | | ----- | |
| 823 | | ----- | | ----- | |
| 824 | | ----- | | ----- | |
| 851 | | ----- | | ----- | |
| 862 | | ----- | | ----- | |
| 869 | | ----- | | ----- | |
| 922 | | ----- | | ----- | |
| 962 | | ----- | | ----- | |
| 963 | | ----- | | ----- | |
| 974 | | ----- | | ----- | |
| 1011 | | ----- | | ----- | |
| 1016 | | ----- | | ----- | |
| 1039 | | ----- | | ----- | |
| 1040 | | ----- | | ----- | |
| 1049 | | ----- | | ----- | |
| 1064 | | ----- | | ----- | |
| 1097 | | ----- | | ----- | |
| 1105 | | ----- | | ----- | |
| 1109 | | ----- | | ----- | |
| 1146 | D5185 | 713.5 | | ----- | |
| 1191 | | ----- | | ----- | |
| 1237 | | ----- | | ----- | |
| 1279 | | ----- | | ----- | |
| 1299 | | ----- | | ----- | |
| 1316 | D7111 | >500 | | ----- | |
| 1320 | | ----- | | ----- | |
| 1357 | | ----- | | ----- | |
| 1372 | | ----- | | ----- | |
| 1399 | | ----- | | ----- | |
| 1412 | | ----- | | ----- | |
| 1417 | | ----- | | ----- | |
| 1455 | | ----- | | ----- | |
| 1496 | | ----- | | ----- | |
| 1538 | | ----- | | ----- | |
| 1585 | | ----- | | ----- | |
| 1586 | | ----- | | ----- | |
| 1587 | | ----- | | ----- | |
| 1610 | | ----- | | ----- | |
| 1613 | | ----- | | ----- | |
| 1616 | | ----- | | ----- | |
| 1631 | | ----- | | ----- | |
| 1634 | | ----- | | ----- | |
| 1720 | | ----- | | ----- | |
| 1724 | | ----- | | ----- | |
| 1730 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 1833 | | ----- | | ----- | |
| 1852 | | ----- | | ----- | |
| 1854 | | ----- | | ----- | |
| 1913 | | ----- | | ----- | |
| 1961 | | ----- | | ----- | |
| 2130 | | ----- | | ----- | |
| 6028 | | ----- | | ----- | |
| 6041 | | ----- | | ----- | |
| 6054 | | ----- | | ----- | |
| 6075 | | ----- | | ----- | |
| 6079 | D7111 | 519 | | ----- | |
| 6114 | | ----- | | ----- | |
| 6203 | | ----- | | ----- | |
| 6274 | | ----- | | ----- | |
| 6315 | | ----- | | ----- | |
| 6321 | | ----- | | ----- | |
| 6324 | | ----- | | ----- | |
| 6344 | | ----- | | ----- | |
| | n | 4 | | | |
| | mean (n) | >500 | | | |

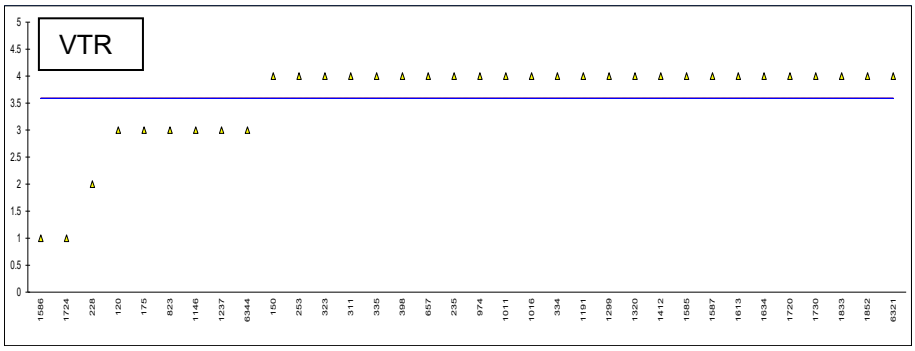
Determination of JFTOT at 260 °C on sample #22155; Visual tube rating (VTR), Interferometric tube rating (ITR) in nm and Ellipsometric tube rating (ETR) in nm, Delta P in mmHg, Evaluation Pass/Fail

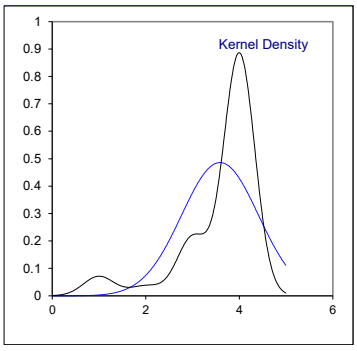
| lab | method | VTR | ITR | ETR | Delta P | | Time to 25 mmHg (min) | | Pumped Vol. (mL) | Heater Temp. (°C) | Pass/Fail |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 52 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 120 | D3241 | 3 | 39.5 | ----- | 4.1 | C | 16 | | 500 | ----- | ----- |
| 140 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 150 | D3241 | 4 | ----- | ----- | 251 | | 29 | C | 500 | 260 | ----- |
| 159 | D3241 | C&B | ----- | ----- | 2.0 | C | ----- | | 550 | 260 | Pass |
| 171 | D3241 | >4 | ----- | ----- | 251 | | 18 | C | 450 | 260 | Fail |
| 175 | D3241 | 3 | ----- | ----- | 250 | | 12 | | 440 | 260 | Fail |
| 177 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 225 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 228 | D3241 | 2 | ----- | ----- | 2.8 | | 16 | | 450 | 260 | Pass |
| 235 | D3241 | 4 | ----- | ----- | ----- | | 30 | C | 500 | 260 | Fail |
| 237 | D3241 | <4 | ----- | ----- | >25 | C | ----- | | 460 | 260 | FAIL |
| 253 | D3241 | 4 | ----- | ----- | 250.1 | | 11.87 | | 450 | 260 | Fail |
| 254 | D3241 | <4 | ----- | ----- | 248 | | 18 | | 450 | 260 | Fail |
| 256 | D3241 | >3 | ----- | ----- | 251.3 | | 15.15 | | 440 | 260 | Fail |
| 311 | D3241 | 4 | ----- | ----- | 280 | | ----- | | 460 | 260 | FAIL |
| 323 | D3241 | 4 | ----- | ----- | 4.0 | | 150 | | 494 | 260 | fail |
| 334 | D3241 | 4 | 67 | ----- | 250 | | 15 | | 485 | 260 | ----- |
| 335 | D3241 | 4 | 52.1 | ----- | 280 | | 14 | | 510 | 260 | ----- |
| 372 | D3241 | 4A | ----- | 45 | 250 | | 16 | | 449 | 260 | Fail |
| 391 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 398 | D3241 | 4 | ----- | ----- | 260 | | 15 | | ----- | 260 | ----- |
| 399 | D3241 | <4 | ----- | 61.73 | 280.1 | | 26 | C | 450 | 260 | Fail |
| 440 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 445 | IP323/D3241 | 3A | ----- | ----- | 280 | | 11.58 | | 400 | 260 | Fail |
| 447 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 467 | D3241 | ----- | ----- | 93.56 | 252.7 | | 19.69 | | 453 | 260.0 | fail |
| 496 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 631 | D3241 | <4 | ----- | ----- | <1.0 | | ----- | | 500 | 260 | Fail |
| 657 | D3241 | 4 | ----- | 195.84 | 250.4 | C | 13.52 | | 440 | 260 | Fail |
| 671 | D3241 | 2A | ----- | 55.52 | 7.0 | C | 32 | | 450 | 260 | ----- |
| 823 | D3241 | 3 | ----- | ----- | 6 | C | 30 | | 450 | 260 | pass |
| 824 | D3241 | <4 | ----- | ----- | 280.1 | | 23 | | 510 | 260 | fail |
| 851 | D3241 | <4 | 72.3 | ----- | 280.0 | | 7.59 | | 450 | 260 | Fail |
| 862 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 869 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 922 | | ----- | ----- | ----- | >25 | | 19 | | ----- | 260 | Fail |
| 962 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 963 | D3241 | >4 | ----- | ----- | ----- | | 12.56 | C | 450 | 260 | Fail |
| 974 | D3241 | 4 | ----- | ----- | >250 | | 17 | | 450 | 260 | Fail |
| 1011 | D3241 | 4 | ----- | ----- | 250 | | 18 | | 450 | 260 | Fail |
| 1016 | D3241 | 4 | ----- | ----- | 251.5 | | ----- | | 433 | 260 | ----- |
| 1039 | | ----- | 76.1 | ----- | 253.5 | | 16.63 | | 459 | 260 | fail |
| 1040 | | ----- | 42.1 | ----- | 252.7 | | ----- | | ----- | ----- | Fail |
| 1049 | D3241 | 3A | ----- | 48.32 | 252 | | 17 | | 438 | 260 | Fail |
| 1064 | D3241 | A [white deposit] | ----- | 200.82 | 250.3 | | 19.5 | | 443 | 260 | Fail |
| 1097 | D3241 | <4A | ----- | ----- | 251.2 | | 13 min 17 s | | 457 | 260 | Fail |
| 1105 | D3241 | > 4 | 85.6 | ----- | 251.1 | | 26.13 | | 434.18 | 260 | FAIL |
| 1109 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 1146 | D3241 | 3 | 77.2 | ----- | 250 | | 13.15 | | 456 | 260 | fail |
| 1191 | D3241 | 4 | 80.8 | ----- | 252.2 | | 14.6 | | 470 | 260 | pass |
| 1237 | D3241 | 3 | ----- | ----- | 280.1 | | 19 | | 450 | 260 | Fail |
| 1279 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 1299 | D3241 | 4 | 105 | ----- | 280 | | 19 | | ----- | 260 | FAIL |
| 1316 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 1320 | D3241 | 4 | ----- | ----- | 250.4 | | 13.95 | | 423 | 260 | Fail |
| 1357 | D3241 | ----- | ----- | ----- | <25 | C | ----- | C | 460 | 260 | Pass |
| 1372 | | <1 | ----- | ----- | 280 | | 10.53 | | 460 | 260 | Fail |
| 1399 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 1412 | D3241 | 4 | ----- | ----- | 0 | | ----- | | 450 | 260 | Fail |
| 1417 | IP323 | >3 | ----- | ----- | 280.1 | | ----- | | 450 | 260 | Fail |
| 1455 | D3241 | Abnormal | ----- | ----- | 252.0 | | 12:26 | | 417.4 | 260 | Fail |
| 1496 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 1538 | D3241 | <4 | ----- | ----- | 280.1 | | 29 | | 450 | 260 | ----- |
| 1585 | D3241/IP323 | 4 | ----- | ----- | 253.1 | | 12.97 | | 455 | 260 | Fail |
| 1586 | IP323 | 1 | ----- | ----- | ----- | W | ----- | W | 510 | 260 | Pass |
| 1587 | D3241 | 4 | ----- | ----- | >25 | | 13min 34sec | C | 446 | 260 | fail |
| 1610 | IP323 | <2 | ----- | ----- | 187.5 | | 121.1 | | 443 | 260 | Fail |
| 1613 | D3241 | 4 | ----- | ----- | 280.2 | | ----- | | 450 | 260 | Fail |
| 1616 | D3241 | 3A | ----- | ----- | 280 | | 15.9 | | 450 | 260 | Fail |
| 1631 | | ----- | ----- | ----- | ----- | | ----- | | ----- | ----- | ----- |
| 1634 | D3241 | 4 | ----- | ----- | 251 | | ----- | | 500 | 260 | Fail |

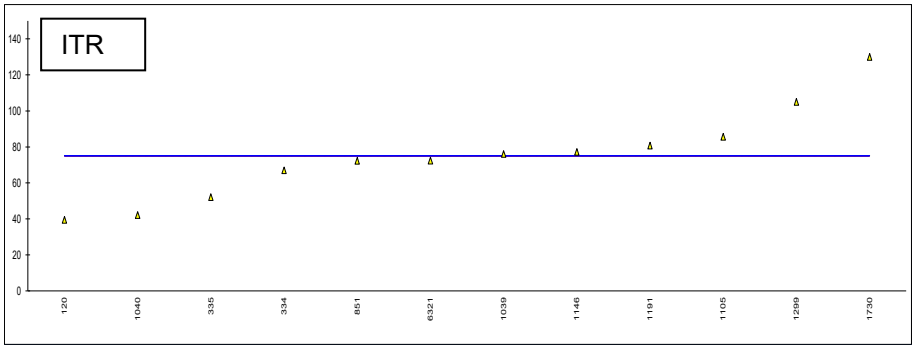
| lab | method | VTR | ITR | ETR | Delta P | Time to 25 mmHg (min) | Pumped Vol. (mL) | Heater Temp. (°C) | Pass/Fail |
|---|---|---|---|---|---|---|---|---|---|
| 1720 | | 4 | ----- | ----- | 280 | 14:54 | ----- | 260 | ----- |
| 1724 | D3241 | 1 | ----- | ----- | 280.1 C | 15.8 C | 510 | 260 | pass |
| 1730 | D3241 | 4 | 130 | ----- | >25 | ----- | 450 | 260 | FAIL |
| 1833 | D3241 | 4 | ----- | ----- | 250.5 | ----- | ----- | 260 | ----- |
| 1852 | D3241/IP323 | 4 | ----- | 194.16 | 251.1 | 12:16 | 463.9 | 260 | Fail |
| 1854 | D3241 | <4 | ----- | ----- | 251 | 18 | 450 | 260 | fail |
| 1913 | | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| 1961 | D3241 | 3A | ----- | ----- | 280.1 | 27 | 450 | 260 | Fail |
| 2130 | | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| 6028 | | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| 6041 | | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| 6054 | | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| 6075 | | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| 6079 | D3241 | ----- | 45.24 | 304.11 | 253.7 | 15.2 | 451 | 260 | Fail |
| 6114 | D3241 | 4A | ----- | ----- | 0.8 | ----- | 450 | 260 | Fail |
| 6203 | D3241 | >4 | ----- | ----- | 100.2 | 10 | 500 | 260.0 | fail |
| 6274 | | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| 6315 | | ----- | ----- | 50.5 | 251.8 | 17 | 700 | 260 | Fail |
| 6321 | IP323 | 4 | 72.4 | ----- | 280.1 | 10.50 | 440 | 260 | Fail |
| 6324 | D3241 | <2.0 | ----- | ----- | >25 C | <20 | 455 | 260 | Fail C |
| 6344 | D3241 | 3 | ----- | ----- | -1 | 15 | 450 | 260 | ----- |
| | n | 44 | 3 | 5 | 55 | | | | |
| | Mean (n) | >2 | >85 | >85 | >25 | | | | |
| | Pass | | | | | | | | 7 |
| | Fail | | | | | | | | 51 |

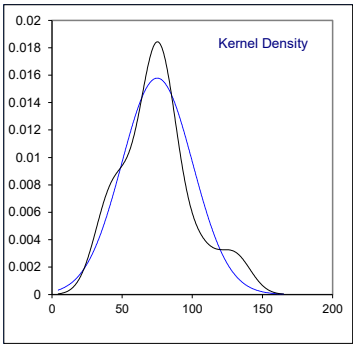
Lab 120 first reported 0
Lab150 first reported 150
Lab 159 first reported 0.1
Lab 171 first reported 150
Lab 235 first reported 40
Lab 237 first reported 0.2
Lab 399 first reported 150
Lab 657 first rported 5.5
Lab 671 first reported 100.0
Lab 823 first reported 4
Lab 963 first reported 0
Lab 1357 first reported <2 and 1 respectively
Lab 1586 test result withdrawn, reported 0 and 0 respectively
Lab 1587 first reported 1334
Lab 1724 first reported 0 and 0 respectively
Lab 6324 first reported 1 and Pass respectively

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.



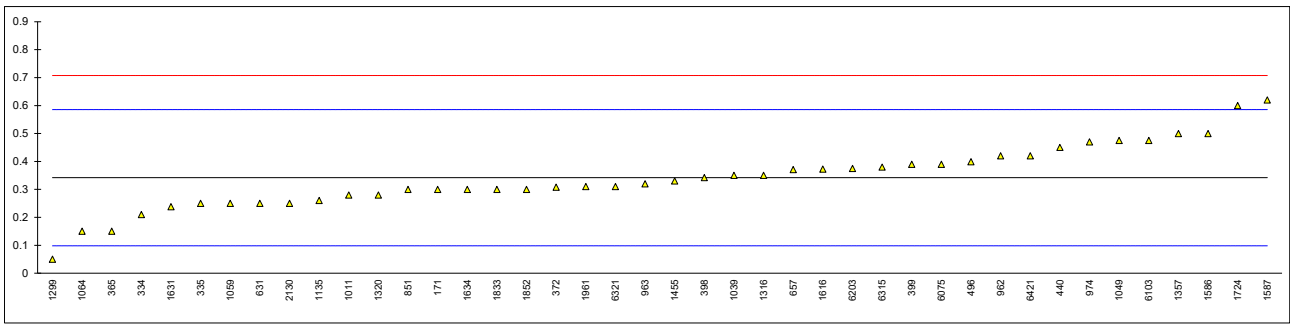



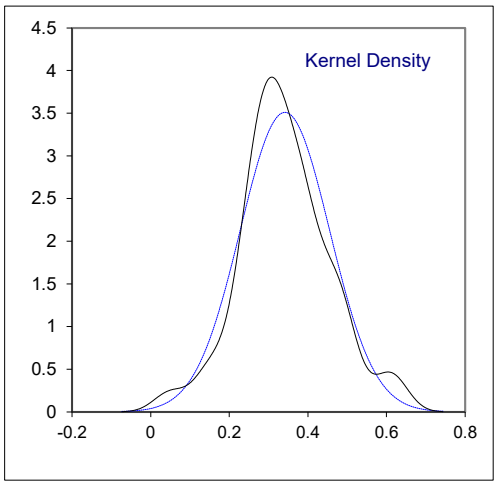



Determination of Particulate Contamination on sample #22156; Particulate matter in mg/L, Filtration time in minutes and Volume of fuel filtered in mL

| lab | method | part. matter | mark | z(targ) | filtr. time | vol. filtered | remarks |
|---|---|---|---|---|---|---|---|
| 140 | | ----- | | ----- | ----- | ----- | |
| 150 | | ----- | | ----- | ----- | ----- | |
| 169 | | ----- | | ----- | ----- | ----- | |
| 171 | D5452 | 0.30 | | -0.34 | ----- | 1000 | |
| 334 | D5452 | 0.21 | | -1.08 | ----- | 3.9 | |
| 335 | D5452 | 0.25 | | -0.75 | ----- | 4000 | |
| 365 | IP423 | 0.15 | | -1.57 | 8 | 4000 | |
| 372 | D5452 | 0.308 | | -0.28 | 14 | 3900 | |
| 398 | D5452 | 0.342 | | 0.00 | ----- | 3800 | |
| 399 | D5452 | 0.39 | | 0.40 | 15 | 3785 | |
| 440 | D5452 | 0.45 | | 0.89 | ----- | 4.0 | |
| 496 | D5452 | 0.399 | | 0.47 | ----- | ----- | |
| 631 | D5452 | 0.25 | | -0.75 | 7 | 4000 | |
| 657 | D5452 | 0.3709 | | 0.24 | 35 | 3828 | |
| 851 | D5452 | 0.30 | | -0.34 | 5 | 4000 | |
| 962 | D5452 | 0.42 | | 0.64 | 25 | 4000 | |
| 963 | D5452 | 0.32 | | -0.18 | 15 | 4000 | |
| 974 | D5452 | 0.47 | | 1.05 | 5 | 3800 | |
| 1011 | D5452 | 0.28 | | -0.50 | ----- | 4000 | |
| 1039 | D5452 | 0.35 | | 0.07 | 4 | 4000 | |
| 1049 | D5452 | 0.475 | | 1.09 | ----- | ----- | |
| 1059 | D5452 | 0.25 | | -0.75 | 79 | 3990 | |
| 1064 | D5452 | 0.15 | | -1.57 | 3.6 | 3970 | |
| 1109 | | ----- | | ----- | ----- | ----- | |
| 1135 | D5452 | 0.26 | | -0.67 | 2.87 | 1959 | |
| 1279 | | ----- | | ----- | ----- | ----- | |
| 1299 | D5452 | 0.05 | | -2.39 | ----- | 3790 | |
| 1316 | D5452 | 0.35 | | 0.07 | ----- | 900 | |
| 1320 | D5452 | 0.28 | | -0.50 | ----- | 3945 | |
| 1357 | D5452 | 0.50 | C | 1.30 | ----- | 4000 | first reported 0.9 |
| 1399 | | ----- | | ----- | ----- | ----- | |
| 1414 | | ----- | | ----- | ----- | ----- | |
| 1455 | D5452 | 0.33 | | -0.09 | 4000 | 40 | |
| 1538 | D5452 | <1.0 | C | ----- | ----- | 4000 | first reported 0.7 |
| 1586 | D5452 | 0.5 | | 1.30 | ----- | 4000 | |
| 1587 | D5452 | 0.62 | | 2.28 | ----- | 3700 | |
| 1610 | | ----- | | ----- | ----- | ----- | |
| 1616 | D5452 | 0.3725 | | 0.25 | 2.50 | 4000 | |
| 1631 | D5452 | 0.238 | | -0.85 | ----- | ----- | |
| 1634 | D5452 | 0.30 | | -0.34 | 13.5 | 3900 | |
| 1724 | IP423 | 0.6 | | 2.12 | ----- | ----- | |
| 1833 | IP423 | 0.3 | | -0.34 | 4 | 3800 | |
| 1852 | D5452 | 0.30 | | -0.34 | 3.44 | 4000 | |
| 1913 | | ----- | | ----- | ----- | ----- | |
| 1961 | D5452 | 0.31 | | -0.26 | ----- | 4000 | |
| 2130 | D5452 | 0.25 | | -0.75 | 12.40.25 | 4000 | |
| 6041 | | ----- | | ----- | ----- | ----- | |
| 6075 | D5452 | 0.39 | | 0.40 | 12 | 3906.6 | |
| 6103 | D5452 | 0.475 | | 1.09 | 21 | 4000 | |
| 6203 | D5452 | 0.375 | | 0.27 | 8.4 | 4000 | |
| 6274 | | ----- | | ----- | ----- | ----- | |
| 6315 | D5452 | 0.38 | | 0.32 | 12 | 3980 | |
| 6321 | IP423 | 0.31 | | -0.26 | ----- | 3900 | |
| 6421 | D5452 | 0.42 | | 0.64 | ----- | ----- | |

| | |
|---|---|
| normality | OK |
| n | 42 |
| outliers | 0 |
| mean (n) | 0.342 |
| st.dev. (n) | 0.1137 |
| R(calc.) | 0.318 |
| st.dev.(D5452:20) | 0.1219 |
| R(D5452:20) | 0.341 |


0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1299 1064 365 334 1631 335 1059 631 2130 1135 1011 1320 851 171 1634 1833 1852 372 1961 6321 963 1455 398 1039 1316 657 1616 6203 6315 399 6075 496 962 6421 440 974 1049 6103 1357 1586 1724 1587


Kernel Density
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.2
0
0.2
0.4
0.6
0.8

## **APPENDIX 2** z-scores of Distillation at 760 mmHg

| lab | IBP | 10% rec | 50% rec | 90% rec | FBP |
|---|---|---|---|---|---|
| 52 | -1.69 | -0.18 | -0.33 | -0.40 | 0.07 |
| 62 | 0.41 | 0.72 | 0.32 | 0.32 | 0.35 |
| 120 | 0.44 | -0.33 | -0.70 | 0.56 | -0.64 |
| 140 | 0.27 | 0.12 | -0.33 | -0.80 | 0.23 |
| 150 | -1.96 | -1.00 | 0.23 | 2.00 | -0.76 |
| 159 | 0.24 | 0.72 | 0.98 | 0.56 | 0.78 |
| 169 | -0.33 | 0.50 | 0.14 | -0.16 | 0.11 |
| 171 | -0.17 | 0.12 | 0.14 | -0.40 | 0.35 |
| 175 | 0.99 | 0.20 | 2.19 | 3.04 | 1.69 |
| 177 | -1.69 | -0.40 | -0.33 | -0.80 | -0.56 |
| 215 | -0.50 | -0.25 | 1.26 | 0.08 | -0.76 |
| 221 | 1.70 | 1.47 | 0.98 | 0.56 | 0.59 |
| 224 | ----- | ----- | ----- | ----- | ----- |
| 225 | 0.17 | -0.25 | 0.32 | 0.88 | 0.43 |
| 228 | 0.51 | 1.24 | 0.32 | -0.72 | 0.82 |
| 235 | -1.08 | -1.30 | -1.45 | -0.96 | -1.35 |
| 237 | 1.19 | 1.99 | 0.32 | 0.08 | -0.36 |
| 238 | ----- | ----- | ----- | ----- | ----- |
| 253 | -0.84 | -1.75 | 0.32 | -0.72 | -0.76 |
| 254 | 0.17 | -0.25 | -0.61 | 0.88 | 0.43 |
| 256 | 0.17 | -0.25 | 0.32 | 0.08 | 0.03 |
| 258 | 1.66 | 0.57 | -0.24 | -1.77 | -0.01 |
| 273 | 0.24 | 0.50 | 1.16 | 0.48 | 1.37 |
| 311 | 0.55 | 0.05 | 0.42 | 0.72 | 0.19 |
| 317 | 0.92 | -0.10 | 0.32 | 0.64 | 0.98 |
| 323 | 0.00 | 0.65 | 0.04 | 0.24 | -0.28 |
| 328 | 0.00 | -0.25 | -0.24 | -0.64 | -0.32 |
| 333 | -1.32 | -0.77 | -1.17 | -1.36 | -0.76 |
| 334 | -0.50 | 0.05 | 0.23 | 0.32 | -0.28 |
| 335 | 0.34 | -0.03 | 0.79 | 1.12 | -0.40 |
| 365 | -0.57 | -0.77 | -0.33 | 0.56 | -0.05 |
| 372 | 0.14 | 0.05 | 0.04 | -0.08 | -0.01 |
| 391 | ----- | ----- | ----- | ----- | ----- |
| 396 | ----- | ----- | ----- | ----- | ----- |
| 399 | ----- | ----- | ----- | ----- | ----- |
| 440 | 0.11 | 0.27 | 0.42 | 1.28 | 0.51 |
| 445 | -0.81 | -1.30 | -0.98 | -0.16 | -0.99 |
| 447 | 0.38 | -0.10 | -0.24 | 0.72 | -0.08 |
| 460 | ----- | ----- | ----- | ----- | ----- |
| 467 | 0.88 | 0.20 | 0.23 | -0.08 | -0.20 |
| 480 | 0.11 | 0.83 | 0.32 | -0.24 | -0.42 |
| 496 | 1.09 | 1.09 | -0.24 | 0.40 | 0.27 |
| 603 | 0.65 | -0.85 | -1.64 | -0.72 | -1.15 |
| 608 | -1.55 | -0.03 | 0.79 | 0.32 | -0.24 |
| 631 | 0.17 | -1.75 | -1.54 | -1.52 | -1.35 |
| 657 | 1.32 | 0.35 | 0.88 | 0.24 | 0.43 |
| 736 | -0.17 | -0.62 | -0.61 | 0.08 | -1.15 |
| 823 | 0.34 | 0.65 | 0.98 | 0.72 | 0.86 |
| 824 | -0.17 | 1.09 | 0.42 | 0.64 | 0.35 |
| 851 | -0.64 | -0.03 | -0.42 | -0.40 | -0.44 |
| 854 | ----- | ----- | ----- | ----- | ----- |
| 862 | ----- | ----- | ----- | ----- | ----- |
| 869 | ----- | ----- | ----- | ----- | ----- |
| 904 | -0.13 | -0.70 | 0.70 | 0.40 | 0.23 |
| 914 | -0.06 | -0.33 | -0.14 | 0.32 | 1.69 |
| 962 | 0.11 | -0.70 | -1.26 | -1.52 | -0.76 |
| 963 | -0.94 | -0.03 | -0.33 | -1.12 | -0.48 |
| 970 | -0.17 | -1.00 | -0.61 | -1.52 | -0.36 |
| 974 | -0.50 | -0.92 | -0.61 | -0.64 | -0.36 |
| 994 | -0.17 | -0.25 | -0.61 | -0.72 | 0.82 |
| 995 | -0.33 | 0.12 | -0.14 | 1.68 | 1.02 |
| 996 | ----- | ----- | ----- | ----- | ----- |
| 997 | -0.50 | 0.50 | 0.32 | 1.68 | 1.02 |
| 1011 | -0.20 | 0.20 | -0.14 | 1.04 | 0.19 |
| 1016 | ----- | ----- | ----- | ----- | ----- |
| 1019 | ----- | ----- | ----- | ----- | ----- |
| 1023 | 0.41 | 0.12 | -0.89 | -0.24 | -0.08 |
| 1039 | 0.58 | 0.65 | 0.60 | 0.16 | -0.44 |
| 1040 | -0.54 | -1.00 | -0.33 | 0.32 | 0.11 |
| 1049 | 0.71 | 0.72 | 0.70 | 1.12 | 0.23 |
| 1059 | 0.14 | 0.27 | 0.14 | -0.24 | 0.27 |
| 1062 | 0.34 | -0.18 | 0.42 | 0.16 | 0.31 |

| lab | IBP | 10% rec | 50% rec | 90% rec | FBP |
|---|---|---|---|---|---|
| 1064 | 0.78 | 0.35 | 0.04 | 0.40 | 0.74 |
| 1065 | -1.32 | -2.79 | 0.04 | 0.72 | 8.87 |
| 1082 | -0.03 | 0.79 | 0.70 | 0.72 | 0.51 |
| 1097 | 0.71 | -0.55 | -0.42 | 0.40 | -0.12 |
| 1105 | -0.64 | 1.02 | 0.51 | 0.00 | -0.24 |
| 1109 | ----- | ----- | ----- | ----- | ----- |
| 1121 | -1.62 | 0.05 | -0.52 | -0.64 | -0.36 |
| 1126 | 0.65 | 0.42 | -0.14 | -1.20 | -0.48 |
| 1140 | -1.42 | -0.55 | -0.42 | -0.40 | 0.23 |
| 1182 | 1.66 | 1.32 | 1.44 | 1.60 | 0.55 |
| 1191 | -1.38 | 0.87 | 0.14 | 0.00 | -0.08 |
| 1205 | 0.51 | 0.35 | 0.60 | -0.32 | -0.20 |
| 1237 | -0.23 | 0.05 | -0.24 | -0.72 | -0.24 |
| 1275 | -0.37 | -0.40 | -0.61 | -0.40 | -0.44 |
| 1279 | ----- | ----- | ----- | ----- | ----- |
| 1299 | 0.24 | 0.42 | 0.70 | 1.12 | 0.63 |
| 1316 | -0.03 | 0.35 | 0.51 | 0.16 | 0.27 |
| 1318 | 1.49 | 0.57 | 0.14 | 0.40 | 0.35 |
| 1320 | -1.11 | -0.62 | -0.42 | -1.12 | -0.36 |
| 1357 | 0.27 | -0.40 | -1.45 | 0.00 | 0.35 |
| 1372 | 0.48 | -1.15 | -1.45 | -1.36 | 0.39 |
| 1397 | 0.71 | 0.72 | 0.04 | -0.80 | -0.60 |
| 1399 | ----- | ----- | ----- | ----- | ----- |
| 1412 | -0.17 | -0.25 | -0.14 | 0.08 | 0.03 |
| 1417 | 0.61 | 0.35 | 1.54 | 2.24 | 0.03 |
| 1444 | ----- | ----- | ----- | ----- | ----- |
| 1455 | 0.17 | 0.65 | 0.42 | 0.08 | 0.11 |
| 1496 | ----- | ----- | ----- | ----- | ----- |
| 1538 | ----- | ----- | ----- | ----- | ----- |
| 1575 | ----- | ----- | ----- | ----- | ----- |
| 1585 | -0.81 | -0.25 | -0.52 | -0.88 | -0.56 |
| 1586 | 0.27 | 0.05 | 0.23 | 0.24 | -0.01 |
| 1587 | -0.03 | 0.05 | -0.05 | -0.48 | -0.24 |
| 1610 | 0.65 | 0.87 | 0.60 | 0.56 | 0.43 |
| 1613 | 0.78 | 0.65 | 0.51 | -0.16 | 0.39 |
| 1616 | -0.57 | -0.70 | -1.36 | -1.28 | -0.32 |
| 1631 | -1.15 | -0.70 | -0.42 | -0.16 | 0.19 |
| 1634 | 0.14 | 0.12 | -0.05 | -0.08 | 0.15 |
| 1636 | -0.27 | 0.57 | 0.79 | 1.04 | -0.44 |
| 1669 | -1.45 | -1.22 | -0.70 | -0.64 | 0.07 |
| 1683 | 0.24 | -0.85 | -1.17 | -0.72 | -1.11 |
| 1688 | ----- | -1.00 | 0.32 | -1.52 | -0.36 |
| 1715 | 1.29 | -0.40 | -0.61 | 0.88 | 0.31 |
| 1720 | -0.47 | 0.20 | 0.23 | 0.00 | 2.36 |
| 1724 | -0.54 | -0.70 | -1.08 | -1.52 | -0.16 |
| 1730 | ----- | ----- | ----- | ----- | ----- |
| 1757 | 0.27 | 0.05 | -0.80 | -0.80 | -0.99 |
| 1776 | -0.54 | -1.00 | -0.52 | -0.08 | -0.44 |
| 1833 | -1.21 | -0.85 | -0.98 | -0.72 | -0.28 |
| 1852 | 0.14 | 0.12 | 0.42 | 0.08 | 0.31 |
| 1913 | ----- | ----- | ----- | ----- | ----- |
| 1944 | -0.30 | 0.12 | 0.23 | 0.08 | 0.23 |
| 1961 | ----- | ----- | ----- | ----- | ----- |
| 2130 | 0.34 | 0.20 | 0.60 | 0.88 | 0.23 |
| 2133 | 0.27 | 0.42 | 0.70 | 0.56 | 0.47 |
| 6028 | ----- | ----- | ----- | ----- | ----- |
| 6041 | ----- | ----- | ----- | ----- | ----- |
| 6054 | ----- | ----- | ----- | ----- | ----- |
| 6075 | -0.98 | 0.42 | 0.98 | 0.88 | -0.01 |
| 6114 | 0.99 | 0.35 | -0.05 | 0.24 | -0.01 |
| 6135 | ----- | ----- | ----- | ----- | ----- |
| 6142 | -0.60 | -0.77 | -0.98 | -1.04 | -0.91 |
| 6203 | -0.64 | -0.25 | 0.14 | 0.24 | -0.12 |
| 6244 | 1.26 | 0.79 | 0.51 | -0.40 | 3.66 |
| 6266 | 0.50 | 0.84 | -0.05 | -0.56 | -0.22 |
| 6274 | ----- | ----- | ----- | ----- | ----- |
| 6312 | ----- | ----- | ----- | ----- | ----- |
| 6315 | -0.37 | 0.05 | 0.04 | 0.16 | 0.19 |
| 6321 | 0.38 | 0.20 | 0.14 | 0.08 | -0.05 |
| 6324 | 0.68 | -0.62 | 0.32 | 0.08 | 0.47 |
| 6332 | 1.36 | 0.87 | 0.79 | 0.88 | 0.23 |
| 6344 | 0.31 | 0.20 | 0.32 | -0.08 | 0.15 |
| 6346 | ----- | ----- | ----- | ----- | ----- |
| 6364 | 0.65 | -0.85 | -1.36 | -1.04 | -0.24 |

| lab | IBP | 10% rec | 50% rec | 90% rec | FBP |
|---|---|---|---|---|---|
| 6384 | -0.44 | 0.35 | 0.42 | 1.36 | 0.59 |
| 6421 | 1.19 | 1.24 | 1.26 | 0.08 | 0.82 |
| 6438 | -1.28 | -1.22 | -1.26 | -0.32 | -0.79 |
| 6479 | ----- | ----- | ----- | ----- | ----- |
| 6487 | ----- | ----- | ----- | ----- | ----- |

## 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 | | | | |
| 311 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 323 | | | | |
| 333 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 334 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 335 | | | | |
| 372 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 447 | | | | |
| 657 | Stanhope-Seta | IP565 | IP565 | ISO4406 |
| 823 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 824 | Stanhope-Seta | IP565 | IP565 | ISO4406 |
| 862 | | | | |
| 963 | Stanhope-Seta | IP565 | IP565 | ISO4406 |
| 974 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 1011 | Stanhope-Seta | IP565 | IP565 | |
| 1016 | Stanhope-Seta | IP565 | IP565 | |
| 1049 | Pamas | IP577 | IP577 | ISO4406 acc. to IP577 |
| 1062 | Stanhope-Seta | IP565 | IP565 | |
| 1064 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 1065 | Stanhope-Seta | IP565 | IP565 | |
| 1097 | Parker Hannifin | IP564 | IP564 | ISO4406 acc. to IP564 |
| 1109 | | | | |
| 1135 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 1140 | Stanhope-Seta | IP565 | IP565 | |
| 1191 | | | | ISO4406 acc. to IP565 |
| 1279 | | | | |
| 1299 | Pamas | IP577 | IP577 | ISO4406 acc. to IP577 |
| 1316 | Pamas | IP577 | IP577 | ISO4406 acc. to IP577 |
| 1318 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 1320 | | | | |
| 1357 | Parker Hannifin | IP564 | IP565 | ISO4406 |
| 1397 | | | | |
| 1399 | | | | |
| 1402 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 1455 | Stanhope-Seta | IP565 | IP565 | |
| 1496 | | | | |
| 1538 | Stanhope-Seta | IP565 | IP565 | |
| 1585 | Stanhope-Seta | IP565 | IP565 | IP565 |
| 1587 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 1610 | Stanhope-Seta | IP565 | IP565 | |
| 1613 | Stanhope-Seta | IP565 | IP565 | IP565 |
| 1634 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 1636 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 1724 | | IP565 | IP565 | ISO4406 acc. to IP565 |
| 1833 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 1852 | Stanhope-Seta | IP565 | IP565 | |
| 1857 | Stanhope-Seta | IP565 | IP565 | IP565 |
| 1913 | | | | |
| 1961 | Pamas | IP577 | IP577 | ISO4406 acc. to IP577 |
| 2130 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 6075 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 6112 | Stanhope-Seta | IP565 | IP565 | ISO4406 |
| 6203 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 6274 | | | | |
| 6315 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |
| 6321 | Stanhope-Seta | IP565 | IP565 | ISO4406 acc. to IP565 |

## APPENDIX 4 z-scores of Particle Size Distribution, counts/mL

| lab | ≥4 µm | ≥6 µm | ≥14 µm | ≥21 µm | ≥25 µm | ≥30 µm |
|---|---|---|---|---|---|---|
| 140 | ----- | ----- | ----- | ----- | ----- | ----- |
| 150 | ----- | ----- | ----- | ----- | ----- | ----- |
| 171 | -1.76 | -1.52 | -0.01 | 0.41 | 0.40 | 1.46 |
| 225 | ----- | ----- | ----- | ----- | ----- | ----- |
| 237 | ----- | ----- | ----- | ----- | ----- | ----- |
| 311 | -1.47 | -0.81 | -1.26 | -1.27 | -1.69 | ----- |
| 323 | ----- | ----- | ----- | ----- | ----- | ----- |
| 333 | 1.52 | 0.82 | 0.65 | 0.10 | -0.65 | -0.16 |
| 334 | -0.22 | -0.31 | 0.68 | 0.86 | 0.74 | 0.65 |
| 335 | ----- | ----- | ----- | ----- | ----- | ----- |
| 372 | 3.02 | 2.12 | 1.97 | 3.23 | 3.59 | 2.92 |
| 447 | ----- | ----- | ----- | ----- | ----- | ----- |
| 657 | -3.55 | 0.17 | 0.98 | 2.53 | 2.86 | 1.21 |
| 823 | 4.08 | 2.67 | 2.25 | 3.19 | 3.39 | 3.97 |
| 824 | 4.84 | 1.76 | 1.86 | 2.91 | 3.04 | 2.67 |
| 862 | ----- | ----- | ----- | ----- | ----- | ----- |
| 963 | -0.23 | -0.37 | -0.67 | -0.46 | -0.44 | -0.97 |
| 974 | -0.71 | -0.76 | -1.11 | -0.81 | -0.65 | -0.16 |
| 1011 | -1.76 | 0.16 | -0.23 | 0.56 | 0.40 | 0.65 |
| 1016 | 0.02 | -0.54 | -0.96 | -1.48 | -1.58 | -1.06 |
| 1049 | 221.50 | 141.27 | 71.62 | 67.08 | 55.30 | 34.93 |
| 1062 | -1.12 | -1.05 | -1.15 | -1.92 | -1.97 | -1.62 |
| 1064 | -0.21 | 0.40 | -1.45 | -2.57 | -2.21 | -1.62 |
| 1065 | -3.27 | -1.06 | -0.71 | -0.13 | -0.23 | -0.73 |
| 1097 | -9.09 | -4.23 | -3.08 | 0.33 | 4.32 | 12.80 |
| 1109 | ----- | ----- | ----- | ----- | ----- | ----- |
| 1135 | -3.10 | -0.04 | -2.39 | -1.57 | -1.69 | -1.79 |
| 1140 | 2.03 | 0.96 | 0.09 | -0.67 | -1.20 | -1.06 |
| 1191 | 1.02 | -0.42 | 0.48 | -0.58 | -0.68 | -1.06 |
| 1279 | ----- | ----- | ----- | ----- | ----- | ----- |
| 1299 | -8.70 | -5.39 | -3.59 | -2.06 | -1.45 | -1.06 |
| 1316 | -5.98 | -2.41 | -0.62 | 0.72 | 2.41 | 2.43 |
| 1318 | 0.20 | -0.38 | 1.05 | 1.18 | 1.51 | 1.46 |
| 1320 | ----- | ----- | ----- | ----- | ----- | ----- |
| 1357 | -0.16 | -1.12 | 0.18 | -1.39 | -1.17 | -0.73 |
| 1397 | ----- | ----- | ----- | ----- | ----- | ----- |
| 1399 | ----- | ----- | ----- | ----- | ----- | ----- |
| 1402 | -1.70 | -0.85 | -0.70 | 0.59 | 1.54 | 2.67 |
| 1455 | -1.85 | 0.54 | -0.32 | -0.81 | -1.34 | -1.79 |
| 1496 | ----- | ----- | ----- | ----- | ----- | ----- |
| 1538 | -1.95 | ----- | ----- | ----- | ----- | ----- |
| 1585 | 1.41 | -0.20 | -0.52 | -0.93 | -0.65 | -0.57 |
| 1587 | -2.24 | -2.04 | 0.89 | 0.74 | 0.78 | 0.81 |
| 1610 | 4.06 | 1.26 | -0.19 | -0.60 | -1.03 | -1.22 |
| 1613 | 1.18 | 1.59 | 0.28 | 1.30 | 1.47 | 0.97 |
| 1634 | -0.12 | 1.00 | -0.38 | 0.41 | 1.09 | 0.65 |
| 1636 | -3.40 | -0.51 | -0.21 | -0.70 | -0.99 | -1.46 |
| 1724 | 0.35 | -0.29 | 1.21 | 0.66 | 1.54 | 1.62 |
| 1833 | 1.54 | 0.00 | 1.20 | 2.84 | 2.83 | 2.59 |
| 1852 | 2.42 | 1.14 | -0.04 | 0.21 | 0.01 | -0.08 |
| 1857 | 2.30 | 1.20 | 0.40 | ----- | ----- | ----- |
| 1913 | ----- | ----- | ----- | ----- | ----- | ----- |
| 1961 | -6.59 | -2.40 | -1.30 | -0.92 | -1.13 | -1.22 |
| 2130 | -0.31 | -2.09 | 0.33 | 0.10 | 0.15 | -0.25 |
| 6075 | -0.13 | -0.56 | -0.88 | -0.73 | -1.06 | -0.81 |
| 6112 | 1.16 | 0.74 | -0.74 | -0.77 | -1.38 | -1.62 |
| 6203 | 1.68 | 0.39 | -0.26 | -0.73 | -0.85 | -0.89 |
| 6274 | ----- | ----- | ----- | ----- | ----- | ----- |
| 6315 | -2.22 | 0.47 | 0.43 | 0.41 | 0.05 | -0.97 |
| 6321 | -0.03 | -0.32 | 0.61 | -1.25 | -1.13 | -1.06 |

## APPENDIX 5

### Number of participants per country

| | | | |
|---|---|---|---|
| 1 lab in | AUSTRALIA | 1 lab in | MARTINIQUE |
| 3 labs in | AZERBAIJAN | 1 lab in | MAURITIUS |
| 5 labs in | BELGIUM | 1 lab in | MOROCCO |
| 1 lab in | BULGARIA | 1 lab in | MOZAMBIQUE |
| 2 labs in | CANADA | 8 labs in | NETHERLANDS |
| 8 labs in | CHINA, People's Republic | 2 labs in | NIGERIA |
| 3 labs in | COLOMBIA | 1 lab in | NORTH MACEDONIA, Republic of |
| 1 lab in | COSTA RICA | 2 labs in | NORWAY |
| 2 labs in | COTE D'IVOIRE | 2 labs in | OMAN |
| 1 lab in | CROATIA | 2 labs in | PAKISTAN |
| 2 labs in | DENMARK | 1 lab in | PHILIPPINES |
| 1 lab in | DJIBOUTI | 3 labs in | POLAND |
| 1 lab in | EGYPT | 2 labs in | PORTUGAL |
| 1 lab in | ESTONIA | 1 lab in | QATAR |
| 3 labs in | FINLAND | 2 labs in | ROMANIA |
| 6 labs in | FRANCE | 2 labs in | RUSSIAN FEDERATION |
| 3 labs in | GEORGIA | 5 labs in | SAUDI ARABIA |
| 6 labs in | GERMANY | 1 lab in | SENEGAL |
| 4 labs in | GREECE | 1 lab in | SINGAPORE |
| 1 lab in | GUINEA REPUBLIC | 2 labs in | SLOVAKIA |
| 1 lab in | GUAM | 2 labs in | SLOVENIA |
| 1 lab in | HONG KONG | 2 labs in | SOUTH AFRICA |
| 1 lab in | HUNGARY | 4 labs in | SPAIN |
| 1 lab in | INDIA | 1 lab in | SUDAN |
| 2 labs in | IRELAND | 5 labs in | SWEDEN |
| 1 lab in | ISRAEL | 3 labs in | TANZANIA |
| 4 labs in | ITALY | 1 lab in | TOGO |
| 1 lab in | JORDAN | 2 labs in | TUNISIA |
| 1 lab in | KAZAKHSTAN | 5 labs in | TURKEY |
| 3 labs in | KENYA | 1 lab in | TURKMENISTAN |
| 2 labs in | KOREA, Republic of | 3 labs in | UNITED ARAB EMIRATES |
| 2 labs in | MALAYSIA | 14 labs in | UNITED KINGDOM |
| 1 lab in | MALTA | 8 labs in | UNITED STATES OF AMERICA |

## APPENDIX 6

### Abbreviations

| | |
|---|---|
| C | = final test result after checking of first reported suspect test result |
| D(0.01) | = outlier in Dixon's outlier test |
| D(0.05) | = straggler in Dixon's outlier test |
| G(0.01) | = outlier in Grubbs' outlier test |
| G(0.05) | = straggler in Grubbs' outlier test |
| DG(0.01) | = outlier in Double Grubbs' outlier test |
| DG(0.05) | = straggler in Double Grubbs' outlier test |
| R(0.01) 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)