# Results of Proficiency Test
# Jet Fuel A1
# March 2010


Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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# 1 INTRODUCTION

Since 1995, the Institute for Interlaboratory Studies organises every year proficiency tests for Jet Fuel A1. The international Interlaboratory study on Jet Fuel of March 2010 was extended with a PT for the determination for Particle Size Distribution. In the regular PT, 65 laboratories in 31 different countries have participated; in the PT for the Particle Size Distribution 25 laboratories in 18 different countries. See appendix 4 for a list of participants in alphabetical country order. In this report, the results of the proficiency test are presented and discussed.

# 2 SET UP

The Institute for Interlaboratory Studies (i.i.s.) in Spijkenisse, The Netherlands, was the organiser of this proficiency test. In the regular Jet Fuel round robin, it was decided, depending on the registration, to send the two identical samples (2*1 liter of sample #1017) for the analyses according to the "Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS)", sometimes referred to as the "Joint Fuelling System Check List For Jet A-1" and/or for the Particle Size round robin to send one sample of 0.5 L (#1018).
The participants were requested to report rounded and unrounded results. The unrounded 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 guide 43 and ILAC-G13:2007, (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This ensures 100% confidentially 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 Organization, Statistics and Evaluation' of January 2010 (iis-protocol, version 3.2), which can be downloaded from www.iisnl.com. The participants were asked to report the analytical results using the indicated units on the report form.

## 2.3 CONFIDENTIALITY STATEMENT

All data present in this report must be regarded as confidential and for use by the participating companies only. Disclosure of the information in this report is only allowed by means of the entire report. Use of the contents of this report for third parties is only allowed by written permission of the Institute for Interlaboratory Studies. Disclosure of the identity of one or more of the participating companies will be done only after receipt of a written agreement of the companies involved.

## 2.4 SAMPLES

### 2.4.1 REGULAR JET FUEL

The necessary bulk material was obtained from a local refinery. The approx. 200 litre bulk sample was homogenised and divided over 176 amber glass bottles of one litre with inner and outer caps and labelled #1017. The homogeneity of the subsamples #1017 was checked by the determination of Density in accordance with ASTM D 4052:09 on 8 stratified random selected samples.

| Sample | Density @ 15°C in kg/m$^3$ |
|---|---|
| #1017-1 | 795.01 |
| #1017-2 | 795.01 |
| #1017-3 | 795.00 |
| #1017-4 | 795.00 |
| #1017-5 | 795.00 |
| #1017-6 | 795.00 |
| #1017-7 | 795.00 |
| #1017-8 | 795.00 |

table 1: homogeneity test of sub samples #1017

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

| | Density @ 15°C in kg/m$^3$ |
|---|---|
| r (observed) | 0.01 |
| reference method | D 4052:09 |
| 0.3 x R (ref. method) | 0.15 |

Table 2: evaluation of repeatability of subsamples #0955

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

### 2.4.2 JET FUEL PARTICLE SIZE DETERMINATION

The second bulk material was obtained from a participating laboratory. The approx. 200 litre bulk sample was homogenised and divided over 48 amber glass bottles of 500 mL with inner and outer caps and labelled #1018. The homogeneity of the subsamples #1018 was checked by the determination of Particle Size Distribution in accordance with IP564:10 on 7 stratified random selected samples.

| Sample | > 4 µm | > 6 µm | > 14 µm | > 21 µm | > 25 µm | > 30 µm |
|---|---|---|---|---|---|---|
| #0957-1 | 17064 | 2873 | 93 | 18 | 9 | 3 |
| #0957-2 | 17123 | 2846 | 83 | 15 | 6 | 2 |
| #0957-3 | 16813 | 2681 | 64 | 11 | 5 | 2 |
| #0957-4 | 16804 | 2747 | 84 | 19 | 9 | 4 |
| #0957-5 | 16862 | 2745 | 79 | 17 | 8 | 3 |
| #0957-6 | 17354 | 2959 | 96 | 19 | 10 | 4 |
| #0957-7 | 17245 | 2945 | 100 | 21 | 10 | 4 |

Table 3: homogeneity test of sub samples #0957

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

| Sample | > 4 µm | > 6 µm | > 14 µm | > 21 µm | > 25 µm | > 30 µm |
|---|---|---|---|---|---|---|
| r (observed) | 612 | 299 | 34 | 9.2 | 5.5 | 2.5 |
| reference method | IP564:10 | IP564:10 | IP564:10 | IP564:10 | IP564:10 | IP564:10 |
| 0.3 x R (ref. method) | 968 | 270 | 15 | 6.5 | 3.3 | 1.6 |

Table 4: evaluation of repeatabilities of subsamples #0957

Regretfully not all repeatabilities of the results for Particle Size are in agreement with 0.3 times the corresponding reproducibility of the target method. However, the repeatabilities of the results do meet the repeatability limits of IP564:10 ($r_{IP564}$= 2305, 557, 38, 17.4, 8.5 and 4.0). Therefore, homogeneity of the subsamples #1018 was assumed.

Depending on the registration of each participant, the following samples were dispatched on March 3, 2010: 2 bottles of 1 litre, labelled #1017 and/or 1*0.5 L, labelled #1018.

### 2.5 STABILITY OF THE SAMPLES

The stability of Jet Fuel A1, packed in the brown glass bottles was checked. The type of bottle was chosen in accordance with ASTM D4306:07. The material has been found sufficiently stable for the period of the proficiency test.

### 2.6 ANALYSIS

The participants were requested to determine on sample #1017: Aromatics by FIA, Aromatics by HPLC (in %M/M and %V/V), Colour Saybolt, Density @15°C, Distillation (IBP, 10%, 20%, 50%, 90% recovered and FBP), Existent Gum, Flash Point, Freezing Point, JFTOT, Mercaptans, MSEP, Naphthalenes, Smoke Point, Specific Energy (on Sulphur free basis), Total Acidity, Total Sulphur and Viscosity @ -20°C. The participants were requested to determine Particle Size only on sample #1018.

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

To get comparable results a detailed report form, on which the units were prescribed as well as some of the required standards, was sent together with each set of samples. Also a letter of instructions and a SDS were added to the package.

## 3 RESULTS

During four weeks after sample despatch, the results of the individual laboratories were gathered. The original data are tabulated per determination in the appendix 1 of this report. The laboratories are presented by their code numbers.

Directly after deadline, a reminder fax was sent to those laboratories that had not yet reported. Shortly after the deadline, the available results were screened for suspect data. A 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 (raw data of the) reported results. Additional or corrected results have been used for data analysis and the original results are placed under 'Remarks' in the result tables in Appendix 1.

### 3.1 STATISTICS

Statistical calculations were performed as described in the report 'iis Interlaboratory Studies: Protocol for the Organization, Statistics and Evaluation' of January 2010 (iis-protocol, version 3.2).

For the statistical evaluation the *unrounded* (when available) figures were used instead of the rounded results. 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. After removal of outliers, this check was repeated. Not all data sets proved to have a normal distribution, in which cases the conclusions of statistical evaluation should be used with due care.
In accordance with ISO 5725 (1986 and 1994) the original results per determination were submitted subsequently to Dixon and Grubbs outlier tests.
Outliers are marked by D(0.01) for the Dixon test, by G(0.01) or DG(0.01) for the Grubbs test. Stragglers are marked by D(0.05) for the Dixon test, by G(0.05) or DG(0.05) for the Grubbs test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

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

### 3.2 GRAPHICS

In order to visualise the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported analysis results are plotted. The corresponding laboratory numbers are under 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 standard. 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 (see appendix 4, nr.14-15).

### 3.3 Z-SCORES

To evaluate the performance of the participating laboratories the z-scores were calculated. As it was decided to evaluate the performance of the participants in this proficiency test (PT) against the literature requirements, e.g. ASTM reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the spread of this interlaboratory study. The target standard deviation was calculated from the literature reproducibility by division with 2.8. The z-scores were calculated according to:

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

The $z_{(target)}$ scores are listed in the 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 |
| $\lvert z \rvert > 3$ | unsatisfactory |

## 4 EVALUATION

In these interlaboratory studies some major problems with couriers and/or customs clearance were encountered during dispatch of the samples to laboratories in Bulgaria, Côte D'Ivoire, Croatia, Greece, P.R. of China, Sudan and United Kingdom.
For the "regular Jet Fuel A1" PT, 13 participants reported the results after the final reporting date and 5 participants did not report any results at all.
For the PT "Particle Size", 5 participants reported the results after the final reporting date and 5 participants did not report any results at all.

In total, the participants reported 1257 numerical results. Observed were 64 outlying results, which is 5.1%. In proficiency studies, outlier percentages of 3 % - 7.5 % are quite normal.

### 4.1 EVALUATION PER TEST

Not all original data sets proved to have a normal distribution. Anormal distributions were found for the following determinations on sample #1017: Colour Saybolt, Density, Distillation 10% recovered, Existent Gum, Flash Point, JFTOT, Mercaptan Sulphur, Naphthalenes and, Specific Energy. Therefore, the statistical evaluation for these determinations should be used with care.
In this section, the results are discussed per test.
Since the checklist is continuously updated, the users are advised to monitor the updates. The latest version at this moment is “Issue 24_October_2008”. One must keep in mind that ISO-methods are not mentioned in the “Checklist”.

Aromatics by: FIA (D1319): This determination was not problematic. No statistical outliers were observed and the calculated reproducibility is in good agreement with ASTM D1319:08.

Aromatics by: HPLC (D6379) The %M/M determination was problematic for two laboratories. Two statistical outliers were observed. The calculated reproducibility is, after rejection of the statistical outliers, in good agreement with ASTM D6379:04. The %V/V determination may also be problematic for two laboratories. Regretfully, no precision data for the determination in %V/V is mentioned in ASTM D6379:04, therefore no further significant conclusions were drawn.

Colour Saybolt: This determination was very problematic in this round robin. Obviously, this was not an “easy” sample as reported results vary between 13 and 28. Four statistical outliers were observed and the calculated reproducibility is, after rejection of the statistical outliers, not in agreement with the requirements of ASTM D156:07a.

Density: This determination is rather problematic for several laboratories. Five statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers, is in good agreement with the requirements of ASTM D4052:09.

Distillation: As only four participants reported their results determined by the manual method, it was decided to evaluate these results together with the automated group. In total four statistical outliers were observed. All calculated reproducibilities (except for 90% recovered) are, after rejection of the statistical outliers in good agreement with the requirements of ASTM D86:09e1 (automated).

Existent Gum: This determination was problematic for some laboratories. Three statistical outliers were observed and the calculated reproducibility, after rejection of the statistical outliers, is in good agreement with ASTM D381:04e1.

Flash Point: This determination was problematic for some laboratories. Three statistical outliers were observed. The calculated reproducibility, after rejection of the statistical outliers, is in agreement with the new requirements of IP170:09. Three laboratories reported a method, that is not mentioned in the Joint Fuelling System Checklist. These three results were excluded from calculations.
When the results for IP170 and ASTM D56 were evaluated separately, both calculated reproducibilities are in agreement with the requirements of the respective method.

Freezing Point: This determination was not problematic. Only two statistical outliers were observed and the calculated reproducibility, after rejection of the statistical outliers, is in good agreement with the requirements of ASTM D2386:06.

JFTOT: Some reporting problems have been observed. Five laboratories reported a higher volume than the maximum allowed (450 ± 45 mL may be pumped in a valid test, see ASTM D 3241:06-B table 2). It should be noted that a pumped volume higher than 495 mL or below 405 mL means that the test is not performed correctly and results obtained are suspect.

Mercaptan Sulphur: This determination was problematic for several laboratories at this positive level of 0.0015%M/M. Five statistical outliers and one false negative result were observed. The calculated reproducibility, after rejection of the statistical outliers, is in full agreement with the requirements of ASTM D3227:04a.

MSEP: This determination was problematic. Two statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers, is not in agreement with the requirements of ASTM D3948:08.

Naphthalenes: This determination was problematic for several laboratories at this level of 1.0 %V/V. Five, statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers, is in full agreement with the requirements of ASTM D1840:07-B.

Smoke Point: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not at all in agreement with the requirements of ASTM D1322:08.

Specific Energy: This determination was problematic for several laboratories. Only one statistical outlier was observed. Also, two other reported results were excluded from statistical evaluation as the test method used is not compatible with ASTM D3338. The calculated reproducibility is not at all in agreement with the requirements of ASTM D3338:09.

Total Acidity: This determination was problematic. Four statistical outliers were observed. The calculated reproducibility, after rejection of the statistical outliers, is not at all in agreement with the requirements of ASTM D3242:08.

Total Sulphur: This determination was problematic for several laboratories at the high level of Sulphur present in this sample (1714 mg/kg). The results seem to be bimodal divided. The results of group 2 seems to be more inline what should be expected, therefore the results of group 1 (nine results) were excluded for statistical evaluation. One statistical outlier was observed. After excluding the nine suspected results and the statistical outlier, the calculated reproducibility is in full agreement with the requirements of ASTM D5453:09.

Viscosity: This determination was not problematic. Only two statistical outliers were observed and the calculated reproducibility, after rejection of the statistical outliers, is almost in agreement with the requirements of ASTM D445:09.

Particle Size: This determination is problematic. The deviating results for particle size distribution of two laboratories were excluded from statistical evaluation. One participant analyzed the wrong sample. After rejection of eight statistical outliers, only the calculated reproducibilities for >21 and >30 µm are in full agreement with the requirements of IP564:10. When compared with IP565:10, none of the calculated reproducibilities agrees.

### 4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the relevant standard and the reproducibility as found for the group of laboratories that participated. The reproducibilities derived from literature standards (in casu ASTM standards) and the calculated reproducibilities of samples #1017 are compared in the next table.

| Parameter | unit | n | Average | 2.8 * sd | R (lit) |
|---|---|---|---|---|---|
| Aromatics by FIA | %V/V | 38 | 18.07 | 1.79 | 3.01 |
| Aromatics by HPLC | %M/M | 13 | 20.83 | 1.28 | 1.98 |
| Aromatics by HPLC | %V/V | 10 | 18.71 | 1.29 | unknown |
| Colour Saybolt | | 43 | 18.1 | 2.9 | 2.0 |
| Density at 15°C | $Kg/m^3$ | 54 | 795.00 | 0.26 | 0.50 |
| Initial Boiling Point (all) | °C | 57 | 151.80 | 6.07 | 8.35 |
| 10% recovered (all) | °C | 57 | 171.38 | 2.69 | 3.77 |
| 50% recovered (all) | °C | 58 | 194.41 | 2.55 | 2.97 |
| 90% recovered (all) | °C | 58 | 229.22 | 3.61 | 3.44 |
| Final Boiling Point (all) | °C | 56 | 258.13 | 4.23 | 7.10 |
| Existent Gum | mg/100mL | 45 | 1.13 | 1.62 | 3.26 |
| Flash Point | °C | 51 | 43.32 | 2.87 | 3.20 |
| Freezing Point | °C | 52 | -55.53 | 1.55 | 2.50 |
| Mercaptan Sulphur | %M/M | 32 | 0.00154 | 0.00040 | 0.00038 |
| MSEP | rating | 43 | 87.86 | 17.53 | 13.03 |
| Naphthalenes | %V/V | 32 | 0.996 | 0.082 | 0.094 |
| Smoke Point | mm | 49 | 23.98 | 4.59 | 3.00 |
| Specific Energy | MJ/kg | 34 | 43.2764 | 0.0774 | 0.0460 |
| Total Acidity | mg KOH/g | 37 | 0.00296 | 0.00436 | 0.00221 |
| Total Sulphur | mg/kg | 36 | 1714.9 | 151.1 | 154.5 |
| Viscosity @ -20°C | cSt | 41 | 3.6332 | 0.0739 | 0.0690 |

table 5: comparison of the observed and target reproducibilities of sample #1017

| Parameter | unit | n | Average | 2.8 * sd | R (lit) |
|---|---|---|---|---|---|
| Particle Size >4 µm | $mL^{-1}$ | 16 | 18992 | 7601 | 3576 |
| Particle Size >6 µm | $mL^{-1}$ | 15 | 3034 | 2121 | 959 |
| Particle Size >14 µm | $mL^{-1}$ | 16 | 115 | 80 | 63 |
| Particle Size >21 µm | $mL^{-1}$ | 17 | 29.2 | 36.6 | 37.1 |
| Particle Size >25 µm | $mL^{-1}$ | 17 | 13.9 | 22.6 | 18.6 |
| Particle Size >30 µm | $mL^{-1}$ | 17 | 6.5 | 12.5 | 10.7 |

table 6: comparison of the observed and target reproducibilities of sample #1018

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

### 4.3 COMPARISON OF THE PROFICIENCY TEST OF MARCH 2010 WITH PREVIOUS PT'S

| Parameter | March 2010 | September 2009 | March 2009 | September 2008 |
|---|---|---|---|---|
| Number of reporting labs | 65 | 186 | 68 | 122 |
| Number of results reported | 1257 | 2377 | 1238 | 2137 |
| Statistical outliers | 64 | 73 | 43 | 65 |
| Percentage outliers | 5.1% | 3.1% | 3.5% | 3.0% |

table 7: Comparison with previous proficiency tests

In proficiency tests outlier percentages of 3 % - 7.5 % are quite normal.

The performance of the determinations of the proficiency tests was compared against the requirements of the respective standards. The conclusions are given the following table:

| Parameter | March 2010 | September 2009 | March 2009 | September 2008 |
|---|---|---|---|---|
| Aromatics by FIA | ++ | ++ | ++ | ++ |
| Aromatics by HPLC | ++ | ++ | ++ | -- |
| Colour Saybolt | -- | -- | -- | + |
| Density at 15°C | ++ | ++ | ++ | ++ |
| Distillation automated | ++ | ++ | ++ | ++ |
| Distillation manual | n.e. | ++ | -- | -- |
| Existent Gum | ++ | ++ | ++ | ++ |
| Flash Point | ++ | -- | -- | -- |
| Freezing Point | ++ | +/- | ++ | + |
| Mercaptan Sulphur | +/- | ++ | ++ | ++ |
| MSEP | -- | + | -- | +/- |
| Naphthalenes | ++ | -- | +/- | +/- |
| Smoke Point | -- | -- | +/- | +/- |
| Specific Energy | -- | ++ | - | -- |
| Total Acidity | -- | -- | + | +/- |
| Total Sulphur | + | -- | + | -- |
| Viscosity @ -20°C | - | -- | -- | -- |
| Particle Size Distribution | -- | +/- | n.e. | n.e. |

table 8: comparison determinations against the standard requirements

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

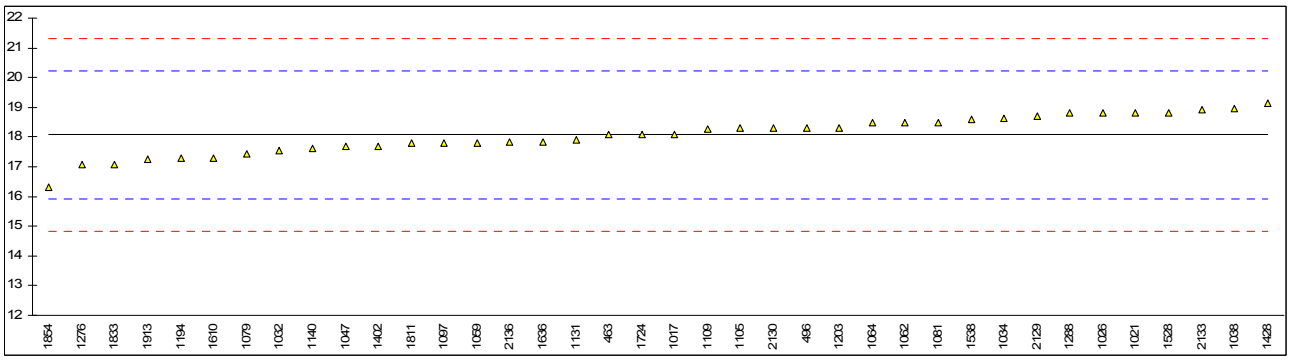
++: group performed much better than the standard
+ : group performed better than the standard
+/-: group performance equals the standard
- : group performed worse than the standard
-- : group performed much worse than the standard
n.d.: not determined
n.e.: not evaluated

## APPENDIX 1

Determination of Aromatics by FIA on sample #1017; results in %V/V

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 225 | | ----- | | ----- | |
| 353 | | ----- | | ----- | |
| 463 | D1319 | 18.1 | | 0.03 | |
| 495 | | ----- | | ----- | |
| 496 | D1319 | 18.3 | | 0.21 | |
| 851 | | ----- | | ----- | |
| 1017 | D1319 | 18.10 | C | 0.03 | First reported 0.0 |
| 1021 | D1319 | 18.8 | | 0.68 | |
| 1026 | IP436 | 18.8 | | 0.68 | |
| 1032 | D1319 | 17.537 | | -0.50 | |
| 1034 | D1319 | 18.64 | | 0.53 | |
| 1038 | D1319 | 18.94 | | 0.81 | |
| 1039 | | ----- | | ----- | |
| 1047 | D1319 | 17.7 | | -0.34 | |
| 1049 | | ----- | | ----- | |
| 1059 | D1319 | 17.8 | | -0.25 | |
| 1062 | D1319 | 18.5 | | 0.40 | |
| 1064 | D1319 | 18.49 | | 0.39 | |
| 1079 | EN15553 | 17.45 | | -0.58 | |
| 1081 | D1319 | 18.5 | | 0.40 | |
| 1097 | D1319 | 17.8 | | -0.25 | |
| 1105 | D1319 | 18.29 | | 0.20 | |
| 1108 | | ----- | | ----- | |
| 1109 | D1319 | 18.26 | | 0.18 | |
| 1126 | | ----- | | ----- | |
| 1131 | D1319 | 17.9 | | -0.16 | |
| 1140 | D1319 | 17.6 | | -0.44 | |
| 1150 | | ----- | | ----- | |
| 1155 | | ----- | | ----- | |
| 1161 | | ----- | | ----- | |
| 1167 | | ----- | | ----- | |
| 1194 | D1319 | 17.3 | | -0.72 | |
| 1201 | | ----- | | ----- | |
| 1203 | D1319 | 18.3 | | 0.21 | |
| 1264 | | ----- | | ----- | |
| 1276 | D1319 | 17.06 | | -0.94 | |
| 1277 | | ----- | | ----- | |
| 1279 | | ----- | | ----- | |
| 1284 | | ----- | | ----- | |
| 1288 | D1319 | 18.8 | | 0.68 | |
| 1318 | | ----- | | ----- | |
| 1402 | D1319 | 17.7 | | -0.34 | |
| 1428 | ISO3837 | 19.15 | C | 1.00 | First reported 15.91 |
| 1528 | D1319 | 18.8 | | 0.68 | |
| 1531 | | ----- | | ----- | |
| 1538 | D1319 | 18.6 | | 0.49 | |
| 1543 | | ----- | | ----- | |
| 1610 | IP156 | 17.3 | | -0.72 | |
| 1634 | | ----- | | ----- | |
| 1635 | | ----- | | ----- | |
| 1636 | D1319 | 17.85 | | -0.20 | |
| 1651 | | ----- | | ----- | |
| 1715 | | ----- | | ----- | |
| 1720 | | ----- | | ----- | |
| 1724 | D1319 | 18.10 | | 0.03 | |
| 1730 | | ----- | | ----- | |
| 1811 | D1319 | 17.79 | | -0.26 | |
| 1833 | D1319 | 17.09 | | -0.91 | |
| 1842 | | ----- | | ----- | |
| 1854 | D1319 | 16.3 | | -1.65 | |
| 1913 | D1319 | 17.26 | | -0.75 | |
| 2129 | D1319 | 18.7 | | 0.59 | |
| 2130 | D1319 | 18.3 | | 0.21 | |
| 2133 | D1319 | 18.92 | | 0.79 | |
| 2136 | D1319 | 17.83 | | -0.22 | |

| | |
|---|---|
| normality | OK |
| n | 38 |
| outliers | 0 |
| mean (n) | 18.07 |
| st.dev. (n) | 0.638 |
| R(calc.) | 1.79 |
| R(D1319:08) | 3.01 |


22
21
20
19
18
17
16
15
14
13
12
1854
1276
1833
1913
1194
1610
1079
1032
1140
1047
1402
1811
1097
1059
2136
1636
1131
463
1724
1017
1109
1105
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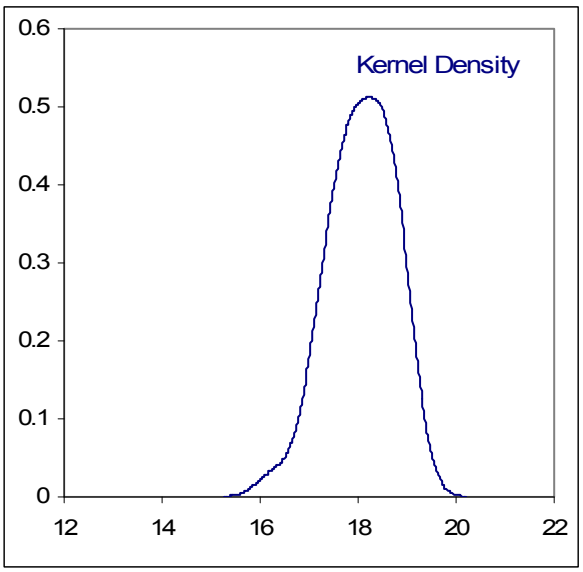
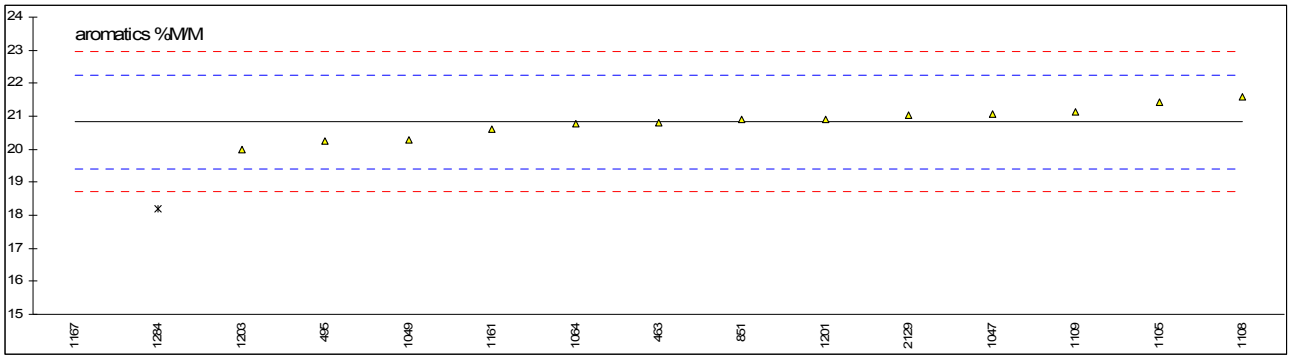
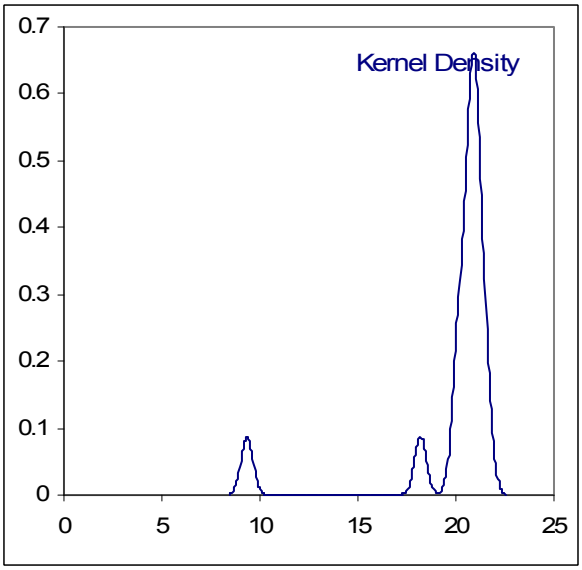
1061
1538
1034
2129
1288
1026
1021
1528
2133
1038
1428

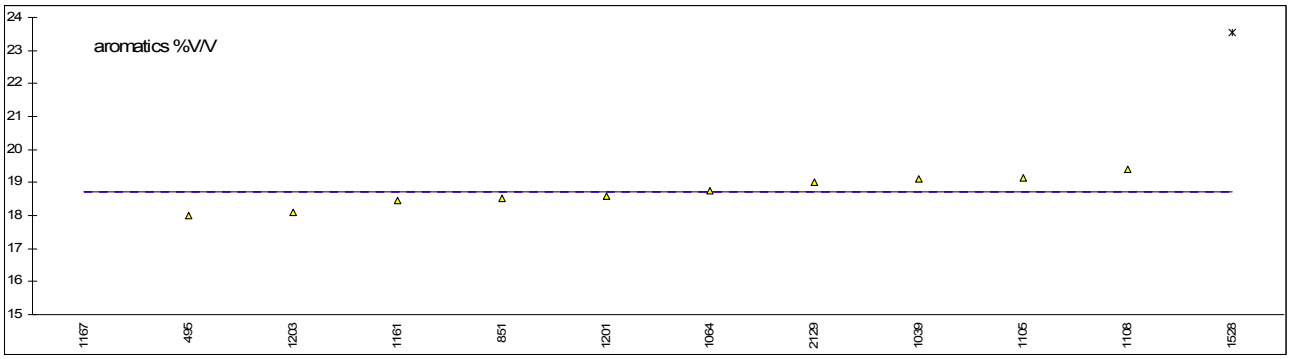

Kernel Density
0.6
0.5
0.4
0.3
0.2
0.1
0
12
14
16
18
20
22

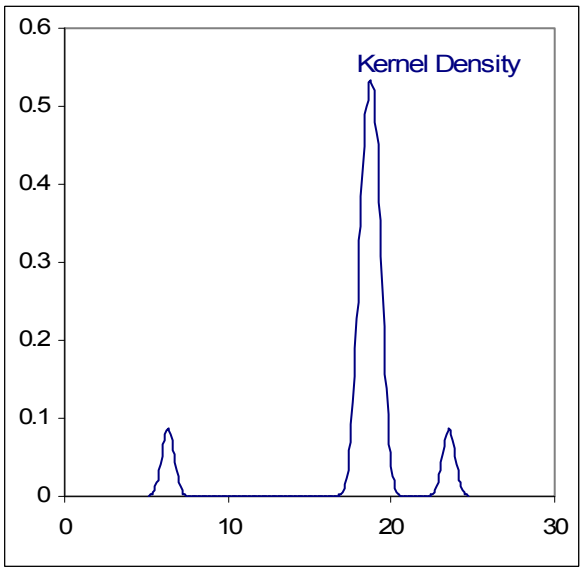
## Determination of Aromatics by HPLC on sample #1017; results in %M/M & %V/V

| lab | method | %M/M | mark | z(targ) | %V/V | mark | z(targ) | Remarks |
|---|---|---|---|---|---|---|---|---|
| 225 | | ----- | | ----- | ----- | | ----- | |
| 353 | | ----- | | ----- | ----- | | ----- | |
| 463 | EN12916 | 20.815 | | -0.02 | ----- | | ----- | |
| 495 | D6379 | 20.26 | | -0.81 | 18.00 | | ----- | |
| 496 | | ----- | | ----- | ----- | | ----- | |
| 851 | D6379 | 20.89 | | 0.09 | 18.51 | | ----- | |
| 1017 | | ----- | | ----- | ----- | | ----- | |
| 1021 | | ----- | | ----- | ----- | | ----- | |
| 1026 | | ----- | | ----- | ----- | | ----- | |
| 1032 | | ----- | | ----- | ----- | | ----- | |
| 1034 | | ----- | | ----- | ----- | | ----- | |
| 1038 | | ----- | | ----- | ----- | | ----- | |
| 1039 | D6379 | ----- | | ----- | 19.1 | | ----- | |
| 1047 | EN12916 | 21.05 | | 0.31 | ----- | | ----- | |
| 1049 | D6379 | 20.279 | | -0.78 | ----- | | ----- | |
| 1059 | | ----- | | ----- | ----- | | ----- | |
| 1062 | | ----- | | ----- | ----- | | ----- | |
| 1064 | D6379 | 20.78 | | -0.07 | 18.75 | | ----- | |
| 1079 | | ----- | | ----- | ----- | | ----- | |
| 1081 | | ----- | | ----- | ----- | | ----- | |
| 1097 | | ----- | | ----- | ----- | | ----- | |
| 1105 | D6379 | 21.421 | | 0.84 | 19.137 | | ----- | |
| 1108 | D6379 | 21.6 | | 1.09 | 19.4 | | ----- | |
| 1109 | D6591 | 21.14 | | 0.44 | ----- | | ----- | |
| 1126 | | ----- | | ----- | ----- | | ----- | |
| 1131 | | ----- | | ----- | ----- | | ----- | |
| 1140 | | ----- | | ----- | ----- | | ----- | |
| 1150 | | ----- | | ----- | ----- | | ----- | |
| 1155 | | ----- | | ----- | ----- | | ----- | |
| 1161 | EN12916 | 20.61 | | -0.31 | 18.45 | | ----- | |
| 1167 | D6379 | 9.35 | G(0.01) | -16.25 | 6.33 | G(0.01) | ----- | |
| 1194 | | ----- | | ----- | ----- | | ----- | |
| 1201 | D6379 | 20.9 | | 0.10 | 18.6 | | ----- | |
| 1203 | D6379 | 20.0 | | -1.17 | 18.1 | | ----- | |
| 1264 | | ----- | | ----- | ----- | | ----- | |
| 1276 | | ----- | | ----- | ----- | | ----- | |
| 1277 | | ----- | | ----- | ----- | | ----- | |
| 1279 | | ----- | | ----- | ----- | | ----- | |
| 1284 | D6379 | 18.2 | G(0.01) | -3.72 | ----- | | ----- | |
| 1288 | | ----- | | ----- | ----- | | ----- | |
| 1318 | | ----- | | ----- | ----- | | ----- | |
| 1402 | | ----- | | ----- | ----- | | ----- | |
| 1428 | | ----- | | ----- | ----- | | ----- | |
| 1528 | D6379 | ----- | | ----- | 23.53 | G(0.01) | ----- | |
| 1531 | | ----- | | ----- | ----- | | ----- | |
| 1538 | | ----- | | ----- | ----- | | ----- | |
| 1543 | | ----- | | ----- | ----- | | ----- | |
| 1610 | | ----- | | ----- | ----- | | ----- | |
| 1634 | | ----- | | ----- | ----- | | ----- | |
| 1635 | | ----- | | ----- | ----- | | ----- | |
| 1636 | | ----- | | ----- | ----- | | ----- | |
| 1651 | | ----- | | ----- | ----- | | ----- | |
| 1715 | | ----- | | ----- | ----- | | ----- | |
| 1720 | | ----- | | ----- | ----- | | ----- | |
| 1724 | | ----- | | ----- | ----- | | ----- | |
| 1730 | | ----- | | ----- | ----- | | ----- | |
| 1811 | | ----- | | ----- | ----- | | ----- | |
| 1833 | | ----- | | ----- | ----- | | ----- | |
| 1842 | | ----- | | ----- | ----- | | ----- | |
| 1854 | | ----- | | ----- | ----- | | ----- | |
| 1913 | | ----- | | ----- | ----- | | ----- | |
| 2129 | D6379 | 21.03 | | 0.28 | 19.01 | | ----- | |
| 2130 | | ----- | | ----- | ----- | | ----- | |
| 2133 | | ----- | | ----- | ----- | | ----- | |
| 2136 | | ----- | | ----- | ----- | | ----- | |
| | normality | OK | | | OK | | | |
| | n | 13 | | | 10 | | | |
| | outliers | 2 | | | 2 | | | |
| | mean (n) | 20.83 | | | 18.71 | | | |
| | st.dev. (n) | 0.457 | | | 0.459 | | | |
| | R(calc.) | 1.28 | | | 1.29 | | | |
| | R(D6379:04) | 1.98 | | | unknown | | | Compare R(iis09J02) = 0.91 |


aromatics %M/M
24
23
22
21
20
19
18
17
16
15
1167
1284
1203
495
1049
1161
1064
463
851
1201
2129
1047
1109
1105
1108

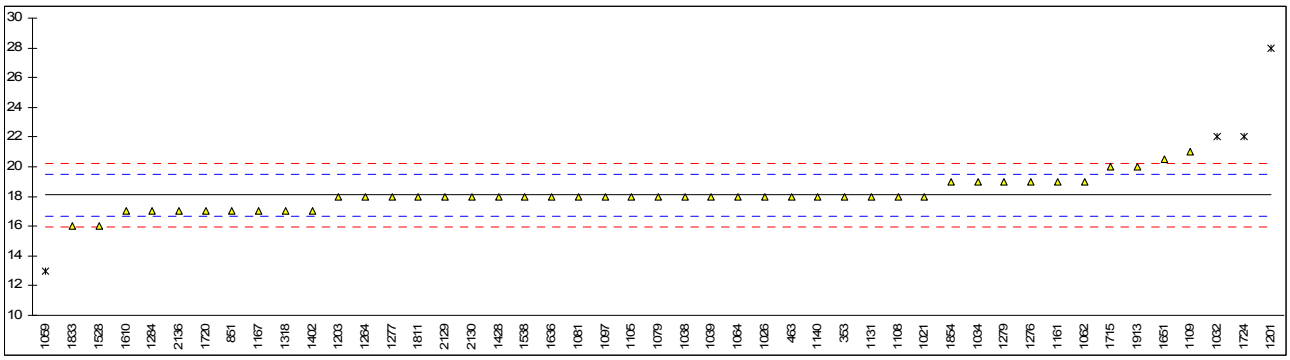

Kernel Density
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
5
10
15
20
25

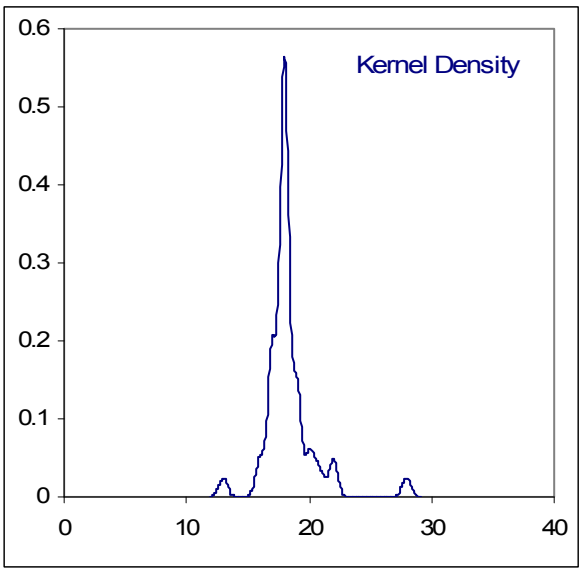

aromatics %V/V
24
23
22
21
20
19
18
17
16
15
1167
495
1203
1161
851
1201
1064
2129
1039
1105
1108
1528


Kernel Density
0.6
0.5
0.4
0.3
0.2
0.1
0
0
10
20
30

## Determination of Colour Saybolt on sample #1017;

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 225 | | ----- | | ----- | |
| 353 | D6045 | 18 | | -0.11 | |
| 463 | D156 | 18 | C | -0.11 | First reported 13 |
| 495 | | ----- | | ----- | |
| 496 | | ----- | | ----- | |
| 851 | D156 | 17 | | -1.51 | |
| 1017 | | ----- | | ----- | |
| 1021 | D6045 | 18 | | -0.11 | |
| 1026 | D156 | 18 | | -0.11 | |
| 1032 | D156 | 22 | DG(0.01) | 5.49 | |
| 1034 | D156 | 19 | | 1.29 | |
| 1038 | D6045 | 18 | | -0.11 | |
| 1039 | D156 | 18 | | -0.11 | |
| 1047 | | ----- | | ----- | |
| 1049 | | ----- | | ----- | |
| 1059 | D156 | 13 | G(0.05) | -7.11 | |
| 1062 | D156 | 19 | | 1.29 | |
| 1064 | D156 | 18 | | -0.11 | |
| 1079 | D156 | 18 | | -0.11 | |
| 1081 | D6045 | 18 | | -0.11 | |
| 1097 | INH003 | 18 | | -0.11 | |
| 1105 | D156 | 18 | | -0.11 | |
| 1108 | D156 | 18 | | -0.11 | |
| 1109 | D156 | 21 | | 4.09 | |
| 1126 | | ----- | | ----- | |
| 1131 | D156 | 18 | | -0.11 | |
| 1140 | D6045 | 18 | | -0.11 | |
| 1150 | | ----- | | ----- | |
| 1155 | | ----- | | ----- | |
| 1161 | D6045 | 19 | | 1.29 | |
| 1167 | D156 | 17 | | -1.51 | |
| 1194 | | ----- | | ----- | |
| 1201 | D156 | 28 | G(0.01) | 13.89 | |
| 1203 | D156 | 18 | | -0.11 | |
| 1264 | D156 | 18 | | -0.11 | |
| 1276 | D156 | 19 | | 1.29 | |
| 1277 | D156 | 18 | | -0.11 | |
| 1279 | D156 | 19 | | 1.29 | |
| 1284 | D156 | 17 | | -1.51 | |
| 1288 | | ----- | | ----- | |
| 1318 | D156 | 17 | | -1.51 | |
| 1402 | D156 | 17 | | -1.51 | |
| 1428 | D156 | 18 | | -0.11 | |
| 1528 | D156 | 16 | | -2.91 | |
| 1531 | | ----- | | ----- | |
| 1538 | D156 | 18 | | -0.11 | |
| 1543 | | ----- | | ----- | |
| 1610 | D156 | 17 | | -1.51 | |
| 1634 | | ----- | | ----- | |
| 1635 | | ----- | | ----- | |
| 1636 | D156 | 18 | | -0.11 | |
| 1651 | D156 | 20.5 | | 3.39 | |
| 1715 | D6045 | 20 | | 2.69 | |
| 1720 | D156 | 17 | | -1.51 | |
| 1724 | D156 | 22 | C,DG(0.01) | 5.49 | First reported 25 |
| 1730 | | ----- | | ----- | |
| 1811 | D156 | 18 | | -0.11 | |
| 1833 | D156 | 16 | | -2.91 | |
| 1842 | | ----- | | ----- | |
| 1854 | D156 | 19 | | 1.29 | |
| 1913 | D156 | 20 | | 2.69 | |
| 2129 | D156 | 18 | | -0.11 | |
| 2130 | D6045 | 18 | | -0.11 | |
| 2133 | | ----- | | ----- | |
| 2136 | D156 | 17 | | -1.51 | |
| | | | | | Only ASTM D156 data: |
| | normality | not OK | | | not OK |
| | n | 43 | | | 34 |
| | outliers | 4 | | | 4 |
| | mean (n) | 18.1 | | | 18.0 |
| | st.dev. (n) | 1.03 | | | 1.10 |
| | R(calc.) | 2.9 | | | 3.1 |
| | R(D156:07a) | 2.0 | | | 2.0 |

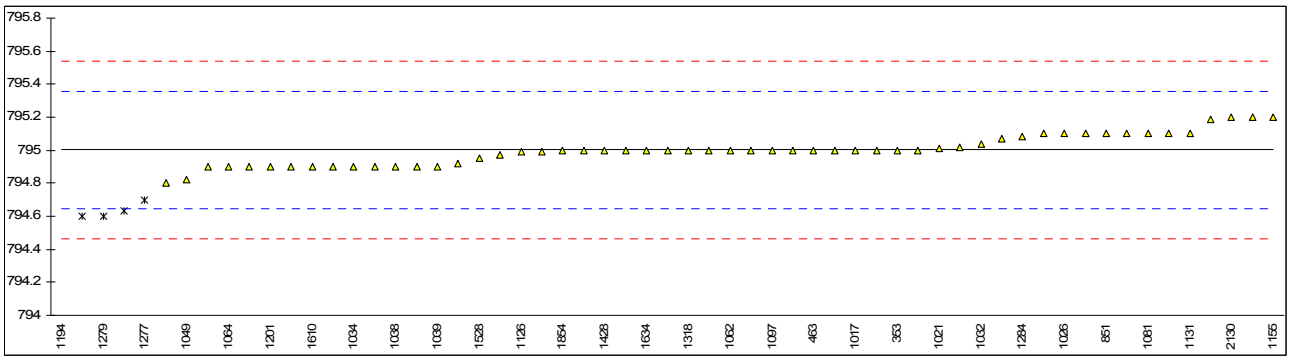

30
28
26
24
22
20
18
16
14
12
10
1059
1833
1528
1610
1284
2136
1720
851
1167
1318
1402
1203
1264
1277
1811
2129
2130
1428
1538
1636
1061
1097
1105
1079
1038
1039
1064
1026
463
1140
353
1131
1108
1021
1854
1034
1279
1276
1161
1062
1715
1913
1651
1109
1032
1724
1201

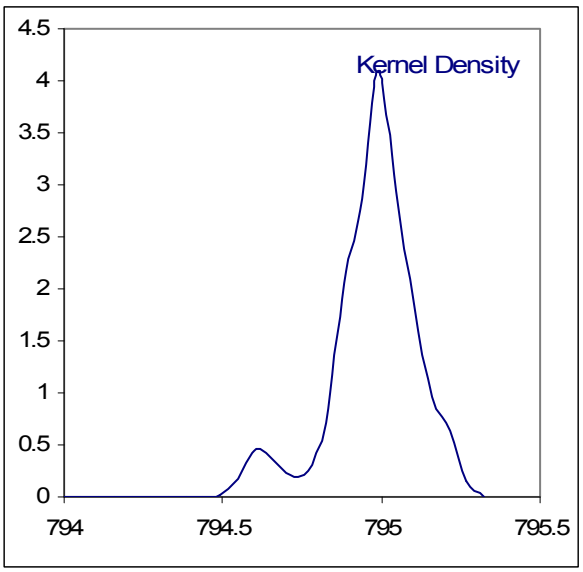

Kernel Density
0.6
0.5
0.4
0.3
0.2
0.1
0
0
10
20
30
40

## Determination of Density @ 15°C on sample #1017; results in kg/m$^3$

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 225 | | ----- | | ----- | |
| 353 | D4052 | 795.0 | | -0.01 | |
| 463 | D4052 | 795.0 | | -0.01 | |
| 495 | D4052 | 795.0 | | -0.01 | |
| 496 | D4052 | 794.92 | | -0.45 | |
| 851 | D4052 | 795.1 | C | 0.55 | First reported 795.71 |
| 1017 | D4052 | 795.0 | | -0.01 | |
| 1021 | D4052 | 795.01 | | 0.05 | |
| 1026 | D4052 | 795.1 | | 0.55 | |
| 1032 | D4052 | 795.04 | | 0.22 | |
| 1034 | D4052 | 794.9 | | -0.57 | |
| 1038 | D4052 | 794.9 | | -0.57 | |
| 1039 | D4052 | 794.9 | | -0.57 | |
| 1047 | D4052 | 794.9 | | -0.57 | |
| 1049 | D4053 | 794.82 | | -1.01 | |
| 1059 | D4052 | 795.0 | | -0.01 | |
| 1062 | D4052 | 795.0 | | -0.01 | |
| 1064 | D4052 | 794.9 | | -0.57 | |
| 1079 | D4052 | 795.0 | | -0.01 | |
| 1081 | ISO12185 | 795.1 | | 0.55 | |
| 1097 | ISO12185 | 795.0 | | -0.01 | |
| 1105 | D4052 | 795.1 | | 0.55 | |
| 1108 | D4052 | 795.07 | | 0.39 | |
| 1109 | D4052 | 795.19 | | 1.06 | |
| 1126 | D4052 | 794.99 | | -0.06 | |
| 1131 | D4052 | 795.1 | | 0.55 | |
| 1140 | D4052 | 795.1 | | 0.55 | |
| 1150 | | ----- | | ----- | |
| 1155 | D1298 | 795.20 | | 1.11 | |
| 1161 | ISO12185 | 794.90 | | -0.57 | |
| 1167 | D4052 | 795.0 | | -0.01 | |
| 1194 | ISO12185 | 781.3 | G(0.01) | -76.73 | |
| 1201 | D4052 | 794.9 | | -0.57 | |
| 1203 | ISO12185 | 795.0 | | -0.01 | |
| 1264 | D4052 | 795.0 | | -0.01 | |
| 1276 | D4052 | 794.97 | | -0.17 | |
| 1277 | D1298 | 794.7 | G(0.01) | -1.69 | |
| 1279 | D1298 | 794.6 | DG(0.05) | -2.25 | |
| 1284 | D4052 | 795.08 | | 0.44 | |
| 1288 | D4052 | 794.9 | | -0.57 | |
| 1318 | D4052 | 795.00 | | -0.01 | |
| 1402 | D4052 | 794.9 | | -0.57 | |
| 1428 | ISO12185 | 795.0 | | -0.01 | |
| 1528 | D4052 | 794.95 | | -0.29 | |
| 1531 | | ----- | | ----- | |
| 1538 | D4052 | 795.1 | | 0.55 | |
| 1543 | | ----- | | ----- | |
| 1610 | IP365 | 794.9 | | -0.57 | |
| 1634 | D4052 | 795.0 | | -0.01 | |
| 1635 | | ----- | | ----- | |
| 1636 | D4052 | 794.9 | | -0.57 | |
| 1651 | D4052 | 795.02 | | 0.11 | |
| 1715 | ISO12185 | 794.8 | | -1.13 | |
| 1720 | D4052 | 795.2 | | 1.11 | |
| 1724 | D4052 | 794.6 | DG(0.05) | -2.25 | |
| 1730 | D4052 | 795.00 | | -0.01 | |
| 1811 | D4052 | 795.0 | | -0.01 | |
| 1833 | D4052 | 795.0 | | -0.01 | |
| 1842 | | ----- | | ----- | |
| 1854 | D4052 | 795.0 | | -0.01 | |
| 1913 | D4052 | 794.9 | | -0.57 | |
| 2129 | D4052 | 795.1 | | 0.55 | |
| 2130 | D4052 | 795.2 | | 1.11 | |
| 2133 | D4052 | 794.63 | G(0.05) | -2.08 | |
| 2136 | D4052 | 794.99 | | -0.06 | |

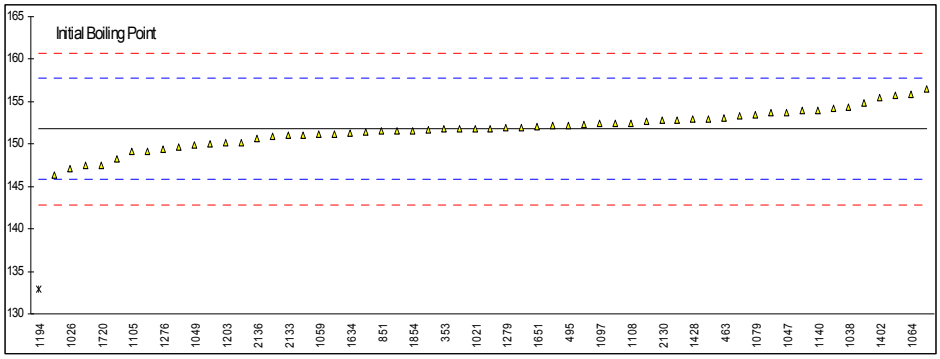
| | |
|---|---|
| normality | not OK |
| n | 54 |
| outliers | 5 |
| mean (n) | 795.00 |
| st.dev. (n) | 0.092 |
| R(calc.) | 0.26 |
| R(D4052:09) | 0.50 |

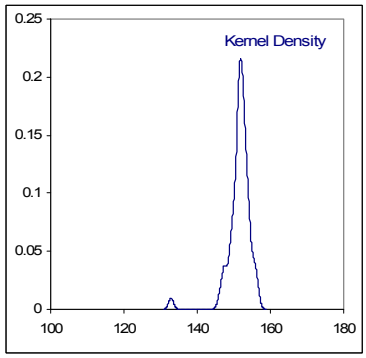

795.8
795.6
795.4
795.2
795
794.8
794.6
794.4
794.2
794
1194
1279
1277
1049
1064
1201
1610
1034
1038
1039
1528
1126
1854
1428
1634
1318
1062
1097
463
1017
353
1021
1032
1284
1026
851
1061
1131
2130
1155

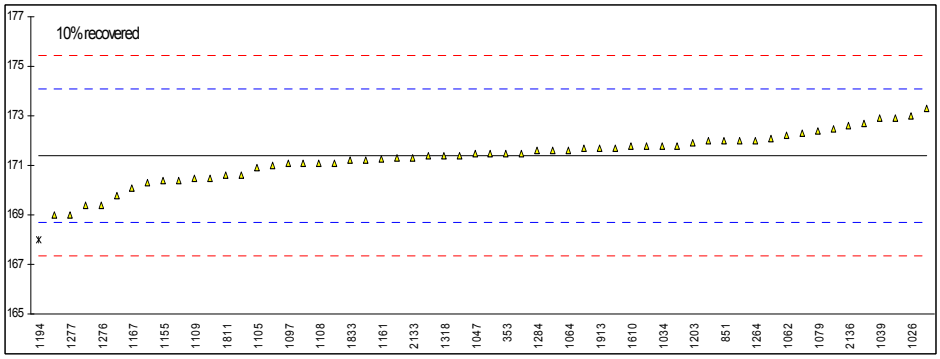

Kernel Density
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
794
794.5
795
795.5

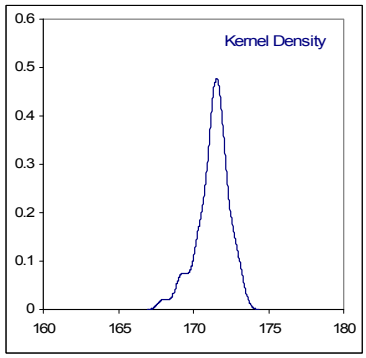
## Determination of Distillation ASTM D86 (automated + manual) on sample #1017; results in °C

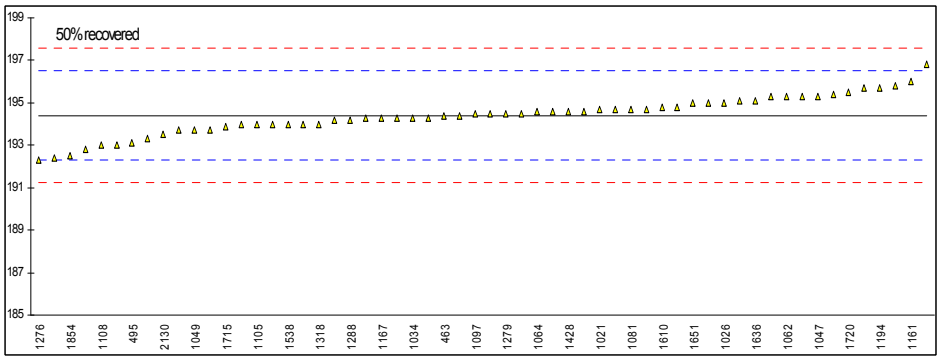
| lab | method | IBP | mark | 10% | mark | 50% | mark | 90% | mark | FBP | mark | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 225 | | ----- | | ----- | | ----- | | ----- | | ----- | | |
| 353 | D86A | 151.8 | | 171.5 | | 195.3 | | 231.5 | | 260.5 | | |
| 463 | D86A | 153.1 | | 173.3 | | 194.4 | | 229.8 | | 261.1 | | |
| 495 | D86A | 152.2 | | 170.3 | | 193.1 | | 228.2 | | 254.3 | | |
| 496 | | ----- | | ----- | | ----- | | ----- | | ----- | | |
| 851 | D86A | 151.5 | | 172.0 | | 194.6 | | 229.4 | | 258.4 | | |
| 1017 | D86A | 152.0 | | 169.8 | | 192.8 | | 226.4 | | 254.4 | | |
| 1021 | D86A | 151.8 | | 171.8 | | 194.7 | | 231.5 | | 258.8 | | |
| 1026 | ISO3405A | 147.1 | | 173.0 | | 195.0 | | 230.0 | | 258.5 | | |
| 1032 | D86A | 152.2 | | 171.1 | | 194.7 | | 230.1 | | 258.2 | | |
| 1034 | D86A | 154.0 | | 171.8 | | 194.3 | | 229.8 | | 259.8 | | |
| 1038 | D86A | 154.3 | | 170.4 | | 193.7 | | 229.6 | | 258.3 | | |
| 1039 | D86A | 151.8 | | 172.9 | | 194.5 | | 229.3 | | 256.9 | | |
| 1047 | D86A | 153.7 | | 171.5 | | 195.3 | | 231.4 | | 258.9 | | |
| 1049 | D86A | 149.9 | | 172.0 | | 193.7 | | 228.5 | | 256.6 | | |
| 1059 | D86A | 151.2 | | 171.8 | | 195.4 | | 229.8 | | 259.1 | | |
| 1062 | D86A | 153.7 | | 172.2 | | 195.3 | | 229.3 | | 258.0 | | |
| 1064 | D86A | 155.9 | | 171.6 | | 194.6 | | 230.4 | | 258.9 | | |
| 1079 | D86A | 153.4 | | 172.4 | | 194.3 | | 228.8 | | 256.7 | | |
| 1081 | D86A | 150.9 | | 171.7 | | 194.7 | | 230.9 | | 256.2 | | |
| 1097 | ISO3405A | 152.4 | | 171.1 | | 194.5 | | 229.5 | | 257.8 | | |
| 1105 | D86A | 149.1 | | 170.9 | | 194.0 | | 226.7 | | 249.5 | G(0.01) | |
| 1108 | D86A | 152.5 | | 171.1 | | 193.0 | | 227.3 | | 258.5 | | |
| 1109 | D86A | 152.4 | | 170.5 | | 194.2 | | 229.8 | | 258.4 | | |
| 1126 | D2887A | 148.2 | | 170.6 | | 196.8 | | 229.0 | | 256.6 | | |
| 1131 | D86A | 151.7 | | 172.7 | | 194.7 | | 229.7 | | 258.0 | | |
| 1140 | D86A | 154.0 | | 172.5 | | 195.7 | | 232.1 | | 259.8 | | |
| 1150 | | ----- | | ----- | | ----- | | ----- | | ----- | | |
| 1155 | ISO3405M | 152.36 | | 170.37 | | 192.39 | | 228.42 | | 258.45 | | |
| 1161 | ISO3405A | 149.65 | | 171.25 | | 196.00 | | 230.05 | | 258.65 | | |
| 1167 | D86A | 150.0 | | 170.1 | | 194.3 | | 227.4 | | 257.1 | | |
| 1194 | D86 | 132.9 | G(0.01) | 168.0 | G(0.05) | 195.7 | | 228.2 | | 256.3 | | |
| 1201 | D86A | 152.7 | | 171.4 | | 194.4 | | 230.3 | | 257.9 | | |
| 1203 | ISO3405A | 150.1 | | 171.9 | | 195.8 | | 229.9 | | 258.8 | | |
| 1264 | D86A | 153 | | 172 | | 195 | | 229 | | 260.5 | | |
| 1276 | D86A | 149.4 | | 169.4 | | 192.3 | | 227.1 | | 257.2 | | |
| 1277 | D86A | 150.2 | | 169.0 | | 193.3 | | 228.1 | | 258.3 | | |
| 1279 | D86M | 152.0 | | 171.5 | | 194.5 | | 229.0 | | 259.5 | | |
| 1284 | D86A | 153.3 | | 171.6 | | 194.0 | | 228.3 | | 256.3 | | |
| 1288 | D86A | 151.4 | | 171.1 | | 194.2 | | 229.3 | | 257.2 | | |
| 1318 | D86A | 151.8 | | 171.4 | | 194.0 | | 228.7 | | 259.3 | | |
| 1402 | D86A | 155.5 | | 171.7 | | 194.0 | | 227.6 | | 258.2 | | |
| 1428 | ISO3405A | 152.9 | | 172.3 | | 194.6 | | 229.0 | | 262.0 | | |
| 1528 | ISO3405A | 151.1 | | 172.0 | | 194.6 | | 229.5 | | 258.1 | | |
| 1531 | D86A | 155.7 | | 171.6 | | 195.1 | | 229.7 | | 259.4 | | |
| 1538 | D86A | 156.5 | | 171.2 | | 194.0 | | 229.9 | | 255.2 | | |
| 1543 | | ----- | | ----- | | ----- | | ----- | | ----- | | |
| 1610 | IP123A | 154.8 | | 171.8 | | 194.8 | | 230.8 | | 258.8 | | |
| 1634 | D86A | 151.3 | | 172.1 | | 194.3 | | 230.1 | | 258.9 | | |
| 1635 | | ----- | | ----- | | ----- | | ----- | | ----- | | |
| 1636 | D86A | 149.2 | | 169.0 | | 195.1 | | 229.9 | | 257.2 | | |
| 1651 | D86 | 152.05 | | 172.93 | | 195.0 | | 229.45 | | 257.05 | | |
| 1715 | D86A | 154.2 | | 171.0 | | 193.9 | | 229.1 | | 258.7 | | |
| 1720 | D86M | 147.5 | | 171.5 | | 195.5 | | 231.0 | | 260.5 | | |
| 1724 | D86A | 151.5 | | 171.4 | | 195.3 | | 230.8 | | 258.4 | | |
| 1730 | | ----- | | ----- | | ----- | | ----- | | ----- | | |
| 1811 | D86A | 146.3 | | 170.6 | | 194.3 | | 229.2 | | 256.5 | | |
| 1833 | D86 | 152.8 | | 171.2 | | 194.8 | | 229.6 | | 259.1 | | |
| 1842 | | ----- | | ----- | | ----- | | ----- | | ----- | | |
| 1854 | D86M | 151.5 | | 170.5 | | 192.5 | | 226.5 | | 256.5 | | |
| 1913 | D86M | 151.2 | | 171.7 | | 194 | | 228.6 | | 258.4 | | |
| 2129 | D86A | 147.5 | | 169.4 | | 193.0 | | 227.5 | | 252.7 | CG(0.05) | Fr 253.3 |
| 2130 | D86A | 152.8 | | 171.3 | | 193.5 | | 227.5 | | 259.2 | | |
| 2133 | D86A | 151.0 | | 171.3 | | 193.7 | | 227.5 | | 257.1 | | |
| 2136 | D86A | 150.7 | | 172.6 | | 194.5 | | 228.8 | | 258.1 | | |
| | normality | OK | | not OK | | OK | | OK | | OK | | |
| | n | 57 | | 57 | | 58 | | 58 | | 56 | | |
| | outliers | 1 | | 1 | | 0 | | 0 | | 2 | | |
| | mean (n) | 151.80 | | 171.38 | | 194.41 | | 229.22 | | 258.13 | | |
| | st.dev. (n) | 2.168 | | 0.960 | | 0.909 | | 1.290 | | 1.512 | | |
| | R(calc.) | 6.07 | | 2.69 | | 2.55 | | 3.61 | | 4.23 | | |
| | R(D86:09e1-A) | 8.35 | | 3.77 | | 2.97 | | 3.44 | | 7.10 | | |

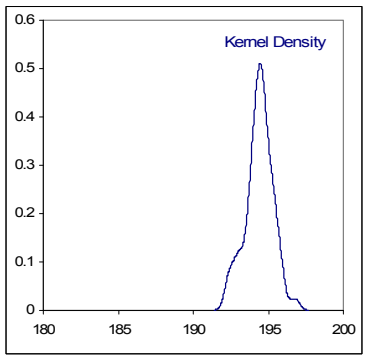

Initial Boiling Point

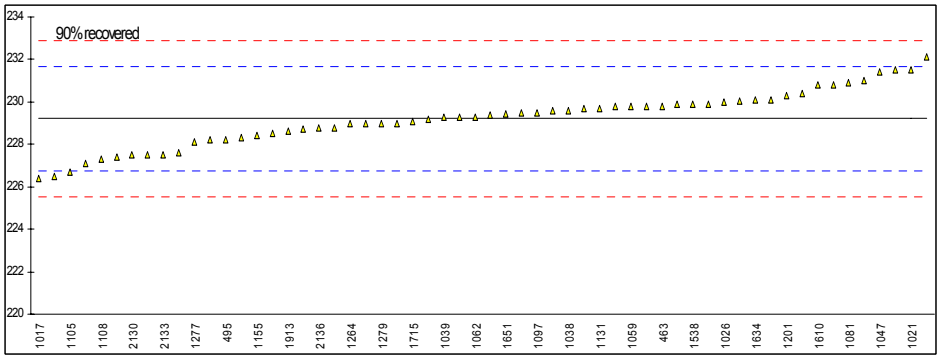

Kernel Density

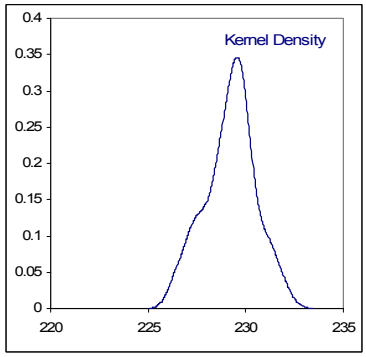

10% recovered

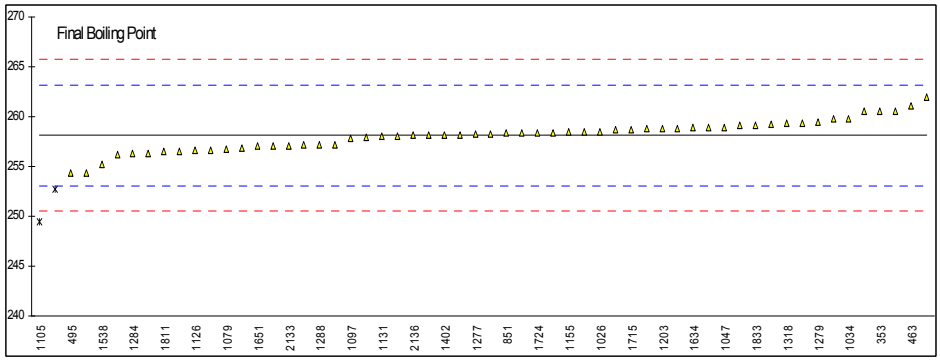

Kernel Density

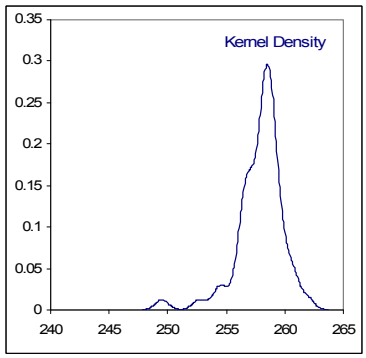

50% recovered


Kernel Density


90% recovered


Kernel Density

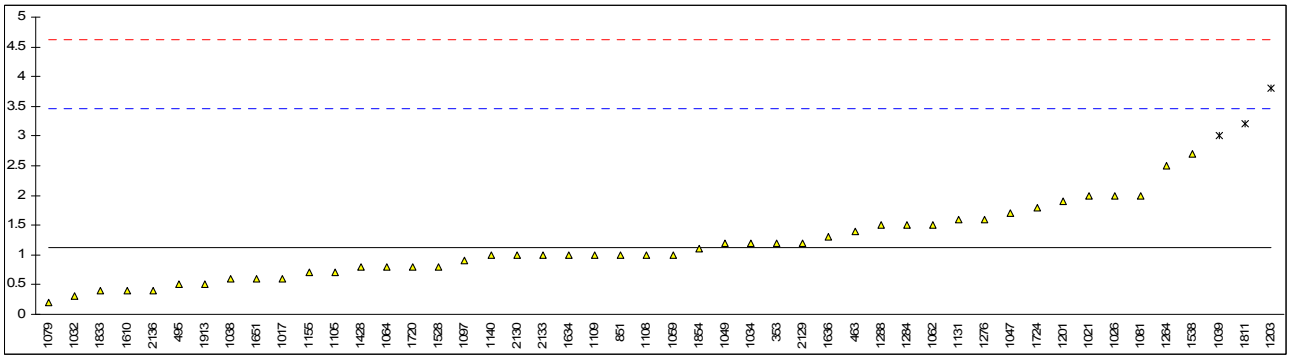

Final Boiling Point

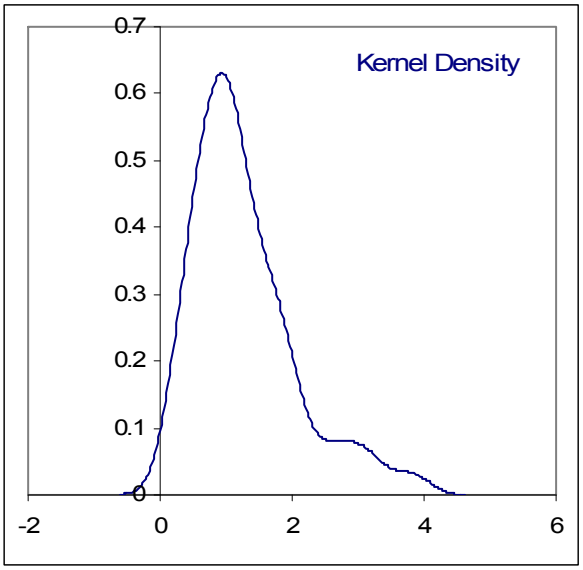

Kernel Density

## Determination of Existent Gum on sample #1017; results in mg/100 mL

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 225 | | ----- | | ----- | |
| 353 | IP540 | 1.2 | | 0.06 | |
| 463 | IP540 | 1.4 | | 0.23 | |
| 495 | D381 | 0.5 | | -0.54 | |
| 496 | | ----- | | ----- | |
| 851 | IP540 | 1 | | -0.11 | |
| 1017 | D381 | 0.6 | | -0.46 | |
| 1021 | IP540 | 2.0 | | 0.75 | |
| 1026 | ISO6246 | 2 | | 0.75 | |
| 1032 | D381 | 0.3 | | -0.71 | |
| 1034 | D381 | 1.2 | | 0.06 | |
| 1038 | IP540 | 0.6 | | -0.46 | |
| 1039 | D381 | 3 | DG(0.05) | 1.61 | |
| 1047 | ISO6246 | 1.7 | | 0.49 | |
| 1049 | D381 | 1.2 | | 0.06 | |
| 1059 | D381 | 1 | | -0.11 | |
| 1062 | D381 | 1.5 | | 0.32 | |
| 1064 | D381 | 0.8 | | -0.28 | |
| 1079 | D381 | 0.2 | | -0.80 | |
| 1081 | D381 | 2 | | 0.75 | |
| 1097 | IP540 | 0.9 | | -0.20 | |
| 1105 | D381 | 0.70 | | -0.37 | |
| 1108 | D381 | 1 | | -0.11 | |
| 1109 | IP540 | 1.0 | | -0.11 | |
| 1126 | | ----- | | ----- | |
| 1131 | IP540 | 1.6 | | 0.40 | |
| 1140 | IP540 | 1 | | -0.11 | |
| 1150 | | ----- | | ----- | |
| 1155 | ISO6246 | 0.70 | | -0.37 | |
| 1161 | | ----- | | ----- | |
| 1167 | | ----- | | ----- | |
| 1194 | | ----- | | ----- | |
| 1201 | D381 | 1.9 | | 0.66 | |
| 1203 | ISO6246 | 3.8 | G(0.05) | 2.29 | |
| 1264 | D381 | 2.5 | | 1.18 | |
| 1276 | D381 | 1.6 | | 0.40 | |
| 1277 | D381 | NIL | | ----- | |
| 1279 | | ----- | | ----- | |
| 1284 | D381 | 1.5 | | 0.32 | |
| 1288 | D381 | 1.5 | | 0.32 | |
| 1318 | | ----- | | ----- | |
| 1402 | D381 | <1 | | <-0.11 | |
| 1428 | ISO6246 | 0.8 | C | -0.28 | First reported 3.8 |
| 1528 | IP540 | 0.8 | | -0.28 | |
| 1531 | | ----- | | ----- | |
| 1538 | D381 | 2.7 | | 1.35 | |
| 1543 | | ----- | | ----- | |
| 1610 | IP540 | 0.4 | | -0.63 | |
| 1634 | D381 | 1 | | -0.11 | |
| 1635 | | ----- | | ----- | |
| 1636 | D381 | 1.3 | | 0.15 | |
| 1651 | D381 | 0.6 | | -0.46 | |
| 1715 | | ----- | | ----- | |
| 1720 | D381 | 0.8 | | -0.28 | |
| 1724 | D381 | 1.8 | | 0.58 | |
| 1730 | | ----- | | ----- | |
| 1811 | D381 | 3.2 | DG(0.05) | 1.78 | |
| 1833 | D381 | 0.4 | | -0.63 | |
| 1842 | | ----- | | ----- | |
| 1854 | D381 | 1.1 | | -0.03 | |
| 1913 | IP540 | 0.50 | | -0.54 | |
| 2129 | D381 | 1.2 | | 0.06 | |
| 2130 | D381 | 1.0 | | -0.11 | |
| 2133 | D381 | 1.0 | | -0.11 | |
| 2136 | D381 | 0.4 | | -0.63 | |

| | |
|---|---|
| normality | not OK |
| n | 45 |
| outliers | 3 |
| mean (n) | 1.13 |
| st.dev. (n) | 0.579 |
| R(calc.) | 1.62 |
| R(D381:09) | 3.26 |


5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1079 1032 1833 1610 2136 495 1913 1038 1651 1017 1155 1105 1428 1064 1720 1528 1097 1140 2130 2133 1634 1109 851 1108 1059 1854 1049 1034 353 2129 1636 463 1288 1284 1062 1131 1276 1047 1724 1201 1021 1026 1061 1264 1538 1039 1811 1203


Kernel Density
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-2
0
2
4
6

## Determination of Flash Point on sample #1017; results in °C

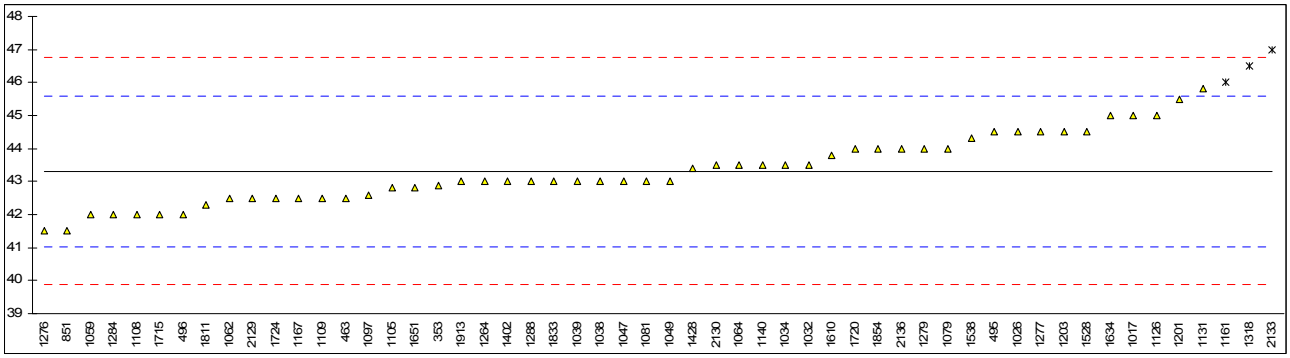
| lab | method | Value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 225 | | ----- | | ----- | |
| 353 | IP170-F | 42.875 | | -0.39 | |
| 463 | IP170-AE | 42.5 | | -0.72 | |
| 495 | IP170-AE | 44.5 | | 1.03 | |
| 496 | D3828-MF | 42.0 | | -1.15 | |
| 851 | IP170-MF | 41.5 | C | -1.59 | First reported 41.2 |
| 1017 | D93-AE | 45.0 | | 1.47 | |
| 1021 | | ----- | | ----- | |
| 1026 | IP170- | 44.5 | | 1.03 | |
| 1032 | IP170-AE | 43.5 | | 0.16 | |
| 1034 | IP170-AE | 43.5 | | 0.16 | |
| 1038 | IP170-MF | 43.0 | | -0.28 | |
| 1039 | IP170-AE | 43.0 | | -0.28 | |
| 1047 | D56-MF | 43.0 | | -0.28 | |
| 1049 | IP170-E | 43 | | -0.28 | |
| 1059 | IP170-AE | 42.0 | | -1.15 | |
| 1062 | IP170-AE | 42.5 | | -0.72 | |
| 1064 | IP170-E | 43.5 | | 0.16 | |
| 1079 | IP170-AE | 44.0 | | 0.60 | |
| 1081 | IP170- | 43.0 | | -0.28 | |
| 1097 | ISO13736-F | 42.6 | | -0.63 | |
| 1105 | IP170-AF | 42.8 | | -0.45 | |
| 1108 | D56-AE | 42.0 | | -1.15 | |
| 1109 | IP170-AF | 42.5 | | -0.72 | |
| 1126 | ISO2719-E | 45.0 | | 1.47 | |
| 1131 | D56-AE | 45.8 | | 2.17 | |
| 1140 | IP170-A | 43.5 | | 0.16 | |
| 1150 | | ----- | | ----- | |
| 1155 | | ----- | | ----- | |
| 1161 | ISO271-AE | 46.0 | G(0.05) | 2.35 | |
| 1167 | IP170- | 42.5 | | -0.72 | |
| 1194 | | ----- | | ----- | |
| 1201 | IP170-AE | 45.5 | | 1.91 | |
| 1203 | D56-F | 44.5 | | 1.03 | |
| 1264 | IP170-AE | 43 | | -0.28 | |
| 1276 | IP170-MF | 41.5 | | -1.59 | |
| 1277 | IP170-A | 44.5 | | 1.03 | |
| 1279 | IP170-AE | 44.0 | | 0.60 | |
| 1284 | D56-F | 42.0 | | -1.15 | |
| 1288 | D3828-AF | 43.0 | | -0.28 | |
| 1318 | IP170-AE | 46.5 | G(0.05) | 2.78 | |
| 1402 | IP170-AF | 43.0 | | -0.28 | |
| 1428 | D56F | 43.4 | | 0.07 | |
| 1528 | D53-AE | 44.5 | | 1.03 | |
| 1531 | | ----- | | ----- | |
| 1538 | D56- | 44.3 | | 0.86 | |
| 1543 | | ----- | | ----- | |
| 1610 | IP170- | 43.8 | | 0.42 | |
| 1634 | IP170-AE | 45.0 | | 1.47 | |
| 1635 | | ----- | | ----- | |
| 1636 | | ----- | | ----- | |
| 1651 | IP170-AE | 42.80 | | -0.45 | |
| 1715 | D56-AE | 42 | | -1.15 | |
| 1720 | D3828-AF | 44.0 | | 0.60 | |
| 1724 | IP170- | 42.5 | | -0.72 | |
| 1730 | | ----- | | ----- | |
| 1811 | IP170-F | 42.3 | | -0.89 | |
| 1833 | IP170-MF | 43 | | -0.28 | |
| 1842 | | ----- | | ----- | |
| 1854 | IP170-MF | 44 | | 0.60 | |
| 1913 | IP170-AF | 43.0 | | -0.28 | |
| 2129 | IP170-F | 42.5 | | -0.72 | |
| 2130 | IP170-AF | 43.5 | | 0.16 | |
| 2133 | D56-E | 47.0 | G(0.05) | 3.22 | |
| 2136 | D56-AE | 44.0 | | 0.60 | |
| | | | | | <u>After excluding ASTM D93/ISO2719:</u> |
| | normality | not OK | | | not OK |
| | n | 51 | | | 49 |
| | outliers | 3 | | | 2 |
| | mean (n) | 43.32 | | | 43.25 |
| | st.dev. (n) | 1.027 | | | 0.987 |
| | R(calc.) | 2.87 | | | 2.76 |
| | R(IP170:09) | 3.20 | | | 3.20 Compare R(IP170:99) = 1.50 |

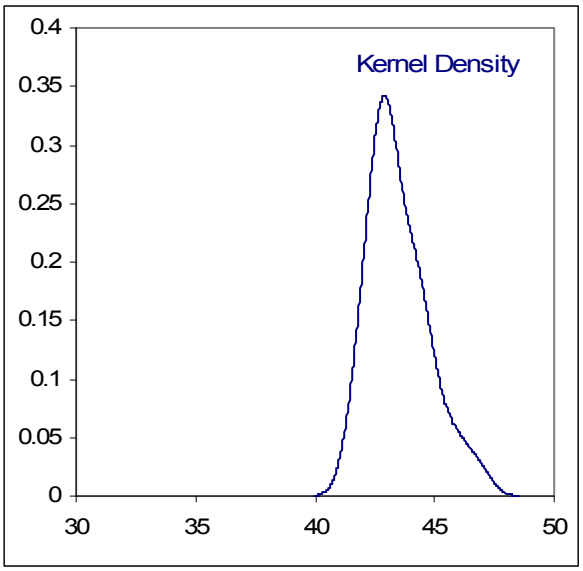
**ONLY ASTM D56**

| | |
|---|---|
| normality | OK |
| n | 10 |
| outliers | 0 |
| mean (n) | 43.55 |
| st.dev. (n) | 1.298 |
| R(calc.) | 3.63 |
| R(D56:05) | 4.30 |

**ONLY IP170/ISO13736**

| | |
|---|---|
| normality | not OK |
| n | 36 |
| outliers | 1 |
| mean (n) | 43.19 |
| st.dev. (n) | 0.901 |
| R(calc.) | 2.52 |
| R(IP170:09) | 3.20 |

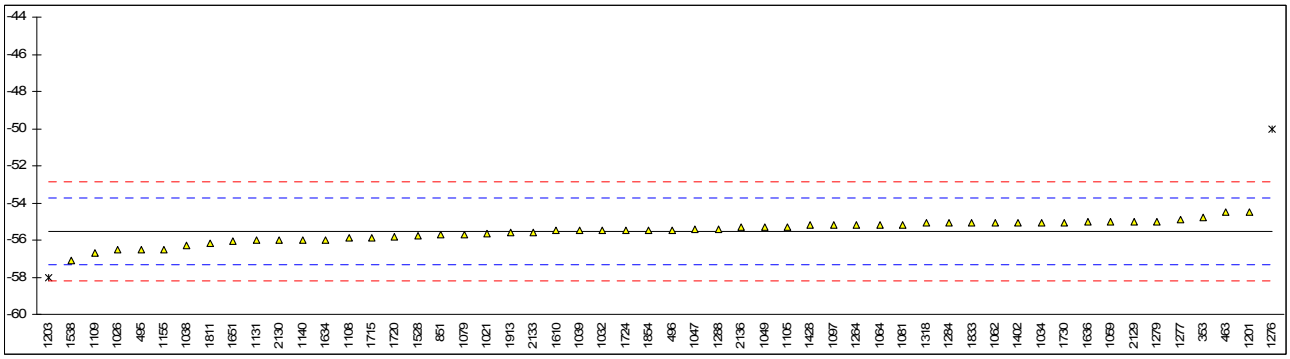


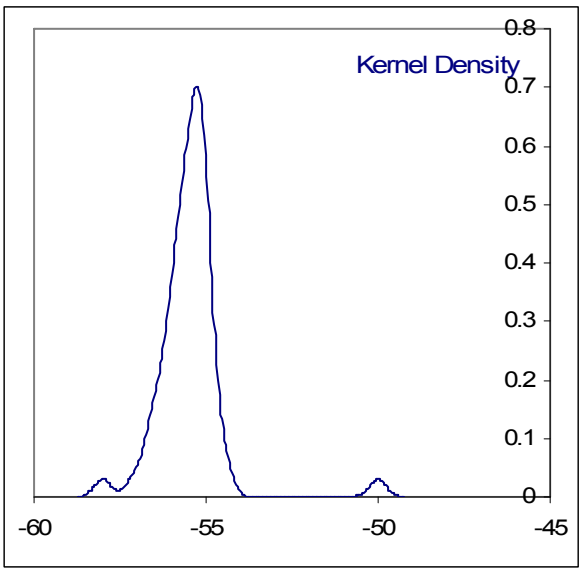



## Determination of Freezing Point on sample #1017; results in °C

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 225 | | ----- | | ----- | |
| 353 | IP16-M | -54.77 | | 0.85 | |
| 463 | D2386-M | -54.5 | | 1.15 | |
| 495 | D2386-M | -56.5 | | -1.09 | |
| 496 | D2386-M | -55.5 | | 0.03 | |
| 851 | D2386-M | -55.7 | | -0.19 | |
| 1017 | | ----- | | ----- | |
| 1021 | D2386-M | -55.64 | | -0.12 | |
| 1026 | D2386-M | -56.5 | | -1.09 | |
| 1032 | IP529-A | -55.5 | | 0.03 | |
| 1034 | D2386-A | -55.1 | | 0.48 | |
| 1038 | D5972-A | -56.3 | | -0.86 | |
| 1039 | D2386-A | -55.5 | | 0.03 | |
| 1047 | D2386-A | -55.4 | | 0.14 | |
| 1049 | D7153-A | -55.3 | | 0.26 | |
| 1059 | D2386-M | -55.0 | | 0.59 | |
| 1062 | IP529-A | -55.1 | | 0.48 | |
| 1064 | D7153-A | -55.2 | | 0.37 | |
| 1079 | D5972-A | -55.7 | | -0.19 | |
| 1081 | D7153-A | -55.2 | | 0.37 | |
| 1097 | IP529-A | -55.2 | | 0.37 | |
| 1105 | D2386-A | -55.3 | | 0.26 | |
| 1108 | D5972-A | -55.9 | | -0.42 | |
| 1109 | D5972-A | -56.7 | | -1.31 | |
| 1126 | | ----- | | ----- | |
| 1131 | D2386- | -56.0 | | -0.53 | |
| 1140 | D5972-A | -56.0 | | -0.53 | |
| 1150 | | ----- | | ----- | |
| 1155 | ISO3013-M | -56.5 | | -1.09 | |
| 1161 | | ----- | | ----- | |
| 1167 | | ----- | | ----- | |
| 1194 | | ----- | | ----- | |
| 1201 | D2386-M | -54.5 | | 1.15 | |
| 1203 | D2386-M | -58 | G(0.01) | -2.77 | |
| 1264 | D5972-A | -55.2 | | 0.37 | |
| 1276 | D2386-M | -50 | G(0.01) | 6.19 | |
| 1277 | D2386-A | -54.9 | | 0.70 | |
| 1279 | D2386-M | -55.0 | | 0.59 | |
| 1284 | D7153-A | -55.1 | | 0.48 | |
| 1288 | D2386-A | -55.4 | | 0.14 | |
| 1318 | D7153-A | -55.1 | | 0.48 | |
| 1402 | D2386-A | -55.1 | | 0.48 | |
| 1428 | D7153-A | -55.2 | | 0.37 | |
| 1528 | D5901-A | -55.76 | | -0.26 | |
| 1531 | | ----- | | ----- | |
| 1538 | D597-M | -57.1 | | -1.76 | |
| 1543 | | ----- | | ----- | |
| 1610 | IP16-M | -55.5 | | 0.03 | |
| 1634 | D2386- | -56.0 | | -0.53 | |
| 1635 | | ----- | | ----- | |
| 1636 | D2386-M | -55.0 | | 0.59 | |
| 1651 | D2386- | -56.03 | | -0.56 | |
| 1715 | D5972-A | -55.9 | | -0.42 | |
| 1720 | D5972-A | -55.8 | | -0.30 | |
| 1724 | D2386- | -55.5 | | 0.03 | |
| 1730 | D5901-A | -55.09 | | 0.49 | |
| 1811 | D5972-A | -56.2 | | -0.75 | |
| 1833 | IP528-A | -55.1 | | 0.48 | |
| 1842 | | ----- | | ----- | |
| 1854 | D2386-M | -55.5 | | 0.03 | |
| 1913 | D7153-A | -55.6 | | -0.08 | |
| 2129 | D2386-A | -55.0 | | 0.59 | |
| 2130 | D2386-M | -56.0 | | -0.53 | |
| 2133 | D2386-A | -55.6 | | -0.08 | |
| 2136 | D7153-A | -55.3 | | 0.26 | |

| | |
|---|---|
| normality | OK |
| n | 52 |
| outliers | 2 |
| mean (n) | -55.53 |
| st.dev. (n) | 0.553 |
| R(calc.) | 1.55 |
| R(D2386:06) | 2.50 |


-44
-46
-48
-50
-52
-54
-56
-58
-60
1203 1538 1109 1026 495 1155 1038 1811 1651 1131 2130 1140 1634 1108 1715 1720 1528 851 1079 1021 1913 2133 1610 1039 1032 1724 1854 496 1047 1288 2136 1049 1105 1428 1097 1264 1064 1061 1318 1284 1833 1062 1402 1034 1730 1636 1069 2129 1279 1277 353 463 1201 1276


Kernel Density
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-60
-55
-50
-45

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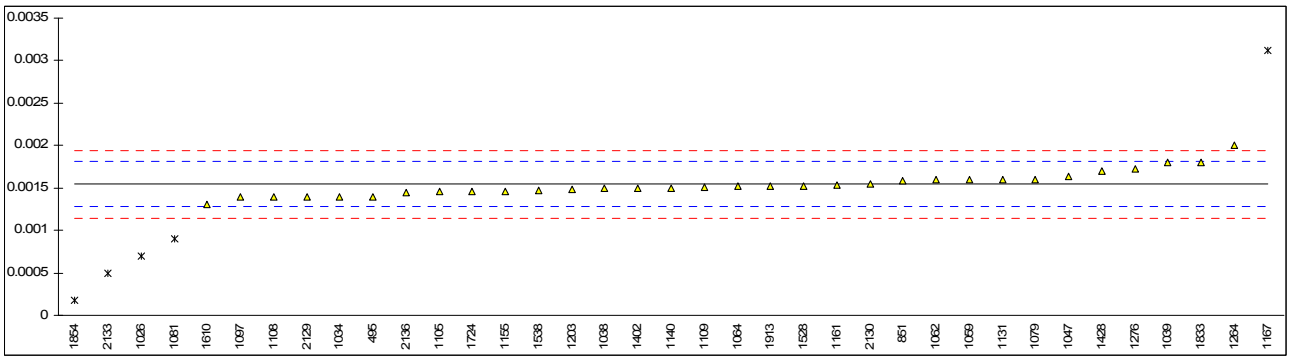
## Determination of JFTOT; Tube Rating, Delta P in mmHg, Pumped Vol. in mL, Temp. in °C

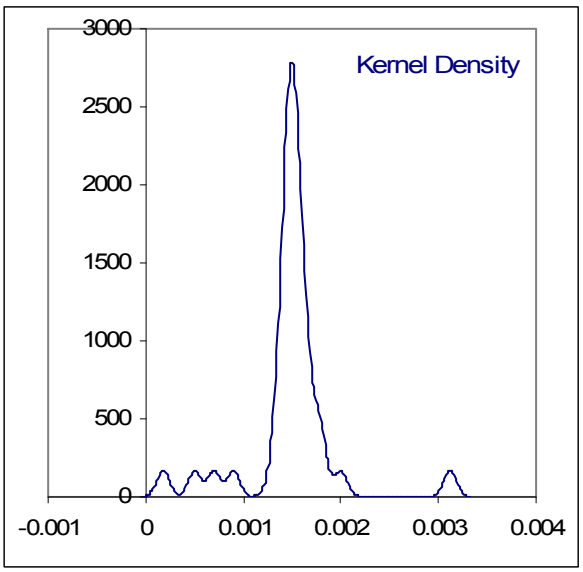
| lab | method | tube | mark | Delta P | mark | volume | mark | temp | mark | remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 225 | | ----- | | ----- | | ----- | | ----- | | |
| 353 | | ----- | | ----- | | ----- | | ----- | | |
| 463 | | ----- | | ----- | | ----- | | ----- | | |
| 495 | D3241 | 1 | | 0 | | 485 | | 260 | | |
| 496 | | ----- | | ----- | | ----- | | ----- | | |
| 851 | D3241 | <1 | | 0.1 | | 500 | | 260 | | |
| 1017 | | ----- | | ----- | | ----- | | ----- | | |
| 1021 | D3241 | 0 | | 0 | | 450 | | 260 | | |
| 1026 | D3241 | 3 | | 1.0 | | ----- | | 260 | | |
| 1032 | D3241 | 1 | | 0.0 | | 455 | | 260 | | |
| 1034 | D3241 | 1 | | 0 | | 450 | | 260 | | |
| 1038 | | ----- | | ----- | | ----- | | ----- | | |
| 1039 | D3241 | <1 | | <1.0 | | 450 | | 260 | | |
| 1047 | D3241 | 0 | | 2 | | 475 | | 260 | | |
| 1049 | D3241 | 1 | | 0 | | 510 | | 260 | | |
| 1059 | | ----- | | ----- | | ----- | | ----- | | |
| 1062 | D3241 | 0 | | 0 | | 500 | | 260 | | |
| 1064 | D3241 | 0 | | 0 | | 450 | | 260 | | |
| 1079 | D3241 | <1 | | 0 | | 455 | | 260 | | |
| 1081 | D3241 | <2 | | 1 | | 450 | | 260 | | |
| 1097 | D3241 | 1 | | 0.0 | | 480 | | 260 | | |
| 1105 | D3241 | 1 | | 1 | | 465 | | 260 | | |
| 1108 | | ----- | | ----- | | ----- | | ----- | | |
| 1109 | D3241 | <1 | | 0 | | 440 | | 260 | | |
| 1126 | | ----- | | ----- | | ----- | | ----- | | |
| 1131 | | ----- | | ----- | | ----- | | ----- | | |
| 1140 | D3241 | 1 | | <1 | | 510 | | 260 | | |
| 1150 | | ----- | | ----- | | ----- | | ----- | | |
| 1155 | | ----- | | ----- | | ----- | | ----- | | |
| 1161 | | ----- | | ----- | | ----- | | ----- | | |
| 1167 | | ----- | | ----- | | ----- | | ----- | | |
| 1194 | | ----- | | ----- | | ----- | | ----- | | |
| 1201 | D3241 | <1 | | 1 | | 450 | | 260 | | |
| 1203 | D3241 | 1 | | 0 | | 450 | | 260 | | |
| 1264 | D3241 | <1 | | 0.6 | | 500 | | 260 | | |
| 1276 | D3241 | <1 | | 0 | | 450 | | 260 | | |
| 1277 | D3241 | 1 | | 2 | | 450 | | 260 | | |
| 1279 | D3241 | <1 | | 0.0 | | 450 | | 260 | | |
| 1284 | D3241 | <1.0 | | 0.1 | | 510 | | 260 | | |
| 1288 | | ----- | | ----- | | ----- | | ----- | | |
| 1318 | D3241 | <1 | | 0.0 | | 450 | | 260 | | |
| 1402 | D3241 | 1 | | 0 | | 460 | | 260 | | |
| 1428 | D3241 | <1 | | 0 | | 450 | | 260 | | |
| 1528 | D3241 | 1 | | 0 | | 450 | | 260 | | |
| 1531 | | ----- | | ----- | | ----- | | ----- | | |
| 1538 | D3241 | <1 | | 1 | | 450 | | 260 | | |
| 1543 | | ----- | | ----- | | ----- | | ----- | | |
| 1610 | IP323 | <1 | | <1 | | 455 | | 260 | | |
| 1634 | | ----- | | ----- | | ----- | | ----- | | |
| 1635 | | ----- | | ----- | | ----- | | ----- | | |
| 1636 | | ----- | | ----- | | ----- | | ----- | | |
| 1651 | D3241 | 1 | | 0 | | 450 | | 260 | | |
| 1715 | | ----- | | ----- | | ----- | | ----- | | |
| 1720 | | ----- | | ----- | | ----- | | ----- | | |
| 1724 | D3241 | <1 | | 0 | | 450 | | 260 | | |
| 1730 | | ----- | | ----- | | ----- | | ----- | | |
| 1811 | | ----- | | ----- | | ----- | | ----- | | |
| 1833 | | ----- | | ----- | | ----- | | ----- | | |
| 1842 | | ----- | | ----- | | ----- | | ----- | | |
| 1854 | D3241 | 1 | | ----- | | 600 | G(0.01) | 260 | | |
| 1913 | D3241 | <1 | | 0.0 | | 450 | | 260 | | |
| 2129 | D3241 | 1 | | 0 | | 450 | | 260 | | |
| 2130 | D3241 | 1 | | 0 | | 450 | | 260 | | |
| 2133 | D3241 | <1 | | 1 | | 475 | | 260 | | |
| 2136 | D3241 | 1 | | 0 | | 450 | | 260 | | |
| | normality | not OK | | not OK | | not OK | | n.a. | | |
| | n | 21 | | 32 | | 36 | | 38 | | |
| | outliers | 0 | | 2 | | 1 | | 0 | | |
| | mean (n) | 0.90 | | 0.34 | | 463.2 | | 260 | | |
| | st.dev. (n) | 0.625 | | 0.588 | | 21.32 | | 0 | | |
| | R(calc.) | 1.7 | | 1.65 | | 59.7 | | 0 | | |
| | R(D3241:09) | n.a. | | n.a. | | n.a. | | n.a. | | |

## Determination of Mercaptan Sulphur on sample #1017; results in % M/M

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 225 | | ----- | | ----- | |
| 353 | | ----- | | ----- | |
| 463 | | ----- | | ----- | |
| 495 | D3227 | 0.0014 | | -1.07 | |
| 496 | | ----- | | ----- | |
| 851 | D3227 | 0.00158 | | 0.27 | |
| 1017 | | ----- | | ----- | |
| 1021 | | ----- | | ----- | |
| 1026 | D3227 | 0.0007 | G(0.01) | -6.30 | |
| 1032 | | ----- | | ----- | |
| 1034 | D3227 | 0.0014 | | -1.07 | |
| 1038 | D3227 | 0.0015 | | -0.32 | |
| 1039 | D3227 | 0.0018 | | 1.92 | |
| 1047 | D3227 | 0.00164 | | 0.72 | |
| 1049 | | ----- | | ----- | |
| 1059 | D3227 | 0.0016 | | 0.42 | |
| 1062 | D3227 | 0.0016 | | 0.42 | |
| 1064 | D3227 | 0.00152 | | -0.17 | |
| 1079 | D3227 | 0.0016 | | 0.42 | |
| 1081 | D3227 | 0.0009 | G(0.01) | -4.81 | |
| 1097 | ISO3012 | 0.0014 | | -1.07 | |
| 1105 | D3227 | 0.00146 | | -0.62 | |
| 1108 | D3227 | 0.0014 | | -1.07 | |
| 1109 | D3227 | 0.00151 | | -0.25 | |
| 1126 | | ----- | | ----- | |
| 1131 | D3227 | 0.0016 | | 0.42 | |
| 1140 | D3227 | 0.0015 | C | -0.32 | First reported 15 |
| 1150 | | ----- | | ----- | |
| 1155 | D3227 | 0.001463 | | -0.60 | |
| 1161 | ISO3012 | 0.00154 | | -0.02 | |
| 1167 | D3227 | 0.00312 | G(0.01) | 11.78 | |
| 1194 | | ----- | | ----- | |
| 1201 | D3227 | <0.0003 | | ----- | False negative? |
| 1203 | UOP163 | 0.00149 | | -0.40 | |
| 1264 | D3227 | 0.0020 | C | 3.41 | First reported 0.0022 |
| 1276 | D3227 | 0.00172 | | 1.32 | |
| 1277 | | ----- | | ----- | |
| 1279 | | ----- | | ----- | |
| 1284 | | ----- | | ----- | |
| 1288 | | ----- | | ----- | |
| 1318 | | ----- | | ----- | |
| 1402 | D3227 | 0.0015 | | -0.32 | |
| 1428 | ISO3012 | 0.0017 | | 1.17 | |
| 1528 | D3227 | 0.00152 | | -0.17 | |
| 1531 | | ----- | | ----- | |
| 1538 | D3227 | 0.00147 | | -0.55 | |
| 1543 | | ----- | | ----- | |
| 1610 | IP342 | 0.0013 | | -1.82 | |
| 1634 | | ----- | | ----- | |
| 1635 | | ----- | | ----- | |
| 1636 | | ----- | | ----- | |
| 1651 | | ----- | | -10.11 | |
| 1715 | | ----- | | ----- | |
| 1720 | | ----- | | ----- | |
| 1724 | D3227 | 0.00146 | | -0.62 | |
| 1730 | | ----- | | ----- | |
| 1811 | | ----- | | ----- | |
| 1833 | D3227 | 0.0018 | | 1.92 | |
| 1842 | | ----- | | ----- | |
| 1854 | D3227 | 0.00018 | G(0.05) | -10.18 | |
| 1913 | D3227 | 0.00152 | | -0.17 | |
| 2129 | D3227 | 0.0014 | | -1.07 | |
| 2130 | D3227 | 0.00155 | | 0.05 | |
| 2133 | D3227 | 0.0005 | G(0.01) | -7.79 | |
| 2136 | D3227 | 0.00144 | | -0.77 | |

| | |
|---|---|
| normality | not OK |
| n | 32 |
| outliers | 5 |
| mean (n) | 0.00154 |
| st.dev. (n) | 0.000142 |
| R(calc.) | 0.00040 |
| R(D3227:04a) | 0.00038 |

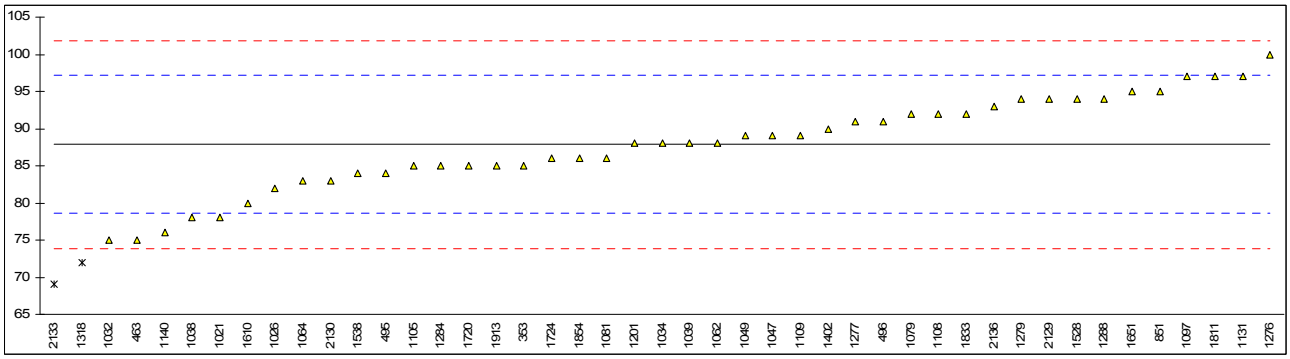

0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
1854
2133
1026
1061
1610
1097
1108
2129
1034
495
2136
1105
1724
1155
1538
1203
1038
1402
1140
1109
1064
1913
1528
1161
2130
861
1062
1059
1131
1079
1047
1428
1276
1039
1833
1264
1167

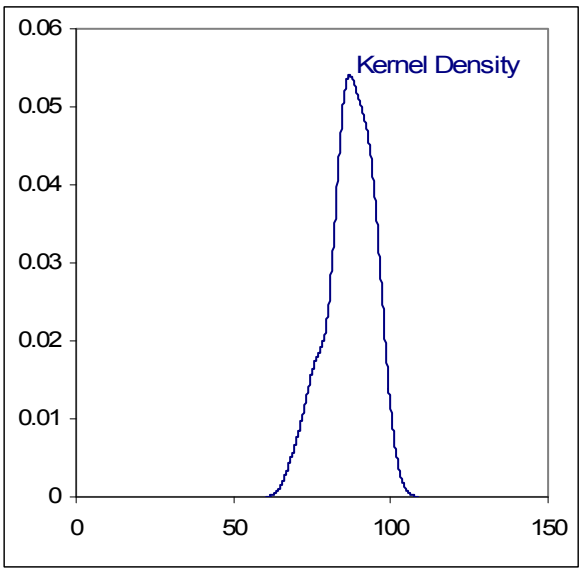

Kernel Density
3000
2500
2000
1500
1000
500
0
-0.001
0
0.001
0.002
0.003
0.004

## Determination of MSEP on sample #1017;

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 225 | | ----- | | ----- | |
| 353 | D3948 | 85 | | -0.61 | |
| 463 | D3948 | 75 | | -2.76 | |
| 495 | D3948 | 84 | | -0.83 | |
| 496 | D3948 | 91 | | 0.67 | |
| 851 | D3948 | 95 | | 1.53 | |
| 1017 | | ----- | | ----- | |
| 1021 | D3948 | 78 | | -2.12 | |
| 1026 | D3948 | 82 | | -1.26 | |
| 1032 | D3948 | 75 | | -2.76 | |
| 1034 | D3948 | 88 | | 0.03 | |
| 1038 | D3948 | 78 | | -2.12 | |
| 1039 | D3948 | 88 | | 0.03 | |
| 1047 | D3948 | 89 | | 0.24 | |
| 1049 | D3948 | 89 | | 0.24 | |
| 1059 | | ----- | | ----- | |
| 1062 | D3948 | 88 | | 0.03 | |
| 1064 | D3948 | 83 | | -1.04 | |
| 1079 | D3948 | 92 | | 0.89 | |
| 1081 | D3948 | 86 | | -0.40 | |
| 1097 | D3948 | 97 | | 1.96 | |
| 1105 | D3948 | 85 | | -0.61 | |
| 1108 | D3948 | 92 | | 0.89 | |
| 1109 | D3948 | 89 | | 0.24 | |
| 1126 | | ----- | | ----- | |
| 1131 | D3948 | 97 | | 1.96 | |
| 1140 | D3948 | 76 | | -2.55 | |
| 1150 | | ----- | | ----- | |
| 1155 | | ----- | | ----- | |
| 1161 | | ----- | | ----- | |
| 1167 | | ----- | | ----- | |
| 1194 | | ----- | | ----- | |
| 1201 | D3948 | 88 | | 0.03 | |
| 1203 | | ----- | | ----- | |
| 1264 | | ----- | | ----- | |
| 1276 | D3948 | 100 | | 2.61 | |
| 1277 | D3948 | 91 | | 0.67 | |
| 1279 | D3948 | 94 | | 1.32 | |
| 1284 | D3948 | 85 | | -0.61 | |
| 1288 | D3948 | 94 | | 1.32 | |
| 1318 | D3948 | 72 | G(0.05) | -3.41 | |
| 1402 | D3948 | 90 | | 0.46 | |
| 1428 | | ----- | | ----- | |
| 1528 | D3948 | 94 | | 1.32 | |
| 1531 | | ----- | | ----- | |
| 1538 | d3227 | 84 | | -0.83 | |
| 1543 | | ----- | | ----- | |
| 1610 | D3948 | 80 | C | -1.69 | First reported 73 |
| 1634 | | ----- | | ----- | |
| 1635 | | ----- | | ----- | |
| 1636 | | ----- | | ----- | |
| 1651 | D3948 | 95 | | 1.53 | |
| 1715 | | ----- | | ----- | |
| 1720 | D3948 | 85 | | -0.61 | |
| 1724 | D3948 | 86 | | -0.40 | |
| 1730 | | ----- | | ----- | |
| 1811 | D3948 | 97 | | 1.96 | |
| 1833 | D3948 | 92 | | 0.89 | |
| 1842 | | ----- | | ----- | |
| 1854 | D3948 | 86 | | -0.40 | |
| 1913 | D3948 | 85 | | -0.61 | |
| 2129 | D3948 | 94 | | 1.32 | |
| 2130 | D3948 | 83 | | -1.04 | |
| 2133 | D3948 | 69 | G(0.05) | -4.05 | |
| 2136 | D3948 | 93 | | 1.10 | |

| | |
|---|---|
| normality | OK |
| n | 43 |
| outliers | 2 |
| mean (n) | 87.86 |
| st.dev. (n) | 6.262 |
| R(calc.) | 17.53 |
| R(D3948:08) | 13.03 |


105
100
95
90
85
80
75
70
65
2133
1318
1032
463
1140
1038
1021
1610
1026
1004
2130
1538
495
1105
1284
1720
1913
353
1724
1854
1061
1201
1034
1039
1062
1049
1047
1109
1402
1277
496
1079
1108
1833
2136
1279
2129
1528
1288
1651
851
1097
1811
1131
1276

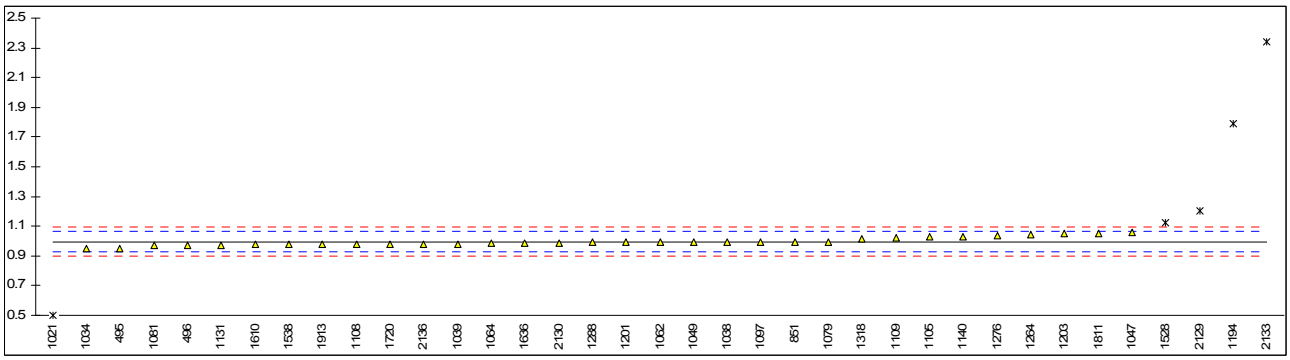

Kernel Density
0.06
0.05
0.04
0.03
0.02
0.01
0
0
50
100
150

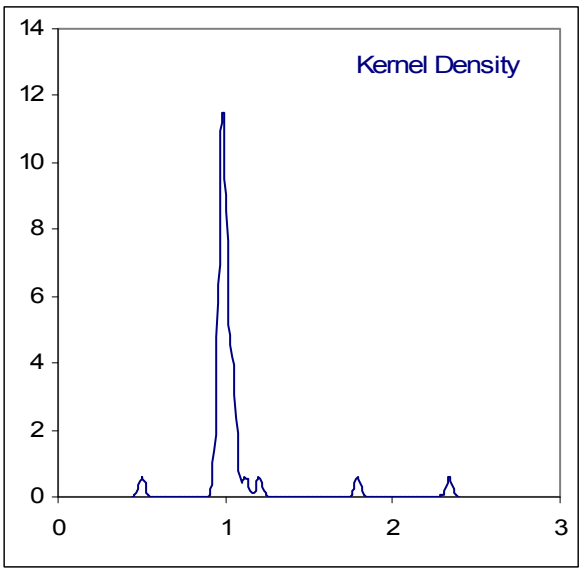
## Determination of Naphthalenes on sample #1017; results in %V/V

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 225 | | ----- | | ----- | |
| 353 | | ----- | | ----- | |
| 463 | | ----- | | ----- | |
| 495 | D1840-B | 0.95 | | -1.38 | |
| 496 | D1840-A | 0.97 | | -0.78 | |
| 851 | D1840-A | 0.992 | | -0.13 | |
| 1017 | | ----- | | ----- | |
| 1021 | D1840-B | 0.50 | G(0.05) | -14.82 | |
| 1026 | | ----- | | ----- | |
| 1032 | | ----- | | ----- | |
| 1034 | D1840-A | 0.949 | | -1.41 | |
| 1038 | D1840-B | 0.99 | | -0.19 | |
| 1039 | D1840-B | 0.98 | | -0.49 | |
| 1047 | D1840-B | 1.06 | | 1.90 | |
| 1049 | D1840-A | 0.99 | | -0.19 | |
| 1059 | | ----- | | ----- | |
| 1062 | D1840-A | 0.99 | | -0.19 | |
| 1064 | D1840-A | 0.986 | | -0.31 | |
| 1079 | D1840-A | 0.996 | | -0.01 | |
| 1081 | D1840-B | 0.97 | | -0.78 | |
| 1097 | D1840-A | 0.99 | | -0.19 | |
| 1105 | D1840-A | 1.0282 | | 0.95 | |
| 1108 | D1840-B | 0.978 | | -0.55 | |
| 1109 | D1840-A | 1.023 | | 0.80 | |
| 1126 | | ----- | | ----- | |
| 1131 | D1840-B | 0.97 | | -0.78 | |
| 1140 | D1840- | 1.03 | | 1.01 | |
| 1150 | | ----- | | ----- | |
| 1155 | | ----- | | ----- | |
| 1161 | | ----- | | ----- | |
| 1167 | | ----- | | ----- | |
| 1194 | D1840-A | 1.79 | G(0.01) | 23.70 | |
| 1201 | D1840-A | 0.99 | | -0.19 | |
| 1203 | D1840-A | 1.05 | C | 1.60 | |
| 1264 | D1840-A | 1.04 | | 1.30 | |
| 1276 | D1840-A | 1.038 | | 1.25 | |
| 1277 | | ----- | | ----- | |
| 1279 | | ----- | | ----- | |
| 1284 | | ----- | | ----- | |
| 1288 | D1840-B | 0.99 | | -0.19 | |
| 1318 | D1840-B | 1.016 | | 0.59 | |
| 1402 | | ----- | | ----- | |
| 1428 | | ----- | | ----- | |
| 1528 | D1840-B | 1.12 | G(0.01) | 3.69 | |
| 1531 | | ----- | | ----- | |
| 1538 | D1840-b | 0.975 | | -0.64 | |
| 1543 | | ----- | | ----- | |
| 1610 | D1840-A | 0.975 | | -0.64 | |
| 1634 | | ----- | | ----- | |
| 1635 | | ----- | | ----- | |
| 1636 | D1840-B | 0.986 | | -0.31 | |
| 1651 | | ----- | | ----- | |
| 1715 | | ----- | | ----- | |
| 1720 | D1840-A | 0.98 | | -0.49 | |
| 1724 | | ----- | | ----- | |
| 1730 | | ----- | | ----- | |
| 1811 | D1840-A | 1.054 | | 1.72 | |
| 1833 | | ----- | | ----- | |
| 1842 | | ----- | | ----- | |
| 1854 | | ----- | | ----- | |
| 1913 | D1840-B | 0.976 | | -0.61 | |
| 2129 | D1840-B | 1.203 | G(0.01) | 6.17 | |
| 2130 | D1840-B | 0.989 | | -0.22 | |
| 2133 | D1840-A | 2.338 | G(0.01) | 40.06 | |
| 2136 | D1840-A | 0.98 | | -0.49 | |

| | |
|---|---|
| normality | not OK |
| n | 32 |
| outliers | 5 |
| mean (n) | 0.996 |
| st.dev. (n) | 0.0293 |
| R(calc.) | 0.082 |
| R(D1840:07-B) | 0.094 |

Compare R(D1840:07-A) = 0.060

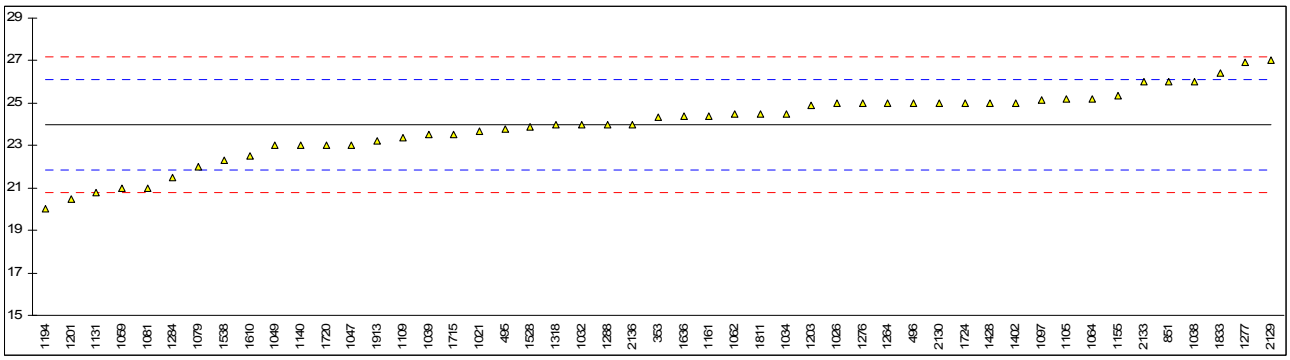

2.5
2.3
2.1
1.9
1.7
1.5
1.3
1.1
0.9
0.7
0.5
1021
1034
495
1061
496
1131
1610
1538
1913
1108
1720
2136
1039
1064
1636
2130
1288
1201
1062
1049
1038
1097
851
1079
1318
1109
1105
1140
1276
1264
1203
1811
1047
1528
2129
1194
2133

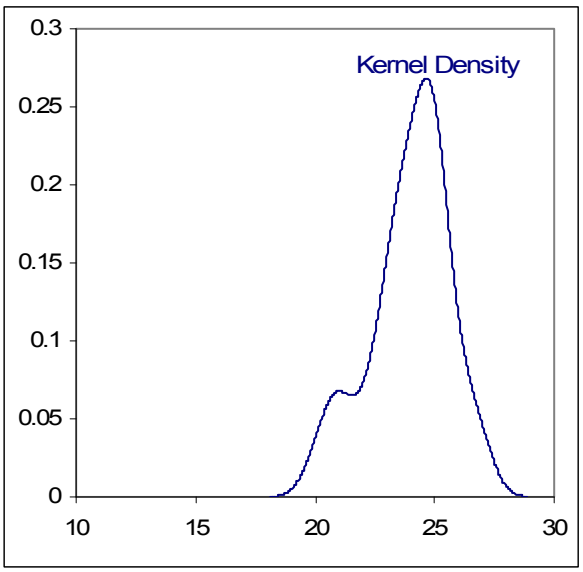

Kernel Density
14
12
10
8
6
4
2
0
0
1
2
3

## Determination of Smoke Point on sample #1017; results in mm

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 225 | | ----- | | ----- | |
| 353 | IP57 | 24.311 | | 0.31 | |
| 463 | | ----- | | ----- | |
| 495 | D1322 | 23.8 | | -0.17 | |
| 496 | D1322 | 25.0 | | 0.95 | |
| 851 | D1322 | 26.0 | | 1.88 | |
| 1017 | | ----- | | ----- | |
| 1021 | D1322 | 23.69 | | -0.27 | |
| 1026 | D1322 | 25.0 | | 0.95 | |
| 1032 | D1322 | 24 | | 0.01 | |
| 1034 | D1322 | 24.5 | | 0.48 | |
| 1038 | D1322 | 26.0 | | 1.88 | |
| 1039 | D1322 | 23.5 | | -0.45 | |
| 1047 | D1322 | 23 | | -0.92 | |
| 1049 | D1322 | 23 | | -0.92 | |
| 1059 | D1322 | 21.0 | | -2.79 | |
| 1062 | D1322 | 24.5 | | 0.48 | |
| 1064 | D1322 | 25.2 | | 1.13 | |
| 1079 | D1322 | 22 | | -1.85 | |
| 1081 | D1322 | 21.0 | | -2.79 | |
| 1097 | D1322 | 25.16 | | 1.10 | |
| 1105 | D1322 | 25.2 | | 1.13 | |
| 1108 | | ----- | | ----- | |
| 1109 | D1322 | 23.35 | | -0.59 | |
| 1126 | | ----- | | ----- | |
| 1131 | D1322 | 20.8 | | -2.97 | |
| 1140 | D1322 | 23 | | -0.92 | |
| 1150 | | ----- | | ----- | |
| 1155 | D1322 | 25.333 | | 1.26 | |
| 1161 | ISO3014 | 24.4 | | 0.39 | |
| 1167 | | ----- | | ----- | |
| 1194 | D1322 | 20.0 | | -3.72 | |
| 1201 | D1322 | 20.5 | | -3.25 | |
| 1203 | D1322 | 24.9 | | 0.85 | |
| 1264 | D1322 | 25 | | 0.95 | |
| 1276 | D1322 | 25.0 | | 0.95 | |
| 1277 | D1322 | 26.9 | | 2.72 | |
| 1279 | | ----- | | ----- | |
| 1284 | D1322 | 21.5 | | -2.32 | |
| 1288 | D1322 | 24.0 | | 0.01 | |
| 1318 | D1322 | 23.992 | | 0.01 | |
| 1402 | D1322 | 25.0 | | 0.95 | |
| 1428 | D1322 | 25 | | 0.95 | |
| 1528 | D1322 | 23.9 | | -0.08 | |
| 1531 | | ----- | | ----- | |
| 1538 | D1322 | 22.3 | | -1.57 | |
| 1543 | | ----- | | ----- | |
| 1610 | IP57 | 22.5 | | -1.39 | |
| 1634 | | ----- | | ----- | |
| 1635 | | ----- | | ----- | |
| 1636 | D1322 | 24.39 | | 0.38 | |
| 1651 | | ----- | | ----- | |
| 1715 | D1322 | 23.5 | | -0.45 | |
| 1720 | D1322 | 23.0 | | -0.92 | |
| 1724 | D1322 | 25 | | 0.95 | |
| 1730 | | ----- | | ----- | |
| 1811 | D1322 | 24.5 | | 0.48 | |
| 1833 | D1322 | 26.4 | | 2.25 | |
| 1842 | | ----- | | ----- | |
| 1854 | | ----- | | ----- | |
| 1913 | D1322 | 23.2 | | -0.73 | |
| 2129 | D1322 | 27.0 | | 2.81 | |
| 2130 | D1322 | 25.0 | | 0.95 | |
| 2133 | D1322 | 26.00 | | 1.88 | |
| 2136 | D1322 | 24.0 | | 0.01 | |

| | |
|---|---|
| normality | OK |
| n | 49 |
| outliers | 0 |
| mean (n) | 23.98 |
| st.dev. (n) | 1.638 |
| R(calc.) | 4.59 |
| R(D1322:08) | 3.00 |

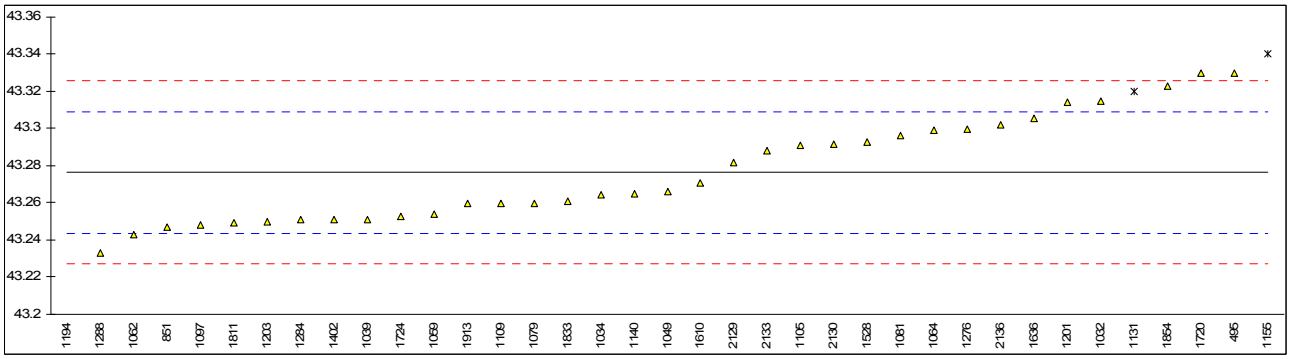

29
27
25
23
21
19
17
15
1194 1201 1131 1069 1081 1284 1079 1538 1610 1049 1140 1720 1047 1913 1109 1039 1715 1021 495 1528 1318 1032 1288 2136 353 1636 1161 1062 1811 1034 1203 1026 1276 1264 496 2130 1724 1428 1402 1097 1105 1064 1155 2133 851 1038 1833 1277 2129

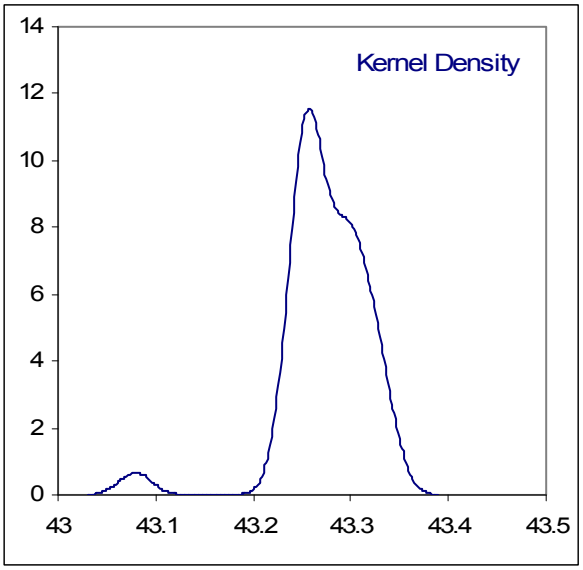

Kernel Density
0.3
0.25
0.2
0.15
0.1
0.05
0
10
15
20
25
30

## Determination of Specific Energy on sample #1017; results in MJ/kg

| lab | method | Value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 225 | | ----- | | ----- | |
| 353 | | ----- | | ----- | |
| 463 | | ----- | | ----- | |
| 495 | D3338 | 43.33 | | 3.26 | |
| 496 | | ----- | | ----- | |
| 851 | D3338 | 43.247 | | -1.79 | |
| 1017 | | ----- | | ----- | |
| 1021 | | ----- | | ----- | |
| 1026 | | ----- | | ----- | |
| 1032 | D3338 | 43.315 | C | 2.35 | First reported 43.108 |
| 1034 | D3338 | 43.2644 | | -0.73 | |
| 1038 | | ----- | | ----- | |
| 1039 | D3338 | 43.251 | | -1.55 | |
| 1047 | | ----- | | ----- | |
| 1049 | D3338 | 43.266 | C | -0.63 | First reported 43.472 |
| 1059 | D3338 | 43.254 | | -1.36 | |
| 1062 | D3338 | 43.243 | | -2.03 | |
| 1064 | D3338 | 43.2991 | | 1.38 | |
| 1079 | D3338 | 43.26 | | -1.00 | |
| 1081 | D3338 | 43.296 | | 1.19 | |
| 1097 | D3338 | 43.248 | | -1.73 | |
| 1105 | D3338 | 43.291 | | 0.89 | |
| 1108 | | ----- | | ----- | |
| 1109 | D3338 | 43.26 | | -1.00 | |
| 1126 | | ----- | | ----- | |
| 1131 | D4521 | 43.32 | ex | 2.65 | Result excluded, test method is not compatible, different calculation |
| 1140 | D3338 | 43.265 | | -0.69 | |
| 1150 | | ----- | | ----- | |
| 1155 | ISO3648 | 43.340 | ex | 3.87 | Result excluded, test method is not compatible, different calculation |
| 1161 | | ----- | | ----- | |
| 1167 | | ----- | | ----- | |
| 1194 | D3338 | 43.079 | G(0.01) | -12.02 | |
| 1201 | D3338 | 43.314 | | 2.29 | |
| 1203 | D3338 | 43.25 | | -1.61 | |
| 1264 | | ----- | | ----- | |
| 1276 | D3338 | 43.3 | | 1.44 | |
| 1277 | | ----- | | ----- | |
| 1279 | | ----- | | ----- | |
| 1284 | D3338 | 43.251 | | -1.55 | |
| 1288 | D3338 | 43.233 | | -2.64 | |
| 1318 | | ----- | | ----- | |
| 1402 | D3338 | 43.251 | | -1.55 | |
| 1428 | | ----- | | ----- | |
| 1528 | D3338 | 43.29263 | | 0.99 | |
| 1531 | | ----- | | ----- | |
| 1538 | | ----- | | ----- | |
| 1543 | | ----- | | ----- | |
| 1610 | D3338 | 43.271 | | -0.33 | |
| 1634 | | ----- | | ----- | |
| 1635 | | ----- | | ----- | |
| 1636 | D3338 | 43.3056 | | 1.78 | |
| 1651 | | ----- | | ----- | |
| 1715 | | ----- | | ----- | |
| 1720 | D3338 | 43.33 | | 3.26 | |
| 1724 | D3338 | 43.253 | | -1.42 | |
| 1730 | | ----- | | ----- | |
| 1811 | D3338 | 43.2494 | | -1.64 | |
| 1833 | D3338 | 43.261 | | -0.94 | |
| 1842 | | ----- | | ----- | |
| 1854 | D3338 | 43.323 | | 2.84 | |
| 1913 | D3338 | 43.26 | | -1.00 | |
| 2129 | D3338 | 43.282 | | 0.34 | |
| 2130 | D3338 | 43.2917 | | 0.93 | |
| 2133 | D3338 | 43.288 | | 0.71 | |
| 2136 | D3338 | 43.302 | | 1.56 | |

| | |
|---|---|
| normality | not OK |
| n | 34 |
| outliers | 1 |
| mean (n) | 43.2764 |
| st.dev. (n) | 0.02763 |
| R(calc.) | 0.0774 |
| R(D3338:09) | 0.0460 |

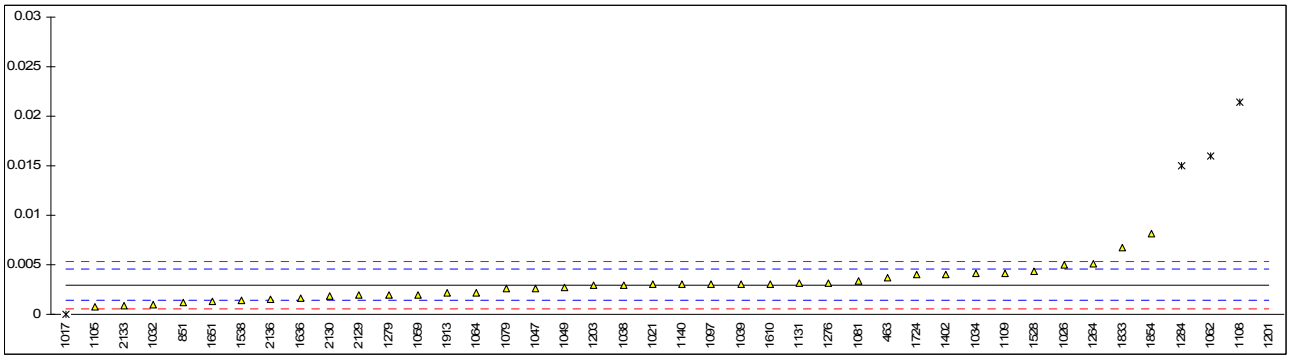

43.36
43.34
43.32
43.3
43.28
43.26
43.24
43.22
43.2
1194
1288
1062
851
1097
1811
1203
1284
1402
1039
1724
1059
1913
1109
1079
1833
1034
1140
1049
1610
2129
2133
1105
2130
1528
1061
1064
1276
2136
1636
1201
1032
1131
1854
1720
495
1155

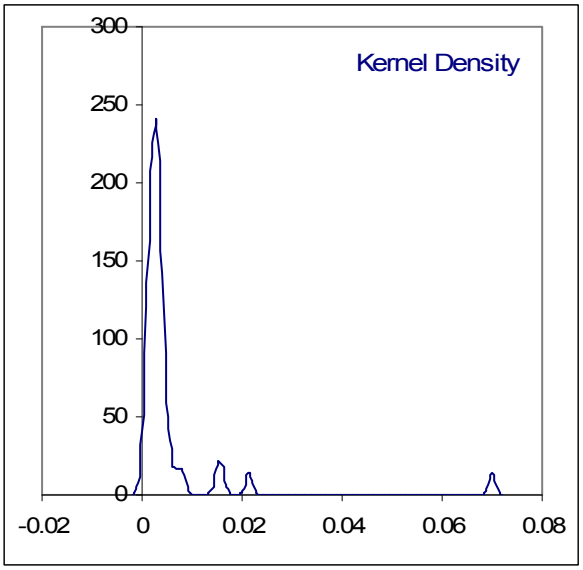

Kernel Density
14
12
10
8
6
4
2
0
43
43.1
43.2
43.3
43.4
43.5

## Determination of Total Acidity on sample #1017; results in mg KOH/g

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 225 | | ----- | | ----- | |
| 353 | | ----- | | ----- | |
| 463 | D3242 | 0.00375 | | 1.00 | |
| 495 | | ----- | | ----- | |
| 496 | | ----- | | ----- | |
| 851 | D3242 | 0.0012 | | -2.23 | |
| 1017 | D3242 | 0.000 | ex | -3.75 | Result excluded not a real result |
| 1021 | D3242 | 0.003 | | 0.05 | |
| 1026 | D3242 | 0.005 | | 2.58 | |
| 1032 | D3242 | 0.0010 | | -2.49 | |
| 1034 | D3242 | 0.0041 | | 1.44 | |
| 1038 | D3242 | 0.0029 | | -0.08 | |
| 1039 | D3242 | 0.003 | | 0.05 | |
| 1047 | D3242 | 0.0026 | | -0.46 | |
| 1049 | D3242 | 0.00269 | | -0.35 | |
| 1059 | D3242 | 0.002 | | -1.22 | |
| 1062 | D3242 | 0.0160 | G(0.01) | 16.51 | |
| 1064 | D3242 | 0.00221 | | -0.95 | |
| 1079 | D3242 | 0.00258 | | -0.49 | |
| 1081 | D3242 | 0.0034 | | 0.55 | |
| 1097 | D3242 | 0.003 | | 0.05 | |
| 1105 | D3242 | 0.0008 | | -2.74 | |
| 1108 | D3242 | 0.0214 | G(0.01) | 23.36 | |
| 1109 | D3242 | 0.0041 | | 1.44 | |
| 1126 | | ----- | | ----- | |
| 1131 | D3242 | 0.0031 | | 0.17 | |
| 1140 | D3242 | 0.003 | | 0.05 | |
| 1150 | | ----- | | ----- | |
| 1155 | | ----- | | ----- | |
| 1161 | | ----- | | ----- | |
| 1167 | | ----- | | ----- | |
| 1194 | | ----- | | ----- | |
| 1201 | D3242 | 0.070 | G(0.01) | 84.92 | |
| 1203 | D3242 | 0.0029 | | -0.08 | |
| 1264 | D3242 | 0.0051 | C | 2.71 | First reported 0.0086 |
| 1276 | D3242 | 0.0032 | | 0.30 | |
| 1277 | | ----- | | ----- | |
| 1279 | D3242 | 0.002 | | -1.22 | |
| 1284 | D3242 | 0.015 | G(0.01) | 15.25 | |
| 1288 | | ----- | | ----- | |
| 1318 | | ----- | | ----- | |
| 1402 | D3242 | 0.004 | | 1.31 | |
| 1428 | | ----- | | ----- | |
| 1528 | D3242 | 0.0044 | | 1.82 | |
| 1531 | | ----- | | ----- | |
| 1538 | D3242 | 0.0014 | | -1.98 | |
| 1543 | | ----- | | ----- | |
| 1610 | IP354 | 0.003 | | 0.05 | |
| 1634 | | ----- | | ----- | |
| 1635 | | ----- | | ----- | |
| 1636 | D3242 | 0.00163 | | -1.69 | |
| 1651 | D3242 | 0.0013 | | -2.11 | |
| 1715 | | ----- | | ----- | |
| 1720 | | ----- | | ----- | |
| 1724 | D3242 | 0.004 | | 1.31 | |
| 1730 | | ----- | | ----- | |
| 1811 | | ----- | | ----- | |
| 1833 | D3242 | 0.0067 | | 4.73 | |
| 1842 | | ----- | | ----- | |
| 1854 | D3242 | 0.0081 | | 6.51 | |
| 1913 | D3242 | 0.0022 | | -0.97 | |
| 2129 | D3242 | 0.00200 | | -1.22 | |
| 2130 | IP354 | 0.0019 | | -1.35 | |
| 2133 | D3242 | 0.0009 | | -2.61 | |
| 2136 | D3242 | 0.0015 | | -1.85 | |

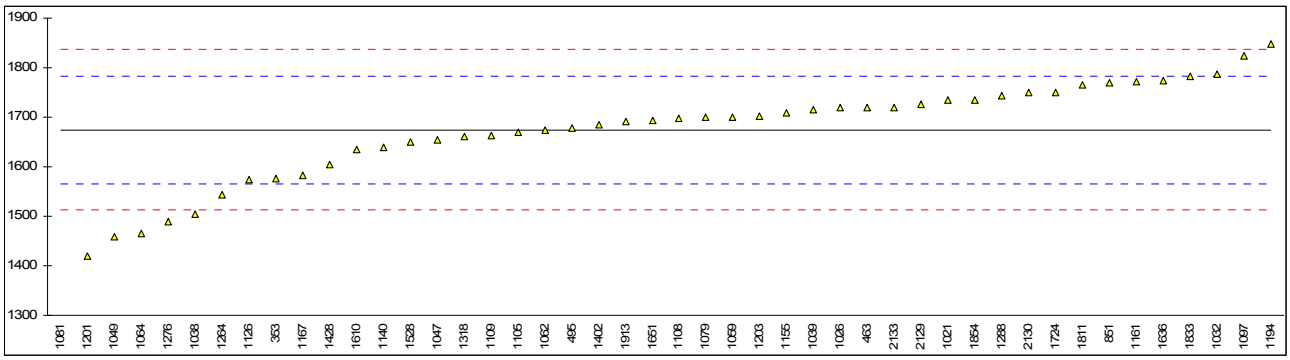
| | |
|---|---|
| normality | OK |
| n | 37 |
| outliers | 5 |
| mean (n) | 0.00296 |
| st.dev. (n) | 0.001556 |
| R(calc.) | 0.00436 |
| R(D3242:08) | 0.00221 |

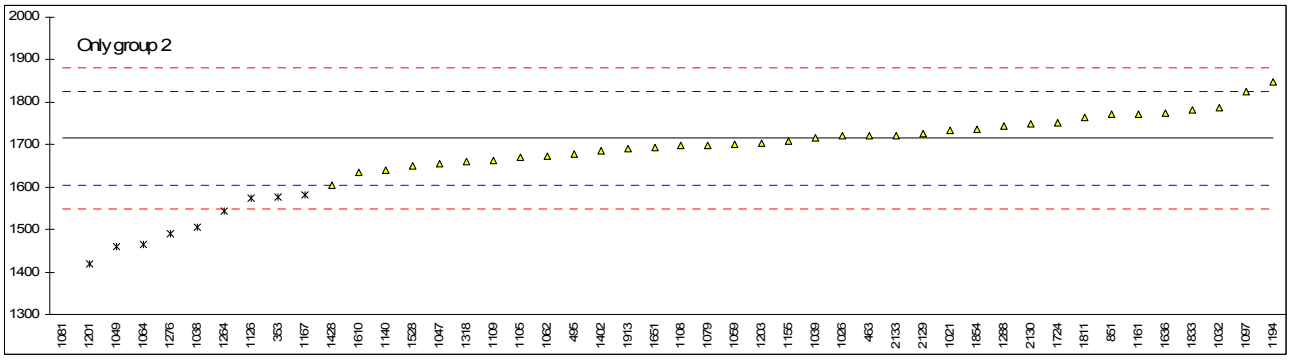

0.03
0.025
0.02
0.015
0.01
0.005
0
1017
1105
2133
1032
851
1651
1538
2136
1636
2130
2129
1279
1059
1913
1064
1079
1047
1049
1203
1038
1021
1140
1097
1039
1610
1131
1276
1081
463
1724
1402
1034
1109
1528
1026
1264
1833
1854
1284
1062
1108
1201

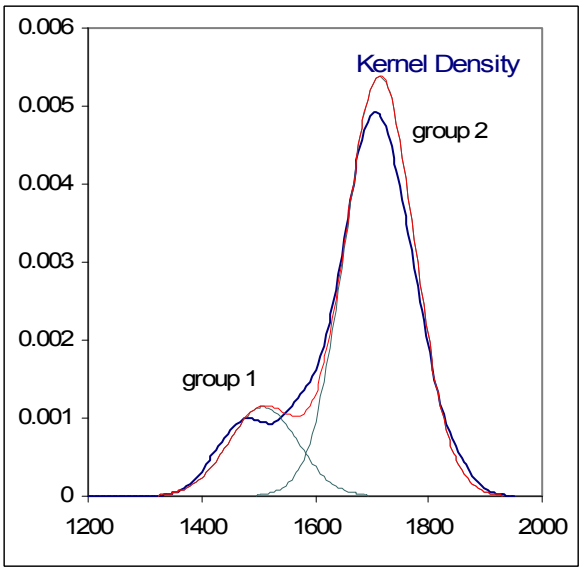

Kernel Density
300
250
200
150
100
50
0
-0.02
0
0.02
0.04
0.06
0.08

## Determination of Total Sulphur on sample #1017; results in mg/kg

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 225 | | ----- | | ----- | |
| 353 | IP336 | 1577 | ex | -2.50 | Result excluded, see paragraph 4.1 |
| 463 | D4294 | 1720 | | 0.09 | |
| 495 | D5453 | 1678 | | -0.67 | |
| 496 | | ----- | | ----- | |
| 851 | D4294 | 1770.5 | | 1.01 | |
| 1017 | | ----- | | ----- | |
| 1021 | D2622 | 1734 | | 0.35 | |
| 1026 | ISO20884 | 1720 | | 0.09 | |
| 1032 | D5453 | 1788 | | 1.32 | |
| 1034 | | ----- | | ----- | |
| 1038 | D2622 | 1505 | ex | -3.81 | Result excluded, see paragraph 4.1 |
| 1039 | D2622 | 1715 | C | 0.00 | First reported 0.1715 |
| 1047 | ISO8754 | 1655 | | -1.09 | |
| 1049 | D5453 | 1459 | ex | -4.64 | Result excluded, see paragraph 4.1 |
| 1059 | ISO14596 | 1700 | | -0.27 | |
| 1062 | D4927 | 1673 | | -0.76 | |
| 1064 | D5453 | 1465.9 | C,ex | -4.51 | First reported 0.1466, result excluded see paragraph 4.1. |
| 1079 | D5453 | 1699 | | -0.29 | |
| 1081 | ISO20846 | 740 | G(0.01) | -17.67 | |
| 1097 | D5453 | 1824 | | 1.98 | |
| 1105 | D4294 | 1670 | | -0.81 | |
| 1108 | D4294 | 1697 | | -0.33 | |
| 1109 | D4294 | 1662 | | -0.96 | |
| 1126 | ISO20846 | 1574.8 | ex | -2.54 | Result excluded, see paragraph 4.1 |
| 1131 | | ----- | | ----- | |
| 1140 | IP336 | 1640 | | -1.36 | |
| 1150 | | ----- | | ----- | |
| 1155 | D1266 | 1707.94 | | -0.13 | |
| 1161 | ISO20846 | 1771.6 | | 1.03 | |
| 1167 | ISO20846 | 1582.4 | ex | -2.40 | Result excluded, see paragraph 4.1 |
| 1194 | D4294 | 1847 | | 2.39 | |
| 1201 | D5453 | 1420 | ex | -5.35 | Result excluded, see paragraph 4.1 |
| 1203 | ISO14596 | 1702 | | -0.23 | |
| 1264 | D5453 | 1543 | ex | -3.12 | Result excluded, see paragraph 4.1 |
| 1276 | D5453 | 1490 | ex | -4.08 | Result excluded, see paragraph 4.1 |
| 1277 | | ----- | | ----- | |
| 1279 | | ----- | | ----- | |
| 1284 | | ----- | | ----- | |
| 1288 | D5453 | 1743 | | 0.51 | |
| 1318 | D4294 | 1660 | | -1.00 | |
| 1402 | IP490 | 1685 | | -0.54 | |
| 1428 | ISO8754 | 1604 | | -2.01 | |
| 1528 | D4294 | 1650 | | -1.18 | |
| 1531 | | ----- | | ----- | |
| 1538 | | ----- | | ----- | |
| 1543 | | ----- | | ----- | |
| 1610 | IP336 | 1634 | | -1.47 | |
| 1634 | | ----- | | ----- | |
| 1635 | | ----- | | ----- | |
| 1636 | D4294 | 1774 | | 1.07 | |
| 1651 | D5453 | 1693.2 | | -0.39 | |
| 1715 | | ----- | | ----- | |
| 1720 | | ----- | | ----- | |
| 1724 | ip336 | 1751 | C | 0.65 | First reported 0.1751 |
| 1730 | | ----- | | ----- | |
| 1811 | D4294 | 1765 | | 0.91 | |
| 1833 | D4294 | 1782 | | 1.22 | |
| 1842 | | ----- | | ----- | |
| 1854 | D5453 | 1735 | | 0.36 | |
| 1913 | D4294 | 1691.8 | | -0.42 | |
| 2129 | IP496 | 1726 | | 0.20 | |
| 2130 | D5453 | 1750 | | 0.64 | |
| 2133 | D4294 | 1720 | | 0.09 | |
| 2136 | | ----- | | ----- | |
| | | Only group 2 | | | All data |
| | normality | OK | | | not OK |
| | n | 36 | | | 45 |
| | outliers | 1 | | | 1 |
| | mean (n) | 1714.9 | | | 1674.6 |
| | st.dev. (n) | 53.96 | | | 98.11 |
| | R(calc.) | 151.1 | | | 274.7 |
| | R(D5453:09) | 154.5 | | | 151.8 |


1900
1800
1700
1600
1500
1400
1300
1081 1201 1049 1064 1276 1038 1264 1126 353 1167 1428 1610 1140 1528 1047 1318 1109 1105 1062 495 1402 1913 1651 1108 1079 1069 1203 1155 1039 1026 463 2133 2129 1021 1854 1288 2130 1724 1811 851 1161 1636 1833 1032 1097 1194

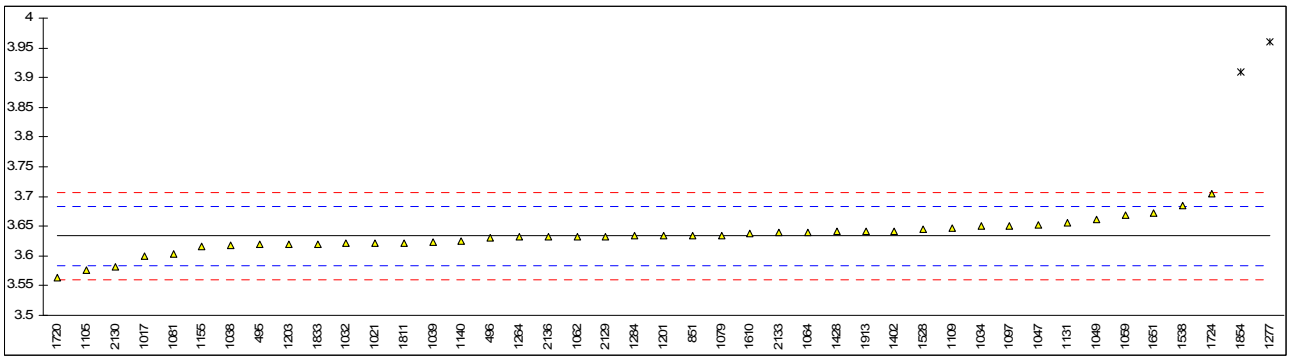

Only group 2
2000
1900
1800
1700
1600
1500
1400
1300
1081 1201 1049 1064 1276 1038 1264 1126 353 1167 1428 1610 1140 1528 1047 1318 1109 1105 1062 495 1402 1913 1651 1108 1079 1069 1203 1155 1039 1026 463 2133 2129 1021 1854 1288 2130 1724 1811 851 1161 1636 1833 1032 1097 1194

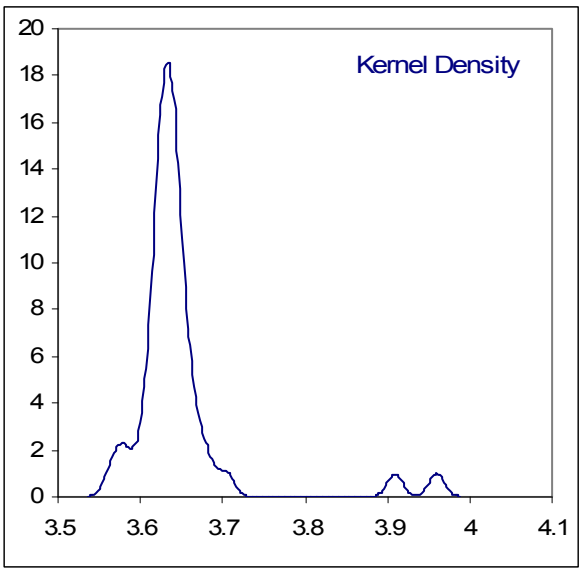

Kernel Density
group 2
group 1
0.006
0.005
0.004
0.003
0.002
0.001
0
1200
1400
1600
1800
2000

## Determination of Viscosity @ -20°C on sample #1017; results in cSt

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 225 | | ----- | | ----- | |
| 353 | | ----- | | ----- | |
| 463 | | ----- | | ----- | |
| 495 | D445 | 3.6188 | | -0.58 | |
| 496 | D445-A | 3.630 | | -0.13 | |
| 851 | D445-M | 3.634 | | 0.03 | |
| 1017 | D445-M | 3.5997 | | -1.36 | |
| 1021 | D445-M | 3.6215 | | -0.47 | |
| 1026 | | ----- | | ----- | |
| 1032 | D445 | 3.621 | | -0.49 | |
| 1034 | D445-M | 3.6508 | | 0.71 | |
| 1038 | D445-M | 3.617 | | -0.66 | |
| 1039 | D445-M | 3.624 | | -0.37 | |
| 1047 | D445-M | 3.652 | | 0.76 | |
| 1049 | D445-M | 3.6605 | | 1.11 | |
| 1059 | D445-M | 3.668 | | 1.41 | |
| 1062 | D445-M | 3.633 | | -0.01 | |
| 1064 | D445-A | 3.6400 | | 0.28 | |
| 1079 | D445-M | 3.63496 | | 0.07 | |
| 1081 | D445-M | 3.603 | | -1.22 | |
| 1097 | ISO3104-M | 3.651 | | 0.72 | |
| 1105 | D445-M | 3.5763 | C | -2.31 | First reported 3.5363 |
| 1108 | | ----- | | ----- | |
| 1109 | D445-M | 3.6459 | | 0.52 | |
| 1126 | | ----- | | ----- | |
| 1131 | D445-A | 3.6560 | | 0.93 | |
| 1140 | D445-A | 3.625 | | -0.33 | |
| 1150 | | ----- | | ----- | |
| 1155 | D445-M | 3.6159 | | -0.70 | |
| 1161 | | ----- | | ----- | |
| 1167 | | ----- | | ----- | |
| 1194 | | ----- | | ----- | |
| 1201 | D445-M | 3.634 | | 0.03 | |
| 1203 | ISO3104-M | 3.619 | | -0.57 | |
| 1264 | D7042-A | 3.6318 | | -0.06 | |
| 1276 | | ----- | | ----- | |
| 1277 | D445-M | 3.96 | G(0.01) | 13.26 | |
| 1279 | | ----- | | ----- | |
| 1284 | D445 | 3.6337 | | 0.02 | |
| 1288 | | ----- | | ----- | |
| 1318 | | ----- | | ----- | |
| 1402 | D445-M | 3.642 | | 0.36 | |
| 1428 | ISO3104-A | 3.642 | | 0.36 | |
| 1528 | D445-M | 3.64562 | | 0.50 | |
| 1531 | | ----- | | ----- | |
| 1538 | D445-M | 3.6849 | | 2.10 | |
| 1543 | | ----- | | ----- | |
| 1610 | IP71-M | 3.638 | | 0.20 | |
| 1634 | | ----- | | ----- | |
| 1635 | | ----- | | ----- | |
| 1636 | | ----- | | ----- | |
| 1651 | D445 | 3.6723 | | 1.59 | |
| 1715 | | ----- | | ----- | |
| 1720 | D445-M | 3.564 | | -2.81 | |
| 1724 | D445 | 3.705 | C | 2.91 | First reported 3.735 |
| 1730 | | ----- | | ----- | |
| 1811 | D445-A | 3.6219 | | -0.46 | |
| 1833 | D445-M | 3.62 | | -0.53 | |
| 1842 | | ----- | | ----- | |
| 1854 | D445-M | 3.909 | G(0.01) | 11.19 | |
| 1913 | D445-A | 3.6420 | | 0.36 | |
| 2129 | D445-M | 3.633 | | -0.01 | |
| 2130 | D445-M | 3.582 | | -2.08 | |
| 2133 | D445-A | 3.6386 | | 0.22 | |
| 2136 | D445-A | 3.6319 | | -0.05 | |

| | |
|---|---|
| normality | OK |
| n | 41 |
| outliers | 2 |
| mean (n) | 3.6332 |
| st.dev. (n) | 0.02640 |
| R(calc.) | 0.0739 |
| R(D445:09) | 0.0690 |


4
3.95
3.9
3.85
3.8
3.75
3.7
3.65
3.6
3.55
3.5
1720
1105
2130
1017
1081
1155
1038
495
1203
1833
1032
1021
1811
1039
1140
496
1264
2136
1062
2129
1284
1201
851
1079
1610
2133
1064
1428
1913
1402
1528
1109
1034
1097
1047
1131
1049
1059
1651
1538
1724
1854
1277


Kernel Density
20
18
16
14
12
10
8
6
4
2
0
3.5
3.6
3.7
3.8
3.9
4
4.1

Determination of Particle Size Distribution on sample #1018; results per mL

| lab | method | >4 µm | mark | >6 µm | mark | >14µm | mark | >21µm | mark | >25µm | mark | >30µm | mark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 225 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 353 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 495 | IP564 | 19507 | | 2948 | | 94 | | 19 | | 8 | | 3 | |
| 851 | IP564 | 17112.0 | | 2716.3 | | 116.1 | | 23.8 | | 7.3 | | 3.5 | |
| 1023 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1038 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1039 | IP565 | 13066 | | 1912 | | 103 | | 36 | | 21 | | 13 | |
| 1047 | ISO4407 | 2373 | ex | 1008 | ex | 206 | ex | 134 | ex | 106 | ex | 54 | ex |
| 1062 | IP564 | 10628 | DG(1) | 1703 | | 69 | | 13 | | 5 | | 2 | |
| 1079 | IP564 | 18684.4 | | 2617.0 | | 155.5 | | 50.5 | | 29.1 | | 16.1 | |
| 1081 | IP564 | 2638 | ex | 47 | ex | 1 | ex | 0 | ex | 0 | ex | 0 | ex |
| 1095 | IP564 | 21430 | | 4077 | | 129 | | 18 | | 6 | | 3 | |
| 1105 | | ----- | | ----- | | ----- | | ----- | | ----- | | ----- | |
| 1108 | IP564 | 22504 | | 2970 | | 108 | | 33 | | 20 | | 11 | |
| 1109 | IP565 | 20619.9 | | 3232.1 | | 128.1 | | 30.8 | | 15.9 | | 7.0 | |
| 1131 | IP565 | 18671 | | 4501 | | 171 | | 26 | | 10 | | 3 | |
| 1146 | IP564 | 19840.3 | | 2931.8 | | 141.9 | | 42.5 | | 19.2 | | 6.4 | |
| 1201 | IP564 | 9691 | DG(1) | 565 | G(1) | 10 | G(1) | 1 | G(1) | <1 | false - | <1 | false - |
| 1279 | IP565 | 18672.7 | | 5788.6 | DG(1) | 250.2 | G(1) | 60.9 | | 30.7 | | 12.8 | |
| 1528 | IP565 | 16213.5 | | 3295.1 | | 86 | | 16.8 | | 6.8 | | 2.9 | |
| 1724 | IP565 | 18392.3 | | 2920.6 | | 131.8 | | 31.7 | | 15.6 | | 8.5 | |
| 1811 | IP565 | 20369.1 | | 3775.9 | | 132.2 | | 30.1 | | 11.2 | | 3.7 | |
| 1833 | IP565 | 14561.7 | | 2330.5 | | 99.4 | | 22.6 | | 10.5 | | 4.5 | |
| 1913 | IP565 | 21575.1 | | 5564.9 | DG(1) | 113.9 | | 30.3 | | 15.9 | | 8.0 | |
| 2130 | IP564 | 22650.6 | | 3584.2 | | 69.6 | | 12.0 | | 4.2 | | 1.3 | |
| | normality | OK | | OK | | OK | | OK | | OK | | OK | |
| | n | 16 | | 15 | | 16 | | 16 | | 17 | | 17 | |
| | outliers | 2 | | 3 | | 2 | | 1 | | 0 | | 0 | |
| | mean (n) | 18992 | | 3034 | | 115 | | 29.2 | | 13.9 | | 6.5 | |
| | st.dev. (n) | 2714.5 | | 757.6 | | 28.7 | | 13.07 | | 8.06 | | 4.46 | |
| | R(calc.) | 7601 | | 2121 | | 80 | | 36.6 | | 22.6 | | 12.5 | |
| *) | R(IP564:10) | 3575 | | 959 | | 63 | | 37.1 | | 18.6 | | 10.7 | |
| | R(IP565:10) | 2091 | | 704 | | 71 | | 24.8 | | 14.5 | | 8.9 | |

*) IP564 is used for calculation of the z-scores

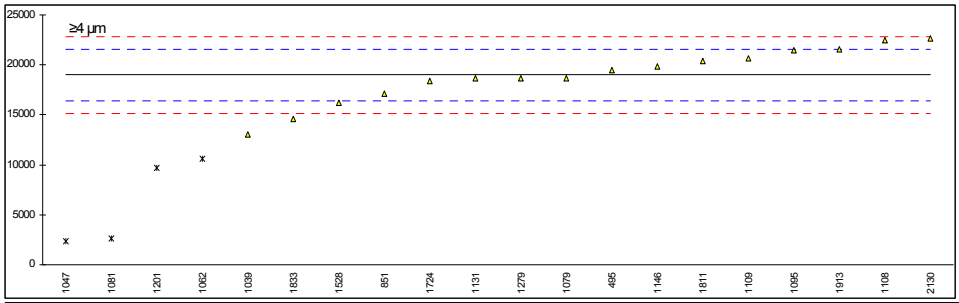
Lab 1047: results are cumulative
Lab 1081: analyzed wrong sample

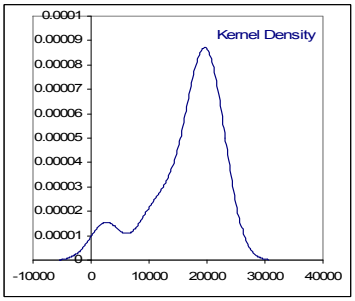
G(1) = Grubbs outlier G(0.01); DG(1) = Grubbs outlier DG(0.01)

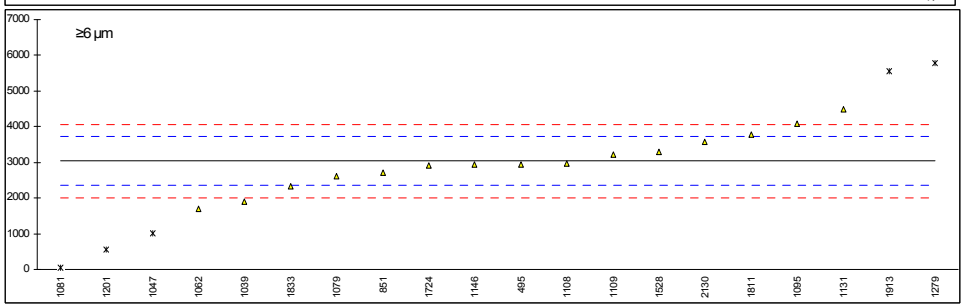
**7**

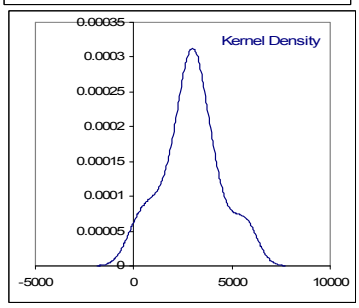
## z-scores particle size

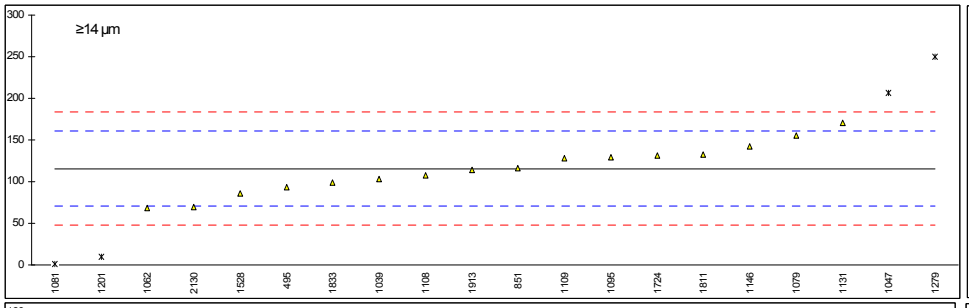
| lab | method | >4 µm | >6 µm | >14µm | >21µm | >25µm | >30µm |
|---|---|---|---|---|---|---|---|
| 225 | | ----- | ----- | ----- | ----- | ----- | ----- |
| 353 | | ----- | ----- | ----- | ----- | ----- | ----- |
| 495 | | 0.40 | -0.25 | -0.95 | -0.77 | -0.89 | -0.91 |
| 851 | | -1.47 | -0.93 | 0.03 | -0.41 | -0.99 | -0.77 |
| 1023 | | ----- | ----- | ----- | ----- | ----- | ----- |
| 1038 | | ----- | ----- | ----- | ----- | ----- | ----- |
| 1039 | | -4.64 | -3.28 | -0.55 | 0.51 | 1.07 | 1.72 |
| 1047 | | -13.02 | -5.91 | 4.00 | 7.91 | 13.85 | 12.47 |
| 1062 | | -6.55 | -3.89 | -2.06 | -1.23 | -1.34 | -1.17 |
| 1079 | | -0.24 | -1.22 | 1.77 | 1.61 | 2.28 | 2.53 |
| 1081 | | -12.81 | -8.72 | -5.07 | -2.21 | -2.09 | -1.69 |
| 1095 | | 1.91 | 3.04 | 0.60 | -0.85 | -1.19 | -0.91 |
| 1105 | | ----- | ----- | ----- | ----- | ----- | ----- |
| 1108 | | 2.75 | -0.19 | -0.33 | 0.28 | 0.92 | 1.19 |
| 1109 | | 1.28 | 0.58 | 0.56 | 0.12 | 0.30 | 0.14 |
| 1131 | | -0.25 | 4.28 | 2.45 | -0.24 | -0.59 | -0.91 |
| 1146 | | 0.66 | -0.30 | 1.17 | 1.00 | 0.80 | -0.01 |
| 1201 | | -7.29 | -7.21 | -4.67 | -2.13 | ----- | ----- |
| 1279 | | -0.25 | 8.04 | 5.96 | 2.39 | 2.53 | 1.66 |
| 1528 | | -2.18 | 0.76 | -1.31 | -0.94 | -1.07 | -0.93 |
| 1724 | | -0.47 | -0.33 | 0.72 | 0.19 | 0.25 | 0.54 |
| 1811 | | 1.08 | 2.16 | 0.74 | 0.07 | -0.41 | -0.72 |
| 1833 | | -3.47 | -2.05 | -0.71 | -0.50 | -0.51 | -0.51 |
| 1913 | | 2.02 | 7.39 | -0.07 | 0.08 | 0.30 | 0.41 |
| 2130 | | 2.87 | 1.61 | -2.03 | -1.30 | -1.46 | -1.35 |

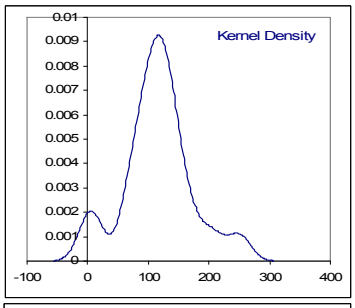

≥4 µm

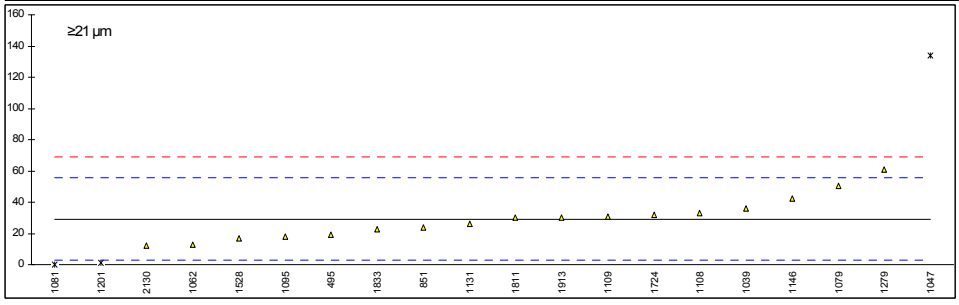

Kernel Density

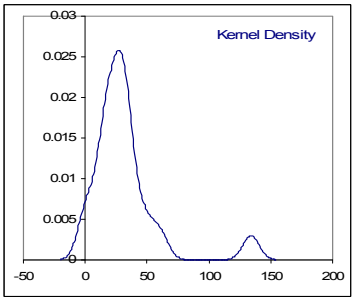

≥6 µm

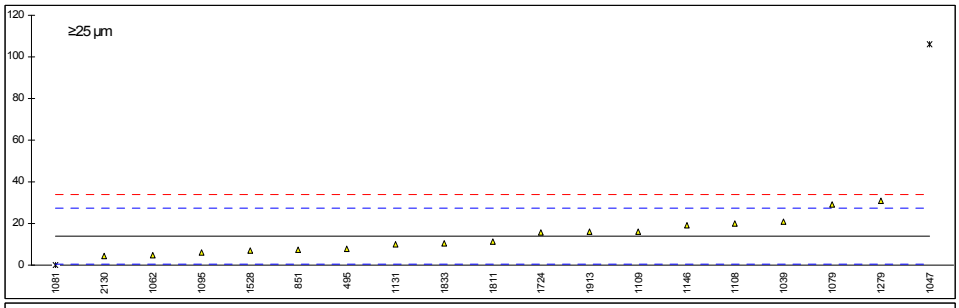

Kernel Density

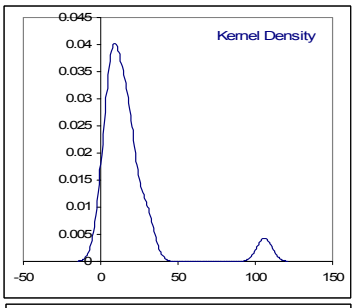

≥14 µm

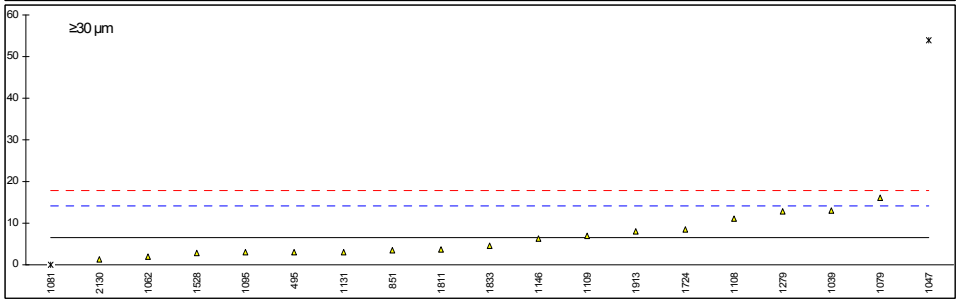

Kernel Density

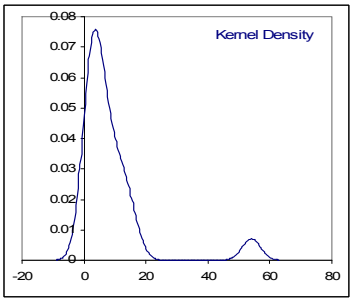

≥21 µm


Kernel Density


≥25 µm


Kernel Density


≥30 µm


Kernel Density

## APPENDIX 2

### Z-scores of individual participants for distillation of sample #1017

| lab | IBP | 10% | 50% | 90% | FBP |
|---|---|---|---|---|---|
| 225 | ----- | ----- | ----- | ----- | ----- |
| 353 | 0.00 | 0.09 | 0.84 | 1.86 | 0.93 |
| 463 | 0.44 | 1.43 | -0.01 | 0.47 | 1.17 |
| 495 | 0.13 | -0.80 | -1.23 | -0.83 | -1.51 |
| 496 | ----- | ----- | ----- | ----- | ----- |
| 851 | -0.10 | 0.46 | 0.18 | 0.15 | 0.10 |
| 1017 | 0.07 | -1.17 | -1.52 | -2.29 | -1.47 |
| 1021 | 0.00 | 0.31 | 0.27 | 1.86 | 0.26 |
| 1026 | -1.58 | 1.20 | 0.56 | 0.64 | 0.14 |
| 1032 | 0.13 | -0.21 | 0.27 | 0.72 | 0.03 |
| 1034 | 0.74 | 0.31 | -0.10 | 0.47 | 0.66 |
| 1038 | 0.84 | -0.73 | -0.67 | 0.31 | 0.07 |
| 1039 | 0.00 | 1.13 | 0.09 | 0.07 | -0.49 |
| 1047 | 0.64 | 0.09 | 0.84 | 1.78 | 0.30 |
| 1049 | -0.64 | 0.46 | -0.67 | -0.58 | -0.61 |
| 1059 | -0.20 | 0.31 | 0.93 | 0.47 | 0.38 |
| 1062 | 0.64 | 0.61 | 0.84 | 0.07 | -0.05 |
| 1064 | 1.37 | 0.16 | 0.18 | 0.96 | 0.30 |
| 1079 | 0.54 | 0.76 | -0.10 | -0.34 | -0.57 |
| 1081 | -0.30 | 0.24 | 0.27 | 1.37 | -0.76 |
| 1097 | 0.20 | -0.21 | 0.09 | 0.23 | -0.13 |
| 1105 | -0.91 | -0.36 | -0.39 | -2.05 | -3.41 |
| 1108 | 0.23 | -0.21 | -1.33 | -1.56 | 0.14 |
| 1109 | 0.20 | -0.65 | -0.20 | 0.47 | 0.10 |
| 1126 | -1.21 | -0.58 | 2.25 | -0.18 | -0.61 |
| 1131 | -0.03 | 0.98 | 0.27 | 0.39 | -0.05 |
| 1140 | 0.74 | 0.83 | 1.22 | 2.35 | 0.66 |
| 1150 | ----- | ----- | ----- | ----- | ----- |
| 1155 | 0.19 | -0.75 | -1.90 | -0.65 | 0.12 |
| 1161 | -0.72 | -0.10 | 1.50 | 0.68 | 0.20 |
| 1167 | -0.60 | -0.95 | -0.10 | -1.48 | -0.41 |
| 1194 | -6.34 | -2.51 | 1.22 | -0.83 | -0.72 |
| 1201 | 0.30 | 0.01 | -0.01 | 0.88 | -0.09 |
| 1203 | -0.57 | 0.39 | 1.31 | 0.56 | 0.26 |
| 1264 | 0.40 | 0.46 | 0.56 | -0.18 | 0.93 |
| 1276 | -0.81 | -1.47 | -1.99 | -1.72 | -0.37 |
| 1277 | -0.54 | -1.77 | -1.04 | -0.91 | 0.07 |
| 1279 | 0.07 | 0.09 | 0.09 | -0.18 | 0.54 |
| 1284 | 0.50 | 0.16 | -0.39 | -0.75 | -0.72 |
| 1288 | -0.14 | -0.21 | -0.20 | 0.07 | -0.37 |
| 1318 | 0.00 | 0.01 | -0.39 | -0.42 | 0.46 |
| 1402 | 1.24 | 0.24 | -0.39 | -1.32 | 0.03 |
| 1428 | 0.37 | 0.68 | 0.18 | -0.18 | 1.52 |
| 1528 | -0.24 | 0.46 | 0.18 | 0.23 | -0.01 |
| 1531 | 1.31 | 0.16 | 0.65 | 0.39 | 0.50 |
| 1538 | 1.58 | -0.13 | -0.39 | 0.56 | -1.16 |
| 1543 | ----- | ----- | ----- | ----- | ----- |
| 1610 | 1.01 | 0.31 | 0.37 | 1.29 | 0.26 |
| 1634 | -0.17 | 0.53 | -0.10 | 0.72 | 0.30 |
| 1635 | ----- | ----- | ----- | ----- | ----- |
| 1636 | -0.87 | -1.77 | 0.65 | 0.56 | -0.37 |
| 1651 | 0.08 | 1.15 | 0.56 | 0.19 | -0.43 |
| 1715 | 0.80 | -0.28 | -0.48 | -0.10 | 0.22 |
| 1720 | -1.44 | 0.09 | 1.03 | 1.45 | 0.93 |
| 1724 | -0.10 | 0.01 | 0.84 | 1.29 | 0.10 |
| 1730 | ----- | ----- | ----- | ----- | ----- |
| 1811 | -1.85 | -0.58 | -0.10 | -0.01 | -0.64 |
| 1833 | 0.33 | -0.13 | 0.37 | 0.31 | 0.38 |
| 1842 | ----- | ----- | ----- | ----- | ----- |
| 1854 | -0.10 | -0.65 | -1.80 | -2.21 | -0.64 |
| 1913 | -0.20 | 0.24 | -0.39 | -0.50 | 0.10 |
| 2129 | -1.44 | -1.47 | -1.33 | -1.40 | -2.14 |
| 2130 | 0.33 | -0.06 | -0.86 | -1.40 | 0.42 |
| 2133 | -0.27 | -0.06 | -0.67 | -1.40 | -0.41 |
| 2136 | -0.37 | 0.91 | 0.09 | -0.34 | -0.01 |

## APPENDIX 3
## List of participants

| Number of laboratories | Country |
|---|---|
| 2 laboratories in | AUSTRALIA |
| 5 laboratories in | BELGIUM |
| 1 laboratory in | BULGARIA |
| 1 laboratory in | CÔTE D'IVOIRE |
| 1 laboratory in | CROATIA |
| 1 laboratory in | CYPRUS |
| 1 laboratory in | CZECH REPUBLIC |
| 1 laboratory in | DENMARK |
| 1 laboratory in | FRANCE |
| 6 laboratories in | GERMANY |
| 4 laboratories in | GREECE |
| 1 laboratory in | HONG KONG |
| 2 laboratories in | HUNGARY |
| 1 laboratory in | IRELAND |
| 1 laboratory in | LITHUANIA |
| 1 laboratory in | NORWAY |
| 3 laboratories in | P.R. of CHINA |
| 2 laboratories in | POLAND |
| 1 laboratory in | PORTUGAL |
| 1 laboratory in | QATAR |
| 1 laboratory in | REPUBLIC OF MACEDONIA |
| 1 laboratory in | ROMANIA |
| 1 laboratory in | SERBIA |
| 1 laboratory in | SLOVENIA |
| 2 laboratories in | SUDAN |
| 1 laboratory in | SWEDEN |
| 6 laboratories in | THE NETHERLANDS |
| 6 laboratories in | TURKEY |
| 2 laboratories in | U.A.E. |
| 6 laboratories in | UNITED KINGDOM |
| 1 laboratory in | ZAMBIA |

**APPENDIX 4**

**Abbreviations**:

| | |
|---|---|
| C | = final result after checking of first reported suspect result |
| U | = reported in wrong unit |
| 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 |
| ex | = excluded from calculations |
| E | = error in calculations |
| n.a. | = not applicable |
| W | = withdrawn on request participant |
| fr. | = first reported |
| U | = reported in a deviating unit |
| SDS | = Safety Data Sheet |

**Literature**: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2 Defence Standard 91-91, Issue 6 Publication date 8 April '08.

3 Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS), Issue 22–28 June 2007, Bulletin No. 21.

4 ASTM E178-02

5 ASTM E1301-03

6 ISO 13528-05

7 ISO 5725, parts 1-6, 1994

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

9 W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)

10 IP 367/84

11 DIN 38402 T41/42

12 P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)

13 J.N. Miller, Analyst, 118, 455, (1993)

14 Analytical Methods Committee Technical Brief, No4 January 2001

15 The Royal Society of Chemistry 2002, Analyst 2002, 127 page1359-1364, P.J. Lowthian and M. Thompson. (see http://www.rsc.org/suppdata/an/b2/b205600n/)