# Results of Proficiency Test
# Engine Oil (fresh)
# June 2021

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

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# 1 INTRODUCTION

Since 1997 the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for the analysis of fresh Engine Oil (Lubricating Oil) in accordance with the latest version of SAE and ASTM D4485 every year. During the annual proficiency testing program 2020/2021 it was decided to continue the round robin for the analysis of Engine Oil (fresh).

In this interlaboratory study 79 laboratories in 43 countries registered for participation. See appendix 2 for the number of participants per country. In this report the results of the Engine Oil (fresh) proficiency test are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

# 2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test (PT). Sample analyzes for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC17025 accredited laboratory.
It was decided to send one 1L bottle and one 0.5L bottle with the same Engine Oil (fresh) and both bottles labelled #21075.
The participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

## 2.1 ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in agreement with ISO/IEC17043:2010 (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This PT falls under the accredited scope. This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentiality of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires.

## 2.2 PROTOCOL

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of June 2018 (iis-protocol, version 3.5). This protocol is electronically available through the iis website www.iisnl.com, from the FAQ page.

## 2.3 CONFIDENTIALITY STATEMENT

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

## 2.4 SAMPLES

A batch of approximately 180 liters fresh Diesel Engine Oil (monograde) was obtained from a third supplier. After homogenization 124 amber glass bottles of 1L and 124 amber glass bottles of 0.5L were filled and all bottles were labelled #21075.
The homogeneity of the subsamples was checked by determination of Density at 15°C in accordance with ISO12185 on 8 stratified randomly selected subsamples.

| | Density at 15°C in kg/L |
|---|---|
| Sample #21075-1 | 0.88413 |
| Sample #21075-2 | 0.88413 |
| Sample #21075-3 | 0.88413 |
| Sample #21075-4 | 0.88413 |
| Sample #21075-5 | 0.88413 |
| Sample #21075-6 | 0.88413 |
| Sample #21075-7 | 0.88413 |
| Sample #21075-8 | 0.88413 |

Table 1: homogeneity test results of subsamples #21075

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

| | Density at 15°C in kg/L |
|---|---|
| r (observed) | 0.00000 |
| reference test method | ISO12185:96 |
| 0.3 x R (reference test method) | 0.00015 |

Table 2: evaluation of the repeatability of subsamples #21075

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

To each of the participating laboratories a set of a 1L and a 0.5L bottle of Engine Oil (fresh) both items labelled #21075 were sent on May 12, 2021. An SDS was added to the sample package.

## 2.5 STABILITY OF THE SAMPLES

The stability of the fresh Engine Oil packed in amber glass bottles was checked. The material was found sufficiently stable for the period of the proficiency test.

### 2.6 ANALYZES

The participants were requested to determine: Total Acid Number, Base Number ($HClO_4$ titration), Color ASTM, Conradson Carbon Residue, Ramsbottom Carbon Residue, Carbon Residue (Micro method), Density at 15°C, Evaporation loss by Noack, Flash Point C.O.C., Flash Point PMcc, Foaming Tendency, Foam Stability, Kinematic Viscosity (40°C and 100°C), Viscosity Index, Kinematic Viscosity Stabinger (40°C and 100°C), Viscosity HTHS, Nitrogen, Pour Point (Manual and Automated), Sulfated Ash, Sulfur, Water, Calcium, Phosphorus and Zinc.
Some additional questions were asked about Total Acid Number and Foaming Characteristics.

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

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

## 3 RESULTS

During five weeks after sample dispatch, the test results of the individual laboratories were gathered via the data entry portal www.kpmd.co.uk/sgs-iis/. The reported test results are tabulated per determination in appendix 1 of this report. The laboratories are presented by their code numbers.

Directly after the deadline, a reminder was sent to those laboratories that had not reported test results at that moment. Shortly after the deadline, the available test results were screened for suspect data. A test result was called suspect in case the Huber Elimination Rule (a robust outlier test) found it to be an outlier. The laboratories that produced these suspect data were asked to check the reported test results (no reanalyzes). Additional or corrected test results are used for data analysis and the original test results are placed under 'Remarks' in the result tables in appendix 1. Test results that came in after the deadline were not taken into account in this screening for suspect data and thus these participants were not requested for checks.

### 3.1 STATISTICS

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report ‘iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation’ of June 2018 (iis-protocol, version 3.5).

For the statistical evaluation the *unrounded* (when available) figures were used instead of the rounded test results. Test results reported as '<…' or '>…' were not used in the statistical evaluation.

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

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

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

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

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

### 3.2 GRAPHICS

In order to visualize the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported test results are plotted. The corresponding laboratory numbers are on the X-axis. The straight horizontal line presents the consensus value (a trimmed mean). The four striped lines, parallel to the consensus value line, are the +3s, +2s, -2s and -3s target reproducibility limits of the selected reference test method. Outliers and other data, which were excluded from the calculations, are represented as a cross. Accepted data are represented as a triangle.

Furthermore, Kernel Density Graphs were made. This is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms.

Also, a normal Gauss curve (dotted line) was projected over the Kernel Density Graph (smooth line) for reference. The Gauss curve is calculated from the consensus value and the corresponding standard deviation.

### 3.3 Z-SCORES

To evaluate the performance of the participating laboratories the z-scores were calculated. As it was decided to evaluate the performance of the participants in this proficiency test (PT) against the literature requirements, e.g. ISO reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation in this interlaboratory study.

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

When a laboratory did use a test method with a reproducibility that is significantly different from the reproducibility of the reference test method used in this report, it is strongly advised to recalculate the z-score, while using the reproducibility of the actual test method used, this in order to evaluate whether the reported test result is fit-for-use.
The z-scores were calculated according to:

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

The $z_{(target)}$ scores are listed in the test result tables in appendix 1.

Absolute values for z<2 are very common and absolute values for z>3 are very rare. Therefore, the usual interpretation of z-scores is as follows:

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

## 4 EVALUATION

In this proficiency test some problems were encountered with the dispatch of the samples. Seven participants reported test results after the final reporting date and three other participants did not report any test results. Not all participants were able to report all tests requested.
In total 76 participants reported 1156 numerical test results. Observed were 36 outlying test results, which is 3.1%. In proficiency tests outlier percentages of 3% - 7.5% are quite normal.

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

### 4.1 EVALUATION PER TEST

In this section the reported test results are discussed per test. The test methods which were used by the various laboratories were taken into account for explaining the observed differences when possible and applicable. These test methods are also in the tables together with the original data. The abbreviations, used in these tables, are explained in appendix 3.

In the iis PT reports ASTM test methods are referred to with a number (e.g. D2270) and an added designation for the year that the test method was adopted or revised (e.g. D2270:10). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D2270:10(2016)). In the test results tables of appendix 1 only the method number and year of adoption or revision (e.g. D2270:10) will be used.

Total Acid Number: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D664-A:18e2 Inflection Point 60mL nor with the other end point modes, except for BEP at 60mL which is in agreement. When evaluated separately for the type of end point the calculated reproducibility of the group using Inflection Point was still not in agreement with the requirements of D664-A:18e2 at both titration volumes, but the group using BEP (pH 10 and 11) is in agreement at both titration volumes.

Base Number ($HClO_4$ titration): This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D2896-A:15, forward mode.

Color ASTM: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D1500:12(2017).

Conradson Carbon Residue: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D189:06(2019).

Ramsbottom Carbon Residue: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D524:15(2019).

Carbon Residue (Micro method): This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D4530:15(2020).

Density at 15°C: This determination was problematic for a number of laboratories. Five statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ISO12185:96.

Evaporation loss by Noack: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D5800:20 procedure B, but is in agreement with procedure A.
When evaluated separately for the test results of procedure A and B of ASTM D5800:20 the calculated reproducibility after rejection of the statistical outlier is still not in agreement with the requirements of procedure B.

Flash Point C.O.C.: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D92:18.

Flash Point PMcc: This determination was not problematic. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D93-A:20.

Foaming Tendency: This determination was problematic. Six statistical outliers were observed over the three sequences. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D892:18 for all three sequences.

Foam Stability: This determination was not problematic. All reporting participants agreed on a test result of 0 (Nil). Therefore, no z-scores were calculated.

Kinematic Viscosity at 40°C: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D445:21.

Kinematic Viscosity at 100°C: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D445:21.

Viscosity Index: This determination was not problematic. No statistical outliers were observed but two test results were excluded. The calculated reproducibility after rejection of the suspect data is in full agreement with the requirements of ASTM D2270:10(2016).

Kinematic Viscosity Stabinger at 40°C: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D7042:21.

Kinematic Viscosity Stabinger at 100°C: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements ASTM D7042:21.

Viscosity HTHS: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D4683:17.

Nitrogen: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D5762:18a.

Pour Point Manual: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D97:17b.

Pour Point Automated: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D5950:14(2020).

Sulfated Ash: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D874:13a(2018).

Sulfur: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D4294:16e1.

Water: This determination was problematic. Two statistical outliers were observed. A new version of ASTM D6304 was published in 2020 with major changes. In the 2016 version one precision statement was mentioned for test results based on mass with a broad application range and one based on volume. In the 2020 version all precision statements are based on mass with three different procedures (A - direct injection, B - oven accessory and C - evaporation accessory) each with a different application range. In ASTM D6304:20 the reproducibility for all three procedures A, B and C is much stricter compared to ASTM D6304:16e1. Therefore, it was decided not to calculate z-scores due to a large variation in the test results compared with the stricter requirements.

Calcium: This determination was problematic. Six statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5185:18.

Phosphorus: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D5185:18.

Zinc: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D5185:18.

### 4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

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

| Parameter | unit | n | average | 2.8 * sd | R(lit) |
|---|---|---|---|---|---|
| Total Acid Number | mg KOH/g | 45 | 2.41 | 1.13 | 0.83 |
| Base Number ($HClO_4$ titration) | mg KOH/g | 49 | 7.78 | 0.55 | 0.54 |
| Color ASTM | | 57 | 2.9 | 0.6 | 1 |
| Conradson Carbon Residue | %M/M | 17 | 0.94 | 0.16 | 0.23 |
| Ramsbottom Carbon Residue | %M/M | 5 | 0.88 | 0.16 | 0.13 |
| Carbon Residue (Micro method) | %M/M | 24 | 0.95 | 0.10 | 0.19 |
| Density at 15°C | kg/L | 60 | 0.8841 | 0.0005 | 0.0005 |
| Evaporation loss by Noack | %M/M | 18 | 5.16 | 0.91 | 0.82 |
| Flash Point C.O.C. | °C | 57 | 244.6 | 22.3 | 18 |
| Flash Point PMcc | °C | 47 | 201.1 | 5.9 | 14.3 |
| Foaming Tendency, Sequence I | mL | 29 | 0.5 | 3.9 | 0.6 |
| Foaming Tendency, Sequence II | mL | 34 | 15.2 | 23.0 | 18.7 |
| Foaming Tendency, Sequence III | mL | 29 | 0.3 | 2.8 | 1.1 |
| Foam Stability, Sequence I | mL | 34 | 0 | n.e. | n.e. |
| Foam Stability, Sequence II | mL | 34 | 0 | n.e. | n.e. |
| Foam Stability, Sequence III | mL | 34 | 0 | n.e. | n.e. |
| Kinematic Viscosity at 40°C | $mm^2/s$ | 62 | 131.04 | 1.81 | 1.60 |
| Kinematic Viscosity at 100°C | $mm^2/s$ | 59 | 14.27 | 0.14 | 0.20 |
| Viscosity Index | | 62 | 107.4 | 2.0 | 2 |
| Kin. Viscosity Stabinger at 40°C | $mm^2/s$ | 23 | 131.32 | 1.77 | 1.54 |
| Kin. Viscosity Stabinger at 100°C | $mm^2/s$ | 21 | 14.31 | 0.08 | 0.14 |
| Viscosity HTHS | mPa·s | 6 | 4.25 | 0.23 | 0.18 |
| Nitrogen | mg/kg | 14 | 809 | 254 | 215 |
| Pour Point Manual | °C | 37 | -11.0 | 5.1 | 9 |
| Pour Point Automated 1°C int. | °C | 21 | -11.6 | 5.4 | 4.5 |
| Sulfated Ash | %M/M | 35 | 0.83 | 0.22 | 0.12 |
| Sulfur | mg/kg | 36 | 4812 | 622 | 453 |
| Water | mg/kg | 38 | 242 | 399 | (91) |
| Calcium as Ca | mg/kg | 44 | 501 | 72 | 49 |
| Phosphorus as P | mg/kg | 52 | 1000 | 161 | 136 |
| Zinc as Zn | mg/kg | 53 | 1100 | 206 | 184 |

Table 3: reproducibilities of tests on sample #21075

Results between brackets should be used with due care

Without further statistical calculations it can be concluded that for many tests there is not a good compliance of the group of participants with the reference test methods. The problematic tests have been discussed in paragraph 4.1.

### 4.3 COMPARISON OF THE PROFICIENCY TEST OF JUNE 2021 WITH PREVIOUS PTS

| | June 2021 | June 2020 | June 2019 | June 2018 | June 2017 |
|---|---|---|---|---|---|
| Number of reporting laboratories | 76 | 62 | 75 | 81 | 67 |
| Number of test results | 1156 | 961 | 1157 | 1337 | 940 |
| Number of statistical outliers | 36 | 34 | 49 | 37 | 45 |
| Percentage of statistical outliers | 3.1% | 3.5% | 4.2% | 2.8% | 4.8% |

Table 4: comparison with previous proficiency tests

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

The performance of the determinations of the proficiency tests was compared to the requirements of the reference test methods. The conclusions are given in the following table.

| Determination | June 2021 | June 2020 | June 2019 | June 2018 | June 2017 |
|---|---|---|---|---|---|
| Total Acid Number | - | -- | -- | - | -- |
| Base Number ($HClO_4$ titration) | +/- | + | + | - | - |
| Color ASTM | + | + | + | + | - |
| Conradson Carbon Residue | + | + | + | +/- | + |
| Ramsbottom Carbon Residue | - | n.e. | (--) | + | + |
| Carbon Residue (Micro method) | + | + | - | + | +/- |
| Density at 15°C | +/- | + | +/- | +/- | + |
| Evaporation loss by Noack | - | + | -- | - | + |
| Flash Point C.O.C. | - | +/- | +/- | + | - |
| Flash Point PMcc | ++ | + | + | + | +/- |
| Foaming Tendency | - | - | +/- | +/- | +/- |
| Kinematic Viscosity at 40°C | - | + | + | + | + |
| Kinematic Viscosity at 100°C | + | + | +/- | + | + |
| Viscosity Index | +/- | - | - | +/- | +/- |
| Kin. Viscosity Stabinger at 40°C | - | +/- | +/- | +/- | - |
| Kin. Viscosity Stabinger at 100°C | + | + | +/- | - | - |
| Viscosity HTHS | - | - | +/- | + | + |
| Nitrogen | - | - | -- | - | - |
| Pour Point Manual | + | +/- | + | +/- | - |
| Pour Point Automated 1°C int. | - | -- | + | +/- | - |
| Sulfated Ash | - | +/- | - | - | + |
| Sulfur | - | - | (--) | - | - |
| Water | (--) | + | + | + | +/- |

| Determination | June 2021 | June 2020 | June 2019 | June 2018 | June 2017 |
|---|---|---|---|---|---|
| Calcium as Ca | - | - | + | - | + |
| Phosphorus as P | - | - | - | - | n.e. |
| Zinc as Zn | - | + | +/- | +/- | n.e. |

Table 5: comparison determinations against the reference test methods

Results between brackets: no z-scores were calculated

The following performance categories were used:

- ++ : group performed much better than the reference test method
- + : group performed better than the reference test method
- +/- : group performance equals the reference test method
- - : group performed worse than the reference test method
- -- : group performed much worse than the reference test method
- n.e. : not evaluated

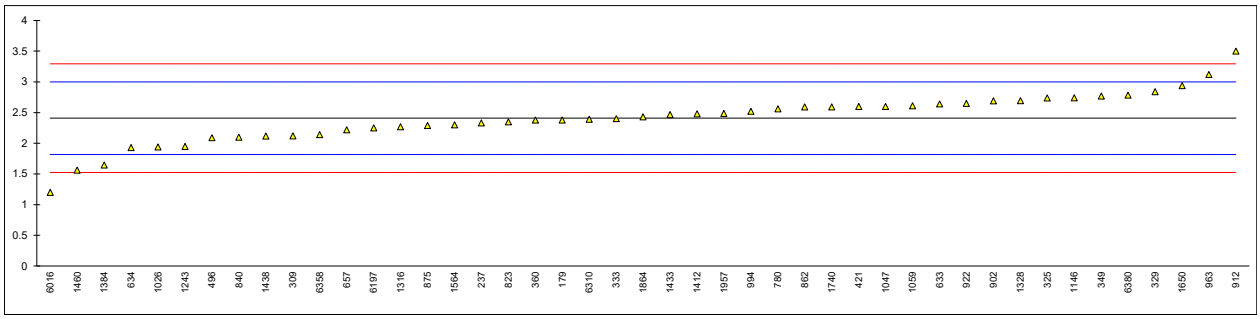
**APPENDIX 1**

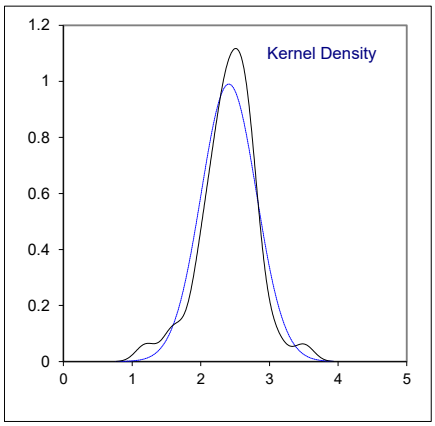
Determination of Total Acid Number on sample #21075; results in mg KOH/g

| lab | method | value | mark | z(targ) | end point type | titration volume | remarks |
|---|---|---|---|---|---|---|---|
| 178 | | ----- | | ----- | --- | --- | |
| 179 | D664-A | 2.38 | | -0.10 | Inflection Point | 60 mL | |
| 211 | | ----- | | ----- | --- | --- | |
| 219 | | ----- | | ----- | --- | --- | |
| 237 | D664-A | 2.3314 | | -0.26 | --- | --- | |
| 254 | | ----- | | ----- | --- | --- | |
| 257 | | ----- | | ----- | --- | --- | |
| 309 | D664-A | 2.12 | | -0.98 | --- | --- | |
| 325 | D664-A | 2.74 | | 1.12 | Buffer End Point (pH 11) | 125 mL | |
| 329 | D664-A | 2.84 | | 1.46 | Inflection Point | 125 mL | |
| 333 | D664-A | 2.4 | | -0.03 | Inflection Point | 125 mL | |
| 339 | | ----- | | ----- | --- | --- | |
| 349 | D664-A | 2.77 | | 1.22 | Buffer End Point (pH 10) | 125 mL | |
| 360 | D664-A | 2.380 | | -0.10 | Inflection Point | 60 mL | |
| 398 | | ----- | | ----- | --- | --- | |
| 421 | ISO6619 | 2.6 | | 0.65 | --- | --- | |
| 432 | | ----- | | ----- | --- | --- | |
| 496 | D664-A | 2.09 | | -1.08 | Buffer End Point (pH 10) | 60 mL | |
| 614 | | ----- | | ----- | --- | --- | |
| 633 | D664-A | 2.64 | | 0.78 | Inflection Point | 125 mL | |
| 634 | D664-A | 1.93 | | -1.62 | --- | --- | |
| 657 | D664-A | 2.22 | C | -0.64 | Inflection Point | 125 mL | fr. 0.55 |
| 780 | D664-A | 2.56 | | 0.51 | Buffer End Point (pH 10) | 60 mL | |
| 823 | D664-A | 2.35 | | -0.20 | Inflection Point | 125 mL | |
| 840 | D664-B | 2.10 | | -1.05 | Inflection Point | 60 mL | |
| 862 | D664-A | 2.59 | | 0.61 | Inflection Point | 60 mL | |
| 875 | D664-A | 2.29 | | -0.40 | --- | --- | |
| 902 | D664-A | 2.692 | | 0.96 | Inflection Point | 60 mL | |
| 912 | D664-A | 3.5 | | 3.69 | --- | --- | |
| 913 | | ----- | | ----- | --- | --- | |
| 922 | D664-A | 2.65 | | 0.82 | Inflection Point | 125 mL | |
| 962 | | ----- | | ----- | --- | --- | |
| 963 | D664-A | 3.12 | | 2.41 | Inflection Point | 60 mL | |
| 974 | | ----- | | ----- | --- | --- | |
| 994 | D664-A | 2.52 | | 0.38 | --- | 125 mL | |
| 1011 | | ----- | | ----- | --- | --- | |
| 1017 | | ----- | | ----- | --- | --- | |
| 1026 | D664-A | 1.94 | | -1.59 | Buffer End Point (pH 10) | 125 mL | |
| 1047 | ISO6619 | 2.6 | | 0.65 | Inflection Point | 125 mL | |
| 1059 | ISO6619 | 2.61 | | 0.68 | Buffer End Point (pH 11) | 60 mL | |
| 1146 | D664-A | 2.741 | | 1.12 | Buffer End Point (pH 10) | 125 mL | |
| 1150 | | ----- | | ----- | --- | --- | |
| 1173 | | ----- | | ----- | --- | --- | |
| 1213 | | ----- | | ----- | --- | --- | |
| 1235 | | ----- | | ----- | --- | --- | |
| 1243 | ISO6618 | 1.95 | | -1.55 | --- | --- | |
| 1316 | D664-A | 2.27 | | -0.47 | Buffer End Point (pH 10) | 60 mL | |
| 1320 | | ----- | | ----- | --- | --- | |
| 1326 | | ----- | | ----- | --- | --- | |
| 1328 | D664-A | 2.695 | | 0.97 | Inflection Point | 125 mL | |
| 1384 | ISO6618 | 1.645 | | -2.59 | --- | --- | |
| 1412 | D664-A | 2.48 | | 0.24 | Buffer End Point (pH 10) | 125 mL | |
| 1431 | | ----- | | ----- | --- | --- | |
| 1433 | D664-A | 2.4665 | | 0.20 | Inflection Point | 125 mL | |
| 1438 | | 2.119 | | -0.98 | --- | --- | |
| 1460 | D664-A | 1.5605 | | -2.87 | Inflection Point | 60 mL | |
| 1510 | | ----- | | ----- | --- | --- | |
| 1564 | D664-A | 2.30 | | -0.37 | Inflection Point | 60 mL | |
| 1650 | D664-A | 2.94 | | 1.80 | Inflection Point | 125 mL | |
| 1740 | D664-A | 2.59 | | 0.61 | --- | --- | |
| 1748 | | ----- | | ----- | --- | --- | |
| 1799 | | ----- | | ----- | --- | --- | |
| 1850 | | ----- | | ----- | --- | --- | |
| 1864 | D664-A | 2.43 | | 0.07 | Inflection Point | 60 mL | |
| 1877 | | ----- | | ----- | --- | --- | |
| 1957 | D664-A | 2.485 | | 0.26 | Buffer End Point (pH 11) | 125 mL | |
| 1969 | | ----- | | ----- | --- | --- | |
| 6016 | D664-A | 1.20 | | -4.09 | Inflection Point | 60 mL | |
| 6032 | | ----- | | ----- | --- | --- | |
| 6035 | | ----- | | ----- | --- | --- | |
| 6181 | | ----- | | ----- | --- | --- | |
| 6183 | | ----- | | ----- | --- | --- | |
| 6197 | D664-A | 2.25 | | -0.54 | Inflection Point | 60 mL | |
| 6266 | | ----- | | ----- | --- | --- | |

| lab | method | value | mark | z(targ) | end point type | titration volume | remarks |
|---|---|---|---|---|---|---|---|
| 6310 | D664-B | 2.39 | | -0.06 | Buffer End Point (pH 10) | 60 mL | |
| 6324 | | ----- | | ----- | --- | --- | |
| 6358 | D664-A | 2.141 | | -0.91 | Buffer End Point (pH 10) | 125 mL | |
| 6380 | D664-A | 2.7833 | | 1.27 | Inflection Point | 125 mL | |
| 6395 | | ----- | | ----- | --- | --- | |

| | | | Inflection Point only | BEP only |
|---|---|---|---|---|
| | normality | suspect | not OK | OK |
| | n | 45 | 22 | 12 |
| | outliers | 0 | 0 | 0 |
| | mean (n) | 2.4089 | 2.4358 | 2.4348 |
| | st.dev. (n) | 0.40271 | 0.42534 | 0.27459 |
| | R(calc.) | 1.1276 | 1.1909 | 0.7689 |
| | st.dev.(D664-A:18e2, IP 60mL) | 0.29535 | 0.29805 | --- |
| | R(D664-A:18e2, IP 60mL) | 0.8270 | 0.8345 | --- |
| Compare | | | | |
| | R(D664-A:18e2, IP 125mL) | 0.5474 | 0.5538 | --- |
| | R(D664-A:18e2, BEP 60mL) | 1.3069 | --- | 1.3206 |
| | R(D664-A:18e2, BEP 125mL) | 0.7963 | --- | 0.8053 |



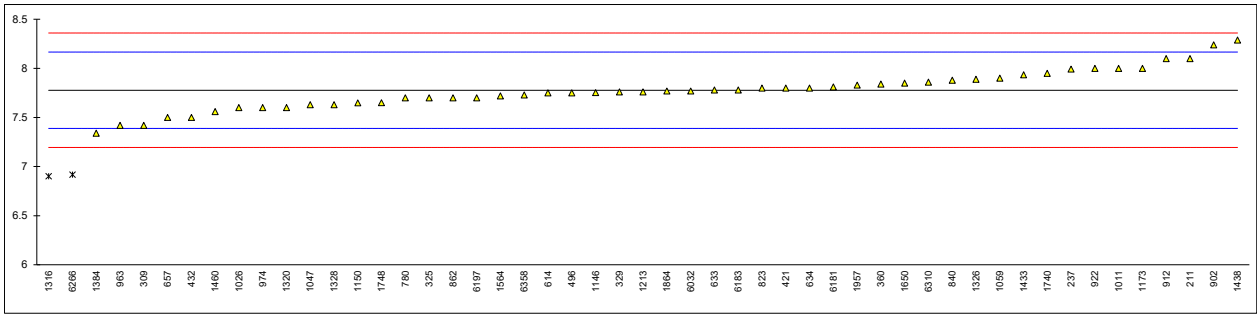



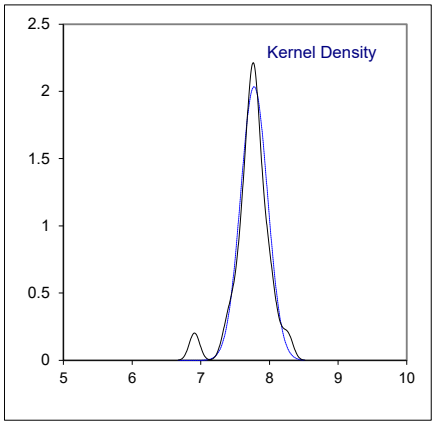
Determination of Base Number ($HClO_4$ titration) on sample #21075; results in mg KOH/g

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | | ----- | | ----- | |
| 211 | D2896-B forward | 8.1 | | 1.66 | |
| 219 | | ----- | | ----- | |
| 237 | D2896-A back | 7.993 | | 1.11 | |
| 254 | | ----- | | ----- | |
| 257 | | ----- | | ----- | |
| 309 | D2896-A forward | 7.42 | | -1.84 | |
| 325 | D2896-B forward | 7.7 | | -0.40 | |
| 329 | D2896-A forward | 7.76 | | -0.09 | |
| 333 | | ----- | | ----- | |
| 339 | | ----- | | ----- | |
| 349 | | ----- | | ----- | |
| 360 | D2896-B forward | 7.84 | | 0.32 | |
| 398 | | ----- | | ----- | |
| 421 | ISO3771 | 7.8 | | 0.12 | |
| 432 | D2896-B back | 7.5 | | -1.43 | |
| 496 | D2896-B back | 7.75 | | -0.14 | |
| 614 | D2896-B forward | 7.75 | | -0.14 | |
| 633 | D2896-A forward | 7.78 | | 0.01 | |
| 634 | D2896-B forward | 7.8 | | 0.12 | |
| 657 | D2896-B forward | 7.5 | | -1.43 | |
| 780 | D2896-B forward | 7.70 | | -0.40 | |
| 823 | D2896-A back | 7.8 | | 0.12 | |
| 840 | D2896-B forward | 7.88 | | 0.53 | |
| 862 | D2896-B forward | 7.7 | | -0.40 | |
| 875 | | ----- | | ----- | |
| 902 | D2896-B forward | 8.24 | | 2.38 | |
| 912 | D2896 | 8.1 | | 1.66 | |
| 913 | | ----- | | ----- | |
| 922 | D2896-B forward | 8.0 | | 1.15 | |
| 962 | | ----- | | ----- | |
| 963 | D2896-A forward | 7.42 | | -1.84 | |
| 974 | D2896-A back | 7.6 | | -0.91 | |
| 994 | | ----- | | ----- | |
| 1011 | D2896 | 8.0 | | 1.15 | |
| 1017 | | ----- | | ----- | |
| 1026 | D2896-B back | 7.60 | | -0.91 | |
| 1047 | PN-76/C04163 | 7.63 | | -0.76 | |
| 1059 | ISO3771 | 7.9 | | 0.63 | |
| 1146 | D2896-A forward | 7.753 | | -0.13 | |
| 1150 | BDS13727 | 7.6482 | | -0.66 | |
| 1173 | In house | 8.0 | | 1.15 | |
| 1213 | D2896-B forward | 7.76 | | -0.09 | |
| 1235 | | ----- | | ----- | |
| 1243 | | ----- | | ----- | |
| 1316 | D4739 | 6.9 | R(0.01) | -4.51 | |
| 1320 | D2896-B forward | 7.60 | | -0.91 | |
| 1326 | D2896-B forward | 7.89 | | 0.58 | |
| 1328 | D2896 | 7.63 | | -0.76 | |
| 1384 | ISO3771 | 7.34 | | -2.25 | |
| 1412 | | ----- | | ----- | |
| 1431 | | ----- | | ----- | |
| 1433 | D2896-B forward | 7.936 | | 0.82 | |
| 1438 | | 8.288 | | 2.63 | |
| 1460 | D2896 | 7.560 | | -1.12 | |
| 1510 | | ----- | | ----- | |
| 1564 | D2896-B back | 7.72 | | -0.29 | |
| 1650 | D2896-A forward | 7.85 | | 0.37 | |
| 1740 | ISO3771 | 7.95 | | 0.89 | |
| 1748 | D2896-A forward | 7.65 | | -0.65 | |
| 1799 | | ----- | | ----- | |
| 1850 | | ----- | | ----- | |
| 1864 | D2896-B forward | 7.77 | | -0.04 | |
| 1877 | | ----- | | ----- | |
| 1957 | D2896-A back | 7.830 | | 0.27 | |
| 1969 | | ----- | | ----- | |
| 6016 | | ----- | | ----- | |
| 6032 | D2896-B forward | 7.77 | | -0.04 | |
| 6035 | | ----- | | ----- | |
| 6181 | D2896-A forward | 7.81 | | 0.17 | |
| 6183 | D2896-A forward | 7.78 | | 0.01 | |
| 6197 | D2896-B forward | 7.70 | | -0.40 | |
| 6266 | ISO3771 | 6.918 | R(0.01) | -4.42 | |
| 6310 | D2896-B back | 7.86 | | 0.43 | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | |
| 6358 | D2896-A forward | 7.73 | | -0.24 | |
| 6380 | | ----- | | ----- | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 49 |
| outliers | 2 |
| mean (n) | 7.777 |
| st.dev. (n) | 0.1960 |
| R(calc.) | 0.549 |
| st.dev.(D2896-A:15 forward) | 0.1944 |
| R(D2896-A:15 forward) | 0.544 |



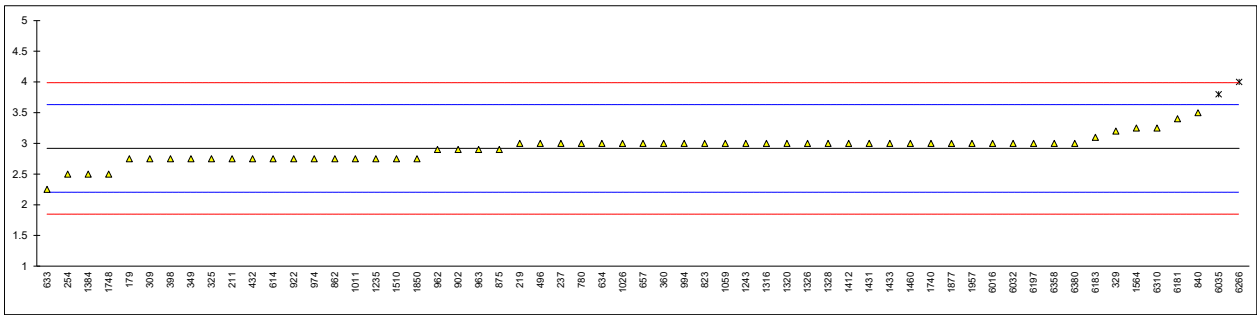
## Determination of Color ASTM on sample #21075

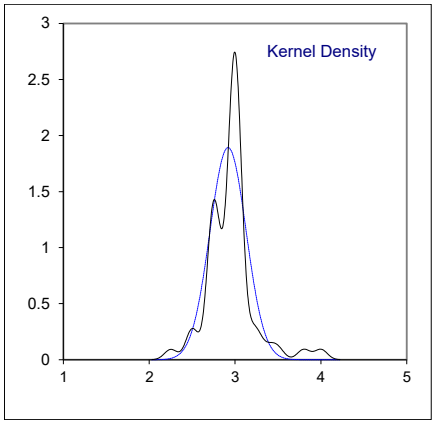
| lab | method | value | iis conversion * | mark | z(targ) | remarks |
|---|---|---|---|---|---|---|
| 178 | | ----- | ----- | | ----- | |
| 179 | D1500 | L3.0 | 2.75 | | -0.47 | |
| 211 | D1500 | L3.0 | 2.75 | | -0.47 | |
| 219 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 237 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 254 | D1500 | 2.5 | 2.5 | | -1.17 | |
| 257 | | ----- | ----- | | ----- | |
| 309 | D1500 | <3.0 | 2.75 | | -0.47 | |
| 325 | D6045 | L3.0 | 2.75 | | -0.47 | |
| 329 | D1500 | 3.2 | 3.2 | | 0.79 | |
| 333 | | ----- | ----- | | ----- | |
| 339 | | ----- | ----- | | ----- | |
| 349 | D6045 | L3,0 | 2.75 | | -0.47 | |
| 360 | ISO2049 | 3.0 | 3.0 | | 0.23 | |
| 398 | D1500 | L3,0 | 2.75 | | -0.47 | |
| 421 | | ----- | ----- | | ----- | |
| 432 | ISO2049 | L3,0 | 2.75 | | -0.47 | |
| 496 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 614 | D1500 | <3.0 | 2.75 | | -0.47 | |
| 633 | D1500 | L2.5 | 2.25 | | -1.87 | |
| 634 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 657 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 780 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 823 | D1500 | 3 | 3 | | 0.23 | |
| 840 | D1500 | 3.5 | 3.5 | | 1.63 | |
| 862 | D1500 | L3.0 | 2.75 | | -0.47 | |
| 875 | D6045 | 2.9 | 2.9 | | -0.05 | |
| 902 | D1500 | 2.9 | 2.9 | | -0.05 | |
| 912 | | ----- | ----- | | ----- | |
| 913 | | ----- | ----- | | ----- | |
| 922 | D1500 | L3.0 | 2.75 | | -0.47 | |
| 962 | D1500 | 2.9 | 2.9 | | -0.05 | |
| 963 | D1500 | 2.9 | 2.9 | | -0.05 | |
| 974 | D1500 | L3.0 | 2.75 | | -0.47 | |
| 994 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 1011 | D6045 | L3.0 | 2.75 | | -0.47 | |
| 1017 | | ----- | ----- | | ----- | |
| 1026 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 1047 | | ----- | ----- | | ----- | |
| 1059 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 1146 | | ----- | ----- | | ----- | |
| 1150 | | ----- | ----- | | ----- | |
| 1173 | | ----- | ----- | | ----- | |
| 1213 | | ----- | ----- | | ----- | |
| 1235 | ISO2049 | L3,0 | 2.75 | | -0.47 | |
| 1243 | ISO2049 | 3.0 | 3.0 | | 0.23 | |
| 1316 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 1320 | D1500 | 3 | 3 | | 0.23 | |
| 1326 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 1328 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 1384 | ISO2049 | 2.5 | 2.5 | | -1.17 | |
| 1412 | D1500 | 3 | 3 | | 0.23 | |
| 1431 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 1433 | D6045 | 3.0 | 3.0 | | 0.23 | |
| 1438 | | ----- | ----- | | ----- | |
| 1460 | D6045 | 3.0 | 3.0 | | 0.23 | |
| 1510 | D1500 | L3.0 | 2.75 | | -0.47 | |
| 1564 | D1500 | L3.5 | 3.25 | | 0.93 | |
| 1650 | | ----- | ----- | | ----- | |
| 1740 | D1500 | 3 | 3 | | 0.23 | |
| 1748 | D1500 | 2.5 | 2.5 | | -1.17 | |
| 1799 | | ----- | ----- | | ----- | |
| 1850 | D1500 | L3,0 | 2.75 | | -0.47 | |
| 1864 | | ----- | ----- | | ----- | |
| 1877 | D6045 | 3.0 | 3.0 | | 0.23 | |
| 1957 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 1969 | | ----- | ----- | | ----- | |
| 6016 | D1500 | 3 | 3 | | 0.23 | |
| 6032 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 6035 | D6045 | 3.8 | 3.8 | C,R(0.01) | 2.47 | first reported 5.4 |
| 6181 | D1500 | 3.4 | 3.4 | | 1.35 | |
| 6183 | D1500 | 3.1 | 3.1 | | 0.51 | |
| 6197 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 6266 | D1500 | 4.0 | 4.0 | R(0.01) | 3.03 | |

| lab | method | value | iis conversion * | mark | z(targ) | remarks |
|---|---|---|---|---|---|---|
| 6310 | D1500 | L3.5 | 3.25 | | 0.93 | |
| 6324 | | ----- | ----- | | ----- | |
| 6358 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 6380 | D1500 | 3.0 | 3.0 | | 0.23 | |
| 6395 | | ----- | ----- | | ----- | |

| | |
|---|---|
| normality | suspect |
| n | 57 |
| outliers | 2 |
| mean (n) | 2.92 |
| st.dev. (n) | 0.211 |
| R(calc.) | 0.59 |
| st.dev.(D1500:12) | 0.357 |
| R(D1500:12) | 1 |

*) In the calculation of the mean, standard deviation and the reproducibility in this column, a reported value of 'L y' is changed tot y-0.25 (for example L3.5 into 3.25)



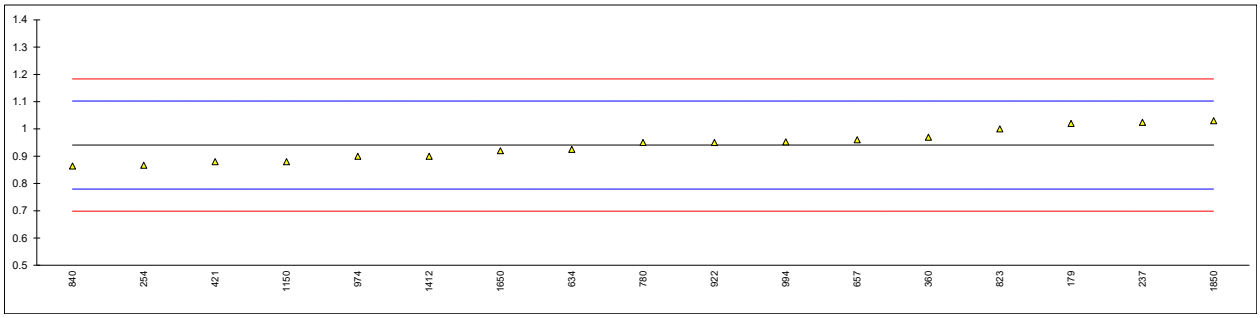



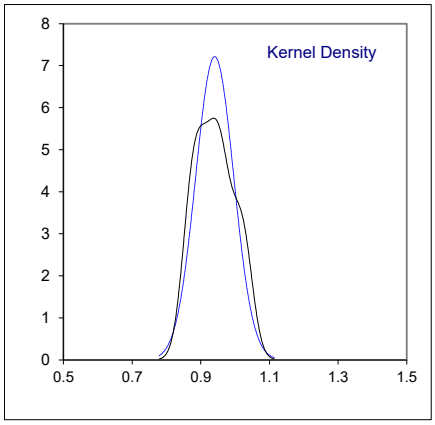
## Determination of Conradson Carbon Residue on sample #21075; results in %M/M

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | D189 | 1.02 | | 0.98 | |
| 211 | | ----- | | ----- | |
| 219 | | ----- | | ----- | |
| 237 | D189 | 1.024 | | 1.03 | |
| 254 | D189 | 0.867 | | -0.91 | |
| 257 | | ----- | | ----- | |
| 309 | | ----- | | ----- | |
| 325 | | ----- | | ----- | |
| 329 | | ----- | | ----- | |
| 333 | | ----- | | ----- | |
| 339 | | ----- | | ----- | |
| 349 | | ----- | | ----- | |
| 360 | D189 | 0.97 | | 0.36 | |
| 398 | | ----- | | ----- | |
| 421 | ISO6615 | 0.88 | | -0.75 | |
| 432 | | ----- | | ----- | |
| 496 | | ----- | | ----- | |
| 614 | | ----- | | ----- | |
| 633 | | ----- | | ----- | |
| 634 | D189 | 0.925 | | -0.20 | |
| 657 | D189 | 0.96 | | 0.24 | |
| 780 | D189 | 0.95 | | 0.11 | |
| 823 | D189 | 1.00 | | 0.73 | |
| 840 | D189 | 0.864 | | -0.95 | |
| 862 | | ----- | | ----- | |
| 875 | | ----- | | ----- | |
| 902 | | ----- | | ----- | |
| 912 | | ----- | | ----- | |
| 913 | | ----- | | ----- | |
| 922 | D189 | 0.95 | | 0.11 | |
| 962 | | ----- | | ----- | |
| 963 | | ----- | | ----- | |
| 974 | D189 | 0.90 | | -0.50 | |
| 994 | D189 | 0.953 | | 0.15 | |
| 1011 | | ----- | | ----- | |
| 1017 | | ----- | | ----- | |
| 1026 | | ----- | | ----- | |
| 1047 | | ----- | | ----- | |
| 1059 | | ----- | | ----- | |
| 1146 | | ----- | | ----- | |
| 1150 | ISO6615 | 0.88 | | -0.75 | |
| 1173 | | ----- | | ----- | |
| 1213 | | ----- | | ----- | |
| 1235 | | ----- | | ----- | |
| 1243 | | ----- | | ----- | |
| 1316 | | ----- | | ----- | |
| 1320 | | ----- | | ----- | |
| 1326 | | ----- | | ----- | |
| 1328 | | ----- | | ----- | |
| 1384 | | ----- | | ----- | |
| 1412 | D189 | 0.90 | | -0.50 | |
| 1431 | | ----- | | ----- | |
| 1433 | | ----- | | ----- | |
| 1438 | | ----- | | ----- | |
| 1460 | | ----- | | ----- | |
| 1510 | | ----- | | ----- | |
| 1564 | | ----- | | ----- | |
| 1650 | D189 | 0.920 | | -0.26 | |
| 1740 | | ----- | | ----- | |
| 1748 | | ----- | | ----- | |
| 1799 | | ----- | | ----- | |
| 1850 | D189 | 1.03 | | 1.11 | |
| 1864 | | ----- | | ----- | |
| 1877 | | ----- | | ----- | |
| 1957 | | ----- | | ----- | |
| 1969 | | ----- | | ----- | |
| 6016 | | ----- | | ----- | |
| 6032 | | ----- | | ----- | |
| 6035 | | ----- | | ----- | |
| 6181 | | ----- | | ----- | |
| 6183 | | ----- | | ----- | |
| 6197 | | ----- | | ----- | |
| 6266 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6310 | | ----- | | ----- | |
| 6324 | | ----- | | ----- | |
| 6358 | | ----- | | ----- | |
| 6380 | | ----- | | ----- | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 17 |
| outliers | 0 |
| mean (n) | 0.941 |
| st.dev. (n) | 0.0553 |
| R(calc.) | 0.155 |
| st.dev.(D189:06) | 0.0807 |
| R(D189:06) | 0.226 |



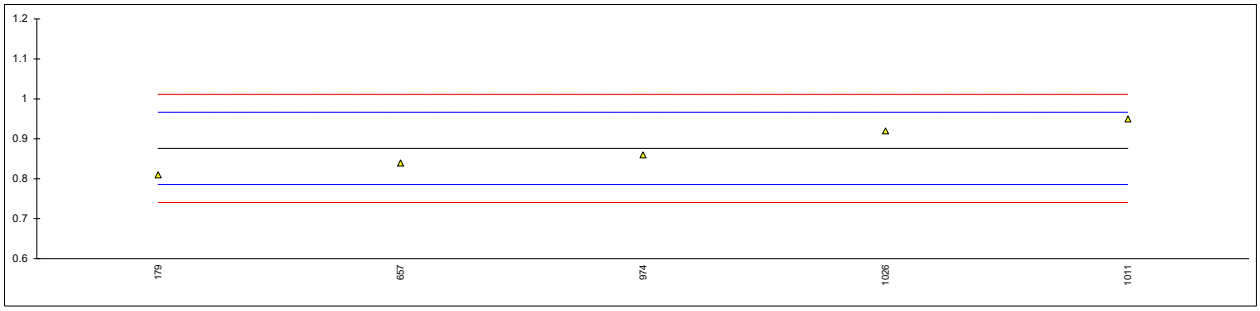



## Determination of Ramsbottom Carbon Residue on sample #21075; results in %M/M

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | D524 | 0.81 | | -1.46 | |
| 211 | | ----- | | ----- | |
| 219 | | ----- | | ----- | |
| 237 | | ----- | | ----- | |
| 254 | | ----- | | ----- | |
| 257 | | ----- | | ----- | |
| 309 | | ----- | | ----- | |
| 325 | | ----- | | ----- | |
| 329 | | ----- | | ----- | |
| 333 | | ----- | | ----- | |
| 339 | | ----- | | ----- | |
| 349 | | ----- | | ----- | |
| 360 | | ----- | | ----- | |
| 398 | | ----- | | ----- | |
| 421 | | ----- | | ----- | |
| 432 | | ----- | | ----- | |
| 496 | | ----- | | ----- | |
| 614 | | ----- | | ----- | |
| 633 | | ----- | | ----- | |
| 634 | | ----- | | ----- | |
| 657 | D524 | 0.84 | | -0.80 | |
| 780 | | ----- | | ----- | |
| 823 | | ----- | | ----- | |
| 840 | | ----- | | ----- | |
| 862 | | ----- | | ----- | |
| 875 | | ----- | | ----- | |
| 902 | | ----- | | ----- | |
| 912 | | ----- | | ----- | |
| 913 | | ----- | | ----- | |
| 922 | | ----- | | ----- | |
| 962 | | ----- | | ----- | |
| 963 | | ----- | | ----- | |
| 974 | D524 | 0.86 | | -0.35 | |
| 994 | | ----- | | ----- | |
| 1011 | D524 | 0.95 | | 1.64 | |
| 1017 | | ----- | | ----- | |
| 1026 | D524 | 0.92 | C | 0.97 | first reported 0.03 |
| 1047 | | ----- | | ----- | |
| 1059 | | ----- | | ----- | |
| 1146 | | ----- | | ----- | |
| 1150 | | ----- | | ----- | |
| 1173 | | ----- | | ----- | |
| 1213 | | ----- | | ----- | |
| 1235 | | ----- | | ----- | |
| 1243 | | ----- | | ----- | |
| 1316 | | ----- | | ----- | |
| 1320 | | ----- | | ----- | |
| 1326 | | ----- | | ----- | |
| 1328 | | ----- | | ----- | |
| 1384 | | ----- | | ----- | |
| 1412 | | ----- | | ----- | |
| 1431 | | ----- | | ----- | |
| 1433 | | ----- | | ----- | |
| 1438 | | ----- | | ----- | |
| 1460 | | ----- | | ----- | |
| 1510 | | ----- | | ----- | |
| 1564 | | ----- | | ----- | |
| 1650 | | ----- | | ----- | |
| 1740 | | ----- | | ----- | |
| 1748 | | ----- | | ----- | |
| 1799 | | ----- | | ----- | |
| 1850 | | ----- | | ----- | |
| 1864 | | ----- | | ----- | |
| 1877 | | ----- | | ----- | |
| 1957 | | ----- | | ----- | |
| 1969 | | ----- | | ----- | |
| 6016 | | ----- | | ----- | |
| 6032 | | ----- | | ----- | |
| 6035 | | ----- | | ----- | |
| 6181 | | ----- | | ----- | |
| 6183 | | ----- | | ----- | |
| 6197 | | ----- | | ----- | |
| 6266 | | ----- | | ----- | |
| 6310 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | |
| 6358 | | ----- | | ----- | |
| 6380 | | ----- | | ----- | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | unknown |
| n | 5 |
| outliers | 0 |
| mean (n) | 0.876 |
| st.dev. (n) | 0.0577 |
| R(calc.) | 0.162 |
| st.dev.(D524:15) | 0.04516 |
| R(D524:15) | 0.126 |

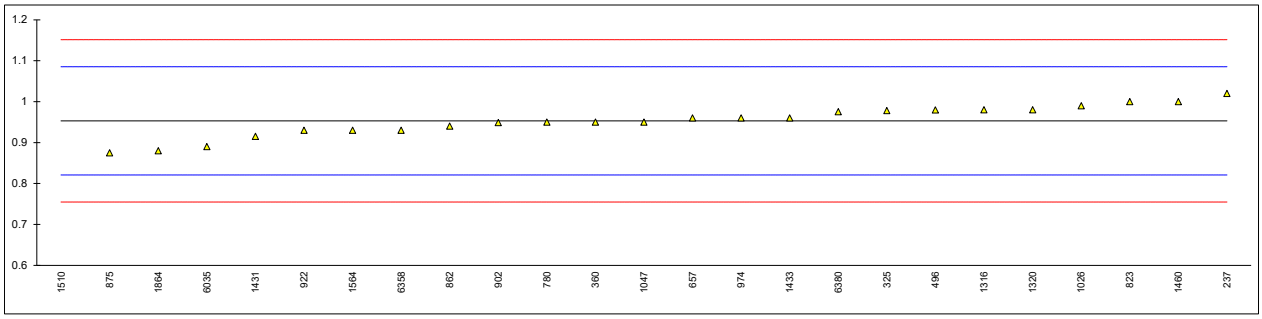


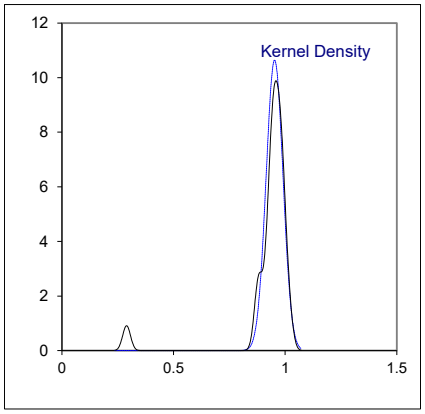
## Determination of Carbon Residue (Micro method) on sample #21075; results in %M/M

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | | ----- | | ----- | |
| 211 | | ----- | | ----- | |
| 219 | | ----- | | ----- | |
| 237 | D4530 | 1.02 | | 1.01 | |
| 254 | | ----- | | ----- | |
| 257 | | ----- | | ----- | |
| 309 | | ----- | | ----- | |
| 325 | D4530 | 0.978 | | 0.38 | |
| 329 | | ----- | | ----- | |
| 333 | | ----- | | ----- | |
| 339 | | ----- | | ----- | |
| 349 | | ----- | | ----- | |
| 360 | D4530 | 0.95 | | -0.05 | |
| 398 | | ----- | | ----- | |
| 421 | | ----- | | ----- | |
| 432 | | ----- | | ----- | |
| 496 | D4530 | 0.9795 | | 0.40 | |
| 614 | | ----- | | ----- | |
| 633 | | ----- | | ----- | |
| 634 | | ----- | | ----- | |
| 657 | D4530 | 0.96 | | 0.11 | |
| 780 | D4530 | 0.95 | | -0.05 | |
| 823 | ISO10370 | 1.00 | | 0.71 | |
| 840 | | ----- | | ----- | |
| 862 | D4530 | 0.94 | | -0.20 | |
| 875 | D4530 | 0.875 | | -1.18 | |
| 902 | D4530 | 0.949 | | -0.06 | |
| 912 | | ----- | | ----- | |
| 913 | | ----- | | ----- | |
| 922 | D4530 | 0.93 | | -0.35 | |
| 962 | | ----- | | ----- | |
| 963 | | ----- | | ----- | |
| 974 | D4530 | 0.96 | | 0.11 | |
| 994 | | ----- | | ----- | |
| 1011 | | ----- | | ----- | |
| 1017 | | ----- | | ----- | |
| 1026 | D4530 | 0.99 | | 0.56 | |
| 1047 | ISO10370 | 0.95 | | -0.05 | |
| 1059 | | ----- | | ----- | |
| 1146 | | ----- | | ----- | |
| 1150 | | ----- | | ----- | |
| 1173 | | ----- | | ----- | |
| 1213 | D4530 | <0.1 | | <-12.91 | possibly a false negative test result? |
| 1235 | | ----- | | ----- | |
| 1243 | | ----- | | ----- | |
| 1316 | D4530 | 0.98 | | 0.41 | |
| 1320 | D4530 | 0.98 | | 0.41 | |
| 1326 | | ----- | | ----- | |
| 1328 | | ----- | | ----- | |
| 1384 | | ----- | | ----- | |
| 1412 | | ----- | | ----- | |
| 1431 | D4530 | 0.915 | | -0.57 | |
| 1433 | D4530 | 0.96 | | 0.11 | |
| 1438 | | ----- | | ----- | |
| 1460 | D524 | 1.0 | | 0.71 | |
| 1510 | D4530 | 0.290 | R(0.01) | -10.03 | |
| 1564 | D4530 | 0.93 | | -0.35 | |
| 1650 | | ----- | | ----- | |
| 1740 | | ----- | | ----- | |
| 1748 | | ----- | | ----- | |
| 1799 | | ----- | | ----- | |
| 1850 | | ----- | | ----- | |
| 1864 | ISO10370 | 0.88 | | -1.10 | |
| 1877 | | ----- | | ----- | |
| 1957 | | ----- | | ----- | |
| 1969 | | ----- | | ----- | |
| 6016 | | ----- | | ----- | |
| 6032 | | ----- | | ----- | |
| 6035 | ISO10370 | 0.89 | | -0.95 | |
| 6181 | | ----- | | ----- | |
| 6183 | | ----- | | ----- | |
| 6197 | | ----- | | ----- | |
| 6266 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6310 | | ----- | | ----- | |
| 6324 | | ----- | | ----- | |
| 6358 | ISO10370 | 0.93 | | -0.35 | |
| 6380 | D4530 | 0.9754 | | 0.34 | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 24 |
| outliers | 1 |
| mean (n) | 0.953 |
| st.dev. (n) | 0.0375 |
| R(calc.) | 0.105 |
| st.dev.(D4530:15) | 0.0661 |
| R(D4530:15) | 0.185 |



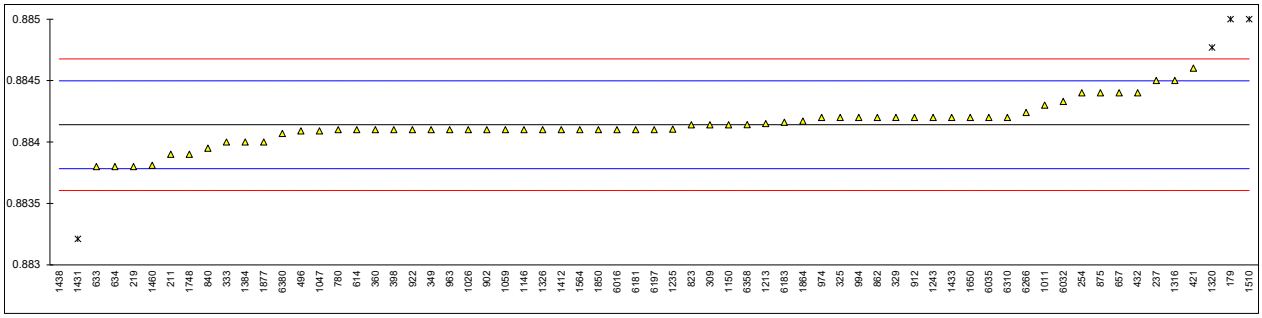



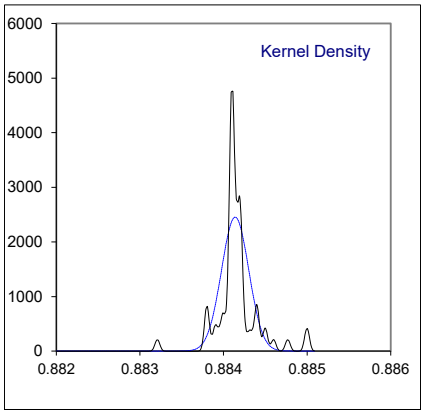
## Determination of Density at 15°C on sample #21075; results in kg/L

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | D1298 | 0.8850 | R(0.01) | 4.81 | |
| 211 | D4052 | 0.8839 | | -1.35 | |
| 219 | D1298 | 0.8838 | | -1.91 | |
| 237 | D4052 | 0.8845 | | 2.01 | |
| 254 | D4052 | 0.8844 | | 1.45 | |
| 257 | | ----- | | ----- | |
| 309 | D4052 | 0.88414 | | 0.00 | |
| 325 | D4052 | 0.8842 | | 0.33 | |
| 329 | D4052 | 0.8842 | | 0.33 | |
| 333 | D4052 | 0.8840 | | -0.79 | |
| 339 | | ----- | | ----- | |
| 349 | D4052 | 0.8841 | | -0.23 | |
| 360 | ISO12185 | 0.8841 | | -0.23 | |
| 398 | ISO12185 | 0.8841 | | -0.23 | |
| 421 | ISO12185 | 0.8846 | | 2.57 | |
| 432 | D4052 | 0.8844 | | 1.45 | |
| 496 | ISO12185 | 0.88409 | | -0.28 | |
| 614 | D4052 | 0.8841 | | -0.23 | |
| 633 | D1298 | 0.8838 | | -1.91 | |
| 634 | D4052 | 0.8838 | | -1.91 | |
| 657 | D4052 | 0.8844 | | 1.45 | |
| 780 | ISO12185 | 0.8841 | | -0.23 | |
| 823 | D4052 | 0.88414 | | 0.00 | |
| 840 | D4052 | 0.88395 | | -1.07 | |
| 862 | D4052 | 0.8842 | | 0.33 | |
| 875 | D4052 | 0.8844 | | 1.45 | |
| 902 | D4052 | 0.8841 | | -0.23 | |
| 912 | ISO12185 | 0.8842 | | 0.33 | |
| 913 | | ----- | | ----- | |
| 922 | D4052 | 0.8841 | | -0.23 | |
| 962 | | ----- | | ----- | |
| 963 | D4052 | 0.8841 | | -0.23 | |
| 974 | D4052 | 0.8842 | | 0.33 | |
| 994 | ISO12185 | 0.8842 | | 0.33 | |
| 1011 | D4052 | 0.8843 | | 0.89 | |
| 1017 | | ----- | | ----- | |
| 1026 | D4052 | 0.8841 | | -0.23 | |
| 1047 | ISO12185 | 0.88409 | | -0.28 | |
| 1059 | ISO12185 | 0.8841 | | -0.23 | |
| 1146 | D4052 | 0.8841 | | -0.23 | |
| 1150 | ISO12185 | 0.88414 | | 0.00 | |
| 1173 | | ----- | | ----- | |
| 1213 | D4052 | 0.88415 | | 0.05 | |
| 1235 | ISO12185 | 0.884105 | | -0.20 | |
| 1243 | ISO12185 | 0.8842 | | 0.33 | |
| 1316 | D4052 | 0.8845 | | 2.01 | |
| 1320 | ISO12185 | 0.88477 | R(0.05) | 3.52 | |
| 1326 | D4052 | 0.8841 | C | -0.23 | reported 884.1 kg/L |
| 1328 | | ----- | | ----- | |
| 1384 | ISO3675 | 0.884 | | -0.79 | |
| 1412 | D4052 | 0.8841 | | -0.23 | |
| 1431 | D4052 | 0.88321 | R(0.01) | -5.21 | |
| 1433 | ISO12185 | 0.8842 | | 0.33 | |
| 1438 | | 0.880 | R(0.01) | -23.19 | |
| 1460 | D4052 | 0.88381 | | -1.85 | |
| 1510 | ISO12185 | 0.8850 | R(0.01) | 4.81 | |
| 1564 | D4052 | 0.8841 | | -0.23 | |
| 1650 | D4052 | 0.8842 | | 0.33 | |
| 1740 | | ----- | | ----- | |
| 1748 | D4052 | 0.8839 | | -1.35 | |
| 1799 | | ----- | | ----- | |
| 1850 | D4052 | 0.8841 | | -0.23 | |
| 1864 | ISO12185 | 0.88417 | | 0.16 | |
| 1877 | D4052 | 0.88400 | | -0.79 | |
| 1957 | | ----- | | ----- | |
| 1969 | | ----- | | ----- | |
| 6016 | D4052 | 0.8841 | | -0.23 | |
| 6032 | D4052 | 0.88433 | | 1.06 | |
| 6035 | ISO12185 | 0.8842 | C | 0.33 | first reported 884.7 kg/m$^3$ |
| 6181 | ISO12185 | 0.8841 | | -0.23 | |
| 6183 | D4052 | 0.884161 | | 0.11 | |
| 6197 | D4052 | 0.8841 | | -0.23 | |
| 6266 | D4052 | 0.88424 | | 0.56 | |
| 6310 | D4052 | 0.8842 | | 0.33 | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | |
| 6358 | ISO12185 | 0.884141 | | 0.00 | |
| 6380 | D4052 | 0.88407 | | -0.40 | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | suspect |
| n | 60 |
| outliers | 5 |
| mean (n) | 0.88414 |
| st.dev. (n) | 0.000163 |
| R(calc.) | 0.00046 |
| st.dev.(ISO12185:96) | 0.000179 |
| R(ISO12185:96) | 0.0005 |



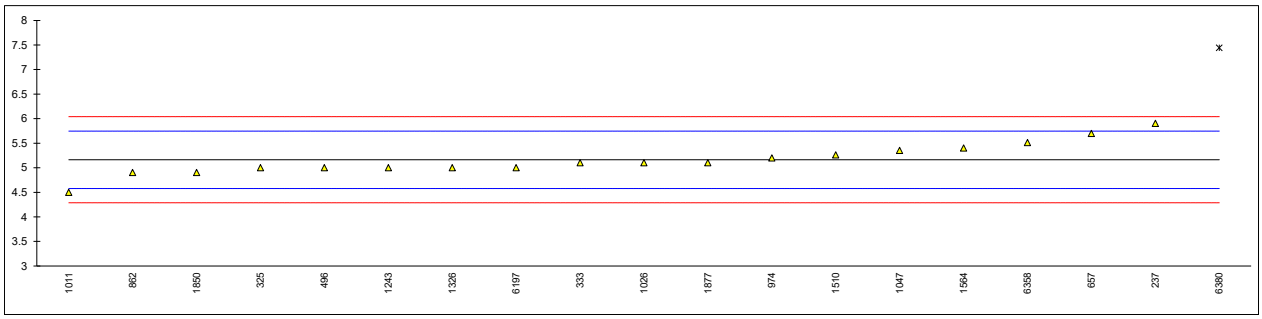



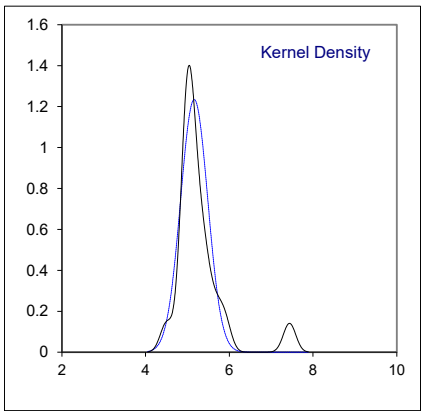
## Determination of Evaporation loss by Noack on sample #21075; results in %M/M

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | | ----- | | ----- | |
| 211 | | ----- | | ----- | |
| 219 | | ----- | | ----- | |
| 237 | D5800-B | 5.9 | | 2.53 | |
| 254 | | ----- | | ----- | |
| 257 | | ----- | | ----- | |
| 309 | | ----- | | ----- | |
| 325 | D5800-B | 5.0 | | -0.56 | |
| 329 | | ----- | | ----- | |
| 333 | CEC L-40-93 | 5.1 | | -0.21 | |
| 339 | | ----- | | ----- | |
| 349 | | ----- | | ----- | |
| 360 | | ----- | | ----- | |
| 398 | | ----- | | ----- | |
| 421 | | ----- | | ----- | |
| 432 | | ----- | | ----- | |
| 496 | D5800-B | 5.0 | | -0.56 | |
| 614 | | ----- | | ----- | |
| 633 | | ----- | | ----- | |
| 634 | | ----- | | ----- | |
| 657 | D5800-B | 5.7 | | 1.84 | |
| 780 | | ----- | | ----- | |
| 823 | | ----- | | ----- | |
| 840 | | ----- | | ----- | |
| 862 | D5800-B | 4.9 | | -0.90 | |
| 875 | | ----- | | ----- | |
| 902 | | ----- | | ----- | |
| 912 | | ----- | | ----- | |
| 913 | | ----- | | ----- | |
| 922 | | ----- | | ----- | |
| 962 | | ----- | | ----- | |
| 963 | | ----- | | ----- | |
| 974 | D5800-B | 5.2 | | 0.13 | |
| 994 | | ----- | | ----- | |
| 1011 | CEC L-40-93 | 4.5 | | -2.27 | |
| 1017 | | ----- | | ----- | |
| 1026 | CEC L-40-93 | 5.1 | | -0.21 | |
| 1047 | DIN51581 | 5.35 | | 0.64 | |
| 1059 | | ----- | | ----- | |
| 1146 | | ----- | | ----- | |
| 1150 | | ----- | | ----- | |
| 1173 | | ----- | | ----- | |
| 1213 | | ----- | | ----- | |
| 1235 | | ----- | | ----- | |
| 1243 | DIN51581 | 5.00 | | -0.56 | |
| 1316 | | ----- | | ----- | |
| 1320 | | ----- | | ----- | |
| 1326 | D5800-A | 5.0 | | -0.56 | |
| 1328 | | ----- | | ----- | |
| 1384 | | ----- | | ----- | |
| 1412 | | ----- | | ----- | |
| 1431 | | ----- | | ----- | |
| 1433 | | ----- | | ----- | |
| 1438 | | ----- | | ----- | |
| 1460 | | ----- | | ----- | |
| 1510 | D5800-B | 5.26 | | 0.33 | |
| 1564 | DIN51581 | 5.4 | | 0.81 | |
| 1650 | | ----- | | ----- | |
| 1740 | | ----- | | ----- | |
| 1748 | | ----- | | ----- | |
| 1799 | | ----- | | ----- | |
| 1850 | DIN51581 | 4.9 | | -0.90 | |
| 1864 | | ----- | | ----- | |
| 1877 | D5800-B | 5.1 | | -0.21 | |
| 1957 | | ----- | | ----- | |
| 1969 | | ----- | | ----- | |
| 6016 | | ----- | | ----- | |
| 6032 | | ----- | | ----- | |
| 6035 | | ----- | | ----- | |
| 6181 | | ----- | | ----- | |
| 6183 | | ----- | | ----- | |
| 6197 | D5800-B | 5.0 | | -0.56 | |
| 6266 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6310 | | ----- | | ----- | |
| 6324 | | ----- | | ----- | |
| 6358 | D5800-A | 5.51 | | 1.19 | |
| 6380 | D5800-B | 7.44 | G(0.01) | 7.80 | |
| 6395 | | ----- | | ----- | |

| | | | D5800-A/DIN51581 only | D5800-B only |
|---|---|---|---|---|
| | normality | suspect | unknown | suspect |
| | n | 18 | 6 | 9 |
| | outliers | 1 | 0 | 1 |
| | mean (n) | 5.162 | 5.193 | 5.229 |
| | st.dev. (n) | 0.3233 | 0.2563 | 0.3457 |
| | R(calc.) | 0.905 | 0.718 | 0.968 |
| | st.dev.(D5800-B:20) | 0.2921 | --- | 0.2950 |
| | R(D5800-B:20) | 0.818 | --- | 0.826 |
| Compare | | | | |
| | R(D5800-A:20) | 0.945 | 0.950 | --- |



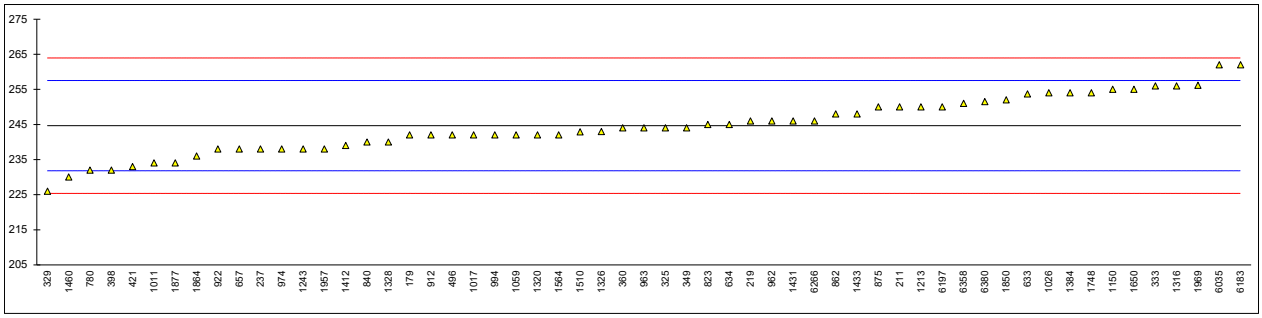



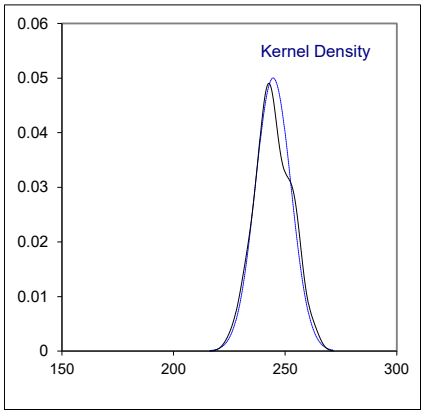
## Determination of Flash Point C.O.C. on sample #21075; results in °C

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | D92 | 242 | | -0.41 | |
| 211 | D92 | 250 | | 0.83 | |
| 219 | D92 | 246.0 | | 0.21 | |
| 237 | D92 | 238 | | -1.03 | |
| 254 | | ----- | | ----- | |
| 257 | | ----- | | ----- | |
| 309 | | ----- | | ----- | |
| 325 | D92 | 244 | | -0.10 | |
| 329 | D92 | 226 | | -2.90 | |
| 333 | D92 | 256 | | 1.77 | |
| 339 | | ----- | | ----- | |
| 349 | D92 | 244 | | -0.10 | |
| 360 | D92 | 244 | | -0.10 | |
| 398 | D92 | 232 | | -1.97 | |
| 421 | ISO2592 | 233 | | -1.81 | |
| 432 | | ----- | | ----- | |
| 496 | D92 | 242 | | -0.41 | |
| 614 | | ----- | | ----- | |
| 633 | D92 | 253.68 | | 1.41 | |
| 634 | D92 | 245 | | 0.06 | |
| 657 | D92 | 238 | | -1.03 | |
| 780 | D92 | 232 | | -1.97 | |
| 823 | D92 | 245 | | 0.06 | |
| 840 | D92 | 240 | | -0.72 | |
| 862 | D92 | 248 | | 0.52 | |
| 875 | D92 | 250 | | 0.83 | |
| 902 | | ----- | | ----- | |
| 912 | D92 | 242 | | -0.41 | |
| 913 | | ----- | | ----- | |
| 922 | D92 | 238 | | -1.03 | |
| 962 | D92 | 246 | | 0.21 | |
| 963 | D92 | 244.0 | | -0.10 | |
| 974 | D92 | 238 | | -1.03 | |
| 994 | D92 | 242.0 | | -0.41 | |
| 1011 | D92 | 234 | | -1.65 | |
| 1017 | D92 | 242 | | -0.41 | |
| 1026 | D92 | 254 | | 1.46 | |
| 1047 | | ----- | | ----- | |
| 1059 | ISO2592 | 242 | | -0.41 | |
| 1146 | | ----- | | ----- | |
| 1150 | ISO2592 | 255 | | 1.61 | |
| 1173 | | ----- | | ----- | |
| 1213 | D92 | 250 | | 0.83 | |
| 1235 | | ----- | | ----- | |
| 1243 | ISO2592 | 238 | | -1.03 | |
| 1316 | D92 | 256 | | 1.77 | |
| 1320 | D92 | 242 | | -0.41 | |
| 1326 | D92 | 243 | | -0.25 | |
| 1328 | D92 | 240 | | -0.72 | |
| 1384 | ISO2592 | 254 | | 1.46 | |
| 1412 | D92 | 239.0 | | -0.88 | |
| 1431 | D92 | 246.0 | | 0.21 | |
| 1433 | D92 | 248 | | 0.52 | |
| 1438 | | ----- | | ----- | |
| 1460 | D92 | 230 | | -2.28 | |
| 1510 | D92 | 242.87 | | -0.27 | |
| 1564 | D92 | 242 | | -0.41 | |
| 1650 | D92 | 255 | C | 1.61 | first reported 155 |
| 1740 | | ----- | | ----- | |
| 1748 | D92 | 254 | | 1.46 | |
| 1799 | | ----- | | ----- | |
| 1850 | ISO2592 | 252 | | 1.15 | |
| 1864 | D92 | 236.0 | | -1.34 | |
| 1877 | D92 | 234 | | -1.65 | |
| 1957 | D92 | 238 | | -1.03 | |
| 1969 | ISO2592 | 256.13 | | 1.79 | |
| 6016 | | ----- | | ----- | |
| 6032 | | ----- | | ----- | |
| 6035 | ISO2592 | 262 | | 2.70 | |
| 6181 | | ----- | | ----- | |
| 6183 | D92 | 262.0 | | 2.70 | |
| 6197 | D92 | 250 | | 0.83 | |
| 6266 | D92 | 246.0 | | 0.21 | |
| 6310 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | |
| 6358 | ISO2592 | 251 | | 0.99 | |
| 6380 | D92 | 251.5 | | 1.07 | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 57 |
| outliers | 0 |
| mean (n) | 244.63 |
| st.dev. (n) | 7.972 |
| R(calc.) | 22.32 |
| st.dev.(D92:18) | 6.429 |
| R(D92:18) | 18 |



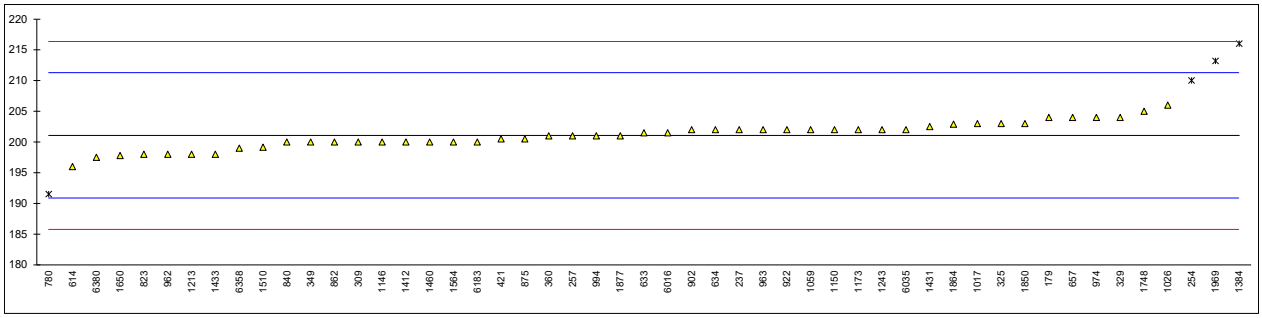



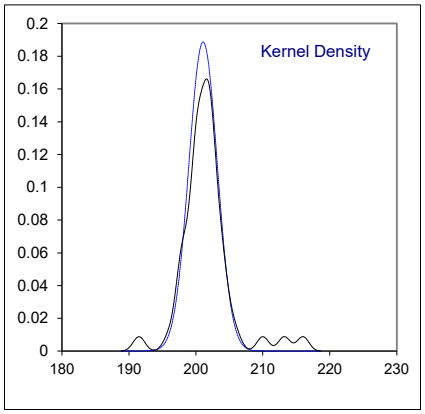
## Determination of Flash Point PMcc on sample #21075; results in °C

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | D93-A | 204.0 | | 0.57 | |
| 211 | | ----- | | ----- | |
| 219 | | ----- | | ----- | |
| 237 | D93-A | 202.0 | | 0.18 | |
| 254 | D93-A | 210 | C,R(0.01) | 1.75 | first reported 192 |
| 257 | D93-A | 201 | | -0.02 | |
| 309 | D93-A | 200.0 | | -0.21 | |
| 325 | D93-A | 203 | | 0.38 | |
| 329 | D93-A | 204 | | 0.57 | |
| 333 | | ----- | | ----- | |
| 339 | | ----- | | ----- | |
| 349 | D93-A | 200 | | -0.21 | |
| 360 | D93-A | 201.0 | | -0.02 | |
| 398 | | ----- | | ----- | |
| 421 | ISO2719-A | 200.5 | | -0.11 | |
| 432 | | ----- | | ----- | |
| 496 | | ----- | | ----- | |
| 614 | D93-A | 196 | | -1.00 | |
| 633 | D93-A | 201.50 | | 0.08 | |
| 634 | D93-A | 202.0 | | 0.18 | |
| 657 | D93-A | 204 | | 0.57 | |
| 780 | D93-A | 191.5 | R(0.01) | -1.88 | |
| 823 | ISO2719-A | 198 | | -0.60 | |
| 840 | D93-A | 200.0 | | -0.21 | |
| 862 | D93-A | 200.0 | | -0.21 | |
| 875 | D93-A | 200.5 | | -0.11 | |
| 902 | D93-A | 202 | | 0.18 | |
| 912 | | ----- | | ----- | |
| 913 | | ----- | | ----- | |
| 922 | D93-A | 202 | | 0.18 | |
| 962 | D93-A | 198.0 | | -0.60 | |
| 963 | D93-A | 202.0 | | 0.18 | |
| 974 | D93-A | 204 | | 0.57 | |
| 994 | D93-A | 201.0 | | -0.02 | |
| 1011 | | ----- | | ----- | |
| 1017 | D93-A | 203 | | 0.38 | |
| 1026 | D93-A | 206.0 | | 0.96 | |
| 1047 | | ----- | | ----- | |
| 1059 | ISO2719-A | 202.0 | | 0.18 | |
| 1146 | D93-A | 200.0 | | -0.21 | |
| 1150 | ISO2719-B | 202 | | 0.18 | |
| 1173 | D93-A | 202.0 | | 0.18 | |
| 1213 | D93-A | 198 | | -0.60 | |
| 1235 | | ----- | | ----- | |
| 1243 | ISO2719-A | 202 | | 0.18 | |
| 1316 | | ----- | | ----- | |
| 1320 | | ----- | | ----- | |
| 1326 | | ----- | | ----- | |
| 1328 | | ----- | | ----- | |
| 1384 | ISO2719-A | 216 | R(0.01) | 2.93 | |
| 1412 | D93-A | 200.0 | | -0.21 | |
| 1431 | D93-A | 202.5 | | 0.28 | |
| 1433 | D93-A | 198 | | -0.60 | |
| 1438 | | ----- | | ----- | |
| 1460 | D93-B | 200 | | -0.21 | |
| 1510 | D93-A | 199.147 | | -0.38 | |
| 1564 | D93-A | 200.0 | | -0.21 | |
| 1650 | D93-A | 197.8 | | -0.64 | |
| 1740 | | ----- | | ----- | |
| 1748 | D93-A | 205 | | 0.77 | |
| 1799 | | ----- | | ----- | |
| 1850 | ISO2719-A | 203 | | 0.38 | |
| 1864 | D93-A | 202.9 | | 0.36 | |
| 1877 | D93-A | 201 | | -0.02 | |
| 1957 | | ----- | | ----- | |
| 1969 | ISO2719-A | 213.20 | R(0.01) | 2.38 | |
| 6016 | D93-A | 201.5 | | 0.08 | |
| 6032 | | ----- | | ----- | |
| 6035 | ISO2719-A | 202.0 | | 0.18 | |
| 6181 | | ----- | | ----- | |
| 6183 | D93-A | 200.0 | | -0.21 | |
| 6197 | | ----- | | ----- | |
| 6266 | | ----- | | ----- | |
| 6310 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | |
| 6358 | ISO2719-A | 199.0 | | -0.41 | |
| 6380 | D93-A | 197.5 | | -0.70 | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 47 |
| outliers | 4 |
| mean (n) | 201.08 |
| st.dev. (n) | 2.113 |
| R(calc.) | 5.92 |
| st.dev.(D93-A:20) | 5.099 |
| R(D93-A:20) | 14.28 |



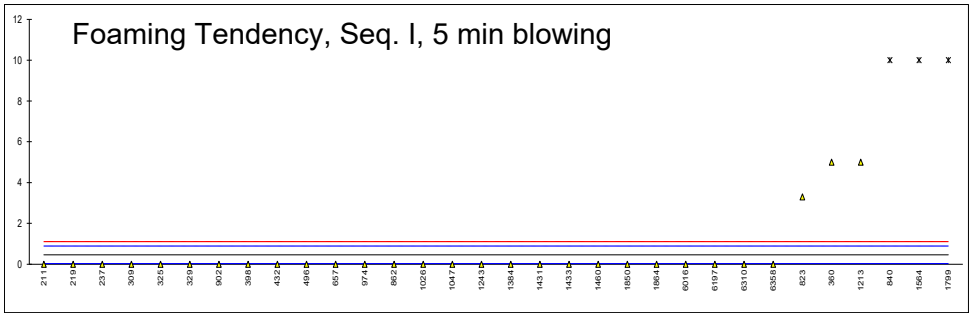



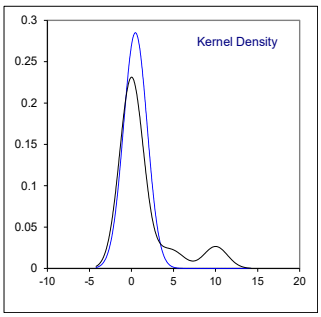
Determination of Foaming Tendency, 5 min blowing period on sample #21075; results in mL

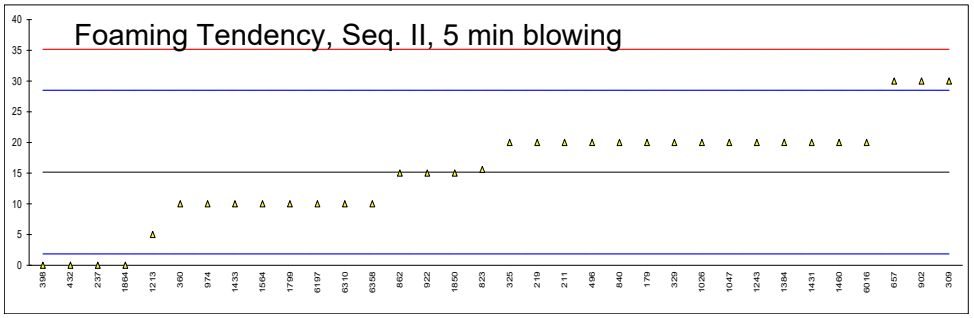
| lab | method | sample used | diffuser | Seq I | mark | z(targ) | Seq II | mark | z(targ) | Seq III | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 178 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 179 | | As received | Metal | ----- | | ----- | 20 | | 0.73 | ----- | | ----- |
| 211 | D892 | As received | Stone | 0 | | -2.12 | 20 | | 0.73 | 0 | | -0.68 |
| 219 | D892 | --- | --- | 0 | | -2.12 | 20 | | 0.73 | 0 | | -0.68 |
| 237 | D892 | --- | --- | 0 | | -2.12 | 0 | | -2.27 | 0 | | -0.68 |
| 254 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 257 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 309 | D892 | --- | --- | 0 | | -2.12 | 30 | | 2.22 | 0 | | -0.68 |
| 325 | D892 | As received | Metal | 0 | | -2.12 | 20 | | 0.73 | 0 | | -0.68 |
| 329 | D892 | After agitation | Stone | 0 | | -2.12 | 20 | | 0.73 | 0 | | -0.68 |
| 333 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 339 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 349 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 360 | D892 (Altern.) | As received | Stone | 5 | | 21.04 | 10 | | -0.77 | 0 | | -0.68 |
| 398 | D892 | After agitation | Stone | 0 | | -2.12 | 0 | | -2.27 | 0 | | -0.68 |
| 421 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 432 | D892 | As received | Stone | 0 | | -2.12 | 0 | | -2.27 | 0 | | -0.68 |
| 496 | D892 | As received | Metal | 0 | | -2.12 | 20 | | 0.73 | 0 | | -0.68 |
| 614 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 633 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 634 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 657 | D892 | As received | Metal | 0 | | -2.12 | 30 | | 2.22 | 0 | | -0.68 |
| 780 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 823 | D892 | As received | Stone | 3.3 | | 13.16 | 15.6 | | 0.07 | 2.4 | | 5.69 |
| 840 | D892 | After agitation | Metal | 10 | R(1) | 44.21 | 20 | | 0.73 | 10 | R(1) | 25.84 |
| 862 | D892 | As received | Metal | 0 | | -2.12 | 15 | | -0.02 | 0 | | -0.68 |
| 875 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 902 | D892 | After agitation | Metal | 0 | | -2.12 | 30 | | 2.22 | 0 | | -0.68 |
| 912 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 913 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 922 | D892 | As received | Stone | <10 | | ----- | 15 | | -0.02 | <10 | | ----- |
| 962 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 963 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 974 | D892 | As received | Metal | 0 | | -2.12 | 10 | | -0.77 | 0 | | -0.68 |
| 994 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1011 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1017 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1026 | D892 | After agitation | Metal | 0 | | -2.12 | 20 | | 0.73 | 0 | | -0.68 |
| 1047 | D892 | As received | Stone | 0 | | -2.12 | 20 | | 0.73 | 0 | | -0.68 |
| 1059 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1146 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1150 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1173 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1213 | D892 | After agitation | Metal | 5 | | 21.04 | 5 | | -1.52 | 5 | | 12.58 |
| 1235 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1243 | D892 | As received | Stone | 0 | | -2.12 | 20 | | 0.73 | 0 | | -0.68 |
| 1316 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1320 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1326 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1328 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1384 | ISO6247 | As received | Metal | 0 | | -2.12 | 20 | | 0.73 | 0 | | -0.68 |
| 1412 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1431 | D892 | --- | --- | 0 | | -2.12 | 20 | | 0.73 | 0 | | -0.68 |
| 1433 | D892 | After agitation | Stone | 0 | | -2.12 | 10 | | -0.77 | 0 | | -0.68 |
| 1438 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1460 | D892 | As received | Metal | 0 | | -2.12 | 20 | | 0.73 | 0 | | -0.68 |
| 1510 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1564 | D892 | As received | Metal | 10 | R(1) | 44.21 | 10 | | -0.77 | 10 | R(1) | 25.84 |
| 1650 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1740 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1748 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1799 | | After agitation | Metal | 10 | R(1) | 44.21 | 10 | | -0.77 | 10 | R(1) | 25.84 |
| 1850 | ISO6247 | As received | Stone | 0 | | -2.12 | 15 | | -0.02 | 0 | | -0.68 |
| 1864 | | After agitation | Metal | 0 | | -2.12 | 0 | | -2.27 | 0 | | -0.68 |
| 1877 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1957 | | As received | Metal | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1969 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6016 | D892 | After agitation | Stone | 0 | | -2.12 | 20 | | 0.73 | 0 | | -0.68 |
| 6032 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6035 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6181 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6183 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6197 | D892 | After agitation | Metal | 0 | | -2.12 | 10 | | -0.77 | 0 | | -0.68 |
| 6266 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6310 | D892 | After agitation | Metal | 0 | | -2.12 | 10 | | -0.77 | 0 | | -0.68 |

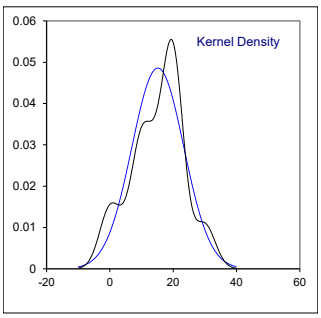
| lab | method | sample used | diffuser | Seq I | mark | z(targ) | Seq II | mark | z(targ) | Seq III | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6324 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6358 | D892 (Altern.) | As received | Stone | 0 | | -2.12 | 10 | | -0.77 | 0 | | -0.68 |
| 6380 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6395 | | --- | --- | ----- | | ----- | ----- | | ----- | ----- | | ----- |

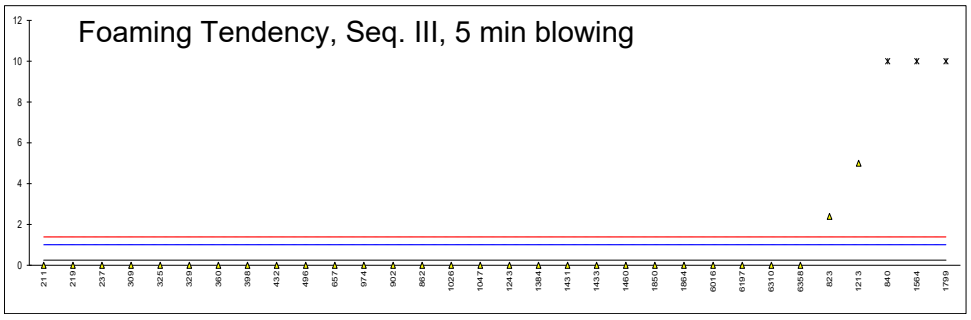
| | Seq I | Seq II | Seq III |
|---|---|---|---|
| normality | not OK | OK | not OK |
| n | 29 | 34 | 29 |
| outliers | 3 | 0 | 3 |
| mean (n) | 0.46 | 15.16 | 0.26 |
| st.dev. (n) | 1.399 | 8.210 | 1.015 |
| R(calc.) | 3.92 | 22.99 | 2.84 |
| st.dev.(D892:18) | 0.216 | 6.668 | 0.377 |
| R(D892:18) | 0.60 | 18.67 | 1.06 |

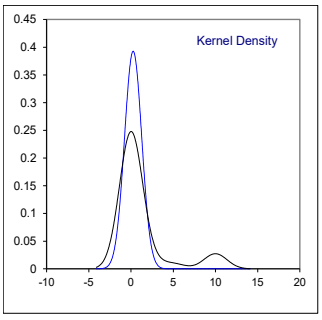


Determination of Foam Stability, 10 min settling point on sample #21075; results in mL

| lab | method | Seq I | mark | z(targ) | Seq II | mark | z(targ) | Seq III | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|---|
| 178 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 179 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 211 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 219 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 237 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 254 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 257 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 309 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 325 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 329 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 333 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 339 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 349 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 360 | D892 (Altern.) | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 398 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 421 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 432 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 496 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 614 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 633 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 634 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 657 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 780 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 823 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 840 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 862 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 875 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 902 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 912 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 913 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 922 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 962 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 963 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 974 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 994 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1011 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1017 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1026 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 1047 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 1059 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1146 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1150 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1173 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1213 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 1235 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1243 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 1316 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1320 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1326 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1328 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1384 | ISO6247 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 1412 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1431 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 1433 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 1438 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1460 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 1510 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1564 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 1650 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1740 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1748 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1799 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 1850 | ISO6247 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 1864 | | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 1877 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1957 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 1969 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6016 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 6032 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6035 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6181 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6183 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6197 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 6266 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6310 | D892 | 0 | | ----- | 0 | | ----- | 0 | | ----- |

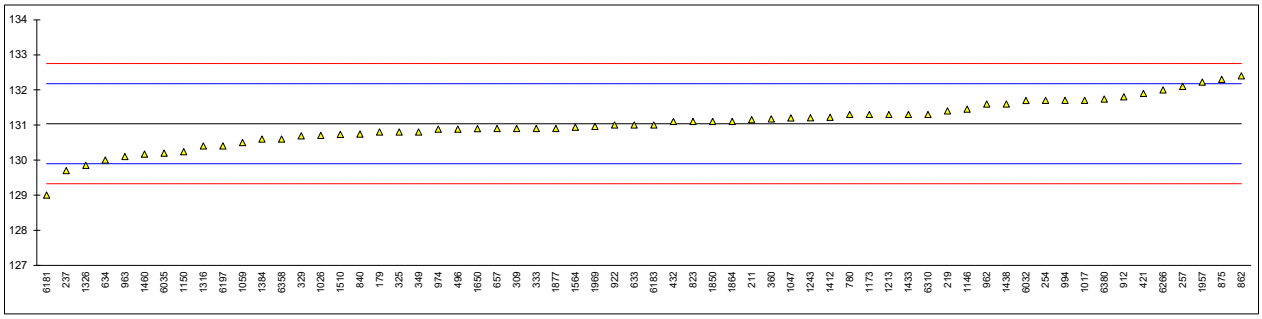
| lab | method | Seq I | mark | z(targ) | Seq II | mark | z(targ) | Seq III | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6358 | D892 (Altern.) | 0 | | ----- | 0 | | ----- | 0 | | ----- |
| 6380 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| 6395 | | ----- | | ----- | ----- | | ----- | ----- | | ----- |
| | n | 34 | | | 34 | | | 34 | | |
| | mean (n) | 0 | | | 0 | | | 0 | | |

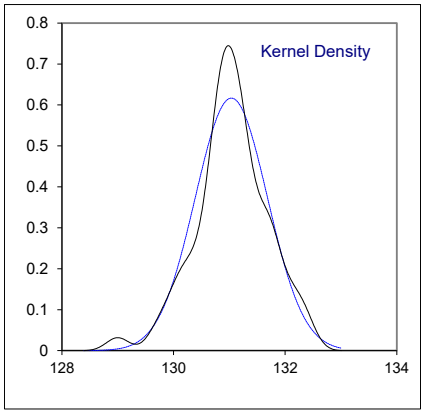
Determination of Kinematic Viscosity at 40°C on sample #21075; results in $mm^2/s$

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | D445 | 130.80 | | -0.42 | |
| 211 | D445 | 131.15 | | 0.20 | |
| 219 | D7279 corr. to D445 | 131.4 | | 0.64 | |
| 237 | D445 | 129.7 | | -2.34 | |
| 254 | D445 | 131.7 | | 1.16 | |
| 257 | D7279 corr. to D445 | 132.1 | | 1.86 | |
| 309 | D445 | 130.9 | | -0.24 | |
| 325 | D445 | 130.8 | | -0.42 | |
| 329 | D445 | 130.69 | | -0.61 | |
| 333 | D445 | 130.9 | | -0.24 | |
| 339 | | ----- | | ----- | |
| 349 | D445 | 130.8 | | -0.42 | |
| 360 | D445 | 131.17 | | 0.23 | |
| 398 | | ----- | | ----- | |
| 421 | ISO3104 | 131.9 | | 1.51 | |
| 432 | D445 | 131.1 | | 0.11 | |
| 496 | D445 | 130.88 | | -0.28 | |
| 614 | | ----- | | ----- | |
| 633 | D7279 corr. to D445 | 131.00 | | -0.07 | |
| 634 | D445 | 130.0 | | -1.82 | |
| 657 | D445 | 130.9 | | -0.24 | |
| 780 | D445 | 131.3 | | 0.46 | |
| 823 | D445 | 131.1 | | 0.11 | |
| 840 | D445 | 130.74 | | -0.52 | |
| 862 | D445 | 132.4 | | 2.39 | |
| 875 | D445 | 132.3 | | 2.21 | |
| 902 | | ----- | | ----- | |
| 912 | D445 | 131.8 | | 1.34 | |
| 913 | | ----- | | ----- | |
| 922 | D445 | 131.0 | | -0.07 | |
| 962 | D445 | 131.6 | C | 0.99 | first reported 133.9 |
| 963 | D445 | 130.1 | | -1.64 | |
| 974 | D445 | 130.88 | | -0.28 | |
| 994 | D445 | 131.7 | | 1.16 | |
| 1011 | | ----- | | ----- | |
| 1017 | D445 | 131.7 | | 1.16 | |
| 1026 | D445 | 130.7 | | -0.59 | |
| 1047 | ISO3104 | 131.2 | | 0.28 | |
| 1059 | ISO3104 | 130.5 | | -0.94 | |
| 1146 | D445 | 131.45 | | 0.72 | |
| 1150 | ISO3104 | 130.2382 | | -1.40 | |
| 1173 | D445 | 131.3 | | 0.46 | |
| 1213 | D445 | 131.3 | C | 0.46 | first reported 14.24 |
| 1235 | | ----- | | ----- | |
| 1243 | D7279 corr. to D445 | 131.205 | | 0.29 | |
| 1316 | ISO3104 | 130.4 | | -1.12 | |
| 1320 | | ----- | | ----- | |
| 1326 | D445 | 129.85 | | -2.08 | |
| 1328 | | ----- | | ----- | |
| 1384 | ISO3104 | 130.6 | | -0.77 | |
| 1412 | D445 | 131.22 | | 0.32 | |
| 1431 | | ----- | | ----- | |
| 1433 | D445 | 131.3 | | 0.46 | |
| 1438 | | 131.6 | | 0.99 | |
| 1460 | D445 | 130.17 | | -1.52 | |
| 1510 | D445 | 130.73 | | -0.54 | |
| 1564 | D445 | 130.934 | | -0.18 | |
| 1650 | D445 | 130.895 | | -0.25 | |
| 1740 | | ----- | | ----- | |
| 1748 | | ----- | | ----- | |
| 1799 | | ----- | | ----- | |
| 1850 | ISO3104 | 131.1 | | 0.11 | |
| 1864 | D445 | 131.1 | | 0.11 | |
| 1877 | D445 | 130.9 | | -0.24 | |
| 1957 | D445 | 132.22 | | 2.07 | |
| 1969 | ISO3104 | 130.9594 | | -0.14 | |
| 6016 | | ----- | | ----- | |
| 6032 | D7279 corr. to D445 | 131.697 | | 1.16 | |
| 6035 | ISO3104 | 130.2 | | -1.47 | |
| 6181 | ISO3104 | 129.0 | | -3.57 | |
| 6183 | D445 | 131.0 | | -0.07 | |
| 6197 | D445 | 130.4 | | -1.12 | |
| 6266 | D7042 | 132.0 | | 1.69 | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6310 | D7279 corr. to D445 | 131.3 | | 0.46 | |
| 6324 | | ----- | | ----- | |
| 6358 | D445 | 130.6 | | -0.77 | |
| 6380 | D445 | 131.738 | | 1.23 | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 62 |
| outliers | 0 |
| mean (n) | 131.037 |
| st.dev. (n) | 0.6468 |
| R(calc.) | 1.811 |
| st.dev.(D445:21) | 0.5709 |
| R(D445:21) | 1.599 |



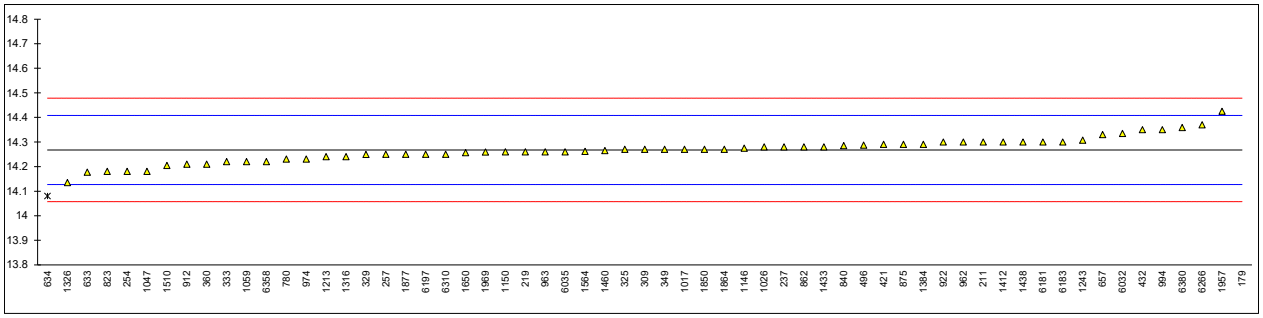



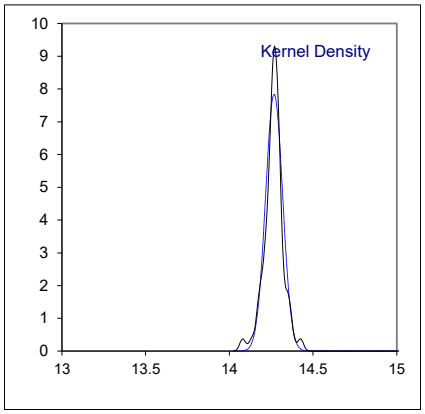
Determination of Kinematic Viscosity at 100°C on sample #21075; results in $mm^2/s$

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | D445 | 16.79 | R(0.01) | 35.87 | |
| 211 | D445 | 14.30 | | 0.46 | |
| 219 | D7279 corr. to D445 | 14.26 | | -0.11 | |
| 237 | D445 | 14.28 | | 0.18 | |
| 254 | D445 | 14.18 | | -1.25 | |
| 257 | D7279 corr. to D445 | 14.25 | | -0.25 | |
| 309 | D445 | 14.27 | | 0.03 | |
| 325 | D445 | 14.27 | | 0.03 | |
| 329 | D445 | 14.249 | | -0.26 | |
| 333 | D445 | 14.22 | | -0.68 | |
| 339 | | ----- | | ----- | |
| 349 | D445 | 14.27 | | 0.03 | |
| 360 | D445 | 14.210 | | -0.82 | |
| 398 | | ----- | | ----- | |
| 421 | ISO3104 | 14.29 | | 0.32 | |
| 432 | D445 | 14.35 | | 1.17 | |
| 496 | D445 | 14.287 | | 0.28 | |
| 614 | | ----- | | ----- | |
| 633 | D7279 corr. to D445 | 14.177 | | -1.29 | |
| 634 | D445 | 14.08 | R(0.05) | -2.67 | |
| 657 | D445 | 14.33 | | 0.89 | |
| 780 | D445 | 14.23 | | -0.54 | |
| 823 | ISO3104 | 14.18 | | -1.25 | |
| 840 | D445 | 14.285 | | 0.25 | |
| 862 | D445 | 14.28 | | 0.18 | |
| 875 | D445 | 14.29 | | 0.32 | |
| 902 | | ----- | | ----- | |
| 912 | D445 | 14.21 | | -0.82 | |
| 913 | | ----- | | ----- | |
| 922 | D445 | 14.30 | | 0.46 | |
| 962 | D445 | 14.30 | C | 0.46 | first reported 14.76 |
| 963 | D445 | 14.26 | | -0.11 | |
| 974 | D445 | 14.23 | | -0.54 | |
| 994 | D445 | 14.35 | | 1.17 | |
| 1011 | | ----- | | ----- | |
| 1017 | D445 | 14.27 | | 0.03 | |
| 1026 | D445 | 14.28 | | 0.18 | |
| 1047 | ISO3104 | 14.18 | | -1.25 | |
| 1059 | ISO3104 | 14.22 | | -0.68 | |
| 1146 | D445 | 14.275 | | 0.10 | |
| 1150 | ISO3104 | 14.2597 | | -0.11 | |
| 1173 | | ----- | | ----- | |
| 1213 | D445 | 14.24 | C | -0.39 | first reported 131.3 |
| 1235 | | ----- | | ----- | |
| 1243 | D7279 corr. to D445 | 14.307 | | 0.56 | |
| 1316 | ISO3104 | 14.24 | | -0.39 | |
| 1320 | | ----- | | ----- | |
| 1326 | D445 | 14.135 | | -1.89 | |
| 1328 | | ----- | | ----- | |
| 1384 | ISO3104 | 14.29 | | 0.32 | |
| 1412 | D445 | 14.30 | | 0.46 | |
| 1431 | | ----- | | ----- | |
| 1433 | D445 | 14.28 | | 0.18 | |
| 1438 | | 14.30 | | 0.46 | |
| 1460 | D445 | 14.265 | | -0.04 | |
| 1510 | D445 | 14.2045 | | -0.90 | |
| 1564 | D445 | 14.262 | | -0.08 | |
| 1650 | D445 | 14.256 | | -0.17 | |
| 1740 | | ----- | | ----- | |
| 1748 | | ----- | | ----- | |
| 1799 | | ----- | | ----- | |
| 1850 | ISO3104 | 14.27 | | 0.03 | |
| 1864 | D445 | 14.27 | | 0.03 | |
| 1877 | D445 | 14.25 | | -0.25 | |
| 1957 | D445 | 14.425 | | 2.24 | |
| 1969 | ISO3104 | 14.2592 | | -0.12 | |
| 6016 | | ----- | | ----- | |
| 6032 | D7279 corr. to D445 | 14.335 | | 0.96 | |
| 6035 | ISO3104 | 14.26 | | -0.11 | |
| 6181 | ISO3104 | 14.3 | | 0.46 | |
| 6183 | D445 | 14.30 | | 0.46 | |
| 6197 | D445 | 14.25 | | -0.25 | |
| 6266 | D7042 | 14.37 | | 1.46 | |
| 6310 | D7279 corr. to D445 | 14.25 | | -0.25 | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | |
| 6358 | D445 | 14.22 | | -0.68 | |
| 6380 | D445 | 14.359 | | 1.30 | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | suspect |
| n | 59 |
| outliers | 2 |
| mean (n) | 14.268 |
| st.dev. (n) | 0.0509 |
| R(calc.) | 0.142 |
| st.dev.(D445:21) | 0.0703 |
| R(D445:21) | 0.197 |



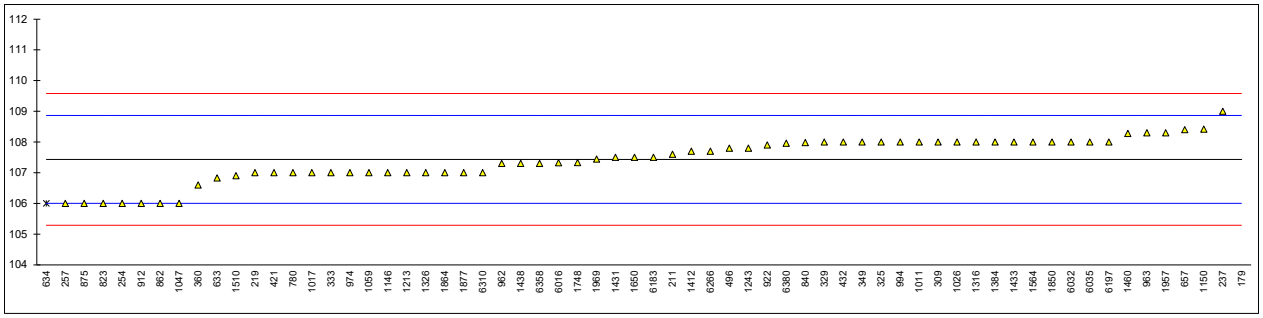



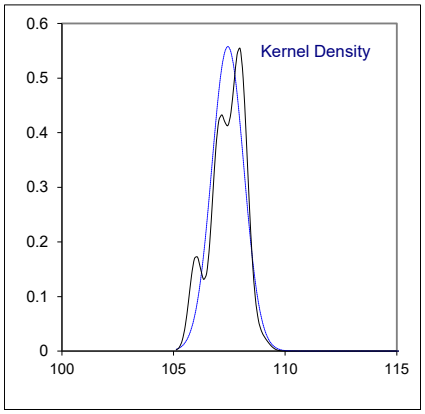
## Determination of Viscosity Index on sample #21075;

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | D2270 | 139 | ex | 44.19 | test result excluded, outlier in KV 100°C |
| 211 | D2270 | 107.6 | | 0.23 | |
| 219 | D2270 | 107 | | -0.61 | |
| 237 | D2270 | 109 | | 2.19 | |
| 254 | D2270 | 106 | | -2.01 | |
| 257 | D2270 | 106 | | -2.01 | |
| 309 | D2270 | 108 | | 0.79 | |
| 325 | D2270 | 108 | | 0.79 | |
| 329 | D2270 | 108 | | 0.79 | |
| 333 | D2270 | 107 | | -0.61 | |
| 339 | | ----- | | ----- | |
| 349 | D2270 | 108 | | 0.79 | |
| 360 | ISO2909 | 106.6 | | -1.17 | |
| 398 | | ----- | | ----- | |
| 421 | ISO2909 | 107 | | -0.61 | |
| 432 | D2270 | 108 | | 0.79 | |
| 496 | D2270 | 107.8 | | 0.51 | |
| 614 | | ----- | | ----- | |
| 633 | D2270 | 106.83 | E | -0.85 | iis calculated 106.35 |
| 634 | D2270 | 106 | ex | -2.01 | test result excluded, outlier in KV 100°C |
| 657 | D2270 | 108.4 | | 1.35 | |
| 780 | D2270 | 107 | | -0.61 | |
| 823 | D2270 | 106 | | -2.01 | |
| 840 | D2270 | 107.98 | | 0.76 | |
| 862 | D2270 | 106 | | -2.01 | |
| 875 | D2270 | 106 | | -2.01 | |
| 902 | | ----- | | ----- | |
| 912 | D2270 | 106 | | -2.01 | |
| 913 | | ----- | | ----- | |
| 922 | D2270 | 107.9 | | 0.65 | |
| 962 | D2270 | 107.3 | C | -0.19 | first reported 110.919 |
| 963 | D2270 | 108.3 | | 1.21 | |
| 974 | D2270 | 107 | | -0.61 | |
| 994 | D2270 | 108 | | 0.79 | |
| 1011 | D2270 | 108 | | 0.79 | |
| 1017 | D2270 | 107 | | -0.61 | |
| 1026 | D2270 | 108 | | 0.79 | |
| 1047 | ISO2909 | 106 | | -2.01 | |
| 1059 | ISO2909 | 107 | | -0.61 | |
| 1146 | D2270 | 107 | | -0.61 | |
| 1150 | ISO2909 | 108.42 | | 1.38 | |
| 1173 | | ----- | | ----- | |
| 1213 | D2270 | 107 | | -0.61 | |
| 1235 | | ----- | | ----- | |
| 1243 | ISO2909 | 107.8 | | 0.51 | |
| 1316 | D2270 | 108 | | 0.79 | |
| 1320 | | ----- | | ----- | |
| 1326 | D2270 | 107 | | -0.61 | |
| 1328 | | ----- | | ----- | |
| 1384 | ISO2909 | 108 | | 0.79 | |
| 1412 | D2270 | 107.7 | | 0.37 | |
| 1431 | D2270 | 107.5 | | 0.09 | |
| 1433 | ISO2909 | 108 | E | 0.79 | iis calculated 107 |
| 1438 | | 107.3 | | -0.19 | |
| 1460 | D2270 | 108.279 | | 1.18 | |
| 1510 | D2270 | 106.9 | | -0.75 | |
| 1564 | D2270 | 108 | | 0.79 | |
| 1650 | D2270 | 107.5 | | 0.09 | |
| 1740 | | ----- | | ----- | |
| 1748 | D2270 | 107.33 | | -0.15 | |
| 1799 | | ----- | | ----- | |
| 1850 | ISO2909 | 108 | E | 0.79 | iis calculated 107 |
| 1864 | D2270 | 107 | | -0.61 | |
| 1877 | D2270 | 107 | | -0.61 | |
| 1957 | D2270 | 108.3 | | 1.21 | |
| 1969 | ISO2909 | 107.44 | | 0.01 | |
| 6016 | D2270 | 107.32 | | -0.16 | |
| 6032 | D2270 | 108 | | 0.79 | |
| 6035 | ISO2909 | 108 | | 0.79 | |
| 6181 | | ----- | | ----- | |
| 6183 | D2270 | 107.5 | | 0.09 | |
| 6197 | D2270 | 108 | | 0.79 | |
| 6266 | D2270 | 107.7 | | 0.37 | |
| 6310 | D2270 | 107 | | -0.61 | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | |
| 6358 | D2270 | 107.3 | | -0.19 | |
| 6380 | D2270 | 107.96 | | 0.74 | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 62 |
| outliers | 0 +2ex |
| mean (n) | 107.43 |
| st.dev. (n) | 0.715 |
| R(calc.) | 2.00 |
| st.dev.(D2270:10) | 0.714 |
| R(D2270:10) | 2 |



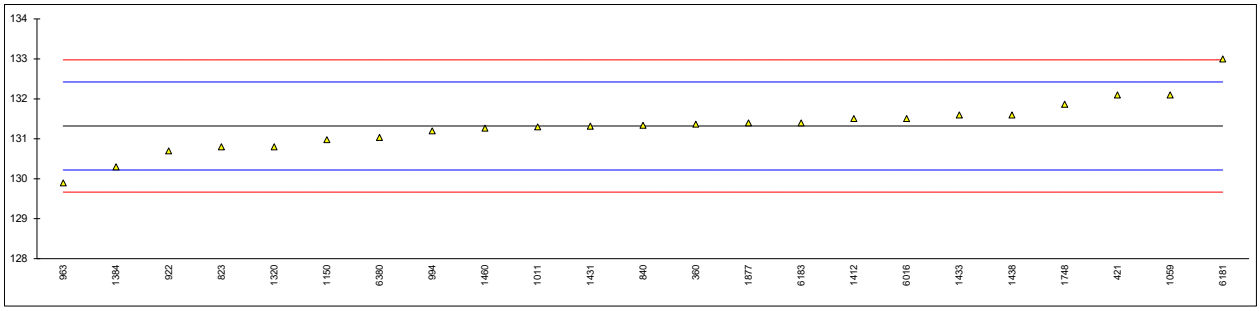



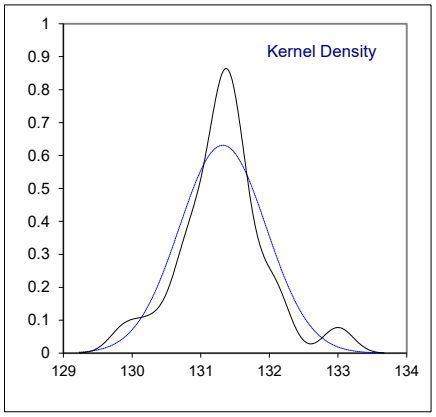
Determination of Kinematic Viscosity Stabinger at 40°C on sample #21075; results in mm$^2$/s

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | | ----- | | ----- | |
| 211 | | ----- | | ----- | |
| 219 | | ----- | | ----- | |
| 237 | | ----- | | ----- | |
| 254 | | ----- | | ----- | |
| 257 | | ----- | | ----- | |
| 309 | | ----- | | ----- | |
| 325 | | ----- | | ----- | |
| 329 | | ----- | | ----- | |
| 333 | | ----- | | ----- | |
| 339 | | ----- | | ----- | |
| 349 | | ----- | | ----- | |
| 360 | D7042 | 131.37 | | 0.09 | |
| 398 | | ----- | | ----- | |
| 421 | D7042 | 132.1 | | 1.41 | |
| 432 | | ----- | | ----- | |
| 496 | | ----- | | ----- | |
| 614 | | ----- | | ----- | |
| 633 | | ----- | | ----- | |
| 634 | | ----- | | ----- | |
| 657 | | ----- | | ----- | |
| 780 | | ----- | | ----- | |
| 823 | D7042 | 130.8 | | -0.95 | |
| 840 | D7042 | 131.34 | | 0.03 | |
| 862 | | ----- | | ----- | |
| 875 | | ----- | | ----- | |
| 902 | | ----- | | ----- | |
| 912 | | ----- | | ----- | |
| 913 | | ----- | | ----- | |
| 922 | D7042 | 130.7 | | -1.13 | |
| 962 | | ----- | | ----- | |
| 963 | D7042 | 129.9 | | -2.58 | |
| 974 | | ----- | | ----- | |
| 994 | D7042 | 131.2 | | -0.22 | |
| 1011 | D7042 | 131.3 | | -0.04 | |
| 1017 | | ----- | | ----- | |
| 1026 | | ----- | | ----- | |
| 1047 | | ----- | | ----- | |
| 1059 | D7042 | 132.1 | | 1.41 | |
| 1146 | | ----- | | ----- | |
| 1150 | D7042 | 130.98 | | -0.62 | |
| 1173 | | ----- | | ----- | |
| 1213 | | ----- | | ----- | |
| 1235 | | ----- | | ----- | |
| 1243 | | ----- | | ----- | |
| 1316 | | ----- | | ----- | |
| 1320 | D7042 | 130.8 | | -0.95 | |
| 1326 | | ----- | | ----- | |
| 1328 | | ----- | | ----- | |
| 1384 | PN-C-04358 | 130.3 | | -1.86 | |
| 1412 | D7042 | 131.51 | | 0.34 | |
| 1431 | D7042 | 131.32 | | 0.00 | |
| 1433 | D7042 | 131.6 | | 0.50 | |
| 1438 | | 131.6 | | 0.50 | |
| 1460 | D7042 | 131.27 | | -0.09 | |
| 1510 | | ----- | | ----- | |
| 1564 | | ----- | | ----- | |
| 1650 | | ----- | | ----- | |
| 1740 | | ----- | | ----- | |
| 1748 | D7042 | 131.87 | | 0.99 | |
| 1799 | | ----- | | ----- | |
| 1850 | | ----- | | ----- | |
| 1864 | | ----- | | ----- | |
| 1877 | D7042 | 131.4 | | 0.14 | |
| 1957 | | ----- | | ----- | |
| 1969 | | ----- | | ----- | |
| 6016 | D7042 | 131.51 | | 0.34 | |
| 6032 | | ----- | | ----- | |
| 6035 | | ----- | | ----- | |
| 6181 | D7042 | 133.0 | | 3.05 | |
| 6183 | D7042 | 131.4 | | 0.14 | |
| 6197 | | ----- | | ----- | |
| 6266 | | ----- | | ----- | |
| 6310 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | |
| 6358 | | ----- | | ----- | |
| 6380 | D7042 | 131.04 | | -0.51 | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | suspect |
| n | 23 |
| outliers | 0 |
| mean (n) | 131.322 |
| st.dev. (n) | 0.6317 |
| R(calc.) | 1.769 |
| st.dev.(D7042:21) | 0.5510 |
| R(D7042:21) | 1.543 |



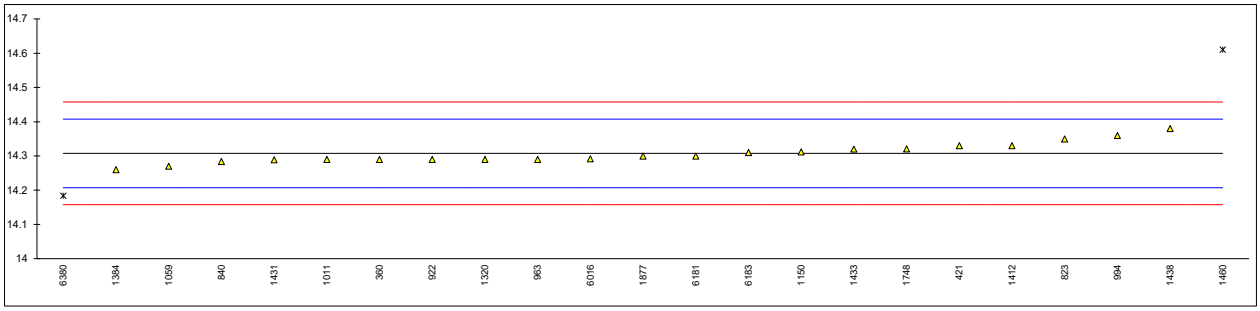



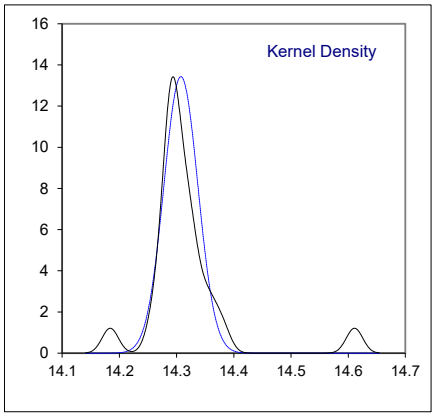
Determination of Kinematic Viscosity Stabinger at 100°C on sample #21075; results in $mm^2/s$

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | | ----- | | ----- | |
| 211 | | ----- | | ----- | |
| 219 | | ----- | | ----- | |
| 237 | | ----- | | ----- | |
| 254 | | ----- | | ----- | |
| 257 | | ----- | | ----- | |
| 309 | | ----- | | ----- | |
| 325 | | ----- | | ----- | |
| 329 | | ----- | | ----- | |
| 333 | | ----- | | ----- | |
| 339 | | ----- | | ----- | |
| 349 | | ----- | | ----- | |
| 360 | D7042 | 14.290 | | -0.35 | |
| 398 | | ----- | | ----- | |
| 421 | D7042 | 14.33 | | 0.45 | |
| 432 | | ----- | | ----- | |
| 496 | | ----- | | ----- | |
| 614 | | ----- | | ----- | |
| 633 | | ----- | | ----- | |
| 634 | | ----- | | ----- | |
| 657 | | ----- | | ----- | |
| 780 | | ----- | | ----- | |
| 823 | D7042 | 14.35 | | 0.85 | |
| 840 | D7042 | 14.284 | | -0.47 | |
| 862 | | ----- | | ----- | |
| 875 | | ----- | | ----- | |
| 902 | | ----- | | ----- | |
| 912 | | ----- | | ----- | |
| 913 | | ----- | | ----- | |
| 922 | D7042 | 14.29 | | -0.35 | |
| 962 | | ----- | | ----- | |
| 963 | D7042 | 14.29 | C | -0.35 | first reported 14.19 |
| 974 | | ----- | | ----- | |
| 994 | D7042 | 14.36 | | 1.05 | |
| 1011 | D7042 | 14.29 | | -0.35 | |
| 1017 | | ----- | | ----- | |
| 1026 | | ----- | | ----- | |
| 1047 | | ----- | | ----- | |
| 1059 | D7042 | 14.27 | | -0.75 | |
| 1146 | | ----- | | ----- | |
| 1150 | D7042 | 14.312 | | 0.09 | |
| 1173 | | ----- | | ----- | |
| 1213 | | ----- | | ----- | |
| 1235 | | ----- | | ----- | |
| 1243 | | ----- | | ----- | |
| 1316 | | ----- | | ----- | |
| 1320 | D7042 | 14.29 | | -0.35 | |
| 1326 | | ----- | | ----- | |
| 1328 | | ----- | | ----- | |
| 1384 | PN-C-01358 | 14.26 | | -0.95 | |
| 1412 | D7042 | 14.33 | | 0.45 | |
| 1431 | D7042 | 14.289 | | -0.37 | |
| 1433 | D7042 | 14.32 | | 0.25 | |
| 1438 | | 14.38 | | 1.45 | |
| 1460 | D7042 | 14.611 | R(0.01) | 6.07 | |
| 1510 | | ----- | | ----- | |
| 1564 | | ----- | | ----- | |
| 1650 | | ----- | | ----- | |
| 1740 | | ----- | | ----- | |
| 1748 | D7042 | 14.321 | | 0.27 | |
| 1799 | | ----- | | ----- | |
| 1850 | | ----- | | ----- | |
| 1864 | | ----- | | ----- | |
| 1877 | D7042 | 14.30 | | -0.15 | |
| 1957 | | ----- | | ----- | |
| 1969 | | ----- | | ----- | |
| 6016 | D7042 | 14.292 | | -0.31 | |
| 6032 | | ----- | | ----- | |
| 6035 | | ----- | | ----- | |
| 6181 | D7042 | 14.3 | | -0.15 | |
| 6183 | D7042 | 14.31 | | 0.05 | |
| 6197 | | ----- | | ----- | |
| 6266 | | ----- | | ----- | |
| 6310 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | |
| 6358 | | ----- | | ----- | |
| 6380 | D7042 | 14.184 | R(0.05) | -2.47 | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 21 |
| outliers | 2 |
| mean (n) | 14.308 |
| st.dev. (n) | 0.0297 |
| R(calc.) | 0.083 |
| st.dev.(D7042:21) | 0.0500 |
| R(D7042:21) | 0.140 |



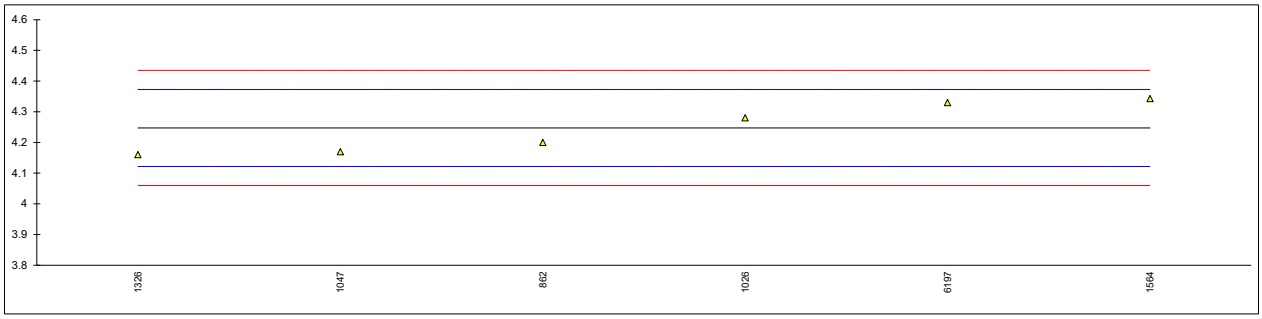



## Determination of Viscosity HTHS on sample #21075; results in mPa·s

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | | ----- | | ----- | |
| 211 | | ----- | | ----- | |
| 219 | | ----- | | ----- | |
| 237 | | ----- | | ----- | |
| 254 | | ----- | | ----- | |
| 257 | | ----- | | ----- | |
| 309 | | ----- | | ----- | |
| 325 | | ----- | | ----- | |
| 329 | | ----- | | ----- | |
| 333 | | ----- | | ----- | |
| 339 | | ----- | | ----- | |
| 349 | | ----- | | ----- | |
| 360 | | ----- | | ----- | |
| 398 | | ----- | | ----- | |
| 421 | | ----- | | ----- | |
| 432 | | ----- | | ----- | |
| 496 | | ----- | | ----- | |
| 614 | | ----- | | ----- | |
| 633 | | ----- | | ----- | |
| 634 | | ----- | | ----- | |
| 657 | | ----- | | ----- | |
| 780 | | ----- | | ----- | |
| 823 | | ----- | | ----- | |
| 840 | | ----- | | ----- | |
| 862 | D4683 | 4.20 | | -0.75 | |
| 875 | | ----- | | ----- | |
| 902 | | ----- | | ----- | |
| 912 | | ----- | | ----- | |
| 913 | | ----- | | ----- | |
| 922 | | ----- | | ----- | |
| 962 | | ----- | | ----- | |
| 963 | | ----- | | ----- | |
| 974 | | ----- | | ----- | |
| 994 | | ----- | | ----- | |
| 1011 | | ----- | | ----- | |
| 1017 | | ----- | | ----- | |
| 1026 | D5481 | 4.28 | | 0.53 | |
| 1047 | PN-C-04098 | 4.17 | | -1.23 | |
| 1059 | | ----- | | ----- | |
| 1146 | | ----- | | ----- | |
| 1150 | | ----- | | ----- | |
| 1173 | | ----- | | ----- | |
| 1213 | | ----- | | ----- | |
| 1235 | | ----- | | ----- | |
| 1243 | | ----- | | ----- | |
| 1316 | | ----- | | ----- | |
| 1320 | | ----- | | ----- | |
| 1326 | D5481 | 4.16 | | -1.39 | |
| 1328 | | ----- | | ----- | |
| 1384 | | ----- | | ----- | |
| 1412 | | ----- | | ----- | |
| 1431 | | ----- | | ----- | |
| 1433 | | ----- | | ----- | |
| 1438 | | ----- | | ----- | |
| 1460 | | ----- | | ----- | |
| 1510 | | ----- | | ----- | |
| 1564 | D4683 | 4.343 | | 1.53 | |
| 1650 | | ----- | | ----- | |
| 1740 | | ----- | | ----- | |
| 1748 | | ----- | | ----- | |
| 1799 | | ----- | | ----- | |
| 1850 | | ----- | | ----- | |
| 1864 | | ----- | | ----- | |
| 1877 | | ----- | | ----- | |
| 1957 | | ----- | | ----- | |
| 1969 | | ----- | | ----- | |
| 6016 | | ----- | | ----- | |
| 6032 | | ----- | | ----- | |
| 6035 | | ----- | | ----- | |
| 6181 | | ----- | | ----- | |
| 6183 | | ----- | | ----- | |
| 6197 | D5481 | 4.33 | | 1.32 | |
| 6266 | | ----- | | ----- | |
| 6310 | | ----- | | ----- | |
| 6324 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6358 | | ----- | | ----- | |
| 6380 | | ----- | | ----- | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | unknown |
| n | 6 |
| outliers | 0 |
| mean (n) | 4.247 |
| st.dev. (n) | 0.0811 |
| R(calc.) | 0.227 |
| st.dev.(D4683:17) | 0.0625 |
| R(D4683:17) | 0.175 |

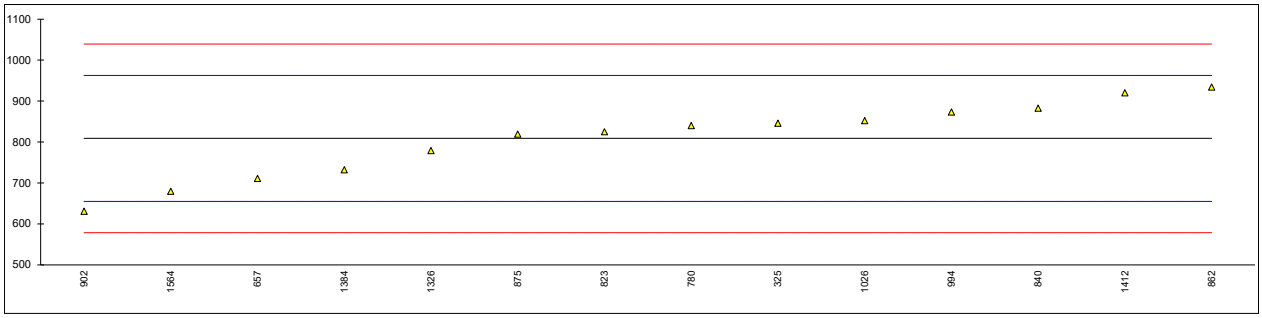


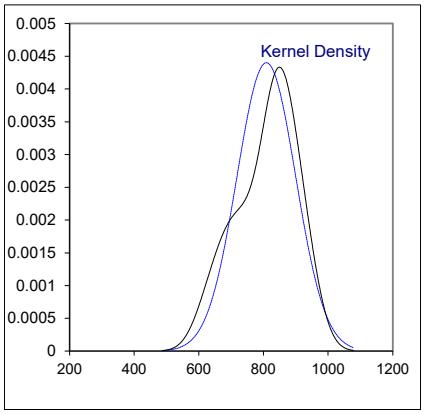
## Determination of Nitrogen on sample #21075; results in mg/kg

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | | ----- | | ----- | |
| 211 | | ----- | | ----- | |
| 219 | | ----- | | ----- | |
| 237 | | ----- | | ----- | |
| 254 | | ----- | | ----- | |
| 257 | | ----- | | ----- | |
| 309 | | ----- | | ----- | |
| 325 | D5762 | 846 | | 0.48 | |
| 329 | | ----- | | ----- | |
| 333 | | ----- | | ----- | |
| 339 | | ----- | | ----- | |
| 349 | | ----- | | ----- | |
| 360 | | ----- | | ----- | |
| 398 | | ----- | | ----- | |
| 421 | | ----- | | ----- | |
| 432 | | ----- | | ----- | |
| 496 | | ----- | | ----- | |
| 614 | | ----- | | ----- | |
| 633 | | ----- | | ----- | |
| 634 | | ----- | | ----- | |
| 657 | D5762 | 711 | | -1.27 | |
| 780 | D3228 | 840 | | 0.41 | |
| 823 | D5762 | 825 | | 0.21 | |
| 840 | D3228 | 882.7 | | 0.96 | |
| 862 | D5762 | 934 | | 1.63 | |
| 875 | D5762 | 819 | | 0.13 | |
| 902 | D5762 | 631 | | -2.31 | |
| 912 | | ----- | | ----- | |
| 913 | | ----- | | ----- | |
| 922 | | ----- | | ----- | |
| 962 | | ----- | | ----- | |
| 963 | | ----- | | ----- | |
| 974 | | ----- | | ----- | |
| 994 | D5762 | 873 | | 0.83 | |
| 1011 | | ----- | | ----- | |
| 1017 | | ----- | | ----- | |
| 1026 | D5762 | 852 | | 0.56 | |
| 1047 | | ----- | | ----- | |
| 1059 | | ----- | | ----- | |
| 1146 | | ----- | | ----- | |
| 1150 | | ----- | | ----- | |
| 1173 | | ----- | | ----- | |
| 1213 | | ----- | | ----- | |
| 1235 | | ----- | | ----- | |
| 1243 | | ----- | | ----- | |
| 1316 | | ----- | | ----- | |
| 1320 | | ----- | | ----- | |
| 1326 | D5762 | 779 | | -0.39 | |
| 1328 | | ----- | | ----- | |
| 1384 | In house | 732 | C | -1.00 | first reported 1131 |
| 1412 | D5762 | 920 | | 1.45 | |
| 1431 | | ----- | | ----- | |
| 1433 | | ----- | | ----- | |
| 1438 | | ----- | | ----- | |
| 1460 | | ----- | | ----- | |
| 1510 | | ----- | | ----- | |
| 1564 | D5762 | 679.5 | | -1.68 | |
| 1650 | | ----- | | ----- | |
| 1740 | | ----- | | ----- | |
| 1748 | | ----- | | ----- | |
| 1799 | | ----- | | ----- | |
| 1850 | | ----- | | ----- | |
| 1864 | | ----- | | ----- | |
| 1877 | | ----- | | ----- | |
| 1957 | | ----- | | ----- | |
| 1969 | | ----- | | ----- | |
| 6016 | | ----- | | ----- | |
| 6032 | | ----- | | ----- | |
| 6035 | | ----- | | ----- | |
| 6181 | | ----- | | ----- | |
| 6183 | | ----- | | ----- | |
| 6197 | | ----- | | ----- | |
| 6266 | | ----- | | ----- | |
| 6310 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | |
| 6358 | | ----- | | ----- | |
| 6380 | | ----- | | ----- | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 14 |
| outliers | 0 |
| mean (n) | 808.87 |
| st.dev. (n) | 90.679 |
| R(calc.) | 253.90 |
| st.dev.(D5762:18a) | 76.843 |
| R(D5762:18a) | 215.16 |



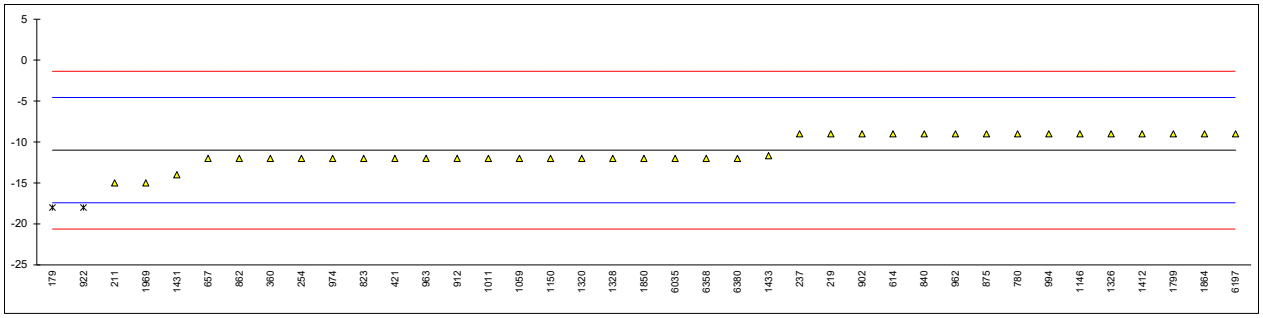



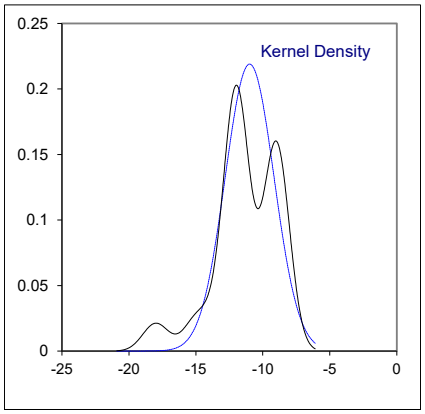
## Determination of Pour Point Manual on sample #21075; results in °C

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | D97 | -18 | R(0.05) | -2.18 | |
| 211 | D97 | -15 | | -1.25 | |
| 219 | D97 | -9 | | 0.62 | |
| 237 | D97 | -9 | | 0.62 | |
| 254 | D97 | -12 | | -0.31 | |
| 257 | | ----- | | ----- | |
| 309 | | ----- | | ----- | |
| 325 | | ----- | | ----- | |
| 329 | | ----- | | ----- | |
| 333 | | ----- | | ----- | |
| 339 | | ----- | | ----- | |
| 349 | | ----- | | ----- | |
| 360 | D97 | -12 | | -0.31 | |
| 398 | | ----- | | ----- | |
| 421 | ISO3016 | -12 | | -0.31 | |
| 432 | | ----- | | ----- | |
| 496 | | ----- | | ----- | |
| 614 | D97 | -9 | | 0.62 | |
| 633 | | ----- | | ----- | |
| 634 | | ----- | | ----- | |
| 657 | D97 | -12 | | -0.31 | |
| 780 | D97 | -9 | | 0.62 | |
| 823 | ISO3016 | -12 | | -0.31 | |
| 840 | D97 | -9 | | 0.62 | |
| 862 | D97 | -12 | | -0.31 | |
| 875 | D97 | -9 | | 0.62 | |
| 902 | D97 | -9 | | 0.62 | |
| 912 | D97 | -12 | | -0.31 | |
| 913 | | ----- | | ----- | |
| 922 | D97 | -18 | R(0.05) | -2.18 | |
| 962 | D97 | -9 | | 0.62 | |
| 963 | D97 | -12 | | -0.31 | |
| 974 | D97 | -12 | | -0.31 | |
| 994 | D97 | -9 | | 0.62 | |
| 1011 | D97 | -12 | | -0.31 | |
| 1017 | | ----- | | ----- | |
| 1026 | | ----- | | ----- | |
| 1047 | | ----- | | ----- | |
| 1059 | ISO3016 | -12 | | -0.31 | |
| 1146 | D97 | -9 | | 0.62 | |
| 1150 | ISO3016 | -12 | | -0.31 | |
| 1173 | | ----- | | ----- | |
| 1213 | | ----- | | ----- | |
| 1235 | | ----- | | ----- | |
| 1243 | | ----- | | ----- | |
| 1316 | | ----- | | ----- | |
| 1320 | D97 | -12 | | -0.31 | |
| 1326 | D97 | -9 | | 0.62 | |
| 1328 | D97 | -12 | | -0.31 | |
| 1384 | | ----- | | ----- | |
| 1412 | D97 | -9 | | 0.62 | |
| 1431 | D97 | -14.0 | | -0.94 | |
| 1433 | ISO3016 | -11.67 | | -0.21 | |
| 1438 | | ----- | | ----- | |
| 1460 | | ----- | | ----- | |
| 1510 | | ----- | | ----- | |
| 1564 | | ----- | | ----- | |
| 1650 | | ----- | | ----- | |
| 1740 | | ----- | | ----- | |
| 1748 | | ----- | | ----- | |
| 1799 | D97 | -9 | | 0.62 | |
| 1850 | ISO3016 | -12 | | -0.31 | |
| 1864 | D97 | -9 | | 0.62 | |
| 1877 | | ----- | | ----- | |
| 1957 | | ----- | | ----- | |
| 1969 | ISO3016 | -15 | | -1.25 | |
| 6016 | | ----- | | ----- | |
| 6032 | | ----- | | ----- | |
| 6035 | ISO3016 | -12 | | -0.31 | |
| 6181 | | ----- | | ----- | |
| 6183 | | ----- | | ----- | |
| 6197 | D97 | -9 | | 0.62 | |
| 6266 | | ----- | | ----- | |
| 6310 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | |
| 6358 | ISO3016 | -12 | | -0.31 | |
| 6380 | D97 | -12 | | -0.31 | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 37 |
| outliers | 2 |
| mean (n) | -10.99 |
| st.dev. (n) | 1.822 |
| R(calc.) | 5.10 |
| st.dev.(D97:17b) | 3.214 |
| R(D97:17b) | 9 |



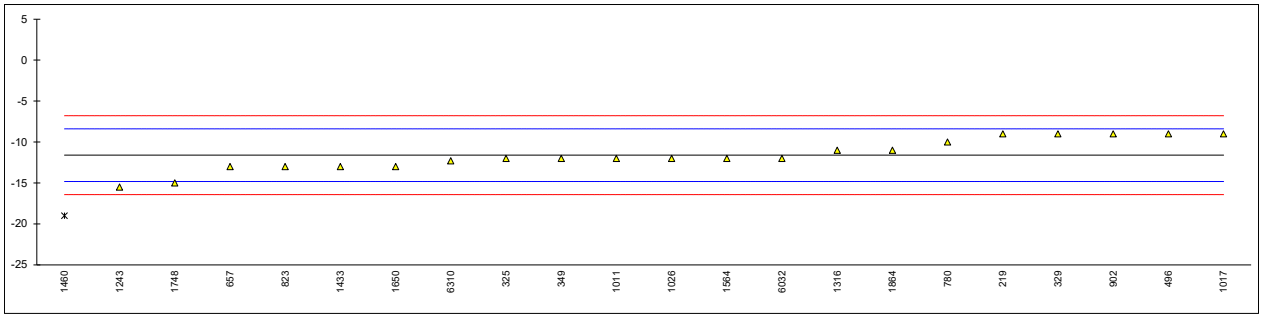



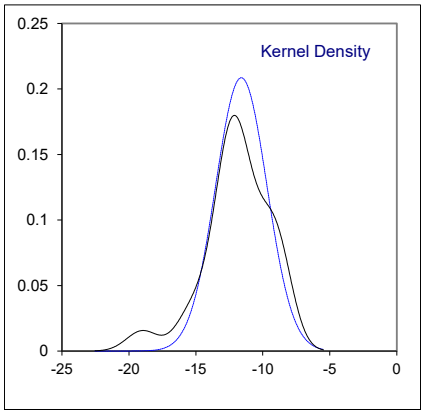
Determination of Pour Point Automated 1°C interval on sample #21075; results in °C

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | | ----- | | ----- | |
| 211 | | ----- | | ----- | |
| 219 | D5950 | -9 | | 1.62 | |
| 237 | | ----- | | ----- | |
| 254 | | ----- | | ----- | |
| 257 | | ----- | | ----- | |
| 309 | | ----- | | ----- | |
| 325 | D5950 | -12 | | -0.24 | |
| 329 | D5950 | -9 | | 1.62 | |
| 333 | | ----- | | ----- | |
| 339 | | ----- | | ----- | |
| 349 | D5950 | -12 | | -0.24 | |
| 360 | | ----- | | ----- | |
| 398 | | ----- | | ----- | |
| 421 | | ----- | | ----- | |
| 432 | | ----- | | ----- | |
| 496 | D5950 | -9 | | 1.62 | |
| 614 | | ----- | | ----- | |
| 633 | | ----- | | ----- | |
| 634 | | ----- | | ----- | |
| 657 | D5950 | -13 | | -0.87 | |
| 780 | D5950 | -10 | | 1.00 | |
| 823 | D5950 | -13 | | -0.87 | |
| 840 | | ----- | | ----- | |
| 862 | | ----- | | ----- | |
| 875 | | ----- | | ----- | |
| 902 | D5950 | -9 | | 1.62 | |
| 912 | | ----- | | ----- | |
| 913 | | ----- | | ----- | |
| 922 | | ----- | | ----- | |
| 962 | | ----- | | ----- | |
| 963 | | ----- | | ----- | |
| 974 | | ----- | | ----- | |
| 994 | | ----- | | ----- | |
| 1011 | D6892 | -12 | | -0.24 | |
| 1017 | D5950 | -9 | C | 1.62 | first reported -27 |
| 1026 | D5950 | -12 | | -0.24 | |
| 1047 | | ----- | | ----- | |
| 1059 | | ----- | | ----- | |
| 1146 | | ----- | | ----- | |
| 1150 | | ----- | | ----- | |
| 1173 | | ----- | | ----- | |
| 1213 | | ----- | | ----- | |
| 1235 | | ----- | | ----- | |
| 1243 | D7346 | -15.5 | | -2.42 | |
| 1316 | D5950 | -11.0 | | 0.38 | |
| 1320 | | ----- | | ----- | |
| 1326 | | ----- | | ----- | |
| 1328 | | ----- | | ----- | |
| 1384 | | ----- | | ----- | |
| 1412 | | ----- | | ----- | |
| 1431 | | ----- | | ----- | |
| 1433 | D5950 | -13 | | -0.87 | |
| 1438 | | ----- | | ----- | |
| 1460 | D5950 | -19.0 | R(0.05) | -4.60 | |
| 1510 | | ----- | | ----- | |
| 1564 | D5950 | -12 | | -0.24 | |
| 1650 | D5950 | -13 | | -0.87 | |
| 1740 | | ----- | | ----- | |
| 1748 | D7346 | -15 | | -2.11 | |
| 1799 | | ----- | | ----- | |
| 1850 | | ----- | | ----- | |
| 1864 | D5950 | -11 | | 0.38 | |
| 1877 | | ----- | | ----- | |
| 1957 | | ----- | | ----- | |
| 1969 | | ----- | | ----- | |
| 6016 | | ----- | | ----- | |
| 6032 | D5950 | -12 | | -0.24 | |
| 6035 | | ----- | | ----- | |
| 6181 | | ----- | | ----- | |
| 6183 | | ----- | | ----- | |
| 6197 | | ----- | | ----- | |
| 6266 | | ----- | | ----- | |
| 6310 | D5950 | -12.3 | | -0.43 | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | |
| 6358 | | ----- | | ----- | |
| 6380 | | ----- | | ----- | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 21 |
| outliers | 1 |
| mean (n) | -11.61 |
| st.dev. (n) | 1.912 |
| R(calc.) | 5.35 |
| st.dev.(D5950:14) | 1.607 |
| R(D5950:14) | 4.5 |



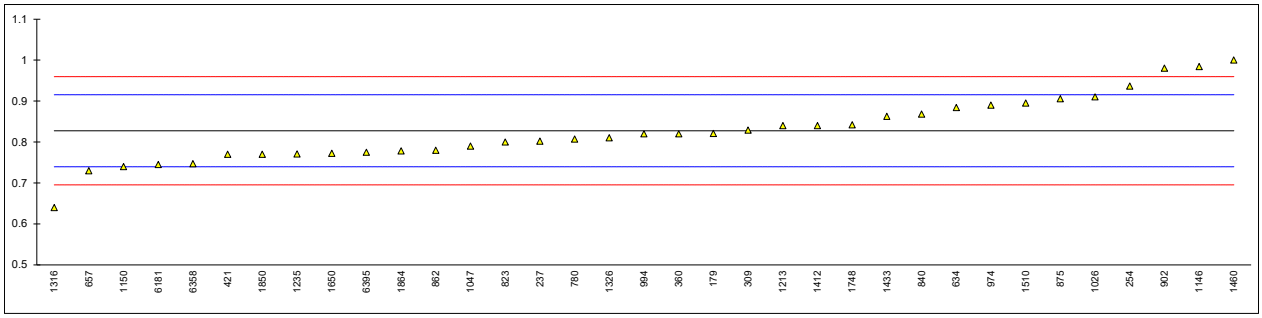



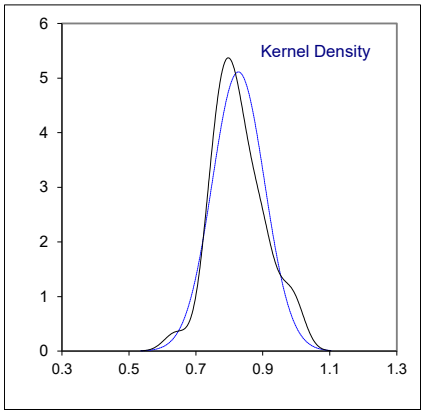
## Determination of Sulfated Ash on sample #21075; results in %M/M

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | D874 | 0.821 | | -0.14 | |
| 211 | | ----- | | ----- | |
| 219 | | ----- | | ----- | |
| 237 | D874 | 0.802 | | -0.58 | |
| 254 | D874 | 0.9365 | | 2.48 | |
| 257 | | ----- | | ----- | |
| 309 | D874 | 0.829 | | 0.04 | |
| 325 | | ----- | | ----- | |
| 329 | | ----- | | ----- | |
| 333 | | ----- | | ----- | |
| 339 | | ----- | | ----- | |
| 349 | | ----- | | ----- | |
| 360 | D874 | 0.82 | | -0.17 | |
| 398 | | ----- | | ----- | |
| 421 | ISO3987 | 0.77 | | -1.30 | |
| 432 | | ----- | | ----- | |
| 496 | | ----- | | ----- | |
| 614 | | ----- | | ----- | |
| 633 | | ----- | | ----- | |
| 634 | D874 | 0.884 | | 1.29 | |
| 657 | D874 | 0.73 | | -2.21 | |
| 780 | D874 | 0.807 | | -0.46 | |
| 823 | D874 | 0.80 | | -0.62 | |
| 840 | D874 | 0.868 | | 0.92 | |
| 862 | D874 | 0.78 | | -1.08 | |
| 875 | D874 | 0.9059 | | 1.79 | |
| 902 | D874 | 0.98 | | 3.47 | |
| 912 | | ----- | | ----- | |
| 913 | | ----- | | ----- | |
| 922 | | ----- | | ----- | |
| 962 | | ----- | | ----- | |
| 963 | | ----- | | ----- | |
| 974 | D874 | 0.89 | | 1.43 | |
| 994 | D874 | 0.82 | | -0.17 | |
| 1011 | | ----- | | ----- | |
| 1017 | | ----- | | ----- | |
| 1026 | D874 | 0.91 | | 1.88 | |
| 1047 | ISO3987 | 0.79 | | -0.85 | |
| 1059 | | ----- | | ----- | |
| 1146 | D874 | 0.9842 | | 3.57 | |
| 1150 | ISO3987 | 0.74 | | -1.98 | |
| 1173 | | ----- | | ----- | |
| 1213 | D874 | 0.84 | | 0.29 | |
| 1235 | ISO3987 | 0.7710 | | -1.28 | |
| 1243 | | ----- | | ----- | |
| 1316 | D874 | 0.64 | | -4.26 | |
| 1320 | | ----- | | ----- | |
| 1326 | D874 | 0.8105 | | -0.38 | |
| 1328 | | ----- | | ----- | |
| 1384 | | ----- | | ----- | |
| 1412 | D874 | 0.84 | | 0.29 | |
| 1431 | | ----- | | ----- | |
| 1433 | D874 | 0.8625 | | 0.80 | |
| 1438 | | ----- | | ----- | |
| 1460 | D874 | 1.0 | | 3.93 | |
| 1510 | D874 | 0.895 | | 1.54 | |
| 1564 | | ----- | | ----- | |
| 1650 | D874 | 0.7722 | | -1.25 | |
| 1740 | | ----- | | ----- | |
| 1748 | D874 | 0.842 | | 0.33 | |
| 1799 | | ----- | | ----- | |
| 1850 | ISO3987 | 0.77 | | -1.30 | |
| 1864 | D874 | 0.778 | | -1.12 | |
| 1877 | | ----- | | ----- | |
| 1957 | | ----- | | ----- | |
| 1969 | | ----- | | ----- | |
| 6016 | | ----- | | ----- | |
| 6032 | | ----- | | ----- | |
| 6035 | | ----- | | ----- | |
| 6181 | ISO3987 | 0.745 | | -1.87 | |
| 6183 | | ----- | | ----- | |
| 6197 | | ----- | | ----- | |
| 6266 | | ----- | | ----- | |
| 6310 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | |
| 6358 | ISO3987 | 0.7470 | | -1.83 | |
| 6380 | | ----- | | ----- | |
| 6395 | In house | 0.775 | | -1.19 | |

| | |
|---|---|
| normality | OK |
| n | 35 |
| outliers | 0 |
| mean (n) | 0.827 |
| st.dev. (n) | 0.0780 |
| R(calc.) | 0.219 |
| st.dev.(D874:13a) | 0.0440 |
| R(D874:13a) | 0.123 |



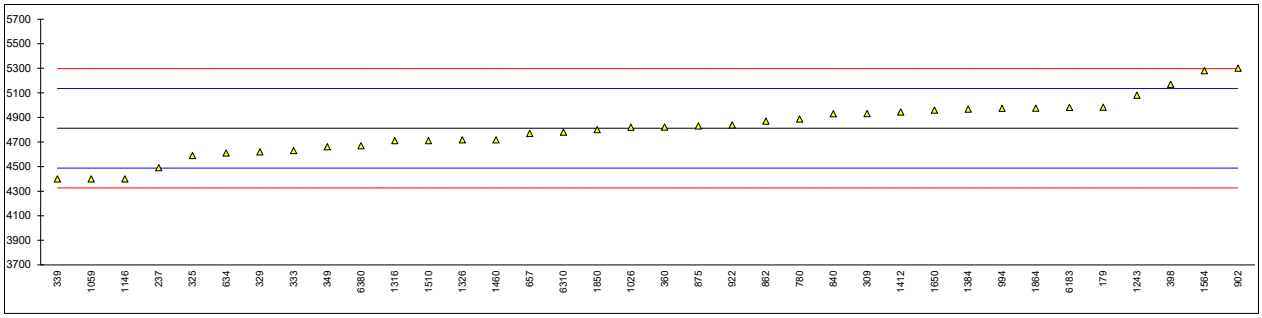



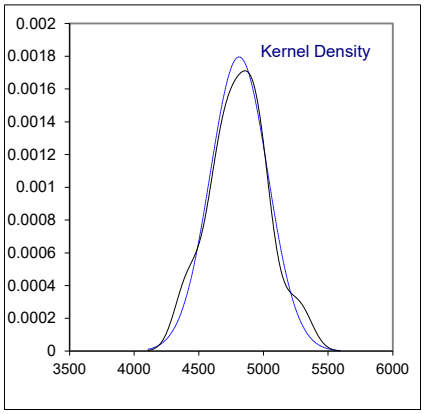
## Determination of Sulfur on sample #21075; results in mg/kg

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | D4294 | 4982 | | 1.05 | |
| 211 | | ----- | | ----- | |
| 219 | | ----- | | ----- | |
| 237 | D4294 | 4490 | | -1.99 | |
| 254 | | ----- | | ----- | |
| 257 | | ----- | | ----- | |
| 309 | D4294 | 4930 | | 0.73 | |
| 325 | D5185 | 4589 | | -1.37 | |
| 329 | D4294 | 4620 | | -1.18 | |
| 333 | D4294 | 4630 | | -1.12 | |
| 339 | INH-050 | 4400 | | -2.54 | |
| 349 | D2622 | 4661 | | -0.93 | |
| 360 | D5453 | 4822 | | 0.06 | |
| 398 | ISO8754 | 5170 | | 2.21 | |
| 421 | | ----- | | ----- | |
| 432 | | ----- | | ----- | |
| 496 | | ----- | | ----- | |
| 614 | | ----- | | ----- | |
| 633 | | ----- | | ----- | |
| 634 | D4294 | 4610 | C | -1.24 | first reported 0.461 mg/kg |
| 657 | D4294 | 4770 | | -0.26 | |
| 780 | D4294 | 4887 | | 0.47 | |
| 823 | | ----- | | ----- | |
| 840 | D5453 | 4929 | C | 0.73 | first reported 0.4929 mg/kg |
| 862 | D2622 | 4870 | | 0.36 | |
| 875 | D4294 | 4830 | C | 0.11 | reported 0.483 mg/kg |
| 902 | D4294 | 5300 | | 3.02 | |
| 912 | | ----- | | ----- | |
| 913 | | ----- | | ----- | |
| 922 | D4294 | 4839 | | 0.17 | |
| 962 | | ----- | | ----- | |
| 963 | | ----- | | ----- | |
| 974 | | ----- | | ----- | |
| 994 | D4294 | 4974 | | 1.00 | |
| 1011 | | ----- | | ----- | |
| 1017 | | ----- | | ----- | |
| 1026 | D2622 | 4820 | | 0.05 | |
| 1047 | | ----- | | ----- | |
| 1059 | ISO14596 | 4400 | | -2.54 | |
| 1146 | D4294 | 4400 | C | -2.54 | first reported 440 |
| 1150 | | ----- | | ----- | |
| 1173 | | ----- | | ----- | |
| 1213 | | ----- | | ----- | |
| 1235 | | ----- | | ----- | |
| 1243 | ISO8754 | 5080 | | 1.66 | |
| 1316 | D7751 | 4710 | | -0.63 | |
| 1320 | | ----- | | ----- | |
| 1326 | D4292 | 4718 | | -0.58 | |
| 1328 | | ----- | | ----- | |
| 1384 | In house | 4968 | | 0.97 | |
| 1412 | D4294 | 4944 | | 0.82 | |
| 1431 | | ----- | | ----- | |
| 1433 | | ----- | | ----- | |
| 1438 | | ----- | | ----- | |
| 1460 | D4294 | 4718 | | -0.58 | |
| 1510 | D4294 | 4710 | | -0.63 | |
| 1564 | D4294 | 5280 | | 2.89 | |
| 1650 | D4294 | 4960 | C | 0.92 | first reported 0.496 mg/kg |
| 1740 | | ----- | | ----- | |
| 1748 | | ----- | | ----- | |
| 1799 | | ----- | | ----- | |
| 1850 | ISO8754 | 4800 | | -0.07 | |
| 1864 | ISO8754 | 4975 | | 1.01 | |
| 1877 | | ----- | | ----- | |
| 1957 | | ----- | | ----- | |
| 1969 | | ----- | | ----- | |
| 6016 | | ----- | | ----- | |
| 6032 | | ----- | | ----- | |
| 6035 | | ----- | | ----- | |
| 6181 | | ----- | | ----- | |
| 6183 | D2622 | 4981.00 | | 1.05 | |
| 6197 | | ----- | | ----- | |
| 6266 | | ----- | | ----- | |
| 6310 | D7751 | 4780 | | -0.19 | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | |
| 6358 | | ----- | | ----- | |
| 6380 | D5185 | 4669.54 | | -0.88 | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 36 |
| outliers | 0 |
| mean (n) | 4811.6 |
| st.dev. (n) | 222.12 |
| R(calc.) | 621.9 |
| st.dev.(D4294:16e1) | 161.93 |
| R(D4294:16e1) | 453.4 |

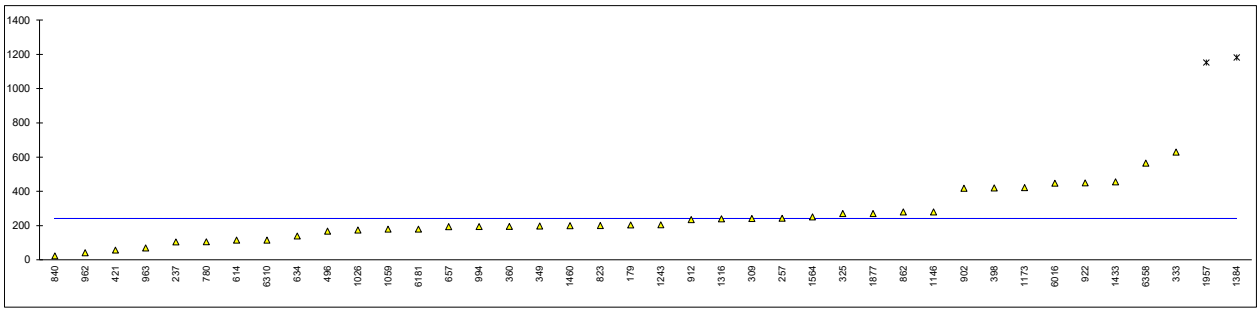


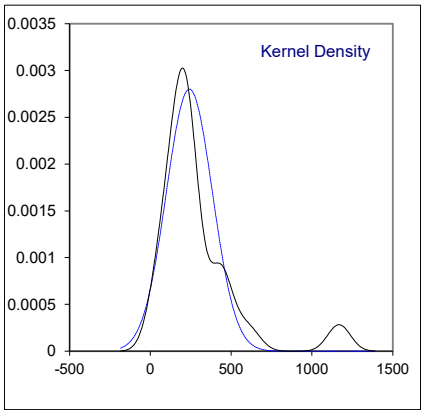



## Determination of Water on sample #21075; results in mg/kg

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | D6304-C | 204 | | ----- | |
| 211 | | ----- | | ----- | |
| 219 | | ----- | | ----- | |
| 237 | D6304-C | 105 | | ----- | |
| 254 | | ----- | | ----- | |
| 257 | D6304-A | 243 | | ----- | |
| 309 | D6304-C | 242 | | ----- | |
| 325 | D6304-C | 271 | | ----- | |
| 329 | | ----- | | ----- | |
| 333 | D6304-A | 630 | | ----- | |
| 339 | | ----- | | ----- | |
| 349 | D6304-C | 198 | | ----- | |
| 360 | D6304-B | 196 | | ----- | |
| 398 | ISO12937 | 420 | | ----- | |
| 421 | D6304-B | 57 | | ----- | |
| 432 | | ----- | | ----- | |
| 496 | D6304-C | 168 | | ----- | |
| 614 | D6304-B | 116 | | ----- | |
| 633 | | ----- | | ----- | |
| 634 | D6304-A | 139 | C | ----- | first reported 680 |
| 657 | D6304-A | 194 | C | ----- | first reported 0.20 %M/M |
| 780 | D6304-B | 106 | | ----- | |
| 823 | D6304-C | 201 | | ----- | |
| 840 | D6304-B | 23.6 | | ----- | |
| 862 | D6304-B | 280 | | ----- | |
| 875 | | ----- | | ----- | |
| 902 | D6304-C | 419.1 | | ----- | |
| 912 | D6304 | 235 | | ----- | |
| 913 | | ----- | | ----- | |
| 922 | D6304-A | 450 | | ----- | |
| 962 | D6304-C | 42 | | ----- | |
| 963 | D6304-C | 70 | | ----- | |
| 974 | | ----- | | ----- | |
| 994 | D6304-C | 195 | | ----- | |
| 1011 | | ----- | | ----- | |
| 1017 | | ----- | | ----- | |
| 1026 | D6304-C | 175 | | ----- | |
| 1047 | | ----- | | ----- | |
| 1059 | D6304-B | 180 | | ----- | |
| 1146 | D6304-C | 280 | | ----- | |
| 1150 | | ----- | | ----- | |
| 1173 | In house | 421.7 | C | ----- | first reported 971.9 |
| 1213 | | ----- | | ----- | |
| 1235 | | ----- | | ----- | |
| 1243 | ISO12937 | 205 | | ----- | |
| 1316 | D6304-B | 240 | | ----- | |
| 1320 | | ----- | | ----- | |
| 1326 | | ----- | | ----- | |
| 1328 | | ----- | | ----- | |
| 1384 | In house | 1182 | C,R(0.01) | ----- | first reported 2622 |
| 1412 | | ----- | | ----- | |
| 1431 | | ----- | | ----- | |
| 1433 | ISO12937 | 455.37 | | ----- | |
| 1438 | | ----- | | ----- | |
| 1460 | D6304-A | 200 | | ----- | |
| 1510 | | ----- | | ----- | |
| 1564 | D6304-C | 251 | | ----- | |
| 1650 | | ----- | | ----- | |
| 1740 | | ----- | | ----- | |
| 1748 | | ----- | | ----- | |
| 1799 | | ----- | | ----- | |
| 1850 | | ----- | | ----- | |
| 1864 | | ----- | | ----- | |
| 1877 | D6304-C | 271 | | ----- | |
| 1957 | D6304-C | 1153 | C,R(0.01) | ----- | first reported 1365 |
| 1969 | | ----- | | ----- | |
| 6016 | D6304-A | 448 | | ----- | |
| 6032 | | ----- | | ----- | |
| 6035 | | ----- | | ----- | |
| 6181 | D6304-C | 180 | | ----- | |
| 6183 | | ----- | | ----- | |
| 6197 | | ----- | | ----- | |
| 6266 | | ----- | | ----- | |
| 6310 | D6304-C | 116 | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6324 | | ----- | | ----- | |
| 6358 | ISO12937 | 565.7 | | ----- | |
| 6380 | | ----- | | ----- | |
| 6395 | | ----- | | ----- | |
| | normality | OK | | | |
| | n | 38 | | | |
| | outliers | 2 | | | |
| | mean (n) | 241.933 | | | |
| | st.dev. (n) | 142.3934 | | | |
| | R(calc.) | 398.701 | | | |
| | st.dev.(D6304-C:20) | (32.4973) | | | |
| | R(D6304-C:20) | (90.992) | | | range 20 - 360 mg/kg |
| Compare | | | | | |
| | R(D6304-A:20) | (112.255) | | | range 20 - 25000 mg/kg |
| | R(D6304-B:20) | (222.307) | | | range 30 - 2100 mg/kg |
| | R(D6304:16e1) | (454.873) | | | |



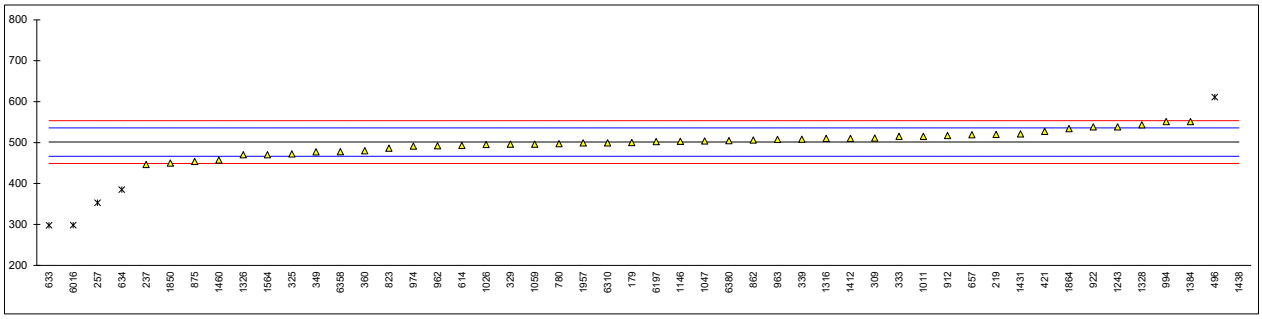



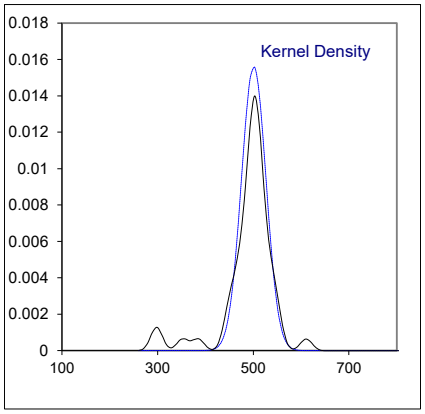
## Determination of Calcium as Ca on sample #21075; results in mg/kg

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | D4951 | 500 | | -0.07 | |
| 211 | | ----- | | ----- | |
| 219 | D5185 | 520 | | 1.09 | |
| 237 | D5185 | 446.1 | | -3.18 | |
| 254 | | ----- | | ----- | |
| 257 | D6595 | 352.49 | R(0.01) | -8.58 | |
| 309 | D5185 | 510.6 | | 0.54 | |
| 325 | D5185 | 472 | | -1.68 | |
| 329 | | 496 | | -0.30 | |
| 333 | D5185 | 515 | | 0.80 | |
| 339 | INH-165 | 508 | | 0.39 | |
| 349 | D5185 | 477 | | -1.39 | |
| 360 | D5185 | 480 | | -1.22 | |
| 398 | | ----- | | ----- | |
| 421 | D5185 | 527 | | 1.49 | |
| 432 | | ----- | | ----- | |
| 496 | D5185 | 610.9 | R(0.01) | 6.33 | |
| 614 | D5185 | 492.5 | | -0.50 | |
| 633 | D6595 | 297.5 | R(0.01) | -11.75 | |
| 634 | D6595 | 385 | C,R(0.01) | -6.70 | first reported 256 |
| 657 | D5185 | 519 | | 1.03 | |
| 780 | D5185 | 497 | | -0.24 | |
| 823 | D5185 | 486 | | -0.88 | |
| 840 | | ----- | | ----- | |
| 862 | D5185 | 506 | | 0.28 | |
| 875 | D5185 | 454 | | -2.72 | |
| 902 | | ----- | | ----- | |
| 912 | D5185 | 517 | | 0.91 | |
| 913 | | ----- | | ----- | |
| 922 | D5185 | 538 | | 2.12 | |
| 962 | D5185 | 492 | | -0.53 | |
| 963 | D5185 | 507.64 | | 0.37 | |
| 974 | | 491 | | -0.59 | |
| 994 | D5185 | 551 | | 2.87 | |
| 1011 | D5185 | 515 | | 0.80 | |
| 1017 | | ----- | | ----- | |
| 1026 | D5185 | 495 | | -0.36 | |
| 1047 | D5185 | 504 | | 0.16 | |
| 1059 | In house | 496 | | -0.30 | |
| 1146 | D5185 | 502.72 | | 0.09 | |
| 1150 | | ----- | | ----- | |
| 1173 | | ----- | | ----- | |
| 1213 | | ----- | | ----- | |
| 1235 | | ----- | | ----- | |
| 1243 | DIN51399 | 538 | | 2.12 | |
| 1316 | D5185 | 510 | | 0.51 | |
| 1320 | | ----- | | ----- | |
| 1326 | D5185 | 470 | | -1.80 | |
| 1328 | D5185 | 543 | | 2.41 | |
| 1384 | D5185 | 551 | | 2.87 | |
| 1412 | D5185 | 510 | | 0.51 | |
| 1431 | | 521 | | 1.14 | |
| 1433 | | ----- | | ----- | |
| 1438 | | 2700 | C,R(0.01) | 126.85 | first reported 270 |
| 1460 | D5185 | 457 | | -2.55 | |
| 1510 | | ----- | | ----- | |
| 1564 | D4951 | 470 | | -1.80 | |
| 1650 | | ----- | | ----- | |
| 1740 | | ----- | | ----- | |
| 1748 | | ----- | | ----- | |
| 1799 | | ----- | | ----- | |
| 1850 | In house | 450 | | -2.95 | |
| 1864 | | 534 | | 1.89 | |
| 1877 | | ----- | | ----- | |
| 1957 | D5185 | 499 | | -0.13 | |
| 1969 | | ----- | | ----- | |
| 6016 | D6595 | 298.37 | R(0.01) | -11.70 | |
| 6032 | | ----- | | ----- | |
| 6035 | | ----- | | ----- | |
| 6181 | | ----- | | ----- | |
| 6183 | | ----- | | ----- | |
| 6197 | D4951 | 502 | | 0.05 | |
| 6266 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6310 | D7751 | 499 | | -0.13 | |
| 6324 | | ----- | | ----- | |
| 6358 | D5185 | 477.3 | | -1.38 | |
| 6380 | | 504.540 | | 0.19 | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 44 |
| outliers | 6 |
| mean (n) | 501.17 |
| st.dev. (n) | 25.558 |
| R(calc.) | 71.56 |
| st.dev.(D5185:18) | 17.335 |
| R(D5185:18) | 48.54 |



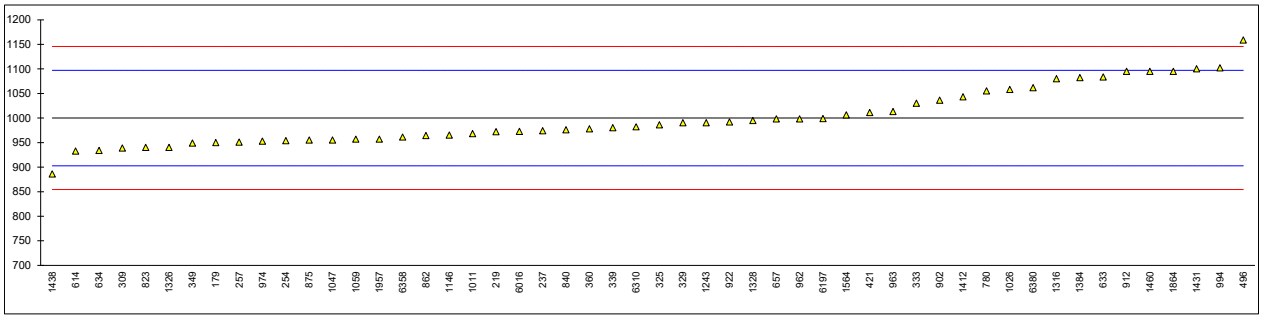



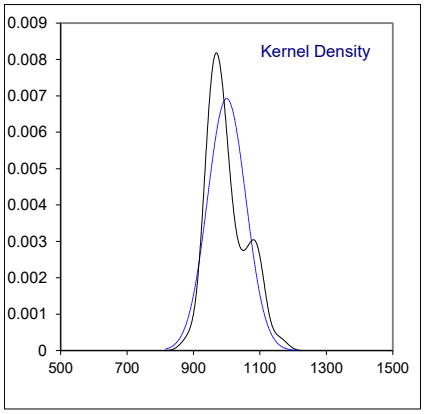
## Determination of Phosphorus as P on sample #21075; results in mg/kg

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | D4951 | 950 | | -1.03 | |
| 211 | | ----- | | ----- | |
| 219 | D5185 | 972 | | -0.58 | |
| 237 | D5185 | 974 | C | -0.53 | first reported 1365 |
| 254 | D5185 | 953.763 | | -0.95 | |
| 257 | D6595 | 950.73 | | -1.01 | |
| 309 | D5185 | 938.6 | | -1.26 | |
| 325 | D5185 | 986 | | -0.29 | |
| 329 | | 990 | | -0.20 | |
| 333 | D5185 | 1030 | | 0.62 | |
| 339 | INH-165 | 980 | | -0.41 | |
| 349 | D5185 | 949 | | -1.05 | |
| 360 | D5185 | 978 | | -0.45 | |
| 398 | | ----- | | ----- | |
| 421 | D5185 | 1011 | | 0.23 | |
| 432 | | ----- | | ----- | |
| 496 | D5185 | 1158.8 | | 3.27 | |
| 614 | D5185 | 932.7 | | -1.38 | |
| 633 | D6595 | 1083.5 | | 1.72 | |
| 634 | D6595 | 934 | | -1.36 | |
| 657 | D5185 | 998 | | -0.04 | |
| 780 | D5185 | 1055 | | 1.13 | |
| 823 | D5185 | 940 | | -1.23 | |
| 840 | D5185 | 976 | | -0.49 | |
| 862 | D5185 | 964 | | -0.74 | |
| 875 | D5185 | 955 | | -0.93 | |
| 902 | D5185 | 1036 | | 0.74 | |
| 912 | D5185 | 1095 | | 1.96 | |
| 913 | | ----- | | ----- | |
| 922 | D5185 | 992 | | -0.16 | |
| 962 | D5185 | 998 | | -0.04 | |
| 963 | D5185 | 1013.0 | | 0.27 | |
| 974 | | 953 | | -0.97 | |
| 994 | D5185 | 1102 | | 2.10 | |
| 1011 | D5185 | 968 | | -0.66 | |
| 1017 | | ----- | | ----- | |
| 1026 | D5185 | 1058 | | 1.20 | |
| 1047 | D5185 | 955 | | -0.93 | |
| 1059 | In house | 957 | | -0.88 | |
| 1146 | D5185 | 965.25 | | -0.71 | |
| 1150 | | ----- | | ----- | |
| 1173 | | ----- | | ----- | |
| 1213 | | ----- | | ----- | |
| 1235 | | ----- | | ----- | |
| 1243 | DIN51399 | 990 | | -0.20 | |
| 1316 | D5185 | 1080 | | 1.65 | |
| 1320 | | ----- | | ----- | |
| 1326 | D5185 | 940 | | -1.23 | |
| 1328 | D5185 | 995 | | -0.10 | |
| 1384 | D5185 | 1082 | | 1.69 | |
| 1412 | D5185 | 1043 | | 0.89 | |
| 1431 | | 1100 | | 2.06 | |
| 1433 | | ----- | | ----- | |
| 1438 | | 886 | | -2.35 | |
| 1460 | D5185 | 1095 | | 1.96 | |
| 1510 | | ----- | | ----- | |
| 1564 | D4951 | 1006 | | 0.12 | |
| 1650 | | ----- | | ----- | |
| 1740 | | ----- | | ----- | |
| 1748 | | ----- | | ----- | |
| 1799 | | ----- | | ----- | |
| 1850 | | ----- | | ----- | |
| 1864 | | 1095 | | 1.96 | |
| 1877 | | ----- | | ----- | |
| 1957 | D5185 | 957 | | -0.88 | |
| 1969 | | ----- | | ----- | |
| 6016 | D6595 | 972.44 | | -0.57 | |
| 6032 | | ----- | | ----- | |
| 6035 | | ----- | | ----- | |
| 6181 | | ----- | | ----- | |
| 6183 | | ----- | | ----- | |
| 6197 | D4951 | 999 | | -0.02 | |
| 6266 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6310 | D7751 | 982 | | -0.37 | |
| 6324 | | ----- | | ----- | |
| 6358 | D5185 | 961.0 | | -0.80 | |
| 6380 | | 1061.613 | | 1.27 | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 52 |
| outliers | 0 |
| mean (n) | 999.95 |
| st.dev. (n) | 57.628 |
| R(calc.) | 161.36 |
| st.dev.(D5185:18) | 48.562 |
| R(D5185:18) | 135.97 |



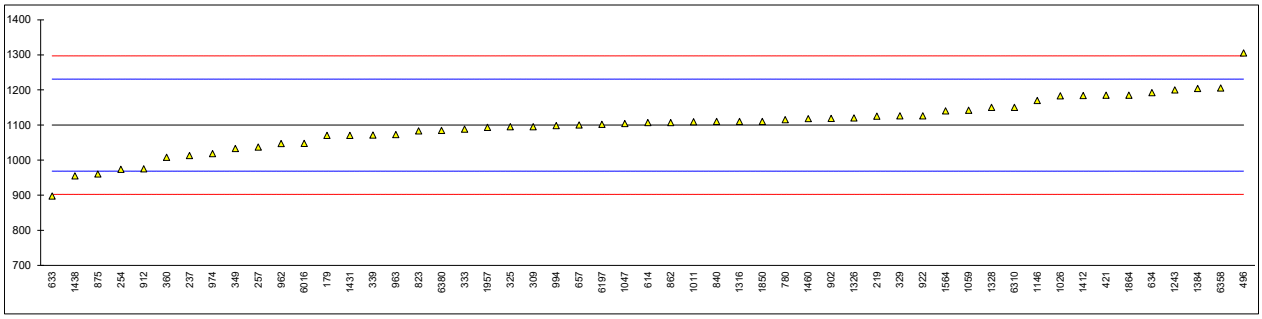



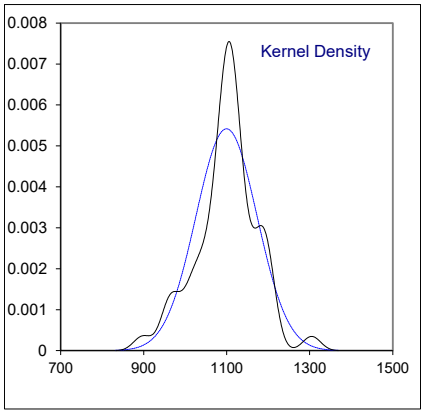
## Determination of Zinc as Zn on sample #21075; results in mg/kg

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 178 | | ----- | | ----- | |
| 179 | D4951 | 1070 | | -0.45 | |
| 211 | | ----- | | ----- | |
| 219 | D5185 | 1125 | | 0.38 | |
| 237 | D5185 | 1013 | | -1.32 | |
| 254 | D5185 | 973.773 | | -1.92 | |
| 257 | D6595 | 1037 | | -0.96 | |
| 309 | D5185 | 1095.3 | | -0.07 | |
| 325 | D5185 | 1095 | | -0.07 | |
| 329 | | 1126 | | 0.40 | |
| 333 | D5185 | 1088 | | -0.18 | |
| 339 | INH-165 | 1071 | | -0.44 | |
| 349 | D5185 | 1033 | | -1.02 | |
| 360 | D5185 | 1008 | | -1.40 | |
| 398 | | ----- | | ----- | |
| 421 | D5185 | 1185 | | 1.30 | |
| 432 | | ----- | | ----- | |
| 496 | D5185 | 1305 | | 3.13 | |
| 614 | D5185 | 1107 | | 0.11 | |
| 633 | D6595 | 897.4 | | -3.08 | |
| 634 | D6595 | 1192 | | 1.40 | |
| 657 | D5185 | 1100 | | 0.00 | |
| 780 | D5185 | 1115 | | 0.23 | |
| 823 | D5185 | 1083 | | -0.26 | |
| 840 | D5185 | 1110 | | 0.16 | |
| 862 | D5185 | 1107 | | 0.11 | |
| 875 | D5185 | 960 | | -2.13 | |
| 902 | D5185 | 1119 | | 0.29 | |
| 912 | D5185 | 975 | | -1.90 | |
| 913 | | ----- | | ----- | |
| 922 | D5185 | 1126 | | 0.40 | |
| 962 | D5185 | 1047 | | -0.80 | |
| 963 | D5185 | 1072.69 | | -0.41 | |
| 974 | | 1018 | | -1.25 | |
| 994 | D5185 | 1098 | | -0.03 | |
| 1011 | D5185 | 1109 | | 0.14 | |
| 1017 | | ----- | | ----- | |
| 1026 | D5185 | 1183 | | 1.27 | |
| 1047 | D5185 | 1104 | | 0.06 | |
| 1059 | In house | 1142 | | 0.64 | |
| 1146 | D5185 | 1169.5 | | 1.06 | |
| 1150 | | ----- | | ----- | |
| 1173 | | ----- | | ----- | |
| 1213 | | ----- | | ----- | |
| 1235 | | ----- | | ----- | |
| 1243 | DIN51399 | 1200 | | 1.53 | |
| 1316 | D5185 | 1110 | | 0.16 | |
| 1320 | | ----- | | ----- | |
| 1326 | D5185 | 1120 | | 0.31 | |
| 1328 | D5185 | 1150 | | 0.76 | |
| 1384 | D5185 | 1204 | | 1.59 | |
| 1412 | D5185 | 1184 | | 1.28 | |
| 1431 | | 1070 | | -0.45 | |
| 1433 | | ----- | | ----- | |
| 1438 | | 955 | | -2.20 | |
| 1460 | D5185 | 1118 | | 0.28 | |
| 1510 | | ----- | | ----- | |
| 1564 | D4951 | 1140 | | 0.61 | |
| 1650 | | ----- | | ----- | |
| 1740 | | ----- | | ----- | |
| 1748 | | ----- | | ----- | |
| 1799 | | ----- | | ----- | |
| 1850 | In house | 1110 | | 0.16 | |
| 1864 | | 1185 | | 1.30 | |
| 1877 | | ----- | | ----- | |
| 1957 | D5185 | 1093 | | -0.10 | |
| 1969 | | ----- | | ----- | |
| 6016 | D6595 | 1047.3 | | -0.80 | |
| 6032 | | ----- | | ----- | |
| 6035 | | ----- | | ----- | |
| 6181 | | ----- | | ----- | |
| 6183 | | ----- | | ----- | |
| 6197 | D4951 | 1102 | | 0.03 | |
| 6266 | | ----- | | ----- | |

| lab | method | value | mark | z(targ) | remarks |
|---|---|---|---|---|---|
| 6310 | D7751 | 1150 | | 0.76 | |
| 6324 | | ----- | | ----- | |
| 6358 | D5185 | 1205 | | 1.60 | |
| 6380 | | 1084.74 | | -0.23 | |
| 6395 | | ----- | | ----- | |

| | |
|---|---|
| normality | OK |
| n | 53 |
| outliers | 0 |
| mean (n) | 1099.77 |
| st.dev. (n) | 73.627 |
| R(calc.) | 206.15 |
| st.dev.(D5185:18) | 65.668 |
| R(D5185:18) | 183.87 |



## APPENDIX 2

### Number of participants per country

| | | | |
|---|---|---|---|
| 1 lab in | AUSTRALIA | 2 labs in | PAKISTAN |
| 1 lab in | AUSTRIA | 1 lab in | PERU |
| 2 labs in | AZERBAIJAN | 2 labs in | PHILIPPINES |
| 5 labs in | BELGIUM | 5 labs in | POLAND |
| 2 labs in | BULGARIA | 1 lab in | PORTUGAL |
| 3 labs in | CHINA, People's Republic | 1 lab in | ROMANIA |
| 1 lab in | CROATIA | 2 labs in | RUSSIAN FEDERATION |
| 1 lab in | CZECH REPUBLIC | 3 labs in | SAUDI ARABIA |
| 2 labs in | FRANCE | 2 labs in | SINGAPORE |
| 5 labs in | GERMANY | 1 lab in | SLOVAKIA |
| 2 labs in | GREECE | 1 lab in | SLOVENIA |
| 2 labs in | INDIA | 1 lab in | SOUTH KOREA |
| 1 lab in | ISRAEL | 2 labs in | SPAIN |
| 1 lab in | ITALY | 1 lab in | SWEDEN |
| 1 lab in | JORDAN | 2 labs in | TANZANIA |
| 1 lab in | KAZAKHSTAN | 1 lab in | TUNISIA |
| 1 lab in | KENYA | 2 labs in | TURKEY |
| 1 lab in | MACEDONIA | 1 lab in | UNITED ARAB EMIRATES |
| 2 labs in | MALAYSIA | 3 labs in | UNITED KINGDOM |
| 2 labs in | MOROCCO | 2 labs in | UNITED STATES OF AMERICA |
| 3 labs in | NETHERLANDS | 2 labs in | VIETNAM |
| 1 lab in | NIGERIA | | |

## APPENDIX 3

### Abbreviations

| | |
|---|---|
| C | = final test result after checking of first reported suspect test result |
| D(0.01) | = outlier in Dixon's outlier test |
| D(0.05) | = straggler in Dixon's outlier test |
| G(0.01) | = outlier in Grubbs' outlier test |
| G(0.05) | = straggler in Grubbs' outlier test |
| DG(0.01) | = outlier in Double Grubbs' outlier test |
| DG(0.05) | = straggler in Double Grubbs' outlier test |
| R(0.01)/R(1) | = outlier in Rosner's outlier test |
| R(0.05) | = straggler in Rosner's outlier test |
| E | = calculation difference between reported test result and result calculated by iis |
| W | = test result withdrawn on request of participant |
| ex | = test result excluded from statistical evaluation |
| n.a. | = not applicable |
| n.e. | = not evaluated |
| n.d. | = not detected |
| fr. | = first reported |
| f+? | = possibly a false positive test result? |
| f-? | = possibly a false negative test result? |
| SDS | = Safety Data Sheet |

### Literature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