**Institute for
Interlaboratory Studies**

Results of Proficiency Test
Gasoil - ASTM (winter)
September 2023

CONTENTS

Appendices:

1   INTRODUCTION

Since 1994 the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for the analysis of Gasoil twice a year. One round is based on the latest version of EN590 and the other round on the latest version of ASTM D975. During the annual proficiency testing program of 2023 it was decided to continue the round robin for the analysis of Gasoil winter quality in accordance with the latest version of ASTM D975.

In this interlaboratory study registered for participation:
-   171 laboratories in 69 countries for regular analyzes in Gasoil iis23G06ASTM
-   40 laboratories in 27 countries on the Cetane Number analyzes iis23G06CN
-   58 laboratories in 35 countries on the Total Contamination analyzes iis23G06TC
-   48 laboratories in 29 countries on the Oxidation Stability analyzes iis23G06OX

In total 179 laboratories in 72 countries registered for participation in one or more proficiency tests, see appendix 2 for the number of participants per country. In this report the results of these Gasoil - ASTM (winter) proficiency tests are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2   SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test (PT). Sample analyzes for fit-for-use and homogeneity testing were subcontracted to a laboratory that has performed the tests in accordance with for ISO/IEC17043 relevant requirements of ISO/IEC17025.
In this proficiency test the participants received, depending on the registration, from one up to four different samples of Gasoil, see table below.

Sample ID	PT ID	Quantity	Purpose
#23170	iis23G06ASTM	1x 1 L + 1x 0.5 L	Regular analyzes
#23171	iis23G06CN	4x 1 L	Cetane Number & DCN
#23172	iis23G06TC	1x 1 L	Total Contamination
#23173	iis23G06OX	1x 1 L	Oxidation Stability

Table 1: Gasoil samples used in PT iis23G06

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

2.1   ACCREDITATION

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

2.2   PROTOCOL

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

2.3   CONFIDENTIALITY STATEMENT

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

2.4   SAMPLES

For the preparation of the sample for the regular analyzes in Gasoil a batch of approximately 400 liters of a winter grade Gasoil was obtained from a local supplier. After homogenization 200 amber glass bottles of 1 L and 200 amber glass bottles of 0.5 L were filled and both were labelled #23170.

The homogeneity of the subsamples was checked by the determination of Density at 15 °C in accordance with ASTM D4052 on 16 stratified randomly selected subsamples.

	Density at 15 °C in kg/m^3
sample #23170-1	835.18
sample #23170-2	835.17
sample #23170-3	835.18
sample #23170-4	835.18
sample #23170-5	835.18
sample #23170-6	835.19
sample #23170-7	835.19
sample #23170-8	835.19
sample #23170-9	835.19
sample #23170-10	835.19
sample #23170-11	835.19
sample #23170-12	835.19
sample #23170-13	835.18
sample #23170-14	835.19
sample #23170-15	835.19
sample #23170-16	835.19

Table 2: homogeneity test results of subsamples #23170

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

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

Table 3: evaluation of the repeatability of subsamples #23170

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

For the preparation of the sample for the analyzes of Cetane Number and DCN a batch of approximately 400 liters of a winter grade Gasoil was obtained from a local supplier. After homogenization 250 amber glass bottles of 1 L were filled and labelled #23171.
The homogeneity of the subsamples was checked by the determination of Density at 15 °C in accordance with ASTM D4052 on 12 stratified randomly selected subsamples.

	Density at 15 °C in kg/m^3
sample #23171-1	835.20
sample #23171-2	835.20
sample #23171-3	835.20
sample #23171-4	835.20
sample #23171-5	835.20
sample #23171-6	835.19
sample #23171-7	835.20
sample #23171-8	835.20
sample #23171-9	835.20
sample #23171-10	835.21
sample #23171-11	835.20
sample #23171-12	835.20

Table 4: homogeneity test results of subsamples #23171

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

	Density at 15 °C in kg/m^3
r (observed)	0.01
reference test method	ASTM D4052:22
0.3 x R (reference test method)	0.15

Table 5: evaluation of the repeatability of subsamples #23171

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

For the preparation of the sample for the analyzes of Total Contamination in Gasoil a batch of approximately 150 liters of Gasoil was obtained from a local supplier. By means of a calibrated pipette, a defined volume of freshly prepared and well shaken Arizona Dust material in an oil suspension was added to an empty glass bottle. The addition was checked by weighing the bottle before and after addition. In total 75 bottles were prepared and subsequently filled up with 1 L from this batch of Gasoil and homogenized. The subsamples were labelled #23172.

For the preparation of the sample for the analyzes of Oxidation Stability in Gasoil a batch of approximately 100 liters of Gasoil was obtained from a local supplier. The batch was made positive for Oxidation Stability by adding copper rods for a while to enhance the oxidation of Gasoil. After homogenization 85 amber glass bottles of 1 L were filled and labelled #23173. The homogeneity of the subsamples was checked by the determination of Density at 15 °C in accordance with ASTM D4052 on 8 stratified randomly selected subsamples.

	Density at 15 °C in kg/m^3
sample #23173-1	841.93
sample #23173-2	841.93
sample #23173-3	841.93
sample #23173-4	841.93
sample #23173-5	841.93
sample #23173-6	841.93
sample #23173-7	841.93
sample #23173-8	841.93

Table 6: homogeneity test results of subsamples #23173

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

	Density at 15 °C in kg/m^3
r (observed)	0.00
reference test method	ASTM D4052:22
0.3 x R (reference test method)	0.15

Table 7: evaluation of the repeatability of subsamples #23173

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

Depending on the registration of the participant the appropriate set of PT samples was sent on August 30, 2023. An SDS was added to the sample package.

2.5   STABILITY OF THE SAMPLES

The stability of the Gasoil 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 on sample #23170: Total Acid Number, API Gravity, Aromatics by FIA without oxygenates correction, Ash content, Calculated Cetane Index (two and four variables), Cloud Point, Cold Filter Plugging Point (CFPP), Color ASTM, Conradson Carbon Residue on 10% residue, Ramsbottom Carbon Residue on 10% distillation residue, Copper Corrosion 3 hrs at 50 °C , Density at 15 °C, Distillation at 760 mmHg (IBP, 10%, 50%, 90%, 95% recovered, FBP, Volume at 250 °C and 350 °C, Distillation Residue), FAME content, Flash Point PMcc, Kinematic Viscosity at 40 °C, Lubricity by HFRR at 60 °C, Nitrogen, Pour Point (Manual and/or Automated), Total Sulfur, Water and Water and Sediment (D2709 and D1796).
On sample #23171 it was requested to determine: Cetane Number, Derived Cetane Number (DCN, D6890 and D7668) and Indicated Cetane Number (ICN).
On sample #23172 it was requested to determine: Particulate Contamination (D6217) and Total Contamination (EN12662).
On sample #23173 it was requested to determine: Oxidation Stability (Filterable Insolubles, Adherent Insolubles and Total Insolubles).

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

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

sample receipt on this data entry portal. The letter of instructions can also be downloaded from the iis website www.iisnl.com.

3   RESULTS

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

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

3.1   STATISTICS

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

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

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

According to ISO13528 all (original received or corrected) results per determination were submitted to outlier tests. In the iis procedure for proficiency tests, outliers are detected prior to calculation of the mean, standard deviation and reproducibility. For small data sets, Dixon (up to 20 test results) or Grubbs (up to 40 test results) outlier tests can be used. For larger data sets (above 20 test results) Rosner's outlier test can be used. Outliers are marked by D(0.01) for the Dixon's test, by G(0.01) or DG(0.01) for the Grubbs' test and by R(0.01) for the Rosner's test. Stragglers are marked by D(0.05) for the Dixon's test, by G(0.05) or

DG(0.05) for the Grubbs' test and by R(0.05) for the Rosner's test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

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

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

3.2 GRAPHICS

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

Furthermore, Kernel Density Graphs were made. This is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms. Also, a normal Gauss curve (dotted line) was projected over the Kernel Density Graph (smooth line) for reference. The Gauss curve is calculated from the consensus value and the corresponding standard deviation.

3.3 Z-SCORES

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

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

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

The z-scores were calculated according to:

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

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

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

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

4   EVALUATION

In this proficiency test some problems were encountered with the dispatch of the samples.
For the PT with the regular analyzes thirty-eight participants reported test results after the
final reporting date and twelve other participants did not report any test results.
For the PT on Cetane Number eleven participants reported test results after the final
reporting date and five other participants did not report any test results.
For the PT on Total Contamination nine participants reported test results after the final
reporting date and eleven other participants did not report any test results.
For the PT on Oxidation Stability six participants reported test results after the final reporting
date and thirteen other participants did not report any test results.
Not all participants were able to report all tests requested.
In total 165 participants reported 2877 numerical test results. Observed were 60 outlying test
results, which is 2.1%. 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 SAMPLE AND PER TEST

In this section the reported test results are discussed per sample and per test. The test
methods which were used by the various laboratories were taken into account for explaining
the observed differences when possible and applicable. These test methods are also in the
tables together with the original data in appendix 1. The abbreviations, used in these tables,
are explained in appendix 3.

In the iis PT reports ASTM test methods are referred to with a number (e.g. D1298) and an
added designation for the year that the test method was adopted or revised (e.g.
D1298:12b).
When a method has been reapproved an "R" will be added and the year of approval (e.g.
D1298:12bR17e1).

sample #23170

Total Acid Number: The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D974:22.

API Gravity: The group of participants met the target requirements. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D1298:12bR17e1.

Aromatics by FIA: The group of participants had difficulty to meet the target requirements. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D1319:20a.
One should be aware that this Gasoil does not meet the scope of ASTM D1319 with regard to the boiling range.

Ash content: All reporting participants agreed on a value near or below the application range. Therefore, no z-scores are calculated.

CCI D976:   The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D976:21e1.

CCI D4737:   The group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the target reproducibility as derived from iis memo 1904.
Regretfully, no reproducibility is mentioned in procedure A of ASTM D4737:21 nor in the equivalent test methods ISO4264 and IP380. Therefore, iis has estimated a reproducibility for Calculated Cetane Index by Four Variable Equation based on previous iis PTs (see iis memo 1904, lit. 13). This reproducibility has been used for the evaluation.

Cloud Point: The group of participants met the target requirements. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D2500:23.

CFPP: The group of participants had difficulty to meet the target requirements. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D6371:17a or EN116:15.
When the test results from ASTM D6371 were evaluated separately the calculated reproducibility is still not in agreement with the requirements of the corresponding test method.
A factor that may contribute to a higher variation in the test results is mentioned in ASTM D6371 Note 9 and Note 11 and EN116 paragraph 10.8: "A small minority of samples may exhibit anomalous aspiration behavior, which can be detected by examining the aspiration times recorded in the test printout for signs of an unexpected reduction in the time

taken to fill the pipet, after which aspiration time again continues to increase progressively until the failure limit of 60 s is reached."

Color ASTM: The group of participants met the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D1500:12R17. Please note: test values reported as text, e.g. "L1.5", were converted to a numeric value (L1.5 to 1.25, see also appendix 1) before calculating the z-scores.

Conradson CR: The group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D189:06R19.

Ramsbottom CR: The group of participants had difficulty to meet the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D524:15R19.

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

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

Distillation at 760 mmHg: The group of participants met all the target requirements. In total ten statistical outliers were observed and six other test results were excluded. All calculated reproducibilities after rejection of the suspect data are in agreement with the requirements of ASTM D86:23 automated mode. When evaluated against the ASTM D86:23 manual mode only the calculated reproducibilities for Temperature at 95% recovered and FBP are not in agreement.

FAME content: The group of participants may have had difficulty to meet the target requirements depending on the procedure used. Seven statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D7371:14R22 but not with the requirements of EN14078:14 mode A and B. NB Test method EN14078:14 mode A is not applicable for this sample. Remarkably, thirty-five (!) participants mentioned to have used EN14078-A.

Flash Point PMcc: The group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D93-A:20.

Kinematic Viscosity at 40 °C: The group of participants met the target requirements. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D445:23.

Lubricity: The group of participants met the target requirements. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D6079:22, ISO12156-1:18 (method A and B) and ISO12156-1:23.
When the test results from ASTM D6079 and ISO12156 were evaluated separately the calculated reproducibilities are also in agreement with the requirements of the respective test methods.

Nitrogen: The group of participants had difficulty to meet the target requirements. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D4629:17.

Pour Point: The group of participants met the target requirements for the manual mode. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D97:17b.
Also for the automated mode the group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5950:14R20.

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

Water: The group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D6304:20 for all modes A, B and C.

Water and Sediment (D2709): All reporting participants agreed on a test result of <0.05 %V/V. Therefore, no z-scores are calculated.

Water and Sediment (D1796): Almost all reporting participants agreed on a test result of <0.05 %V/V. Therefore, no z-scores are calculated.

sample #23171
Cetane Number: The group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D613:18ae1.

Derived Cetane Number (D6890): Only one participant reported a test result for DCN and Ignition Delay (ID). Therefore, no z-scores are calculated.

Derived Cetane Number (D7668): The group of participants had difficulty to meet the target requirements. One statistical outlier was observed over three parameters. The calculated reproducibilities for DCN, Ignition Delay (ID) and Combustion Delay (CD) are not in agreement with the requirements of ASTM D7668:17.

Indicated Cetane Number (ICN): Only four participants reported an test result. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D8183:22.

sample #23172

Particulate Contamination: The group of participants had difficulty to meet the target requirements. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D6217:21.

Total Contamination: The group of participants had difficulty to meet the target requirements. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of EN12662:14.

sample #23173

Filterable Insolubles (A): The group of participants met the target requirements. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with ASTM D2274:14R19.

Adherent Insolubles (B): The group of participants met the target requirements. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with ASTM D2274:14R19.

Total Insolubles (A+B): The group of participants met the target requirements. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with ASTM D2274:14R19.

4.2   PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

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

Parameter	unit	n	average	2.8 * sd	R(lit)
Total Acid Number	mg KOH/g	81	0.04	0.03	0.04
API Gravity		85	37.81	0.11	0.3
Aromatics by FIA	%V/V	27	19.7	4.1	3.7
Ash content	%M/M	94	<0.01	n.e.	n.e.
Calc. Cetane Index ASTM D976		85	53.6	0.7	2
Calc. Cetane Index ASTM D4737		93	53.3	0.9	0.9
Cloud Point	°C	117	-7.4	2.6	4
Cold Filter Plugging Point	°C	91	-25.3	10.2	5.1
Color ASTM		111	1.1	0.6	1
Conradson Carbon Residue	%M/M	55	0.02	0.02	0.03
Ramsbottom Carbon Residue	%M/M	10	0.05	0.06	0.03
Copper Corrosion 3 hrs at 50 °C		116	1(1A/1B)	n.a.	n.a.
Density at 15 °C	kg/m^3	150	835.2	0.2	0.5
Initial Boiling Point	°C	131	170.4	6.9	9.4
Temp at 10% recovery	°C	133	208.6	4.9	4.6
Temp at 50% recovery	°C	133	273.6	3.0	3.0
Temp at 90% recovery	°C	133	333.1	4.1	5.0
Temp at 95% recovery	°C	129	347.3	6.1	8.5
Final Boiling Point	°C	129	356.4	6.6	7.1
Volume at 250 °C	%V/V	123	32.6	2.4	2.7
Volume at 350 °C	%V/V	119	95.6	1.5	2.7
FAME content	%V/V	58	5.5	0.5	1.0
Flash Point PMcc	°C	142	63.8	3.2	4.5
Kinematic Viscosity at 40 °C	mm^2/s	123	2.800	0.027	0.031
Lubricity by HFRR at 60 °C	μm	56	200	42	80
Nitrogen	mg/kg	44	11.5	3.4	2.8
Pour Point Manual	°C	70	-31.4	5.2	9
Pour Point Automated 3 °C inter.	°C	38	-30.2	3.8	6.1
Total Sulfur	mg/kg	105	7.8	1.6	2.7
Water	mg/kg	113	52.8	20.0	38.4
Water and Sediment (D2709)	%V/V	47	<0.05	n.e.	n.e.
Water and Sediment (D1796)	%V/V	24	<0.05	n.e.	n.e.

Table 8: reproducibilities of tests on sample #23170

Parameter	unit	n	average	2.8 * sd	R(lit)
Cetane Number		22	52.9	1.7	4.4
DCN (D6890)		1	n.e.	n.e.	n.e.
Ignition Delay (D6890)	ms	1	n.e.	n.e.	n.e.
DCN (D7668)		7	53.4	1.8	1.5
Ignition Delay (D7668)	ms	7	3.1	0.4	0.2

Parameter	unit	n	average	2.8 * sd	R(lit)
Combustion Delay (D7668)	ms	6	4.5	0.2	0.1
Indicated Cetane Number (D8183)		4	52.2	1.1	2.1

Table 9: reproducibilities of tests on sample #23171

Parameter	unit	n	average	2.8 * sd	R(lit)
Particulate Contamination	mg/L	8	10.8	5.8	3.7
Total Contamination	mg/kg	38	18.6	8.5	7.2

Table 10: reproducibilities of tests on sample #23172

Parameter	unit	n	average	2.8 * sd	R(lit)
Oxidation Stab. Filt. Insol. A	mg/100 mL	26	0.16	0.36	0.56
Oxidation Stab. Adher. Insol. B	mg/100 mL	26	0.08	0.18	0.56
Oxidation Stab. Tot. Insol. (A+B)	mg/100 mL	29	0.30	0.55	0.79

Table 11: reproducibilities of tests on sample #23173

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

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

	September 2023	September 2022	September 2021	September 2020	September 2019
Number of reporting laboratories	165	152	161	151	165
Number of test results	2877	2591	2906	2691	3201
Number of statistical outliers	60	75	86	67	62
Percentage of statistical outliers	2.1%	2.9%	3.0%	2.5%	1.9%

Table 12: comparison with previous proficiency tests

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

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

Parameter	September 2023	September 2022	September 2021	September 2020	September 2019
Total Acid Number	+	+	+	+	+
API Gravity	++	+	+	++	++
Aromatics by FIA	-	-	-	+/-	+/-
Ash content	n.e.	n.e.	n.e.	n.e.	++
Calc. Cetane Index ASTM D976	++	++	++	++	++
Calc. Cetane Index ASTM D4737	+/-	+/-	+	+/-	+
Cloud Point	+	+	+	+	+

Parameter	September 2023	September 2022	September 2021	September 2020	September 2019
Cold Filter Plugging Point	-	-	+	-	-
Color ASTM	+	+	+	+	+
Conradson Carbon Residue	+/-	+/-	+	+/-	+/-
Ramsbottom Carbon Residue	-	-	-	n.e.	+/-
Density at 15 °C	++	+	+	++	+
Distillation at 760 mmHg	+	+	+	+	+
FAME content	+	+	+	+	+
Flash Point PMcc	+	+	+	+/-	+/-
Kinematic Viscosity at 40 °C	+	+	+/-	+/-	+/-
Lubricity by HFRR at 60 °C	+	+	++	++	+
Nitrogen	-	+/-	+/-	--	-
Pour Point (Manual and Auto)	+	+	+	+	+
Total Sulfur	+	+	+	+/-	+
Water	+	+	+	++	++
Cetane Number	++	+	+	+	+
DCN (D6890)	n.e.	+	n.e.	-	+
DCN (D7668)	-	-	-	+/-	--
Indicated Cetane Number (D8183)	+	n.e.	n.e.	n.e.	n.e.
Particulate Contamination	-	--	-	(--)	(--)
Total Contamination	-	-	+/-	-	-
Oxidation Stability	+	+	-	+/-	+

Table 13: comparison of determinations to the reference test methods

For results between brackets no z-scores are 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 similar to 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 #23170; results in mg KOH/g

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D974	<0.02		-----	736	D974	0.026		-0.70
53		-----		-----	750		-----		-----
62	D974	0.04		0.28	779		-----		-----
90		-----		-----	785		-----		-----
92		-----		-----	825	D974	0.03		-0.42
120	D664-A	0.05		0.98	845	D664	<0.1		-----
140	D664-A	0.057	C	1.47	846	GB/T258	0.027		-0.63
150	D664-A	<0.1		-----	851	D664-A	0.0598		1.67
158		-----		-----	854	D974	0.041		0.35
159		-----		-----	856	D974	0.041		0.35
169		-----		-----	861	D974	0.046		0.70
171	D974	0.05		0.98	862	D974	0.04		0.28
194		-----		-----	864	D974	0.04		0.28
203		-----		-----	872		-----		-----
212	D664-A	0.061		1.75	873	D974	0.03		-0.42
215		-----		-----	874	D974	0.038		0.14
217	D974	0.044		0.56	875		-----		-----
221		-----		-----	886		-----		-----
224		-----		-----	887	D664-A	0.018		-1.26
225	D974	0.03		-0.42	912	D974	0.031		-0.35
228	D974	0.0396		0.26	914	D974	0.04		0.28
231		-----		-----	922	D664-A	0.031		-0.35
235	D664-A	0.044		0.56	962	D974	0.031		-0.35
237	D974	0.051		1.05	963	D974	0.026		-0.70
238	D974	0.035		-0.07	970		-----		-----
253	D974	0.034		-0.14	971	D974	0.04		0.28
254	D974	0.04		0.28	974	D974	0.04		0.28
256	D974	0.03		-0.42	988		-----		-----
258		-----		-----	994	D974	0.03		-0.42
273		-----		-----	995	D974	0.03		-0.42
300	D664-A	0.03		-0.42	996	D974	0.0413		0.37
312	D974	0.038	C	0.14	997	D664-A	0.03		-0.42
317	D974	0.03		-0.42	1006	D974	0.040		0.28
323	D974	0.04		0.28	1011		-----		-----
328		-----		-----	1017		-----		-----
333		-----		-----	1026	D664-A	<0.05		-----
334	D974	0.035		-0.07	1039	D664-A	0.05		0.98
335		-----		-----	1059		-----		-----
337		-----		-----	1082	ISO6619	0.07	R(0.05)	2.38
339		-----		-----	1091	D974	0.037		0.07
342		-----		-----	1105	D974	0.0331		-0.20
344		-----		-----	1121	D664-A	0.0442		0.58
349	D664-A	0.02		-1.12	1126		-----		-----
355		-----		-----	1146		-----		-----
356		-----		-----	1186		-----		-----
365		-----		-----	1191		-----		-----
381	D664-A	0.04		0.28	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227	D664-A	0.014		-1.54
494	D974	0.030		-0.42	1299		-----		-----
498		-----		-----	1318	D664-A	0.034		-0.14
507	D664-A	0.022		-0.98	1356	D664-A	<0.05		-----
511		-----		-----	1357	D974	0.03		-0.42
551	D974	0.01		-1.82	1399	D664	0.03765		0.12
554		-----		-----	1417	D664-A	<0.05		-----
555		-----		-----	1429	D974	0.02325		-0.89
558		-----		-----	1430	D974	0.03		-0.42
562		-----		-----	1498		-----		-----
575	D664-A	0.032		-0.28	1575		-----		-----
603	D664-A	0.032		-0.28	1588		-----		-----
604		-----		-----	1629		-----		-----
608	D664-A	0.03		-0.42	1650	D664-A	0.036		0.00
614		-----		-----	1709		-----		-----
621	D664-A	0.04		0.28	1720		-----		-----
631	D974	0.030		-0.42	1740	D664-A	0.03		-0.42
633	D664-A	0.0428		0.48	1741		-----		-----
634	D664-A	0.04		0.28	1776	D664-A	0.02		-1.12
657	D974	0.046		0.70	1807	D664-A	0.020		-1.12
704		-----		-----	1810		-----		-----
710		-----		-----	1811		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854	D664-A	0.035		-0.07	6332	D974	0.0410		0.35
1906		-----		-----	6346		-----		-----
1941		-----		-----	6364	D974	<0.010		-----
1944		-----		-----	6373	D974	0.0414		0.38
1995	D664-A	0.03		-0.42	6384	D664-A	0.037		0.07
6018		-----		-----	6406	D974	0.0433		0.51
6035		-----		-----	6416		-----		-----
6049	D664-A	0.05		0.98	6443		-----		-----
6068		-----		-----	6447		-----		-----
6142	D664-A	0.037		0.07	6469		-----		-----
6172		-----		-----	6479		-----		-----
6266		-----		-----	6496		-----		-----
6284	D664-A	0.044		0.56	6499		-----		-----
6302		-----		-----	6540	D974	0.04		0.28
6317		-----		-----	6546		-----		-----
6319	D974	0.034		-0.14					

normality	OK
n	81
outliers	1
mean (n)	0.0360
st.dev. (n)	0.00946
R(calc.)	0.0265
st.dev.(D974:22)	0.01429
R(D974:22)	0.04

Lab 140 first reported 0.1075
Lab 312 first reported 0.068
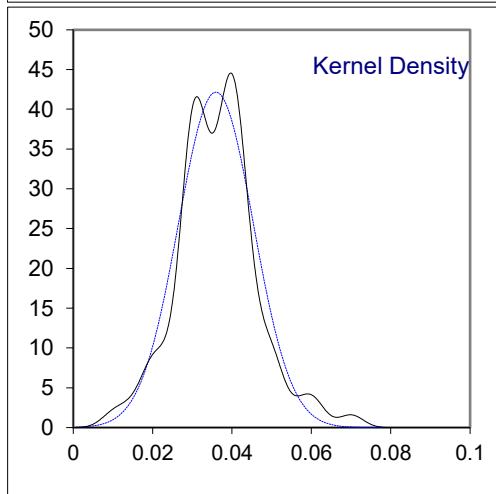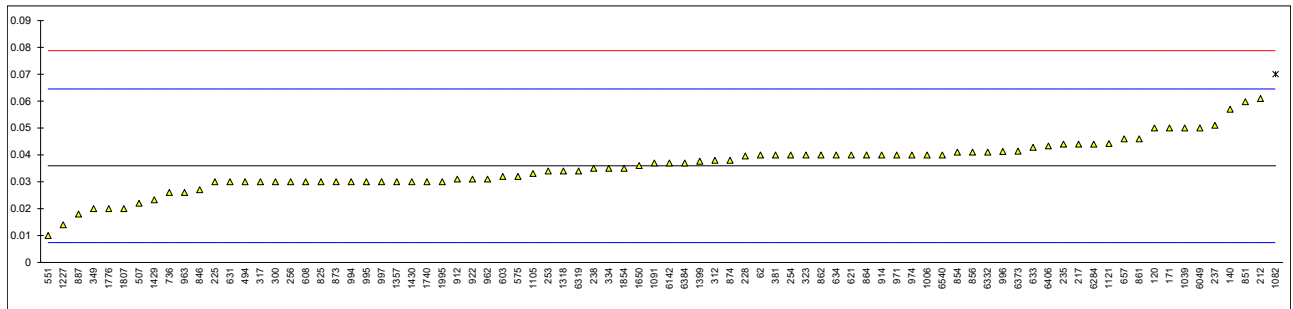
Determination of API Gravity on sample #23170;

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4052	37.9		0.88	736	D1298	37.8		-0.06
53		-----		-----	750		-----		-----
62	D4052	37.8		-0.06	779		-----		-----
90	D4052	37.83		0.22	785	D1298	37.85		0.41
92	D4052	37.74		-0.62	825	D4052	37.8		-0.06
120	D4052	37.8		-0.06	845	D1298	37.825		0.18
140	D4052	37.82		0.13	846		-----		-----
150		-----		-----	851		-----		-----
158	D4052	37.8		-0.06	854	D1298	37.83		0.22
159		-----		-----	856	D1298	37.81		0.04
169		-----		-----	861	D4052	37.81		0.04
171	D1298	37.8	C	-0.06	862	D1298	37.8		-0.06
194		-----		-----	864	D1298	37.83		0.22
203		-----		-----	872	D4052	37.83		0.22
212	ISO12185	37.735		-0.66	873	D1298	37.83		0.22
215		-----		-----	874	D1298	37.9		0.88
217	D4052	37.817		0.10	875	D1298	37.84		0.32
221		-----		-----	886		-----		-----
224	D1298	37.81		0.04	887		-----		-----
225	D4052	37.8		-0.06	912	D1298	37.82		0.13
228	D4052	37.73		-0.71	914	D1298	37.84		0.32
231	D4052	37.80		-0.06	922	D4052	37.8		-0.06
235		-----		-----	962	D4052	37.84		0.32
237	D4052	37.74		-0.62	963	D1298	37.84		0.32
238	D1298	37.8		-0.06	970		-----		-----
253	D4052	37.81		0.04	971	D4052	37.81		0.04
254	D4052	37.8		-0.06	974	D1298	37.83		0.22
256	D4052	37.8		-0.06	988	D1298	37.8		-0.06
258	D4052	37.758		-0.45	994	D1250	37.8		-0.06
273		-----		-----	995	D1298	37.8		-0.06
300	D4052	37.84		0.32	996	D1298	37.82		0.13
312	D4052	37.83		0.22	997	D1250	37.8		-0.06
317	D1298	37.79		-0.15	1006		-----		-----
323	D1298	37.84		0.32	1011		-----		-----
328		-----		-----	1017		-----		-----
333		-----		-----	1026		-----		-----
334		-----		-----	1039		-----		-----
335		-----		-----	1059		-----		-----
337		-----		-----	1082		-----		-----
339		-----		-----	1091		-----		-----
342		-----		-----	1105	D4052	37.8190		0.12
344		-----		-----	1121	D4052	37.73		-0.71
349		-----		-----	1126		-----		-----
355		-----		-----	1146		-----		-----
356	ISO12185	37.8		-0.06	1186		-----		-----
365		-----		-----	1191		-----		-----
381		-----		-----	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227	D4052	37.77		-0.34
494	D1298	37.85		0.41	1299		-----		-----
498		-----		-----	1318		-----		-----
507	D4052	37.7		-0.99	1356		-----		-----
511	D4052	37.9		0.88	1357		-----		-----
551	D4052	37.8		-0.06	1399		-----		-----
554	D4052	37.8		-0.06	1417		-----		-----
555	D4052	37.8		-0.06	1429		-----		-----
558	D4052	37.8		-0.06	1430		-----		-----
562	D1298	37.9		0.88	1498	D4052	37.8		-0.06
575	D1298	37.8		-0.06	1575		-----		-----
603	D4052	37.8		-0.06	1588		-----		-----
604	D4052	37.7		-0.99	1629		-----		-----
608	D4052	37.78		-0.24	1650		-----		-----
614		-----		-----	1709		-----		-----
621	D4052	37.8		-0.06	1720		-----		-----
631	D4052	37.78		-0.24	1740	D1298	37.8		-0.06
633		-----		-----	1741	D4052	37.8		-0.06
634		-----		-----	1776		-----		-----
657	D4052	37.8		-0.06	1807		-----		-----
704	D1298	37.75		-0.52	1810		-----		-----
710	ISO12185	37.83		0.22	1811		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854	D4052	37.7		-0.99	6332		-----		-----
1906		-----		-----	6346		-----		-----
1941		-----		-----	6364	D1298	37.859		0.50
1944		-----		-----	6373	D4052	37.85		0.41
1995	D4052	37.768		-0.35	6384		-----		-----
6018		-----		-----	6406	D4052	37.84		0.32
6035		-----		-----	6416	D4052	37.8		-0.06
6049	D4052	37.75		-0.52	6443		-----		-----
6068		-----		-----	6447		-----		-----
6142		-----		-----	6469	D4052	37.8		-0.06
6172		-----		-----	6479		-----		-----
6266	D4052	37.751		-0.51	6496		-----		-----
6284	D4052	37.84		0.32	6499		-----		-----
6302		-----		-----	6540	D4052	37.85		0.41
6317		-----		-----	6546		-----		-----
6319	Calc.	37.84		0.32					

normality	suspect
n	85
outliers	0
mean (n)	37.806
st.dev. (n)	0.0406
R(calc.)	0.114
st.dev.(D1298:12bR17e1)	0.1071
R(D1298:12bR17e1)	0.3

Lab 171 first reported 0.8

Kernel Density
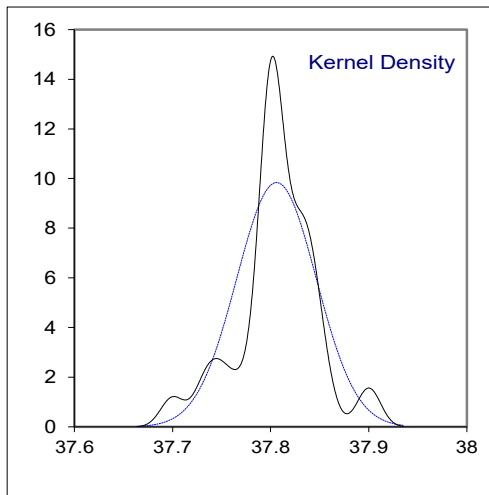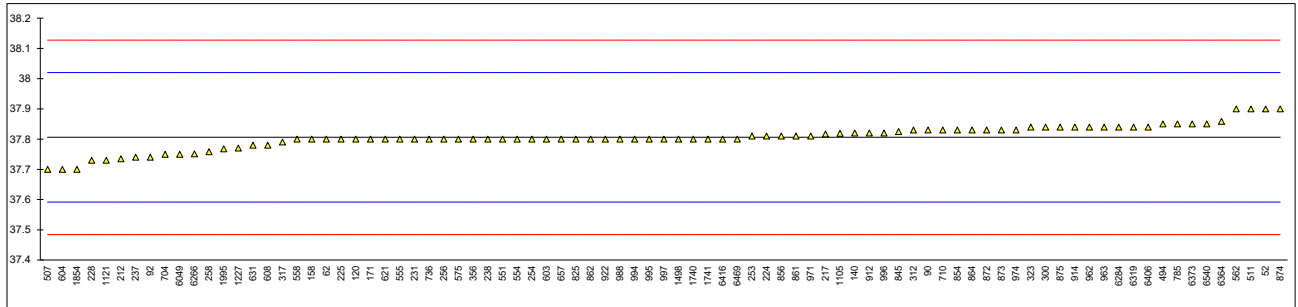
Determination of Aromatics by FIA (without oxygenates correction) on sample #23170; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	736	D1319	18.13		-1.21
53		-----		-----	750		-----		-----
62	D1319	20.2		0.36	779		-----		-----
90		-----		-----	785		-----		-----
92		-----		-----	825		-----		-----
120		-----		-----	845	IP391	19.1		-0.48
140	D1319	20.2		0.36	846		-----		-----
150		-----		-----	851		-----		-----
158		-----		-----	854	IP391	18.89		-0.63
159		-----		-----	856	D1319	21.1		1.04
169		-----		-----	861	D1319	21.0		0.96
171		-----		-----	862	D1319	20.8		0.81
194		-----		-----	864	IP391	19.1		-0.48
203		-----		-----	872		-----		-----
212		-----		-----	873	D1319	17.89		-1.39
215		-----		-----	874		-----		-----
217		-----		-----	875	D1319	20.2		0.36
221		-----		-----	886		-----		-----
224		-----		-----	887		-----		-----
225		-----		-----	912		-----		-----
228		-----		-----	914		-----		-----
231		-----		-----	922		-----		-----
235		-----		-----	962	D1319	19.0		-0.55
237	D1319	20.7		0.74	963	D1319	19.5		-0.17
238		-----		-----	970		-----		-----
253	D1319	20.0		0.21	971	D1319	19.5		-0.17
254		-----		-----	974		-----		-----
256		-----		-----	988		-----		-----
258		-----		-----	994		-----		-----
273		-----		-----	995	D1319	17.9		-1.38
300		-----		-----	996		-----		-----
312		-----		-----	997		-----		-----
317		-----		-----	1006		-----		-----
323	D1319	16.9		-2.14	1011		-----		-----
328		-----		-----	1017		-----		-----
333	EN12916	23.1		2.55	1026	EN12916	18.6		-0.85
334		-----		-----	1039		-----		-----
335		-----		-----	1059		-----		-----
337		-----		-----	1082		-----		-----
339		-----		-----	1091		-----		-----
342		-----		-----	1105		-----		-----
344		-----		-----	1121		-----		-----
349		-----		-----	1126		-----		-----
355		-----		-----	1146		-----		-----
356		-----		-----	1186		-----		-----
365		-----		-----	1191		-----		-----
381		-----		-----	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227		-----		-----
494		-----		-----	1299		-----		-----
498		-----		-----	1318		-----		-----
507		-----		-----	1356		-----		-----
511		-----		-----	1357		-----		-----
551		-----		-----	1399		-----		-----
554		-----		-----	1417		-----		-----
555		-----		-----	1429		-----		-----
558		-----		-----	1430		-----		-----
562		-----		-----	1498		-----		-----
575		-----		-----	1575	In house	23.2		2.63
603		-----		-----	1588		-----		-----
604		-----		-----	1629		-----		-----
608	D1319	19.5		-0.17	1650	D1319	21.07	C	1.02
614		-----		-----	1709		-----		-----
621		-----		-----	1720		-----		-----
631		-----		-----	1740		-----		-----
633		-----		-----	1741		-----		-----
634		-----		-----	1776		-----		-----
657	D1319	18.1		-1.23	1807		-----		-----
704		-----		-----	1810		-----		-----
710		-----		-----	1811		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854		-----		-----	6332		-----		-----
1906		-----		-----	6346		-----		-----
1941		-----		-----	6364	D1319	20.45		0.55
1944	D1319	19.7		-0.02	6373		-----		-----
1995		-----		-----	6384		-----		-----
6018		-----		-----	6406	IP391	18.83		-0.68
6035		-----		-----	6416		-----		-----
6049		-----		-----	6443		-----		-----
6068		-----		-----	6447		-----		-----
6142		-----		-----	6469		-----		-----
6172		-----		-----	6479		-----		-----
6266		-----		-----	6496		-----		-----
6284		-----		-----	6499		-----		-----
6302		-----		-----	6540		-----		-----
6317		-----		-----	6546		-----		-----
6319		-----		-----					

normality	OK
n	27
outliers	0
mean (n)	19.728
st.dev. (n)	1.4710
R(calc.)	4.119
st.dev.(D1319:20a)	1.3214
R(D1319:20a)	3.7

Lab 1650 first reported 24.07

Kernel Density
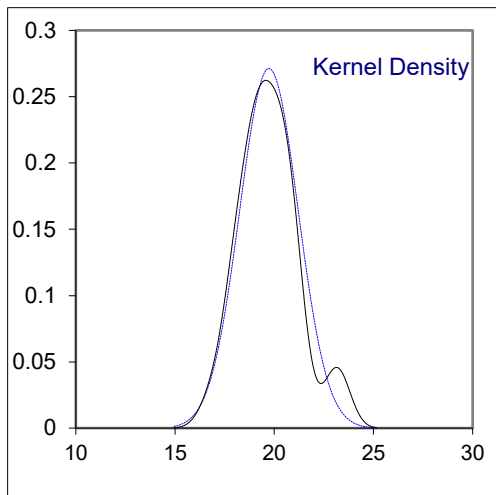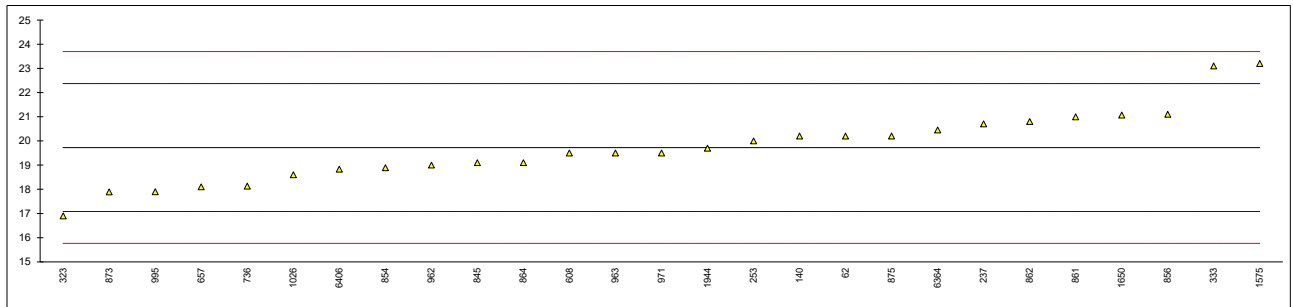
Determination of Ash content on sample #23170; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D482	<0.010		-----	736	D482	0.0009		-----
53		-----		-----	750		-----		-----
62	D482	<0.010		-----	779	D482	0.0006		-----
90	D482	0.0005		-----	785	D482	0.0002		-----
92	D482	<0.001		-----	825	D482	<0.001		-----
120	D482	<0.01		-----	845	D482	<0.001		-----
140	D482	0.000		-----	846	GB/T508	0.001		-----
150	D482	<0.01		-----	851	ISO6245	0.002		-----
158	D482	<0.001		-----	854	D482	<0.010		-----
159		-----		-----	856	D482	<0.001		-----
169		-----		-----	861	D482	<0.01		-----
171	D482	<0.001		-----	862	D482	<0.001		-----
194		-----		-----	864	D482	<0.001		-----
203		-----		-----	872		-----		-----
212	ISO6245	0.00		-----	873	D482	<0.01		-----
215		-----		-----	874	D482	<0.01		-----
217	D482	0.00099		-----	875	D482	<0.01		-----
221	D482	<0.01		-----	886		-----		-----
224	D482	0.00006		-----	887	D482	0.0015		-----
225	D482	0.001		-----	912	D482	0.0005		-----
228	D482	<0.01		-----	914	D482	0.001		-----
231		-----		-----	922	D482	<0.01		-----
235	D482	0.00		-----	962	D482	<0.010		-----
237	D482	<0.01		-----	963	D482	<0.01		-----
238		-----		-----	970		-----		-----
253		-----		-----	971	D482	<0.01		-----
254	D482	<0.01		-----	974	D482	<0.01		-----
256	D482	0.0007		-----	988		-----		-----
258		-----		-----	994	D482	<0.01		-----
273		-----		-----	995	D482	<0.010		-----
300		-----		-----	996	D482	0.0011		-----
312		-----		-----	997	D482	<0.010		-----
317	D482	<0.010		-----	1006		-----		-----
323	D482	<0.001		-----	1011	ISO6245	<0.001		-----
328		-----		-----	1017		-----		-----
333		-----		-----	1026	D482	<0.010		-----
334	D482	0		-----	1039	ISO6245	<0.001		-----
335		-----		-----	1059	ISO6245	<0,001		-----
337		-----		-----	1082		-----		-----
339		-----		-----	1091		-----		-----
342	D482	0.000		-----	1105	D482	0.0007		-----
344	D482	<0.01		-----	1121	D482	0.0004		-----
349		-----		-----	1126		-----		-----
355		-----		-----	1146	D482	-0.0005		-----
356	D482	<0.001		-----	1186		-----		-----
365	IP4	<0.001		-----	1191		-----		-----
381		-----		-----	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227		-----		-----
494	D482	0.0018		-----	1299		-----		-----
498		-----		-----	1318		-----		-----
507	D482	0.00		-----	1356	ISO6245	<0.010		-----
511	D482	<0.01		-----	1357	D482	<0.01		-----
551	D482	<0.01		-----	1399		-----		-----
554		-----		-----	1417		-----		-----
555	D482	<0.01		-----	1429		-----		-----
558		-----		-----	1430	D482	<0.01		-----
562	D482	<0.01		-----	1498		-----		-----
575		-----		-----	1575	D482	<0.01		-----
603	D482	<0.01		-----	1588		-----		-----
604		-----		-----	1629		-----		-----
608	D482	<0.001		-----	1650	D482	0.00019		-----
614	D482	<0.001		-----	1709		-----		-----
621	D482	<0.01		-----	1720		-----		-----
631	D482	0.00074		-----	1740	D482	0.001		-----
633	D482	<0.010		-----	1741		-----		-----
634	D482	0.002		-----	1776		-----		-----
657	D482	<0.010		-----	1807		-----		-----
704	D482	0.0004		-----	1810		-----		-----
710	D482	<0.01		-----	1811		-----		-----

lab	Method	value	mark	z(targ)	lab	Method	value	mark	z(targ)
1854	ISO6245	0.0009		-----	6332		-----		-----
1906		-----		-----	6346		-----		-----
1941	ISO6245	0.00074		-----	6364		-----		-----
1944	D482	0.0008		-----	6373	ISO6245	0		-----
1995	D482	0.0012		-----	6384	D482	0.0003171		-----
6018		-----		-----	6406		-----		-----
6035		-----		-----	6416		-----		-----
6049	D482	0.001		-----	6443		-----		-----
6068		-----		-----	6447		-----		-----
6142		-----		-----	6469	D482	0.0006		-----
6172		-----		-----	6479		-----		-----
6266		-----		-----	6496	ISO6245	0.0013		-----
6284	D482	<0.01		-----	6499		-----		-----
6302		-----		-----	6540	D482	<0.01		-----
6317		-----		-----	6546		-----		-----
6319	D482	<0.01		-----					

n	94	
mean (n)	<0.01	Application range 0.010-0.180 %M/M

Determination of Calculated Cetane Index, two variables ASTM D976 on sample #23170

lab	Method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D976	53.3		-0.36	736	D976	53.6		0.06
53		-----		-----	750		-----		-----
62	D976	53.5		-0.08	779		-----		-----
90	D976	53.22		-0.48	785	D976	54.2		0.90
92	D976	53.50		-0.08	825	D976	53.8		0.34
120	D976	53.2	E,C	-0.50	845	D976	53.5		-0.08
140	D976	53.7		0.20	846		-----		-----
150	D976	53.2		-0.50	851	D976	53.6		0.06
158	D976	53.4		-0.22	854	D976	53.5		-0.08
159		-----		-----	856	D976	53.4		-0.22
169				-----	861	D976	53.7		0.20
171		-----		-----	862	D976	53.3		-0.36
194		-----		-----	864	D976	53.4		-0.22
203		-----		-----	872	D976	53.7		0.20
212		-----		-----	873	D976	53.7		0.20
215		-----		-----	874	D976	53.7		0.20
217	D976	53.41		-0.21	875		-----		-----
221	D976	53.47		-0.13	886	D976	53.8		0.34
224	D976	53.35		-0.29	887	D976	53.90		0.48
225		-----		-----	912	D976	54.57	R(0.01)	1.41
228	D976	53.2		-0.50	914		-----		-----
231	D976	53.5		-0.08	922	D976	53.7		0.20
235	D976	53.6		0.06	962	D976	53.8		0.34
237	D976	53.8		0.34	963	D976	53.6		0.06
238	D976	53.1		-0.64	970		-----		-----
253	D976	53.7		0.20	971	D976	53.8		0.34
254	D976	53.7		0.20	974	D976	54.0	E	0.62
256	D976	53.6		0.06	988	D976	53.6		0.06
258	D976	53.69		0.18	994	D976	53.1	E	-0.64
273		-----		-----	995	D976	53.6		0.06
300	D976	53.2		-0.50	996	D976	53.43		-0.18
312	D976	53.5		-0.08	997		-----		-----
317		-----		-----	1006	D976	53.6		0.06
323		-----		-----	1011		-----		-----
328	D976	53.3		-0.36	1017		-----		-----
333		-----		-----	1026		-----		-----
334	D976	53.3	E	-0.36	1039		-----		-----
335		-----		-----	1059		-----		-----
337		-----		-----	1082		-----		-----
339		-----		-----	1091		-----		-----
342		-----		-----	1105	D976	53.6		0.06
344		-----		-----	1121		-----		-----
349		-----		-----	1126		-----		-----
355	D976	54.05		0.69	1146		-----		-----
356	D976	53.1		-0.64	1186		-----		-----
365		-----		-----	1191		-----		-----
381		-----		-----	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227	D976	53.12	E	-0.62
494	D976	53.9		0.48	1299		-----		-----
498		-----		-----	1318	D976	53.4		-0.22
507	D976	52.9	E	-0.92	1356	ISO3405	53		-0.78
511	D976	53.8		0.34	1357		-----		-----
551		-----		-----	1399		-----		-----
554		-----		-----	1417		-----		-----
555		-----		-----	1429		-----		-----
558		-----		-----	1430		-----		-----
562		-----		-----	1498	D976	53.6		0.06
575		-----		-----	1575	D976	54.0		0.62
603	D976	53.6		0.06	1588		-----		-----
604	D976	53.6		0.06	1629		-----		-----
608	D976	53.5		-0.08	1650		-----		-----
614		-----		-----	1709		-----		-----
621	D976	53.9		0.48	1720		-----		-----
631	D976	53.86		0.42	1740	D976	53.5		-0.08
633	D976	53.8		0.34	1741		-----		-----
634	D976	53.7		0.20	1776		-----		-----
657	D976	53.7		0.20	1807	D976	53.4		-0.22
704		-----		-----	1810		-----		-----
710	D976	53.7		0.20	1811	D976	53.4		-0.22

lab	Method	value	mark	z(targ)	lab	method	Value	mark	z(targ)
1854		-----		-----	6332	D976	53.5	E	-0.08
1906		-----		-----	6346		-----		-----
1941		-----		-----	6364		-----		-----
1944	D976	53.46		-0.14	6373	D976	53.5		-0.08
1995	D976	53.46		-0.14	6384	D976	53.73		0.24
6018		-----		-----	6406	D976	53.8		0.34
6035		-----		-----	6416	D976	53.7		0.20
6049	D976	53.57		0.01	6443	D976	53.5		-0.08
6068		-----		-----	6447		-----		-----
6142		-----		-----	6469	D976	53.647		0.12
6172		-----		-----	6479		-----		-----
6266	D86	53.51		-0.07	6496		-----		-----
6284	D976	53.7		0.20	6499		-----		-----
6302		-----		-----	6540	D976	53.90		0.48
6317		-----		-----	6546		-----		-----
6319		-----		-----					

normality	OK
n	85
outliers	1
mean (n)	53.560
st.dev. (n)	0.2480
R(calc.)	0.694
st.dev.(D976:21e1)	0.7143
R(D976:21e1)	2

Lab 120 first reported 52.3; calculation difference, iis calculated 53.6
Lab 334 calculation difference, iis calculated 53.5
Lab 507 calculation difference, iis calculated 53.2
Lab 974 calculation difference, iis calculated 53.8
Lab 994 calculation difference, iis calculated 53.7
Lab 1227 calculation difference, iis calculated 53.32
Lab 6332 calculation difference, iis calculated 53.7

iis calculated the Calculated Cetane Index according to ASTM D974 equation 2 paragraph 5.1 (with Density)
Possibly the calculation differences are the result of calculation with equation 1 of paragraph 5.1 (with API Gravity)
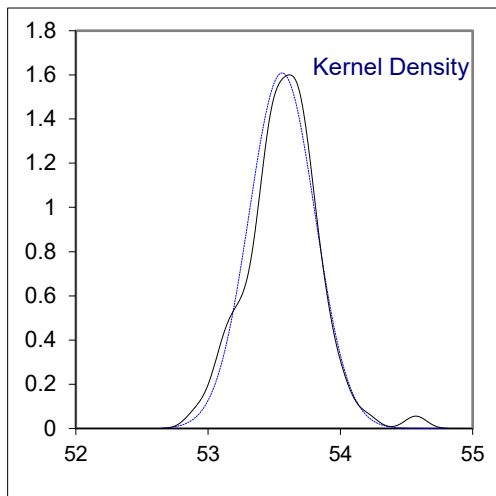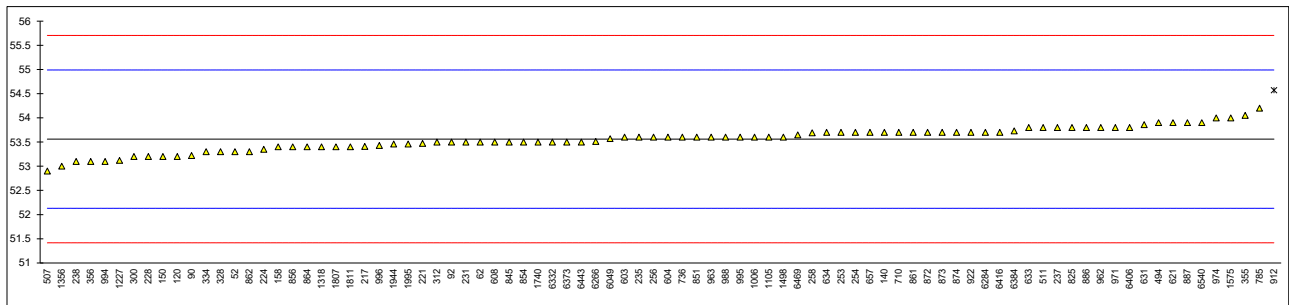
Determination of Calculated Cetane Index, four variables ASTM D4737 on sample #23170

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4737-A	53.0		-1.03	736	D4737-A	53.4		0.21
53		-----		-----	750		-----		-----
62		-----		-----	779	ISO4264	54.3		2.98
90	D4737-A	52.74		-1.83	785	D4737-A	54.2		2.68
92	D4737-A	53.177		-0.48	825	D4737-A	53.7		1.13
120	D4737-A	52.4	E	-2.88	845	D4737	53.4		0.21
140	D4737-A	53.5		0.52	846	SH/T0694	53.4		0.21
150		-----		-----	851	D4737-A	53.5		0.52
158	D4737-A	53.1		-0.72	854	D4737-A	53.2		-0.41
159		-----		-----	856	D4737-A	53.3		-0.10
169		-----		-----	861	D4737-A	53.5		0.52
171		-----		-----	862	D4737-A	53.1		-0.72
194		-----		-----	864	D4737-A	53.1		-0.72
203		-----		-----	872		-----		-----
212	ISO4264	53.3		-0.10	873	D4737-A	53.4		0.21
215		-----		-----	874	D4737-A	53.4		0.21
217	D4737-A	53.15		-0.56	875	ISO4264	53.6		0.82
221	D4737-A	53.11		-0.69	886	D4737-A	53.9		1.75
224		-----		-----	887	D4737-A	53.88		1.69
225		-----		-----	912		54.57	R(0.05)	3.82
228	D4737-A	52.8		-1.64	914	D4737	53.1		-0.72
231	D4737-A	53.1		-0.72	922		-----		-----
235	ISO4264	53.5		0.52	962	D4737-A	53.7		1.13
237	D4737-A	53.6		0.82	963	D4737-A	53.4		0.21
238		-----		-----	970		-----		-----
253		-----		-----	971	D4737-A	53.6		0.82
254		-----		-----	974	D4737-A	53.9	E	1.75
256		-----		-----	988		-----		-----
258		-----		-----	994	D4737-A	53.2		-0.41
273		-----		-----	995		-----		-----
300	D4737-A	52.7		-1.95	996	D4737-A	53.25		-0.26
312	ISO4264	53.2		-0.41	997		-----		-----
317	D4737-A	53.5	E	0.52	1006	D4737-A	53.3		-0.10
323		-----		-----	1011	ISO4264	53.6		0.82
328	D4737-A	53.0		-1.03	1017		-----		-----
333		-----		-----	1026		-----		-----
334		-----		-----	1039	ISO4264	53.3		-0.10
335		-----		-----	1059	ISO4264	53.5		0.52
337		-----		-----	1082		-----		-----
339		-----		-----	1091	D4737-A	53.7		1.13
342	ISO4264	53.6	E	0.82	1105	D4737-A	53.4		0.21
344	D4737-A	53.53		0.61	1121	ISO4264	52.94		-1.21
349		-----		-----	1126		-----		-----
355	D4737-A	53.505		0.53	1146	ISO4264	53.42		0.27
356	ISO4264	52.6		-2.26	1186		-----		-----
365		-----		-----	1191		-----		-----
381		-----		-----	1199		-----		-----
433		-----		-----	1205	ISO4264	53.57		0.73
480	D4737-A	53.9		1.75	1227	D4737-A	53.16		-0.53
494	D4737-A	53.7		1.13	1299	D4737-A	52.9		-1.34
498		-----		-----	1318	D4737-A	53.2		-0.41
507	ISO4264	53.0		-1.03	1356		-----		-----
511	D4737-A	53.6		0.82	1357	D4737-A	53.55		0.67
551	D4737-A	53.1		-0.72	1399	D4737	53.1		-0.72
554		-----		-----	1417		-----		-----
555	D4737	52.95		-1.18	1429		-----		-----
558		-----		-----	1430	D4737-A	52	R(0.05)	-4.11
562	D4737	53.6	E	0.82	1498	D4737-A	53.4		0.21
575		-----		-----	1575		-----		-----
603	D4737-A	53.2	E	-0.41	1588		-----		-----
604		-----		-----	1629		-----		-----
608		-----		-----	1650	ISO4264	53.0		-1.03
614		-----		-----	1709		-----		-----
621	ISO4264	53	E	-1.03	1720		-----		-----
631	D4737-A	53.72		1.20	1740	D4737-A	53.20		-0.41
633		-----		-----	1741	D4737-A	53.4		0.21
634		-----		-----	1776	ISO4264	52.8		-1.64
657	D4737-A	53.6		0.82	1807	D4737-A	52.9		-1.34
704	ISO4264	53.3		-0.10	1810		-----		-----
710	ISO4264	53.40		0.21	1811		-----		-----

lab	method	Value	mark	z(targ)	lab	method	Value	mark	z(targ)
1854	D4737-A	53.3		-0.10	6332		-----		-----
1906		-----		-----	6346		-----		-----
1941	ISO4264	53.2	C	-0.41	6364		-----		-----
1944	D4737-A	53.25		-0.26	6373	ISO4264	53.2		-0.41
1995	D4737-A	53.19		-0.44	6384		-----		-----
6018	ISO4264	53.2		-0.41	6406	D4737-A	53.7		1.13
6035	ISO4264	53.4		0.21	6416	D4737-A	53.4		0.21
6049	D4737-A	53.25		-0.26	6443		-----		-----
6068	ISO4264	53.3		-0.10	6447		-----		-----
6142		-----		-----	6469	D4737-A	53.369		0.11
6172		-----		-----	6479		-----		-----
6266		-----		-----	6496	D4737-A	53.33		-0.01
6284		-----		-----	6499	D4737-A	53.6		0.82
6302		-----		-----	6540		-----		-----
6317		-----		-----	6546		-----		-----
6319	D4737-A	53.3		-0.10					

normality	OK	
n	93	
outliers	2	
mean (n)	53.333	
st.dev. (n)	0.3214	
R(calc.)	0.900	
st.dev.(iis memo1904)	0.3241	
R(iis memo1904)	0.907	

Lab 120 calculation difference, iis calculated 53.7 for A
Lab 317 calculation difference, iis calculated 53.8 for A
Lab 342 calculation difference, iis calculated 53.4 for ISO4264
Lab 562 calculation difference, iis calculated 53.3 for A and 52.5 for B
Lab 603 calculation difference, iis calculated 53.4 for A
Lab 621 calculation difference, iis calculated 53.8 for ISO4264
Lab 974 calculation difference, iis calculated 53.7 for A
Lab 1941 first reported 52.3

Kernel Density
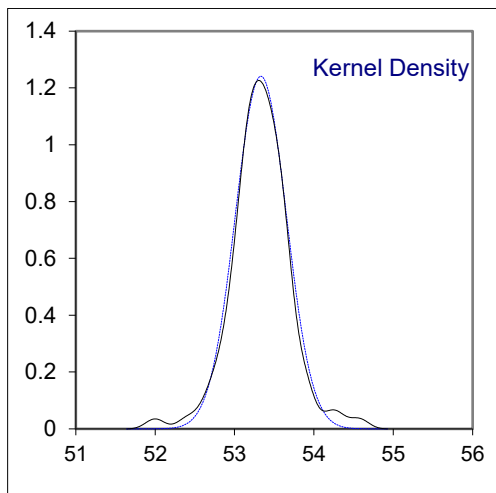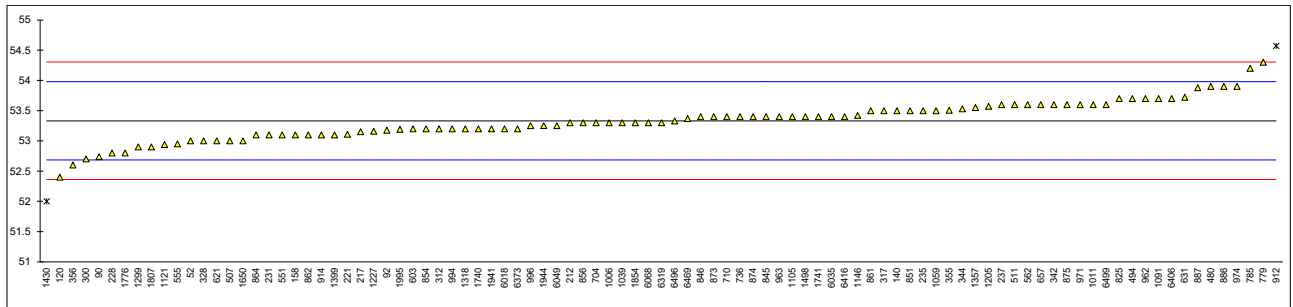
Determination of Cloud Point on sample #23170; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5773	-7		0.30	736	D2500	-6		1.00
53	D2500	-6		1.00	750		-----		-----
62	D2500	-7		0.30	779	D2500	-8		-0.40
90	D2500	-9		-1.10	785	D2500	-8		-0.40
92	D2500	-7		0.30	825	D2500	-7		0.30
120	D2500	-7.3		0.09	845	D2500	-6		1.00
140	D5773	-6.9		0.37	846		-----		-----
150		-----		-----	851	D2500	-7		0.30
158		-----		-----	854		-----		-----
159		-----		-----	856	D2500	-7		0.30
169		-----		-----	861	D2500	-7		0.30
171	D2500	-8		-0.40	862	D2500	-7		0.30
194		-----		-----	864	D2500	-6		1.00
203	D2500	-8		-0.40	872	D2500	-8		-0.40
212	ISO3015	-8		-0.40	873	D2500	-7		0.30
215		-----		-----	874	D2500	-7		0.30
217	D2500	-8		-0.40	875	D2500	-8		-0.40
221	D2500	-3	R(0.01)	3.10	886		-----		-----
224	D2500	-10		-1.80	887	D2500	-7		0.30
225	D2500	-7		0.30	912	D2500	-7		0.30
228		-----		-----	914	D2500	-7		0.30
231	D2500	-8		-0.40	922	D2500	-7		0.30
235	D2500	-7.0		0.30	962	D5771	-8.2		-0.54
237	D2500	-8		-0.40	963	D2500	-8		-0.40
238	D2500	-7		0.30	970		-----		-----
253	D2500	-7		0.30	971	D2500	-8		-0.40
254	D2500	-5		1.70	974	D2500	-7		0.30
256	D2500	-7		0.30	988	D2500	-7		0.30
258		-----		-----	994	D2500	-6		1.00
273		-----		-----	995	D2500	-6		1.00
300	D2500	-6		1.00	996	D2500	-6		1.00
312	D2500	-8		-0.40	997	D2500	-6		1.00
317	D5771	-8		-0.40	1006		-----		-----
323	D2500	-9		-1.10	1011	D2500	-7		0.30
328	D2500	-8		-0.40	1017	D2500	-9		-1.10
333	D2500	-8		-0.40	1026	D5773	-8		-0.40
334	D2500	-8		-0.40	1039	ISO3015	-8.2		-0.54
335	D2500	-8.7		-0.89	1059	ISO3015	-8		-0.40
337	D2500	-7		0.30	1082	D5771	-8.3		-0.61
339		-----		-----	1091	ISO3015	-7.1		0.23
342	ISO3015	-7		0.30	1105	D5773	-7.1		0.23
344		-----		-----	1121	D2500	-6.8		0.44
349		-----		-----	1126		-----		-----
355		-----		-----	1146	D2500	-8.2		-0.54
356		-----		-----	1186		-----		-----
365	IP219	-8		-0.40	1191	D5773	-6.8		0.44
381		-----		-----	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227	D2500	-8		-0.40
494	D2500	-9.7		-1.59	1299	D2500	-8		-0.40
498		-----		-----	1318		-8.0		-0.40
507	D2500	-8		-0.40	1356	EN23015	-3	R(0.01)	3.10
511		-----		-----	1357	D5773	-7.0		0.30
551	D2500	-6.5		0.65	1399	D5773	-7.5		-0.05
554		-----		-----	1417	IP444	-9		-1.10
555		-----		-----	1429	D2500	-8		-0.40
558		-----		-----	1430	D5771	-7.3		0.09
562		-----		-----	1498	D2500	-7		0.30
575	D2500	-5		1.70	1575		-----		-----
603	D2500	-6		1.00	1588		-----		-----
604	D2500	-9		-1.10	1629		-----		-----
608	D2500	-6		1.00	1650	D5771	-8		-0.40
614	D2500	-8		-0.40	1709		-----		-----
621	D2500	-5		1.70	1720		-----		-----
631	D5773	-7.8		-0.26	1740	D2500	-8		-0.40
633		-----		-----	1741	ISO3015	-9		-1.10
634	D2500	-7		0.30	1776	ISO3015	-7.7		-0.19
657	D2500	-8		-0.40	1807	D2500	-8		-0.40
704	D2500	-7		0.30	1810	D2500	-7.7		-0.19
710	EN23015	-6		1.00	1811	D2500	-7.8		-0.26

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854	D2500	-7		0.30	6332	D2500	-9		-1.10
1906		-----		-----	6346		-----		-----
1941	ISO3015	-8		-0.40	6364	D2500	-7		0.30
1944	D2500	-8		-0.40	6373	D2500	-8		-0.40
1995	D5771	-7.6		-0.12	6384	D5771	-5.4		1.42
6018		-----		-----	6406	D2500	-7.6		-0.12
6035	ISO3015	-8		-0.40	6416		-----		-----
6049	D2500	-8		-0.40	6443		-----		-----
6068	ISO3015	-8		-0.40	6447		-----		-----
6142	EN23015	-0.8	R(0.01)	4.64	6469	D2500	-8		-0.40
6172		-----		-----	6479		-----		-----
6266	D2500	-8.0		-0.40	6496	D2500	-8.2		-0.54
6284	D5773	-6		1.00	6499	D2500	-7		0.30
6302		-----		-----	6540		-----		-----
6317		-----		-----	6546		-----		-----
6319	D2500	-7		0.30					

normality	OK	
n	117	
outliers	3	
mean (n)	-7.42	
st.dev. (n)	0.943	
R(calc.)	2.64	
st.dev.(D2500:23)	1.429	
R(D2500:23)	4	

Kernel Density
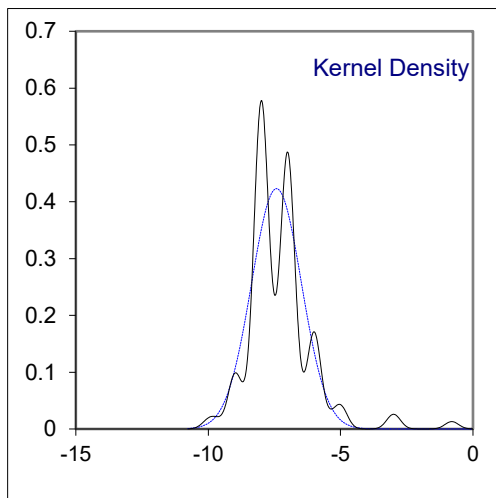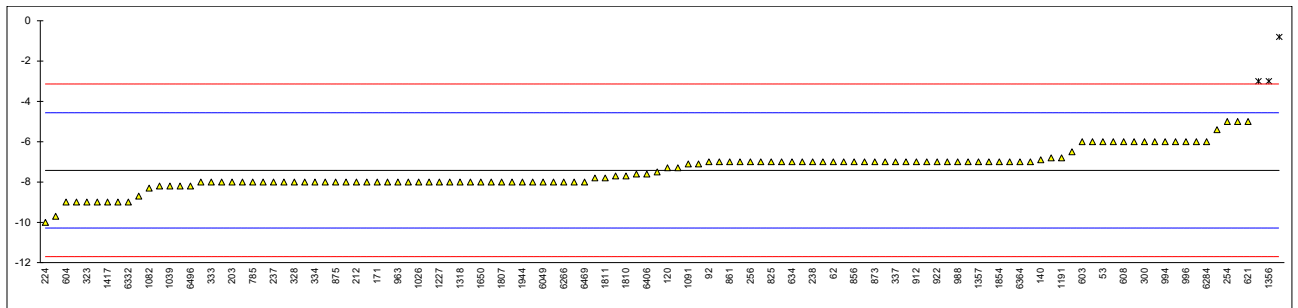
Determination of Cold Filter Plugging Point (CFPP) on sample #23170; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D6371	-22		1.79	736	D6371	-22		1.79
53		-----		-----	750		-----		-----
62	D6371	-19		3.43	779	EN116	-27		-0.94
90		-----		-----	785	D6371	-27		-0.94
92		-----		-----	825	D6371	-24		0.70
120		-----		-----	845	D6371	-22		1.79
140	D6371	-28.0		-1.48	846	NB/SH/T0248	-24		0.70
150	D6371	-27		-0.94	851		-----		-----
158	D6371	-30		-2.58	854	D6371	-22		1.79
159		-----		-----	856	D6371	-21		2.34
169		-----		-----	861	D6371	-22		1.79
171	D6371	-29		-2.03	862	D6371	-22		1.79
194		-----		-----	864	D6371	-22		1.79
203		-----		-----	872		-----		-----
212	EN116	-31		-3.12	873	EN116	-25		0.15
215		-----		-----	874	D6371	-27		-0.94
217	D6371	-24		0.70	875	EN116	-25		0.15
221		-----		-----	886		-----		-----
224		-----		-----	887		-----		-----
225		-----		-----	912	D6371	-20		2.88
228		-----		-----	914	D6371	-22		1.79
231		-----		-----	922	D6371	-24		0.70
235	IP309	-26		-0.39	962	D6371	-22		1.79
237	D6371	-27		-0.94	963	D6371	-27		-0.94
238		-----		-----	970		-----		-----
253		-----		-----	971	IP309	-27		-0.94
254		-----		-----	974	IP309	-26		-0.39
256	IP309	-19		3.43	988		-----		-----
258		-----		-----	994	D6371	-20		2.88
273		-----		-----	995	D6371	-19		3.43
300	EN116	-26		-0.39	996	D6371	-19		3.43
312	EN116	-26		-0.39	997	D6371	-19		3.43
317	D6371	-24		0.70	1006	D6371	-26		-0.39
323	EN116	-30		-2.58	1011		-----		-----
328	EN116	-27		-0.94	1017		-----		-----
333	D6371	-29		-2.03	1026	EN16329	-29		-2.03
334	D6371	-29		-2.03	1039	EN116	-30		-2.58
335	EN116	-29		-2.03	1059	EN116	-30		-2.58
337	EN116	-20		2.88	1082	EN116	-29		-2.03
339		-----		-----	1091	EN116	-30		-2.58
342	D6371	-26.5		-0.66	1105	D6371	-27.0		-0.94
344	EN116	-19		3.43	1121	D6371	-20.7		2.50
349		-----		-----	1126		-----		-----
355		-----		-----	1146		-----		-----
356		-----		-----	1186		-----		-----
365	IP309	-28		-1.48	1191		-----		-----
381	EN116	-22		1.79	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227	EN116	-28		-1.48
494	D6371	-28		-1.48	1299	EN116	-28		-1.48
498		-----		-----	1318	D6371	-27		-0.94
507	D6371	-19		3.43	1356	EN116	-30		-2.58
511		-----		-----	1357	D6371	-----		-----
551		-----		-----	1399	IP309	-27		-0.94
554		-----		-----	1417	IP309	-28		-1.48
555		-----		-----	1429		-----		-----
558		-----		-----	1430	EN116	-20	C	2.88
562		-----		-----	1498	D6371	-28		-1.48
575		-----		-----	1575		-----		-----
603		-----		-----	1588		-----		-----
604		-----		-----	1629		-----		-----
608		-----		-----	1650	EN116	-29		-2.03
614		-----		-----	1709		-----		-----
621		-----		-----	1720		-----		-----
631		-----		-----	1740	D6371	-23		1.25
633		-----		-----	1741	EN116	-29		-2.03
634		-----		-----	1776	EN116	-26		-0.39
657	IP309	-20		2.88	1807	EN116	-31		-3.12
704	D6371	-21.5		2.06	1810	EN116	-28		-1.48
710	EN116	-21		2.34	1811	D6371	-29.0		-2.03

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854	IP309	-23		1.25	6332		-----		-----
1906		-----		-----	6346		-----		-----
1941	EN116	-29		-2.03	6364		-----		-----
1944	D6371	-21		2.34	6373		-----		-----
1995	D6371	-23		1.25	6384	EN116	-31		-3.12
6018	EN116	-22		1.79	6406	D6371	-30		-2.58
6035	EN116	-28		-1.48	6416		-----		-----
6049	EN116	-26		-0.39	6443		-----		-----
6068	EN116	-27		-0.94	6447		-----		-----
6142	EN116	-30		-2.58	6469		-----		-----
6172		-----		-----	6479		-----		-----
6266		-----		-----	6496	D6371	-28.0		-1.48
6284		-----		-----	6499	D6371	-26		-0.39
6302		-----		-----	6540		-----		-----
6317		-----		-----	6546		-----		-----
6319	D6371	-20		2.88					

			D6371 only:
	normality	OK	OK
	n	91	47
	outliers	0	0
	mean (n)	-25.28	-24.14
	st.dev. (n)	3.660	3.484
	R(calc.)	10.25	9.76
	st.dev.(D6371:17a)	1.832	1.790
	R(D6371:17a)	5.13	5.01
Compare:			
	R(EN116:15)	4.52	-----

Lab 1430 first reported -15

Kernel Density
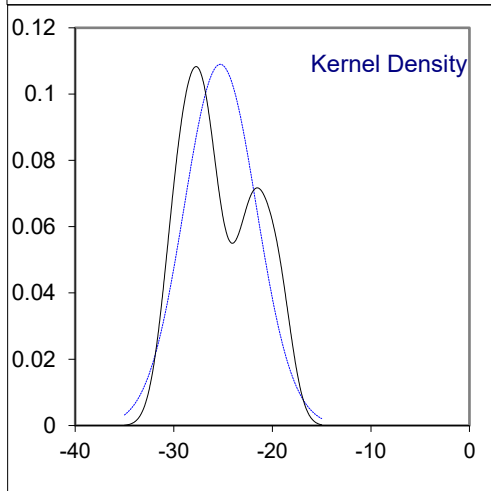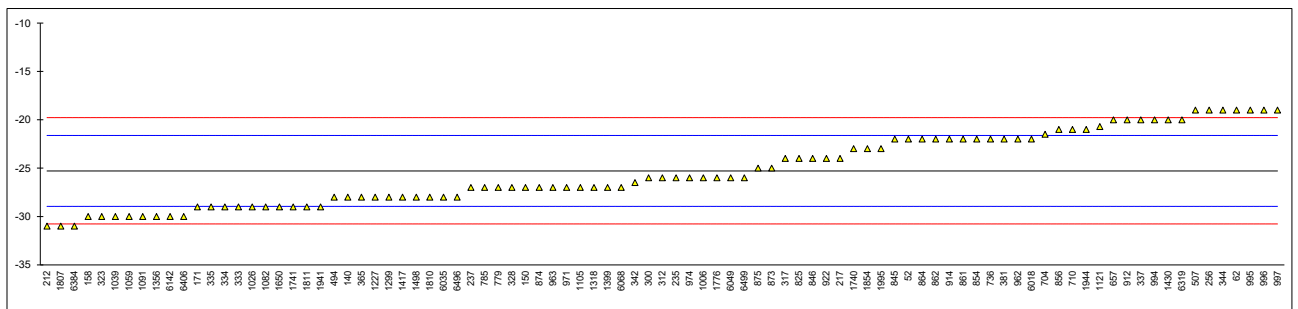
Determination of Color ASTM on sample #23170;

lab	method	reported test value	iis conversion*	mark	z(targ)	remarks
52	D6045	1.5	1.5		1.04	
53		-----	-----		-----	
62	D1500	1	1		-0.36	
90		-----	-----		-----	
92	D1500	1.0	1.0		-0.36	
120		-----	-----		-----	
140	D1500	L1.5	1.25		0.34	
150		-----	-----		-----	
158	D1500	L1.0	0.75		-1.06	
159		-----	-----		-----	
169		-----	-----		-----	
171	D1500	L1.5	1.25		0.34	
194		-----	-----		-----	
203	D1500	L1.5	1.25		0.34	
212	D1500	1	1		-0.36	
215		-----	-----		-----	
217	D1500	<1.0	0.75		-1.06	
221	D1500	1.5	1.5		1.04	
224	D1500	1.0	1.0		-0.36	
225		-----	-----		-----	
228	D1500	1	1		-0.36	
231	D6045	1.2	1.2		0.20	
235	D1500	1.0	1.0		-0.36	
237	D1500	1.0	1.0		-0.36	
238	D1500	1.0	1.0		-0.36	
253	D1500	< 1.5	1.25		0.34	
254	D1500	L1.0	0.75		-1.06	
256	D1500	1.0	1.0		-0.36	
258	D1500	L1.0	0.75		-1.06	
273		-----	-----		-----	
300	D1500	2	2	R(0.05)	2.44	
312	D1500	L1.5	1.25		0.34	
317	D1500	L1.0	0.75		-1.06	
323	D6045	<1.5	1.25		0.34	
328	D1500	L1.5	1.25		0.34	
333		-----	-----		-----	
334	D1500	L 1.5	1.25		0.34	
335	D6045	1.2	1.2		0.20	
337		-----	-----		-----	
339		-----	-----		-----	
342	D1500	L1.0	0.75		-1.06	
344	D1500	<1.5	1.25		0.34	
349	D6045	1.34	1.34		0.59	
355	D1500	L1.5	1.25		0.34	
356		-----	-----		-----	
365	D6045	1.2	1.2		0.20	
381		-----	-----		-----	
433		-----	-----		-----	
480		-----	-----		-----	
494	D1500	1.5	1.5		1.04	
498		-----	-----		-----	
507	D1500	1.0	1.0		-0.36	
511	D6045	L1.5	1.25		0.34	
551	D1500	1.5	1.5		1.04	
554	D1500	1.5	1.5		1.04	
555	D1500	1.5	1.5		1.04	
558	D1500	1.5	1.5		1.04	
562		-----	-----		-----	
575	D1500	1	1		-0.36	
603	D1500	1.0	1.0		-0.36	
604	D1500	L1.5	1.25		0.34	
608	D1500	L1.5	1.25		0.34	
614	D1500	<1.5	1.25		0.34	
621	D1500	L 1.0	0.75		-1.06	
631	D6045	1.2	1.2		0.20	
633	D1500	L1.5	1.25		0.34	
634	D1500	<1.5	1.25		0.34	
657	D1500	L1.0	0.75		-1.06	
704	D1500	L1.0	0.75		-1.06	
710	D1500	1.0	1.0		-0.36	
736	D6045	1.2	1.2		0.20	
750		-----	-----		-----	
779	D1500	<1.5	1.25		0.34	
785	D6045	1.2	1.2		0.20	
825	D1500	1.0	1.0		-0.36	

lab	method	reported test value	iis conversion*	mark	z(targ)	remarks
845	D1500	L1.5	1.25		0.34	
846	GB/T6540	<1.0	0.75		-1.06	
851	D1500	L1.5	1.25		0.34	
854	D1500	L1.0	0.75		-1.06	
856	D1500	L1.5	1.25		0.34	
861	D1500	1.0	1.0		-0.36	
862	D1500	L1.0	0.75		-1.06	
864	D1500	L1.5	1.25		0.34	
872	D1500	<1.5	1.25		0.34	
873	D1500	1.0	1.0		-0.36	
874	D1500	1.0	1.0		-0.36	
875	D6045	1.2	1.2		0.20	
886		-----	-----		-----	
887	D1500	L1.5	1.25		0.34	
912	D1500	1.2	1.2		0.20	
914	D1500	L1.0	0.75		-1.06	
922	D1500	L1.0	0.75		-1.06	
962	D1500	L1.5	1.25		0.34	
963	D1500	L1.5	1.25		0.34	
970		-----	-----		-----	
971	D1500	L1.5	1.25		0.34	
974	D1500	L1.5	1.25		0.34	
988	D1500	L1.5	1.25		0.34	
994	D1500	1.0	1.0		-0.36	
995	D6045	1.2	1.2		0.20	
996	D1500	1.0	1.0		-0.36	
997		-----	-----		-----	
1006		-----	-----		-----	
1011		-----	-----		-----	
1017		-----	-----		-----	
1026	D1500	L1.5	1.25		0.34	
1039	D1500	1.2	1.2		0.20	
1059	D1500	1.0	1.0		-0.36	
1082	D6045	L 1,5	1.25		0.34	
1091	D1500	L1.0	0.75		-1.06	
1105	D6045	1.2	1.2		0.20	
1121	D1500	<1.5	1.25		0.34	
1126		-----	-----		-----	
1146		-----	-----		-----	
1186		-----	-----		-----	
1191	D6045	1.0	1.0		-0.36	
1199		-----	-----		-----	
1205		-----	-----		-----	
1227	D1500	1	1		-0.36	
1299	D1500	L1.5	1.25		0.34	
1318	D6045	1.2	1.2		0.20	
1356		-----	-----		-----	
1357	D6045	1.2	1.2		0.20	
1399	D6045	1.1	1.1		-0.08	
1417	D6045	<1.5	1.25		0.34	
1429	D1500	1.5	1.5		1.04	
1430	D1500	L1.5	1.25		0.34	
1498		-----	-----		-----	
1575	D1500	L1.5	1.25		0.34	
1588		-----	-----		-----	
1629		-----	-----		-----	
1650		-----	-----		-----	
1709		-----	-----		-----	
1720		-----	-----		-----	
1740	D1500	L1.5	1.25		0.34	
1741	ISO2049	1.0	1.0		-0.36	
1776		-----	-----		-----	
1807	D1500	1.0	1.0		-0.36	
1810		-----	-----		-----	
1811		-----	-----		-----	
1854		-----	-----		-----	
1906		-----	-----		-----	
1941		-----	-----		-----	
1944	D6045	1.2	1.2		0.20	
1995	D1500	<1.5	1.25		0.34	
6018	D1500	1.5	1.5		1.04	
6035		-----	-----		-----	
6049	D6045	1.5	1.5		1.04	
6068		-----	-----		-----	
6142		-----	-----		-----	
6172		-----	-----		-----	
6266	D1500	L1.0	0.75		-1.06	
6284	D1500	<1.0	0.75		-1.06	

lab	method	reported test value	iis conversion*	mark	z(targ)	remarks
6302		-----	-----		-----	
6317		-----	-----		-----	
6319	D1500	1.0	1.0		-0.36	
6332	D1500	1	1		-0.36	
6346		-----	-----		-----	
6364	D1500	1.0	1.0		-0.36	
6373	D1500	1.5	1.5		1.04	
6384	D1500	1.5	1.5		1.04	
6406	D1500	1.0	1.0		-0.36	
6416		-----	-----		-----	
6443		-----	-----		-----	
6447		-----	-----		-----	
6469		-----	-----		-----	
6479		-----	-----		-----	
6496		-----	-----		-----	
6499		-----	-----		-----	
6540	D1500	1.0	1.0		-0.36	
6546		-----	-----		-----	

normality		OK
n		111
outliers		1
mean (n)		1.13
st.dev. (n)		0.218
R(calc.)		0.61
st.dev.(D1500:12R17)		0.357
R(D1500:12R17)		1

*In the calculation of the mean, standard deviation and the reproducibility a reported value of 'Ly' or '<y' is changed into y-0.25
(for example, L1.5 is changed into 1.25)

Kernel Density
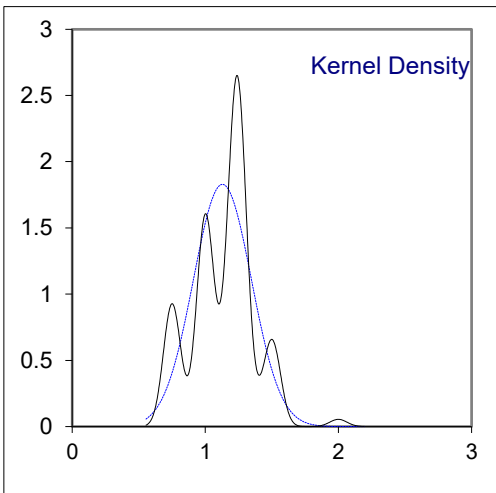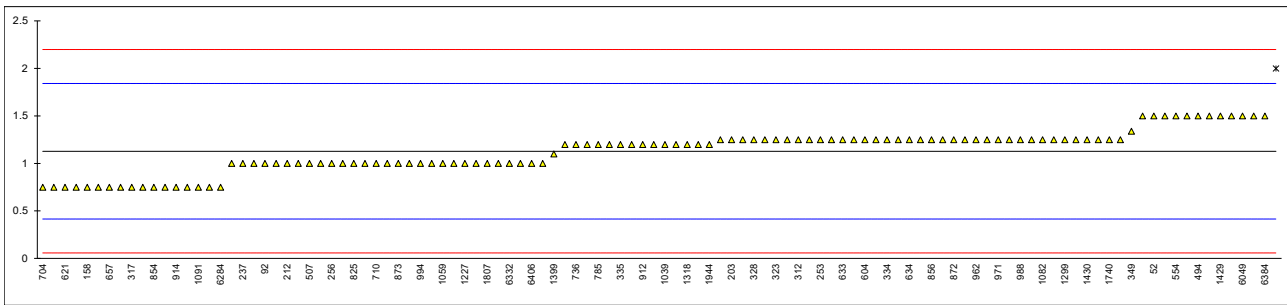
Determination of Conradson Carbon Residue on 10% residue on sample #23170; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4530	<0.1		-----	736	D4530	0.021		0.38
53		-----		-----	750		-----		-----
62		-----		-----	779		-----		-----
90		-----		-----	785	D4530	0.01		-0.76
92		-----		-----	825		-----		-----
120		-----		-----	845		-----		-----
140	D4530	0.02		0.28	846		-----		-----
150		-----		-----	851	ISO10370	0.0099		-0.77
158		-----		-----	854	D4530	<0.10		-----
159		-----		-----	856		-----		-----
169		-----		-----	861	D4530	<0.10		-----
171	D189	0.05	R(0.05)	3.40	862	D189	<0.1		-----
194		-----		-----	864	D4530	<0.10		-----
203		-----		-----	872		-----		-----
212	ISO10370	0.015	C	-0.24	873	D189	0.02		0.28
215		-----		-----	874	D4530	0.03		1.32
217	D189	0.028		1.11	875		-----		-----
221		-----		-----	886		-----		-----
224	D189	0.025		0.80	887	D4530	0.02		0.28
225	D4530	0.02		0.28	912		-----		-----
228		-----		-----	914		-----		-----
231		-----		-----	922	D189	0.022		0.49
235	D189	0.00		-1.80	962	D4530	<0.1		-----
237	D189	0.027		1.01	963	D4530	<0.1		-----
238		-----		-----	970		-----		-----
253		-----		-----	971	D189	0.01		-0.76
254	D189	0.021		0.38	974	D189	0.01		-0.76
256	D189	0.03		1.32	988		-----		-----
258		-----		-----	994	D189	0.024		0.70
273		-----		-----	995	D189	0.02		0.28
300	D4530	<0.10		-----	996	D189	0.015		-0.24
312		-----		-----	997		-----		-----
317	D4530	<0.10		-----	1006		-----		-----
323	D189	<0.10		-----	1011	ISO10370	<0.10		-----
328		-----		-----	1017		-----		-----
333		-----		-----	1026	ISO10370	<0.10		-----
334	D189	0.00		-1.80	1039	ISO10370	<0.10		-----
335		-----		-----	1059	ISO10370	0.01		-0.76
337		-----		-----	1082	ISO10370	0.01295		-0.45
339		-----		-----	1091	D4530	0.007		-1.07
342	ISO10370	0.02		0.28	1105	D4530	< 0.1		-----
344	D4530	0.0215		0.44	1121	D4530	0.004		-1.38
349		-----		-----	1126		-----		-----
355		-----		-----	1146		-----		-----
356		-----		-----	1186		-----		-----
365	IP13	0.011		-0.65	1191		-----		-----
381		-----		-----	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227	D4530	0.00		-1.80
494	D4530	0.012		-0.55	1299		-----		-----
498		-----		-----	1318		-----		-----
507	D4530	0.030		1.32	1356	ISO10370	<0.01		-----
511		-----		-----	1357	D4530	<0.1		-----
551	D189	0.02		0.28	1399	D4530	<0.01		-----
554		-----		-----	1417		-----		-----
555		-----		-----	1429		-----		-----
558		-----		-----	1430	D4530	<0.1		-----
562		-----		-----	1498		-----		-----
575		-----		-----	1575	D4530	0.02		0.28
603	D4530	0.037		2.05	1588		-----		-----
604		-----		-----	1629		-----		-----
608	D4530	0.02		0.28	1650	D189	0.017		-0.03
614		-----		-----	1709		-----		-----
621	D189	<0.01		-----	1720		-----		-----
631	D4530	0.0297		1.29	1740	D189	0.02		0.28
633		-----		-----	1741	ISO10370	0.0185		0.12
634	D189	0.024		0.70	1776		-----		-----
657	D4530	0.02		0.28	1807		-----		-----
704	D4530	0.01		-0.76	1810		-----		-----
710	D4530	0.015		-0.24	1811		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854	ISO10370	0.017		-0.03	6332	D189	0.016		-0.14
1906		-----		-----	6346		-----		-----
1941	ISO10370	0.0188		0.16	6364		-----		-----
1944	D189	0.0063		-1.14	6373	ISO10370	0		-1.80
1995		-----		-----	6384	D4530	0.00		-1.80
6018		-----		-----	6406		-----		-----
6035	ISO10370	0.09	R(0.01)	7.55	6416		-----		-----
6049	D4530	0.03		1.32	6443		-----		-----
6068	ISO10370	0.02		0.28	6447		-----		-----
6142		-----		-----	6469	D4530	0.013		-0.45
6172		-----		-----	6479		-----		-----
6266		-----		-----	6496	ISO10370	0.031		1.42
6284		-----		-----	6499		-----		-----
6302		-----		-----	6540		-----		-----
6317		-----		-----	6546		-----		-----
6319	D189	0.022		0.49					

normality	OK
n	55
outliers	2
mean (n)	0.0173
st.dev. (n)	0.00888
R(calc.)	0.0249
st.dev.(D189:06R19)	0.00963
R(D189:06R19)	0.0270

Lab 212 first reported 0.045

Kernel Density
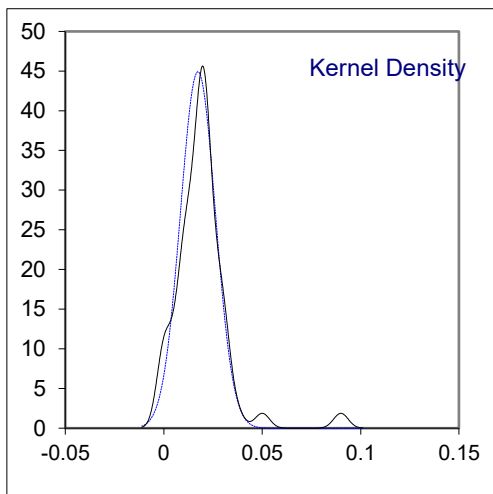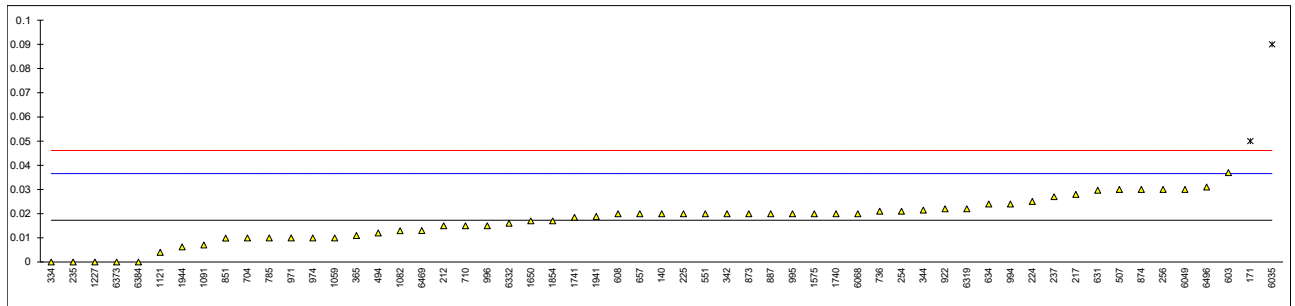
Determination of Ramsbottom Carbon Residue on 10% distillation residue on sample #23170; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	736		-----		-----
53		-----		-----	750		-----		-----
62		-----		-----	779		-----		-----
90		-----		-----	785		-----		-----
92		-----		-----	825		-----		-----
120		-----		-----	845	D4530	<0.10		-----
140	D524	0.08		2.47	846		-----		-----
150		-----		-----	851		-----		-----
158	D524	0.06		0.50	854		-----		-----
159		-----		-----	856	D4530	<0.10		-----
169		-----		-----	861		-----		-----
171	D524	0.18	G(0.01)	12.31	862		-----		-----
194		-----		-----	864		-----		-----
203		-----		-----	872		-----		-----
212		-----		-----	873		-----		-----
215		-----		-----	874		-----		-----
217		-----		-----	875		-----		-----
221		-----		-----	886		-----		-----
224		-----		-----	887		-----		-----
225		-----		-----	912	D524	0.06		0.50
228		-----		-----	914	D524	0.02		-3.43
231		-----		-----	922		-----		-----
235		-----		-----	962		-----		-----
237		-----		-----	963	D524	0.04		-1.47
238		-----		-----	970		-----		-----
253		-----		-----	971	D524	0.03		-2.45
254		-----		-----	974	D524	0.06		0.50
256		-----		-----	988		-----		-----
258		-----		-----	994		-----		-----
273		-----		-----	995		-----		-----
300		-----		-----	996		-----		-----
312		-----		-----	997		-----		-----
317		-----		-----	1006		-----		-----
323		-----		-----	1011		-----		-----
328		-----		-----	1017		-----		-----
333		-----		-----	1026		-----		-----
334		-----		-----	1039		-----		-----
335		-----		-----	1059		-----		-----
337		-----		-----	1082		-----		-----
339		-----		-----	1091		-----		-----
342		-----		-----	1105	D524	0.049		-0.58
344		-----		-----	1121		-----		-----
349		-----		-----	1126		-----		-----
355		-----		-----	1146		-----		-----
356		-----		-----	1186		-----		-----
365		-----		-----	1191		-----		-----
381		-----		-----	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227		-----		-----
494		-----		-----	1299		-----		-----
498		-----		-----	1318		-----		-----
507		-----		-----	1356		-----		-----
511		-----		-----	1357		-----		-----
551	D524	0.07		1.49	1399		-----		-----
554		-----		-----	1417		-----		-----
555		-----		-----	1429		-----		-----
558		-----		-----	1430		-----		-----
562		-----		-----	1498		-----		-----
575		-----		-----	1575		-----		-----
603		-----		-----	1588		-----		-----
604		-----		-----	1629		-----		-----
608		-----		-----	1650		-----		-----
614		-----		-----	1709		-----		-----
621		-----		-----	1720		-----		-----
631		-----		-----	1740		-----		-----
633		-----		-----	1741		-----		-----
634		-----		-----	1776		-----		-----
657	D524	0.08		2.47	1807		-----		-----
704		-----		-----	1810		-----		-----
710		-----		-----	1811		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854		-----		-----	6332		-----		-----
1906		-----		-----	6346		-----		-----
1941		-----		-----	6364		-----		-----
1944		-----		-----	6373		-----		-----
1995		-----		-----	6384		-----		-----
6018		-----		-----	6406		-----		-----
6035		-----		-----	6416		-----		-----
6049		-----		-----	6443		-----		-----
6068		-----		-----	6447		-----		-----
6142		-----		-----	6469		-----		-----
6172		-----		-----	6479		-----		-----
6266		-----		-----	6496		-----		-----
6284		-----		-----	6499		-----		-----
6302		-----		-----	6540		-----		-----
6317		-----		-----	6546		-----		-----
6319		-----		-----					

normality	OK
n	10
outliers	1
mean (n)	0.0549
st.dev. (n)	0.02017
R(calc.)	0.0565
st.dev.(D524:15R19)	0.01016
R(D524:15R19)	0.0285

Kernel Density
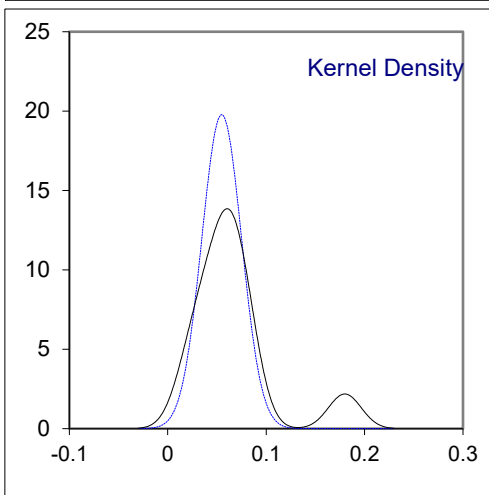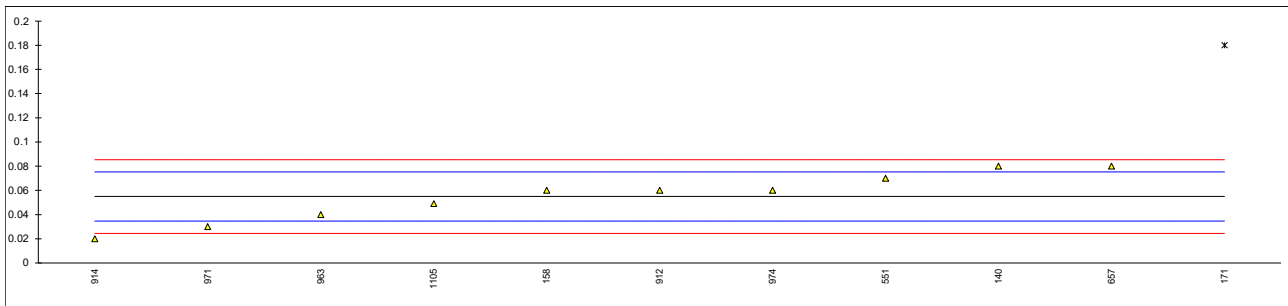
Determination of Copper Corrosion 3 hrs at 50 °C on sample #23170;

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D130	1a		-----	736	D130	1a		-----
53		-----		-----	750		-----		-----
62	D130	1B		-----	779	D130	1a		-----
90	D130	1a		-----	785	D130	1a		-----
92	D130	1a		-----	825	D130	1a		-----
120	D130	1A		-----	845	D130	1a		-----
140	D130	1a		-----	846	GB/T5096	1a		-----
150	D130	1A		-----	851	D130	1a		-----
158	D130	1a		-----	854	D130	1a		-----
159		-----		-----	856	D130	1a		-----
169		-----		-----	861	D130	1a		-----
171	D130	1a		-----	862	D130	1a		-----
194		-----		-----	864	D130	1a		-----
203		1A		-----	872		-----		-----
212	D130	1a		-----	873	D130	1a		-----
215		-----		-----	874	D130	1a		-----
217	D130	1A		-----	875	D130	1a		-----
221	D130	1 A		-----	886	D130	1a		-----
224	D130	1a		-----	887	D130	1a		-----
225	D130	1A		-----	912		1A		-----
228		-----		-----	914	D130	1a		-----
231	D130	1A		-----	922	D130	1A		-----
235	D130	1a		-----	962	D130	1a		-----
237	D130	1A		-----	963	D130	1a		-----
238		-----		-----	970		-----		-----
253	D130	1a		-----	971	D130	1a		-----
254	D130	1a		-----	974	D130	1a		-----
256	D130	1A		-----	988		-----		-----
258	D130	1a		-----	994	D130	1a		-----
273		-----		-----	995	D130	1A		-----
300	D130	1B		-----	996	D130	1a		-----
312		-----		-----	997		-----		-----
317	D130	1A		-----	1006	D130	1A		-----
323		-----		-----	1011	ISO2160	1a		-----
328	D130	1a		-----	1017		-----		-----
333		-----		-----	1026	ISO2160	1A		-----
334	D130	1		-----	1039	ISO2160	1A		-----
335	D130	1a		-----	1059	ISO2160	1a		-----
337		-----		-----	1082	ISO2160	1a		-----
339		-----		-----	1091		-----		-----
342	D130	1a		-----	1105	D130	1a		-----
344	D130	1a		-----	1121	D130	1a		-----
349		-----		-----	1126		-----		-----
355		-----		-----	1146		-----		-----
356	D130	1B		-----	1186		-----		-----
365	IP154	1a		-----	1191		-----		-----
381		-----		-----	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227	D130	1A		-----
494	D130	1A		-----	1299	D130	1A		-----
498		-----		-----	1318	D130	1a		-----
507	D130	1a		-----	1356		-----		-----
511	D130	1a		-----	1357	D130	1a		-----
551	D130	1A		-----	1399		-----		-----
554		-----		-----	1417	D130	1A		-----
555	D130	1A		-----	1429	D130	1a		-----
558		-----		-----	1430	D130	1a		-----
562	D130	1A		-----	1498		-----		-----
575	D130	1a		-----	1575	D130	1A		-----
603	D130	1A		-----	1588		-----		-----
604		-----		-----	1629		-----		-----
608	D130	1a		-----	1650	D130	1a		-----
614	D130	1a		-----	1709		-----		-----
621	D130	1A		-----	1720		-----		-----
631	D130	1a		-----	1740	D130	1A		-----
633	D130	1a		-----	1741	ISO2160	Class 1		-----
634	D130	1a		-----	1776		-----		-----
657	D130	1a		-----	1807	D130	1a		-----
704	D130	1a		-----	1810		-----		-----
710		-----		-----	1811		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854	D130	1A		-----	6332	D130	1a		-----
1906		-----		-----	6346		-----		-----
1941	ISO2160	1A		-----	6364	D130	1A		-----
1944	D130	1a		-----	6373	D130	1A		-----
1995	D130	1A		-----	6384	D130	1b		-----
6018	D130	1a		-----	6406		1A		-----
6035	ISO2160	1a		-----	6416	D130	1A		-----
6049	D130	1a		-----	6443	D130	1A		-----
6068	ISO2160	1a		-----	6447		-----		-----
6142		-----		-----	6469	D130	1A		-----
6172		-----		-----	6479		-----		-----
6266	D130	1a		-----	6496	ISO2160	Class 1		-----
6284	D130	1a		-----	6499		-----		-----
6302		-----		-----	6540	D130	1a		-----
6317	D130	1a		-----	6546		-----		-----
6319	D130	1a		-----					

n	116	
mean (n)	1(1A/1B)	

Determination of Density at 15 °C on sample #23170; results in kg/m^3

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4052	835.1		-0.73	736	D4052	835.2		-0.17
53	D4052	835.2		-0.17	750		-----		-----
62	D4052	835.2		-0.17	779	D4052	835.1		-0.73
90	D4052	835.2		-0.17	785	D4052	835.1		-0.73
92	D4052	835.2		-0.17	825	D4052	835.2		-0.17
120	D1298	835.2		-0.17	845	D4052	835.225		-0.03
140	D4052	835.2		-0.17	846	SH/T0604	835.3		0.39
150	D4052	835.2		-0.17	851	D4052	835.3		0.39
158	D4052	835.2		-0.17	854	D4052	835.19		-0.22
159		-----		-----	856	D4052	835.26	C	0.17
169		-----		-----	861	D4052	835.3		0.39
171	D4052	835.3		0.39	862	D4052	835.2		-0.17
194		-----		-----	864	D4052	835.3		0.39
203	D4052	835.17		-0.34	872	D4052	835.2		-0.17
212	ISO12185	835.35		0.67	873	D4052	835.2		-0.17
215	D1298	835.6	R(0.01)	2.07	874	D4052	835.1		-0.73
217	D4052	835.3		0.39	875	D4052	835.2		-0.17
221	D4052	835.3		0.39	886	D4052	835.2		-0.17
224	D1298	835.3		0.39	887	D4052	835.2		-0.17
225	D4052	835.2		-0.17	912	D189	835.2		-0.17
228	D4052	835.3		0.39	914	D4052	835.2		-0.17
231	D4052	835.1		-0.73	922	D4052	835.2		-0.17
235	D4052	835.25		0.11	962	D4052	835.3		0.39
237	D4052	835.3		0.39	963	D4052	835.2		-0.17
238	D4052	835.2		-0.17	970		-----		-----
253	D4052	835.3		0.39	971	D4052	835.3		0.39
254	D4052	835.2		-0.17	974	D4052	835.2		-0.17
256	D4052	835.3		0.39	988	D1298	835.2	C	-0.17
258	D4052	835.2		-0.17	994	D4052	835.2		-0.17
273		-----		-----	995	D4052	835.3		0.39
300	D4052	835.2		-0.17	996	D4052	835.3		0.39
312	D4052	835.2		-0.17	997	D4052	835.3		0.39
317	D4052	835.2		-0.17	1006	D4052	835.3		0.39
323	D4052	835.2		-0.17	1011	ISO12185	835.2		-0.17
328	D4052	835.1		-0.73	1017	D4052	835.2		-0.17
333	D4052	835.0		-1.29	1026	D4052	834.3	R(0.01)	-5.21
334	D4052	835.2		-0.17	1039	ISO12185	835.2		-0.17
335	ISO12185	835.2		-0.17	1059	ISO12185	835.2		-0.17
337	D4052	835.3		0.39	1082	ISO12185	835.4		0.95
339		-----		-----	1091	D4052	835.2		-0.17
342	D4052	835.2		-0.17	1105	D4052	835.3		0.39
344	D4052	835.2		-0.17	1121	D4052	835.4		0.95
349	D4052	835.1		-0.73	1126	D4052	835.21		-0.11
355	D4052	835.4		0.95	1146	D4052	835.2		-0.17
356	ISO12185	835.2		-0.17	1186		-----		-----
365	IP365	835.1		-0.73	1191	ISO12185	835.21		-0.11
381	D4052	835.2		-0.17	1199		-----		-----
433	ISO12185	835.2		-0.17	1205	ISO12185	835.19		-0.22
480	D4052	835.2		-0.17	1227	D4052	835.2		-0.17
494	D4052	835.2		-0.17	1299	D4052	835.2		-0.17
498		-----		-----	1318	D4052	835.20		-0.17
507	D4052	835.4		0.95	1356	ISO12185	835.3		0.39
511	D4052	835.18		-0.28	1357	D4052	835.3		0.39
551	D4052	835.4		0.95	1399	D4052	835.2		-0.17
554	D4052	835.4		0.95	1417	IP365	835.2		-0.17
555	D4052	835.4		0.95	1429	D4052	835.2	C	-0.17
558	D4052	835.4		0.95	1430	D4052	835.4		0.95
562	D4052	835.1		-0.73	1498	D4052	835.2		-0.17
575	D4052	835.1		-0.73	1575		-----		-----
603	D4052	835.2		-0.17	1588	ISO12185	835.21		-0.11
604	D4052	835.3		0.39	1629		-----		-----
608	D4052	835.48		1.40	1650	D4052	835.23		0.00
614	D4052	835.4		0.95	1709		-----		-----
621	D4052	835.3		0.39	1720		-----		-----
631	D4052	835.46		1.29	1740	D4052	835.3		0.39
633	D4052	835.3		0.39	1741	ISO12185	835.2		-0.17
634	D4052	835.2		-0.17	1776	ISO12185	835.31		0.45
657	D4052	835.4		0.95	1807	D4052	835.24		0.06
704	D4052	835.18		-0.28	1810	D4052	835.2		-0.17
710	ISO12185	835.22		-0.06	1811	D4052	835.2		-0.17

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854	D4052	835.3		0.39	6332	D4052	835.4		0.95
1906		-----		-----	6346		-----		-----
1941	ISO12185	835.26		0.17	6364	D4052	835.1		-0.73
1944	D4052	835.1		-0.73	6373	D4052	835.17		-0.34
1995	D4052	835.2		-0.17	6384	D4052	835.2		-0.17
6018	ISO12185	835.2		-0.17	6406	D4052	835.2	C	-0.17
6035	ISO12185	835.2		-0.17	6416	D4052	835.4		0.95
6049	D4052	835.2		-0.17	6443	D4052	835.2		-0.17
6068	ISO12185	835.3		0.39	6447	D4052	835.2		-0.17
6142	ISO12185	835.3		0.39	6469	D4052	835.2		-0.17
6172	D4052	835		-1.29	6479		-----		-----
6266	D4052	835.22		-0.06	6496	D4052	835.19		-0.22
6284	D4052	835.2		-0.17	6499	D4052	835.07		-0.90
6302		-----		-----	6540	D4052	835.1		-0.73
6317	D4052	835.16		-0.39	6546		-----		-----
6319	D4052	835.2		-0.17					

normality	OK
n	150
outliers	2
mean (n)	835.230
st.dev. (n)	0.0856
R(calc.)	0.240
st.dev.(D4052:22)	0.1786
R(D4052:22)	0.5

Lab 856 reported 0.83526 kg/m^3
Lab 988 reported 0.8352 kg/m^3
Lab 1429 first reported 0.8352 kg/m^3
Lab 6406 reported 0.8352 kg/m^3
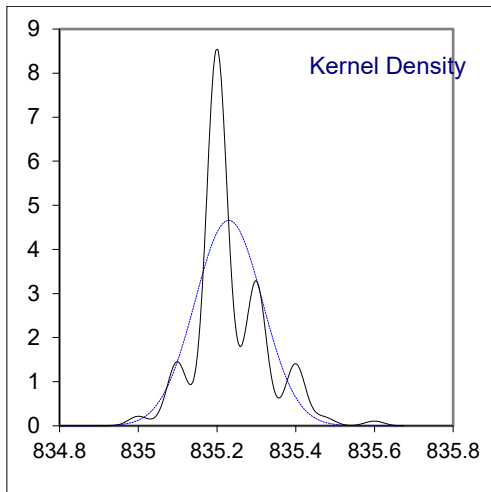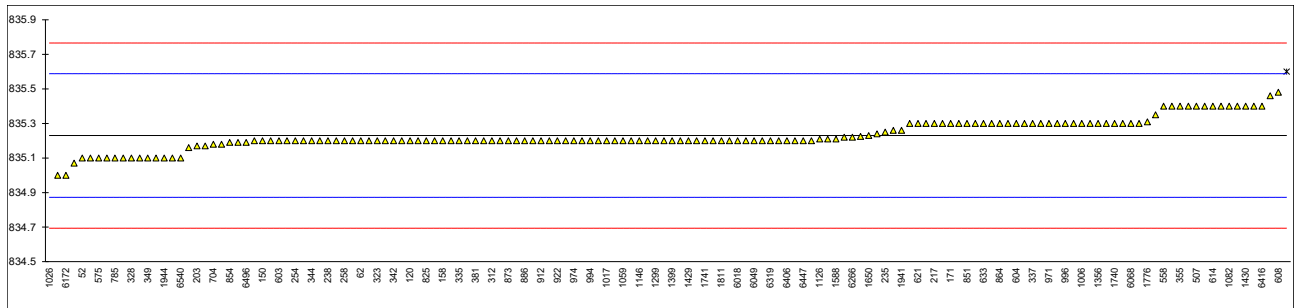
Determination of Distillation at 760 mmHg on sample #23170; results in °C

lab	method	IBP		10% rec		50% rec		90% rec		95% rec		FBP	
52	D86-automated	167.0	C	205.9	C	271.7	C	331.6	C	345.7	C	353.7	C
53		-----		-----		-----		-----		-----		-----	
62	D86-automated	169.1		208.9		273.4		332.2		346.7		355.5	
90	D86-manual	169.8		204.8		271.8		333.7		346.7		351.7	
92	D86-automated	172.1		207.2		273.2		332.1		346.4		352.9	
120		-----		212.6		273.6	C	333.1	C	-----		-----	
140	D86-automated	168.8		209.4		274.2		333.9		349.0		358.1	
150	D86-automated	164.0		206.8		271.8		332.0		346.9		355.4	
158		-----		-----		-----		-----		-----		-----	
159		-----		-----		-----		-----		-----		-----	
169		-----		-----		-----		-----		-----		-----	
171	D86-automated	167.2		209.2		273.4		332.8		346.8		357.0	
194		-----		-----		-----		-----		-----		-----	
203		-----		-----		-----		-----		-----		-----	
212	ISO3405-automated	170.2		207.5		273.8		333.7		349.3		357.0	
215		-----		-----		-----		-----		-----		-----	
217	D86-automated	171.4		208.1		272.9		331.7		345.8		354.0	
221	D86-automated	171.4		206.8		273.2		332.6		347.6		355.5	
224	D86-manual	172.61		205.87		272.63		333.58		348.15		356.15	
225		-----		-----		-----		-----		-----		-----	
228	D86-manual	170.0		206.0		272.0		330.0	C	342.0	C	354.0	
231	D86-manual	172.0		206.0		273.0		333.0		347.0		359.0	
235	D86-automated	172.1		209.8		273.8		331.9		344.5		350.2	
237		174.0		208.0		275.0		334.0		346.0		361.0	
238	D86-manual	173		205		271		332		344		352	
253	D86-manual	172.5		210.0		274.5		334.0		350.0		356.5	
254	D86-manual	174.0		208.0		274.0		335.0		-----		358.0	
256	D86-manual	172.0		209.0		274.0		333.0		350.0		357.0	
258	D86-automated	173.9		209.8		274.1		332.7		346.0		353.1	
273		-----		-----		-----		-----		-----		-----	
300	D86-automated	169.8		205.0		271.8		329.3		341.0		356.8	
312	D86-automated	170.4		206.8		273.4		331.5		344.2		356.5	
317	D86-automated	175.6		210.3		275.3		335.0		349.6		358.4	
323	D86-automated	170.9		207.4		273.0		332.6		344.0		356.0	
328	D86-automated	169.6		206.7	C	272.4	C	331.6		345.7		354.8	
333		-----		-----		-----		-----		-----		-----	
334	D86	168.0		208.0		273.3		332.4		347.4		352.5	
335	D86-automated	171.9		205.9		273.1		333.7		349.2		355.7	
337	D86-automated	165.8		206.3		274.4		335.4		350		352.8	
339		-----		-----		-----		-----		-----		-----	
342	D86-automated	173.9		209.1		273.5		333.5		348.8		355.5	
344	D86-automated	169.7		208.9		274.3		333.8		347.6		352.7	
349		171.2		208.1		273.2		332.3		346.5		353.9	
355	D86-manual	168.5		205.25		276.25		336.75		352.25		362.5	
356	D86-manual	170.0		205.0		271.0		333.0		350.0		355.0	
365	D86-automated	167.4		207.8		273.3		332.6		347.2		355.1	
381	D86-automated	168.6		209.3		272.1		329.5		341.2		352.2	
433		-----		-----		-----		-----		-----		-----	
480	D86-automated	174.5		211.25		275.40		333.7		347.55		356.1	
494	D86-automated	170.6		209.3		275.1		334.1		349.0		358.3	
498		-----		-----		-----		-----		-----		-----	
507	D86-manual	167	C	208		272		330	C	344	C	351	C
511	D86-manual	173		209.5		274.5		336.5		350	C	357.5	
551	D86-automated	168.5		209.0		273.5		332.5		344.0		359.1	
554	D86-manual	169.0		210.5		274.5		334.0		345.0		360.0	
555	D86-manual	167.0		208.0		272.0		332.5		345.5		360.0	
558	D86-manual	168.0		210.0		272.5		333.0		345.0		360.5	
562	D86	169.2		208.6		273.1		332.4		-----		-----	
575		-----		-----		-----		-----		-----		-----	
603	D86-automated	169.4		209.4		273.5		332.8		346.2		359.7	
604	D86-automated	172.4		210.3		274.0		333.4		348.1		354.2	
608	D86-automated	170.2		207.7		273.7		333.2		348.4		355.6	
614		-----		-----		-----		-----		-----		-----	
621	D86-manual	175.2		210.2	C	275.2		335.3		349.3		355.3	
631	D86-manual	175.0		210.0		275.5		336.0		349.0		360.0	
633	D86-automated	171.2		210.9		275.0		335.4		350.6		359.1	
634	D86-automated	172.0		208.0		274.0		334.0		351.0		356.0	
657	D86-automated	168.5		210.1		274.7		333.1		347.2		356.2	
704	D86-manual	171.5		209.0		273.0		330.5		343.0		355.0	
710	D86-manual	172.0		207.0		274.5		334.5		347.5		360.0	

lab	method	IBP		10% rec		50% rec		90% rec		95% rec		FBP	
736	D86-manual	171.0		209.0		273.5		333.5		347.0		357.0	
750		-----		-----		-----		-----		-----		-----	
779	D86-manual	173.0		212.0		276.5		337.5		350.5		363.5	
785	D86-manual	171.0		211.0		276.5		336.5		349.5		359.5	
825	D86-automated	169.8		210.7		274.6		333.6		347.6		355.6	
845	D86-automated	169.5		210.4		273.2		332.5		347.3		357.7	
846	GB/T6536	167.2		208.6		274.2		334.6		348.6		-----	
851	D86-automated	173.0		209.5		274.0		333.0		346.5		358.5	
854	D86-automated	166.9		207.8		273.1		331.8		346.0		356.3	
856	D86-automated	168.9		209.2		273.0		332.4		346.7		354.8	
861	D86-automated	167.0		209.1		274.2		334.4		348.9		356.0	
862	D86-manual	167.7		208.7		272.1		331.2		345.2		355.1	
864	D86-automated	166.7		207.0		273.0		332.2		346.8		355.4	
872	D86	171.0		207.5		274.0		334.0		348.0		358.0	
873	D86-manual	172.0		208.0		274.0		333.5		348.0		358.0	
874	D86-manual	172.0		208.0		274.0		333.0		347.0		359.0	
875	D86-automated	170.8		209.7		274.0		333.7		349.3		355.7	
886		-----		211.9		274.8		333.4		-----		-----	
887	D86-automated	171.0		211.3		275.1		334.8		350.0		359.0	
912	D86	172.0	ex	211.0	ex	279.0	R(1)	340.0	R(1)	356.0	R(5)	365.0	ex
914	D86	167.5		207.6		272.6		331.6		345.6		356.3	
922	D86-automated	174.5		213.2		274.0		331.2		347.9		353.5	
962	D86-automated	171.6		210.2		274.7		334.5		350.9		357.2	
963	D86-automated	169.1		209.3		273.5		332.5		346.8		356.4	
970		-----		-----		-----		-----		-----		-----	
971	D86-automated	172.0		210.1		274.9		334.4		350.0		357.7	
974	D86-automated	171.9		210.1		274.6		334.8		350.0		357.7	
988	D86	172.0		207.5		273.5		334.0		349.0		357.0	
994	D86-manual	172.0		206.0		274.0		334.0		346.0		360.0	
995	D86-manual	171.0		207.0		274.0		333.5		347.0		359.0	
996	D86-manual	171.0		208.0		273.0		333.0		348.0		358.0	
997	D86-manual	169.5		206.5		273.5		333.0		347.0		358.0	
1006	D86-automated	173.4		208.4		273.7		331.9		345.1		355.5	
1011	D86-automated	168.1		209.7		274.1		333.3		348.5		355.7	
1017		-----		-----		-----		-----		-----		-----	
1026	ISO3405-automated	172.1		209.2		273.3		333.5		349.0		357.2	
1039	D2887-automated	173.4		209.8		272.6		333.8		348.4		360.8	
1059	D86-automated	171.6		208.7		274.1		331.8		346.5		355.1	
1082	ISO3405-automated	173.4		208.6		274.5		333.4		347.8		357.1	
1091	D86-automated	175.7		210.6		274.5		334.0		351.0		355.6	
1105	D86-automated	170.8		208.8		274.0		333.2		347.7		356.3	
1121	D86-automated	166.2	C	208.2		271.9		332.0		345.1		355.58	C
1126		173.6		210.4		273.0		331.1		345.4		357.3	
1146	ISO3405-automated	170.8		209.4		273.5		333.6		348.2		357.6	
1186		-----		-----		-----		-----		-----		-----	
1191		-----		-----		-----		-----		-----		-----	
1199		-----		-----		-----		-----		-----		-----	
1205	D86-automated	172.5		209.7		274.2		332.7		346.5		357.9	
1227	D86-automated	172		209		272.3		331.1		344.7		355.4	
1299	D86-automated	164.5		206		272.1		332.3		347.5		356.3	
1318	D86-automated	168.8		207.9		272.8		332.0		345.9		359.5	
1356		-----		-----		-----		-----		-----		-----	
1357	D86-automated	-----		-----		-----		-----		346.6		-----	
1399	D86-automated	165.9		206.7		273.0		334.6		351.0		357.3	
1417	D86-automated	172.3		213.2		275.5		334.6		351.4		356.9	
1429		-----		-----		-----		-----		-----		-----	
1430		166.5	ex	205.8	ex	268.8	R(1)	326.2	R(1)	338.3	R(5)	350.5	ex
1498		169.8		208.5		273.7		333.2		347.8		356.1	
1575		-----		-----		-----		-----		-----		-----	
1588		-----		-----		-----		-----		-----		-----	
1629		-----		-----		-----		-----		-----		-----	
1650	D86-automated	165.0		207.2		272.4		331.5		345.3		356.1	
1709		170.8		211.2		274.6		332.6		346.3		354.8	
1720		-----		-----		-----		-----		-----		-----	
1740	D86-automated	169.2		207.1		273.3		333.3		348.1		356.7	
1741	ISO3405-automated	169.4		208.9		273.0		332.6		346.2		356.1	
1776	ISO3405-automated	166.9		207.7		271.2		329.8		342.9		351.1	
1807	D86-automated	168.9		205.6		272.5		331.7		344.6		355.7	
1810	D86-automated	172.8		210.4		274.5		333.0		346.5		356.9	
1811	D86-automated	170.5		210.0		273.4		332.0		345.2		355.3	

lab	method	IBP	10% rec	50% rec	90% rec	95% rec	FBP
1854	ISO3405-automated	169.0	208.0	273.7	332.6	346.7	356.7
1906		-----	-----	-----	-----	-----	-----
1941		169.4	209.6	272.4	332.0	346.5	356.0
1944	D86-automated	170.4	208.4	272.8	332.4	346.6	356.3
1995	D86-automated	171.1	208.5	272.7	331.2	345.0	356.9
6018	ISO3405-automated	170.4	207.2	273.3	332.8	347.6	356.2
6035	ISO3405-automated	173.6	208.7	273.9	333.8	349.1	354.8
6049	D86-automated	167.5	207.4	273.5	332.9	348.2	355.9
6068	ISO3405-automated	167.7	208.8	273.4	332.2	346.9	354.0
6142	ISO3405-automated	167.4	207.3	271.7	330.7	344.7	353.5
6172	D86-automated	168.3	207.7	273.8	334.9	350.7	355.4
6266		167.1	209.3	273.9	332.0	346.1	354.1
6284		174	213	274	331	348	353
6302		-----	-----	-----	-----	-----	-----
6317		-----	-----	-----	-----	-----	-----
6319	D86-manual	171.5	206.0	274.5	334.5	347.0	360.0
6332		173.7	209	274.7	335.3	350.7	358.7
6346		-----	-----	-----	-----	-----	-----
6364	D86-automated	167.2	208.8	273.8	332.1	345.2	355.2
6373		-----	-----	-----	-----	-----	-----
6384	D86-automated	167.3	208.3	274.3	333.9	348.8	357.3
6406	D86-automated	172.5	210.0	274.5	333.3	347.2	357.3
6416	D86-automated	169.8	207.7	274.5	335.8	353.2	357.4
6443	D86-manual	170.80	205.00	273.17	333.96	347.24	360.5
6447		-----	-----	-----	-----	-----	-----
6469	D86-automated	169.9	207.9	273.9	333.3	349.7	356.8
6479		-----	-----	-----	-----	-----	-----
6496	D86-automated	170.9 C	210.2	272.7	331.5	347.7	355.0
6499	D86-automated	170.5	208.4	274.8	335.0	349.6	351.7
6540	D86-manual	174.0	209.0	275.0	335.0	-----	359.0
6546		-----	-----	-----	-----	-----	-----
	normality	OK	OK	OK	OK	OK	OK
	n	131	133	133	133	129	129
	outliers	0+2ex	0+2ex	2	2	2	0+2ex
	mean (n)	170.42	208.58	273.62	333.09	347.34	356.43
	st.dev. (n)	2.465	1.753	1.065	1.466	2.190	2.371
	R(calc.)	6.90	4.91	2.98	4.10	6.13	6.64
	st.dev.(D86-A:23)	3.348	1.639	1.071	1.784	3.040	2.536
	R(D86-A:23)	9.37	4.59	3.0	5.00	8.51	7.10
Compare:							
	R(D86-M:23)	6.35	4.55	3.87	3.98	4.90	3.86

Lab 52 first reported 162.2, 207.2, 272.0, 332.1, 347.0 and 355.7 for IBP, 10% rec, 50% rec, 90% rec, 95% rec and FBP
Lab 120 first reported 268.2 and 316.4 for 50% rec and 90% rec
Lab 228 first reported 328.0 and 339.0 90% rec and 95% rec
Lab 328 first reported 192.8 and 172.4 for 10% rec and 50% rec
Lab 507 first reported 145, 325, 339, 344 for IBP, 90% rec, 95% rec and FBP
Lab 511 first reported 354 for 95% rec
Lab 621 first reported 201.2 for 10% rec
Lab 1121 first reported 157.9 and 349.4 for IBP and FBP
Lab 6496 first reported 179.0 for IBP

Test values of lab 912 and lab 1430 are excluded as related test values are statistical outliers.

Initial Boiling Point

Temp. at 10% recovered

Temp. at 50% recovered

Temp. at 90% recovered

Temp. at 95% recovered

Final Boiling Point

Kernel Density
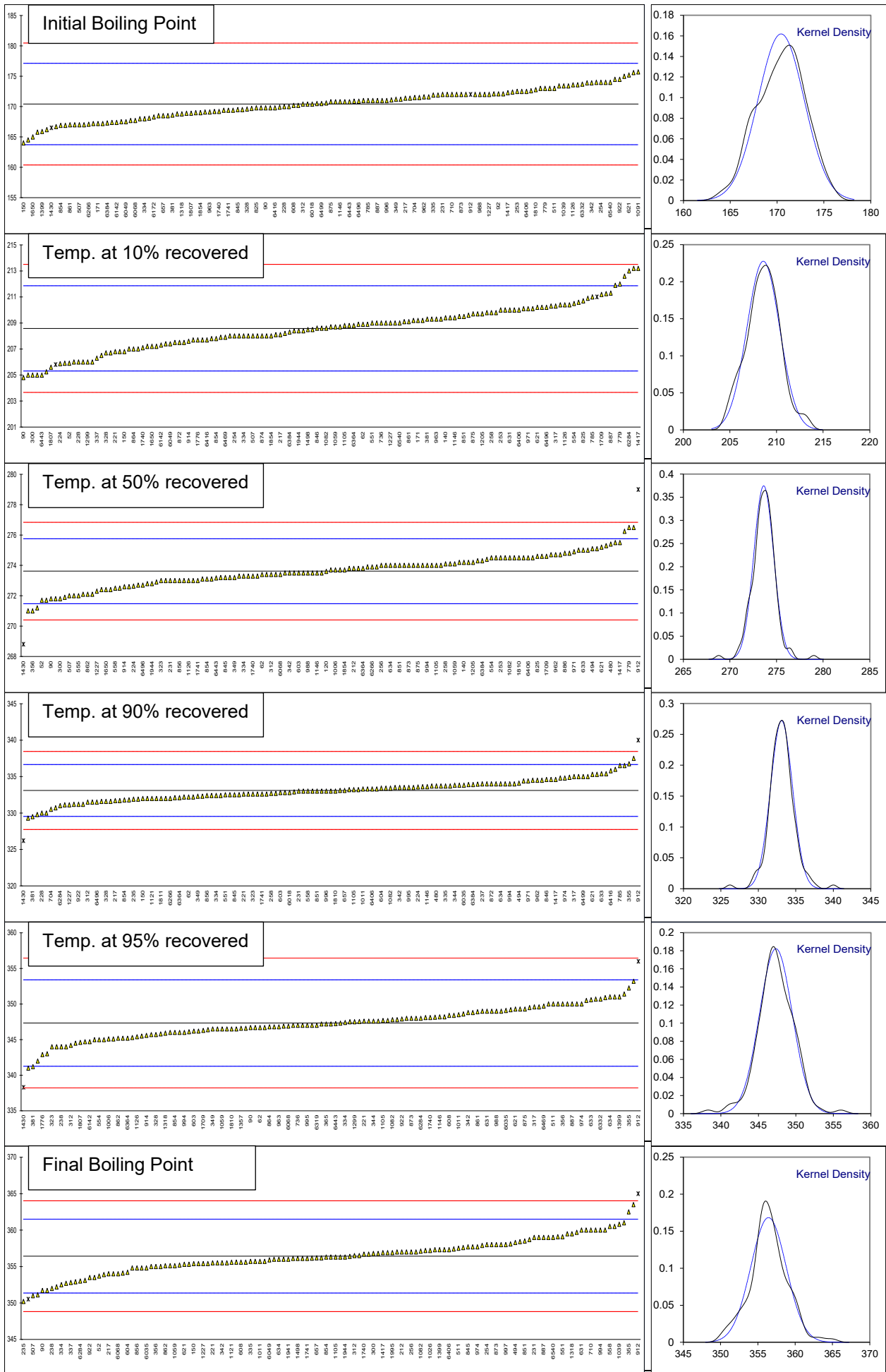
z-scores Distillation at 760 mmHg on sample #23170

lab	IBP	10% rec	50% rec	90% rec	95% rec	FBP
52	-1.02	-1.64	-1.79	-0.84	-0.54	-1.08
53	-----	-----	-----	-----	-----	-----
62	-0.40	0.19	-0.21	-0.50	-0.21	-0.37
90	-0.19	-2.31	-1.70	0.34	-0.21	-1.86
92	0.50	-0.84	-0.39	-0.56	-0.31	-1.39
120	-----	2.45	-0.02	0.00	-----	-----
140	-0.49	0.50	0.54	0.45	0.55	0.66
150	-1.92	-1.09	-1.70	-0.61	-0.14	-0.41
158	-----	-----	-----	-----	-----	-----
159	-----	-----	-----	-----	-----	-----
169	-----	-----	-----	-----	-----	-----
171	-0.96	0.38	-0.21	-0.16	-0.18	0.23
194	-----	-----	-----	-----	-----	-----
203	-----	-----	-----	-----	-----	-----
212	-0.07	-0.66	0.17	0.34	0.65	0.23
215	-----	-----	-----	-----	-----	-----
217	0.29	-0.29	-0.67	-0.78	-0.51	-0.96
221	0.29	-1.09	-0.39	-0.28	0.09	-0.37
224	0.65	-1.65	-0.93	0.27	0.27	-0.11
225	-----	-----	-----	-----	-----	-----
228	-0.13	-1.57	-1.51	-1.73	-1.76	-0.96
231	0.47	-1.57	-0.58	-0.05	-0.11	1.01
235	0.50	0.74	0.17	-0.67	-0.93	-2.46
237	1.07	-0.35	1.29	0.51	-0.44	1.80
238	0.77	-2.19	-2.45	-0.61	-1.10	-1.75
253	0.62	0.87	0.82	0.51	0.88	0.03
254	1.07	-0.35	0.35	1.07	-----	0.62
256	0.47	0.26	0.35	-0.05	0.88	0.23
258	1.04	0.74	0.45	-0.22	-0.44	-1.31
273	-----	-----	-----	-----	-----	-----
300	-0.19	-2.19	-1.70	-2.13	-2.08	0.15
312	-0.01	-1.09	-0.21	-0.89	-1.03	0.03
317	1.55	1.05	1.57	1.07	0.74	0.78
323	0.14	-0.72	-0.58	-0.28	-1.10	-0.17
328	-0.25	-1.15	-1.14	-0.84	-0.54	-0.64
333	-----	-----	-----	-----	-----	-----
334	-0.72	-0.35	-0.30	-0.39	0.02	-1.55
335	0.44	-1.64	-0.49	0.34	0.61	-0.29
337	-1.38	-1.39	0.73	1.29	0.88	-1.43
339	-----	-----	-----	-----	-----	-----
342	1.04	0.32	-0.11	0.23	0.48	-0.37
344	-0.22	0.19	0.63	0.40	0.09	-1.47
349	0.23	-0.29	-0.39	-0.44	-0.27	-1.00
355	-0.57	-2.03	2.45	2.05	1.62	2.39
356	-0.13	-2.19	-2.45	-0.05	0.88	-0.56
365	-0.90	-0.48	-0.30	-0.28	-0.04	-0.52
381	-0.55	0.44	-1.42	-2.01	-2.02	-1.67
433	-----	-----	-----	-----	-----	-----
480	1.22	1.63	1.66	0.34	0.07	-0.13
494	0.05	0.44	1.38	0.56	0.55	0.74
498	-----	-----	-----	-----	-----	-----
507	-1.02	-0.35	-1.51	-1.73	-1.10	-2.14
511	0.77	0.56	0.82	1.91	0.88	0.42
551	-0.57	0.26	-0.11	-0.33	-1.10	1.05
554	-0.43	1.17	0.82	0.51	-0.77	1.41
555	-1.02	-0.35	-1.51	-0.33	-0.60	1.41
558	-0.72	0.87	-1.05	-0.05	-0.77	1.61
562	-0.37	0.01	-0.49	-0.39	-----	-----
575	-----	-----	-----	-----	-----	-----
603	-0.31	0.50	-0.11	-0.16	-0.37	1.29
604	0.59	1.05	0.35	0.17	0.25	-0.88
608	-0.07	-0.54	0.07	0.06	0.35	-0.33
614	-----	-----	-----	-----	-----	-----
621	1.43	0.99	1.47	1.24	0.65	-0.44
631	1.37	0.87	1.75	1.63	0.55	1.41
633	0.23	1.42	1.29	1.29	1.07	1.05
634	0.47	-0.35	0.35	0.51	1.21	-0.17
657	-0.57	0.93	1.01	0.00	-0.04	-0.09
704	0.32	0.26	-0.58	-1.45	-1.43	-0.56
710	0.47	-0.96	0.82	0.79	0.05	1.41

lab	IBP	10% rec	50% rec	90% rec	95% rec	FBP
736	0.17	0.26	-0.11	0.23	-0.11	0.23
750	-----	-----	-----	-----	-----	-----
779	0.77	2.09	2.69	2.47	1.04	2.79
785	0.17	1.48	2.69	1.91	0.71	1.21
825	-0.19	1.29	0.91	0.28	0.09	-0.33
845	-0.28	1.11	-0.39	-0.33	-0.01	0.50
846	-0.96	0.01	0.54	0.84	0.42	-----
851	0.77	0.56	0.35	-0.05	-0.27	0.82
854	-1.05	-0.48	-0.49	-0.72	-0.44	-0.05
856	-0.46	0.38	-0.58	-0.39	-0.21	-0.64
861	-1.02	0.32	0.54	0.73	0.51	-0.17
862	-0.81	0.07	-1.42	-1.06	-0.70	-0.52
864	-1.11	-0.96	-0.58	-0.50	-0.18	-0.41
872	0.17	-0.66	0.35	0.51	0.22	0.62
873	0.47	-0.35	0.35	0.23	0.22	0.62
874	0.47	-0.35	0.35	-0.05	-0.11	1.01
875	0.11	0.68	0.35	0.34	0.65	-0.29
886	-----	2.03	1.10	0.17	-----	-----
887	0.17	1.66	1.38	0.96	0.88	1.01
912	0.47	1.48	5.02	3.87	2.85	3.38
914	-0.87	-0.60	-0.95	-0.84	-0.57	-0.05
922	1.22	2.82	0.35	-1.06	0.19	-1.15
962	0.35	0.99	1.01	0.79	1.17	0.30
963	-0.40	0.44	-0.11	-0.33	-0.18	-0.01
970	-----	-----	-----	-----	-----	-----
971	0.47	0.93	1.19	0.73	0.88	0.50
974	0.44	0.93	0.91	0.96	0.88	0.50
988	0.47	-0.66	-0.11	0.51	0.55	0.23
994	0.47	-1.57	0.35	0.51	-0.44	1.41
995	0.17	-0.96	0.35	0.23	-0.11	1.01
996	0.17	-0.35	-0.58	-0.05	0.22	0.62
997	-0.28	-1.27	-0.11	-0.05	-0.11	0.62
1006	0.89	-0.11	0.07	-0.67	-0.74	-0.37
1011	-0.69	0.68	0.45	0.12	0.38	-0.29
1017	-----	-----	-----	-----	-----	-----
1026	0.50	0.38	-0.30	0.23	0.55	0.30
1039	0.89	0.74	-0.95	0.40	0.35	1.72
1059	0.35	0.07	0.45	-0.72	-0.27	-0.52
1082	0.89	0.01	0.82	0.17	0.15	0.26
1091	1.58	1.23	0.82	0.51	1.21	-0.33
1105	0.11	0.13	0.35	0.06	0.12	-0.05
1121	-1.26	-0.23	-1.61	-0.61	-0.74	-0.33
1126	0.95	1.11	-0.58	-1.12	-0.64	0.34
1146	0.11	0.50	-0.11	0.28	0.28	0.46
1186	-----	-----	-----	-----	-----	-----
1191	-----	-----	-----	-----	-----	-----
1199	-----	-----	-----	-----	-----	-----
1205	0.62	0.68	0.54	-0.22	-0.27	0.58
1227	0.47	0.26	-1.23	-1.12	-0.87	-0.41
1299	-1.77	-1.57	-1.42	-0.44	0.05	-0.05
1318	-0.49	-0.42	-0.77	-0.61	-0.47	1.21
1356	-----	-----	-----	-----	-----	-----
1357	-----	-----	-----	-----	-0.24	-----
1399	-1.35	-1.15	-0.58	0.84	1.21	0.34
1417	0.56	2.82	1.75	0.84	1.34	0.19
1429	-----	-----	-----	-----	-----	-----
1430	-1.17	-1.70	-4.50	-3.86	-2.97	-2.34
1498	-0.19	-0.05	0.07	0.06	0.15	-0.13
1575	-----	-----	-----	-----	-----	-----
1588	-----	-----	-----	-----	-----	-----
1629	-----	-----	-----	-----	-----	-----
1650	-1.62	-0.84	-1.14	-0.89	-0.67	-0.13
1709	0.11	1.60	0.91	-0.28	-0.34	-0.64
1720	-----	-----	-----	-----	-----	-----
1740	-0.37	-0.90	-0.30	0.12	0.25	0.11
1741	-0.31	0.19	-0.58	-0.28	-0.37	-0.13
1776	-1.05	-0.54	-2.26	-1.85	-1.46	-2.10
1807	-0.46	-1.82	-1.05	-0.78	-0.90	-0.29
1810	0.71	1.11	0.82	-0.05	-0.27	0.19
1811	0.02	0.87	-0.21	-0.61	-0.70	-0.44

lab	IBP	10% rec	50% rec	90% rec	95% rec	FBP
1854	-0.43	-0.35	0.07	-0.28	-0.21	0.11
1906	-----	-----	-----	-----	-----	-----
1941	-0.31	0.62	-1.14	-0.61	-0.27	-0.17
1944	-0.01	-0.11	-0.77	-0.39	-0.24	-0.05
1995	0.20	-0.05	-0.86	-1.06	-0.77	0.19
6018	-0.01	-0.84	-0.30	-0.16	0.09	-0.09
6035	0.95	0.07	0.26	0.40	0.58	-0.64
6049	-0.87	-0.72	-0.11	-0.11	0.28	-0.21
6068	-0.81	0.13	-0.21	-0.50	-0.14	-0.96
6142	-0.90	-0.78	-1.79	-1.34	-0.87	-1.15
6172	-0.63	-0.54	0.17	1.01	1.11	-0.41
6266	-0.99	0.44	0.26	-0.61	-0.41	-0.92
6284	1.07	2.70	0.35	-1.17	0.22	-1.35
6302	-----	-----	-----	-----	-----	-----
6317	-----	-----	-----	-----	-----	-----
6319	0.32	-1.57	0.82	0.79	-0.11	1.41
6332	0.98	0.26	1.01	1.24	1.11	0.90
6346	-----	-----	-----	-----	-----	-----
6364	-0.96	0.13	0.17	-0.56	-0.70	-0.48
6373	-----	-----	-----	-----	-----	-----
6384	-0.93	-0.17	0.63	0.45	0.48	0.34
6406	0.62	0.87	0.82	0.12	-0.04	0.34
6416	-0.19	-0.54	0.82	1.52	1.93	0.38
6443	0.11	-2.19	-0.42	0.49	-0.03	1.61
6447	-----	-----	-----	-----	-----	-----
6469	-0.16	-0.42	0.26	0.12	0.78	0.15
6479	-----	-----	-----	-----	-----	-----
6496	0.14	0.99	-0.86	-0.89	0.12	-0.56
6499	0.02	-0.11	1.10	1.07	0.74	-1.86
6540	1.07	0.26	1.29	1.07	-----	1.01
6546	-----	-----	-----	-----	-----	-----

Determination of Distillation at 760 mmHg on sample #23170; results in %V/V

lab	method	Vol. 250 °C	mark	z(targ)	Vol. 350 °C	mark	z(targ)	% residue	
52	D86-automated	34.0	C	1.50	96.1	C	0.48	1.3	C
53		-----		-----	-----		-----	-----	
62	D86-automated	-----		-----	-----		-----	1.4	
90	D86-manual	34.0		1.50	95.5		-0.15	1.4	
92	D86-automated	32.4		-0.18	95.9		0.27	1.8	
120		-----		-----	-----		-----	-----	
140	D86-automated	31.7		-0.92	95.2		-0.47	1.4	C
150	D86-automated	-----		-----	-----		-----	1.4	
158		-----		-----	-----		-----	-----	
159		-----		-----	-----		-----	-----	
169		-----		-----	-----		-----	-----	
171	D86-automated	32.3		-0.29	95.7		0.06	1.4	
194		-----		-----	-----		-----	-----	
203		-----		-----	-----		-----	-----	
212	ISO3405-automated	32.7		0.13	95.2		-0.47	1.7	
215		-----		-----	-----		-----	-----	
217	D86-automated	32.7		0.13	96.0		0.37	1.4	
221	D86-automated	32.8		0.24	95.6		-0.05	1.4	
224	D86-manual	34.5		2.03	96.0		0.37	1.5	
225		-----		-----	-----		-----	-----	
228	D86-manual	34.0		1.50	96.5	C	0.90	0.5	
231	D86-manual	33.5	C	0.97	96.5		0.90	1.8	
235	D86-automated	32.0		-0.60	96.8		1.22	1.4	
237		32.0		-0.60	96.0		0.37	1.0	
238	D86-manual	33		0.45	96		0.37	1.5	
253	D86-manual	32.0		-0.60	95.0		-0.68	1.2	
254		-----		-----	-----		-----	-----	
256	D86-manual	33.0		0.45	95.0		-0.68	-----	
258	D86-automated	32.6		0.03	96.0		0.37	1.4	
273		-----		-----	-----		-----	-----	
300	D86-automated	33.9		1.40	96.6	C	1.01	1.6	
312	D86-automated	33.1		0.55	96.3		0.69	1.8	
317	D86-automated	31.8		-0.81	95.1		-0.57	1.5	
323	D86-automated	33.3		0.76	95.6		-0.05	1.4	
328	D86-automated	33.2		0.66	96.0		0.37	1.6	
333		-----		-----	-----		-----	-----	
334	D86	32.2		-0.39	95.6		-0.05	1.4	
335	D86-automated	32.8		0.24	94.9		-0.78	1.2	
337	D86-automated	33.5		0.97	94.9		-0.78	2	
339		-----		-----	-----		-----	-----	
342	D86-automated	32.3		-0.29	95.2		-0.47	-----	
344	D86-automated	32.3		-0.29	95.7		0.06	0.5	
349		32.5		-0.08	96.0		0.37	-----	
355	D86-manual	31.3		-1.34	94.5		-1.20	1.74	
356	D86-manual	35.0		2.55	95.0		-0.68	1.8	
365	D86-automated	32.7		0.13	95.7		0.06	1.7	
381	D86-automated	33.7		1.19	96.5	C	0.90	1.3	
433		-----		-----	-----		-----	-----	
480	D86-automated	30.95		-1.71	95.65		0.01	1.4	
494	D86-automated	31.46		-1.17	95.22		-0.45	1.9	
498		-----		-----	-----		-----	-----	
507	D86-manual	-----		-----	-----		-----	1.0	
511		-----		-----	-----		-----	-----	
551	D86-automated	32.2		-0.39	91.0	R(0.01)	-4.89	1.2	
554	D86-manual	32.0		-0.60	91.0	R(0.01)	-4.89	1.2	
555	D86-manual	32.0		-0.60	91.0	R(0.01)	-4.89	1.3	
558	D86-manual	32.0		-0.60	91.0	R(0.01)	-4.89	1.2	
562		-----		-----	-----		-----	-----	
575		-----		-----	-----		-----	-----	
603	D86-automated	32.2		-0.39	95.9		0.27	0.9	
604	D86-automated	32.0		-0.60	95.5		-0.15	1.4	
608		-----		-----	-----		-----	-----	
614		-----		-----	-----		-----	-----	
621	D86-manual	33		0.45	95.5		-0.15	1	
631	D86-manual	32.0		-0.60	95.5		-0.15	1.6	
633	D86-automated	-----		-----	-----		-----	1.6	
634	D86-automated	-----		-----	-----		-----	1.1	
657	D86-automated	31.7		-0.92	95.7		0.06	1.2	
704	D86-manual	31.5		-1.13	96.5		0.90	2.0	
710	D86-manual	33.5		0.97	96.0		0.37	1.0	

lab	method	Vol. 250 °C	mark	z(targ)	Vol. 350 °C	mark	z(targ)	% residue
736	D86-manual	33.0		0.45	96.0		0.37	1.0
750		-----		-----	-----		-----	-----
779	D86-manual	30.5		-2.18	94.5		-1.20	1.7
785	D86-manual	32		-0.60	96.0		0.37	1.0
825	D86-automated	31.5		-1.13	95.6		-0.05	1.4
845	D86-automated	33.0		0.45	95.6		-0.05	1.4
846		-----		-----	-----		-----	-----
851	D86-automated	32.0		-0.60	96.0		0.37	1.4
854	D86-automated	32.6		0.03	96.0		0.37	1.4
856	D86-automated	32.76		0.20	96.11		0.49	1.4
861	D86-automated	32.4		-0.18	95.2		-0.47	1.4
862	D86-manual	33.4		0.87	96.3		0.69	1.4
864	D86-automated	33.0		0.45	95.8		0.16	1.5
872	86	32.5		-0.08	95.5		-0.15	1.4
873	D86-manual	34.0		1.50	95.5		-0.15	1.1
874	D86-manual	33.0		0.45	95.5		-0.15	1.4
875	D86-automated	32.2		-0.39	95.2		-0.47	1.2
886		-----		-----	-----		-----	-----
887	D86-automated	31.15		-1.50	95.10		-0.57	1.2
912	D86	30.0		-2.71	94.0		-1.73	1.5
914	D86	33.0		0.45	96.0		0.37	1.4
922	D86-automated	32.5		-0.08	95.5		-0.15	1.4
962	D86-automated	32.3		-0.29	94.9		-0.78	1.4
963	D86-automated	32.3		-0.29	95.7		0.06	1.0
970		-----		-----	-----		-----	-----
971	D86-automated	31.5		-1.13	94.8		-0.89	1.0
974	D86-automated	31.2		-1.45	95.0		-0.68	1.3
988	D86	32.0		-0.60	95.5		-0.15	1.0
994	D86-manual	34.2		1.71	96.5		0.90	0.8
995	D86-manual	33.5		0.97	96.0		0.37	1.0
996	D86-manual	33.5		0.97	95.5		-0.15	1.0
997	D86-manual	34.0		1.50	95.5		-0.15	1.2
1006	D86-automated	32.4		-0.18	96.2		0.58	1.4
1011	D86-automated	32.0		-0.60	95.4		-0.26	1.5
1017		-----		-----	-----		-----	-----
1026	ISO3405-automated	32.2		-0.39	95.2		-0.47	1.9
1039	D2887-automated	33.1		0.55	95.6		-0.05	-----
1059	D86-automated	32.1		-0.50	95.8		0.16	1.4
1082	ISO3405-automated	31.5		-1.13	95.6		-0.05	-----
1091	D86-automated	31.9		-0.71	94.8		-0.89	1.7
1105	D86-automated	32.3		-0.29	95.4		-0.26	1.8
1121	D86-automated	33.6		1.08	96.2		0.58	1.9
1126		32.8		0.24	96.0		0.37	1.6
1146	ISO3405-automated	33		0.45	95		-0.68	0.9
1186		-----		-----	-----		-----	-----
1191		-----		-----	-----		-----	-----
1199		-----		-----	-----		-----	-----
1205	D86-automated	31.9		-0.71	95.9		0.27	1.4
1227	D86-automated	33.7		1.19	96.3		0.69	0.9
1299	D86-automated	33.7		1.19	95.5		-0.15	1.4
1318	D86-automated	33.0		0.45	95.8		0.16	1.1
1356		-----		-----	-----		-----	-----
1357	D86-automated	32.2		-0.39	95.7		0.06	-----
1399	D86-automated	33.0		0.45	94.8		-0.89	1.0
1417	D86-automated	30.9		-1.76	94.7		-0.99	1.4
1429		-----		-----	-----		-----	-----
1430		-----		-----	-----		-----	-----
1498		33		0.45	96		0.37	1.4
1575		-----		-----	-----		-----	-----
1588		-----		-----	-----		-----	-----
1629		-----		-----	-----		-----	-----
1650	D86-automated	33.0		0.45	96.0		0.37	1.1
1709		31.5		-1.13	95.9		0.27	1.4
1720		-----		-----	-----		-----	-----
1740	D86-automated	33.0		0.45	95.4		-0.26	1.1
1741	ISO3405-automated	32.6		0.03	95.7		0.06	1.0
1776	ISO3405-automated	33.9		1.40	97.3		1.74	-----
1807	D86-automated	33.5		0.97	96.2		0.58	1.4
1810	D86-automated	32.1		-0.50	95.9		0.27	1.4
1811	D86-automated	32.4		-0.18	96.2		0.58	1.4

lab	method	Vol. 250 °C	mark	z(targ)	Vol. 350 °C	mark	z(targ)	% residue
1854	ISO3405-automated	32.5		-0.08	96.0		0.37	-----
1906		-----		-----	-----		-----	-----
1941		32.9		0.34	96.0		0.37	1.1
1944	D86-automated	32.9		0.34	95.7		0.06	1.4
1995	D86-automated	32.91		0.35	96.09		0.47	1.3
6018	ISO3405-automated	32.6		0.03	95.5		-0.15	1.3
6035	ISO3405-automated	32.2		-0.39	95.0		-0.68	1.4
6049	D86-automated	32.5		-0.08	95.4		-0.26	1.4
6068	ISO3405-automated	32.3		-0.29	95.8		0.16	1.4
6142	ISO3405-automated	33.8		1.29	96.3		0.69	1.4
6172	D86-automated	30.7		-1.97	96.2		0.58	1.2
6266		32.2		-0.39	95.8		0.16	1.4
6284		33		0.45	95		-0.68	1.4
6302		-----		-----	-----		-----	-----
6317		-----		-----	-----		-----	-----
6319	D86-manual	34.0		1.50	96.0		0.37	1.0
6332		32.7		0.13	95.0		-0.68	1.6
6346		-----		-----	-----		-----	-----
6364	D86-automated	32.3		-0.29	96.1		0.48	1.8
6373		-----		-----	-----		-----	-----
6384	D86-automated	32.18		-0.41	95.21		-0.46	1.4
6406	D86-automated	31.8		-0.81	95.7		0.06	1.4
6416	D86-automated	32.8		0.24	94.1		-1.63	1.4
6443	D86-manual	32.5		-0.08	96.0		0.37	1.5
6447		-----		-----	-----		-----	-----
6469	D86-automated	32.6		0.03	95.5		-0.15	1.4
6479		-----		-----	-----		-----	-----
6496	D86-automated	32.6		0.03	95.7		0.06	1.4
6499	D86-automated	32.0		-0.60	95.2		-0.47	4.0
6540	D86-manual	32		-0.60	95		-0.68	-----
6546		-----		-----	-----		-----	-----

	normality	OK		OK
	n	123		119
	outliers	0		4
	mean (n)	32.57		95.64
	st.dev. (n)	0.850		0.544
	R(calc.)	2.38		1.52
	st.dev.(D86-A:23)	0.950		0.950
	R(D86-A:23)	2.66		2.66
Compare:				
	R(D86-M:23)	2.59		2.48

Lab 52 first reported 33.6, 95.7 and 1.4 for Vol. 250 °C, Vol. 350 °C and % residue respectively
Lab 140 first reported 98.1 for % residue
Lab 228 first reported 98.0 for Vol. 350 °C
Lab 231 first reported 38.0 for Vol. 250 °C
Lab 300 first reported 97.6 for Vol. 350 °C
Lab 381 first reported 97.5 for Vol. 350 °C
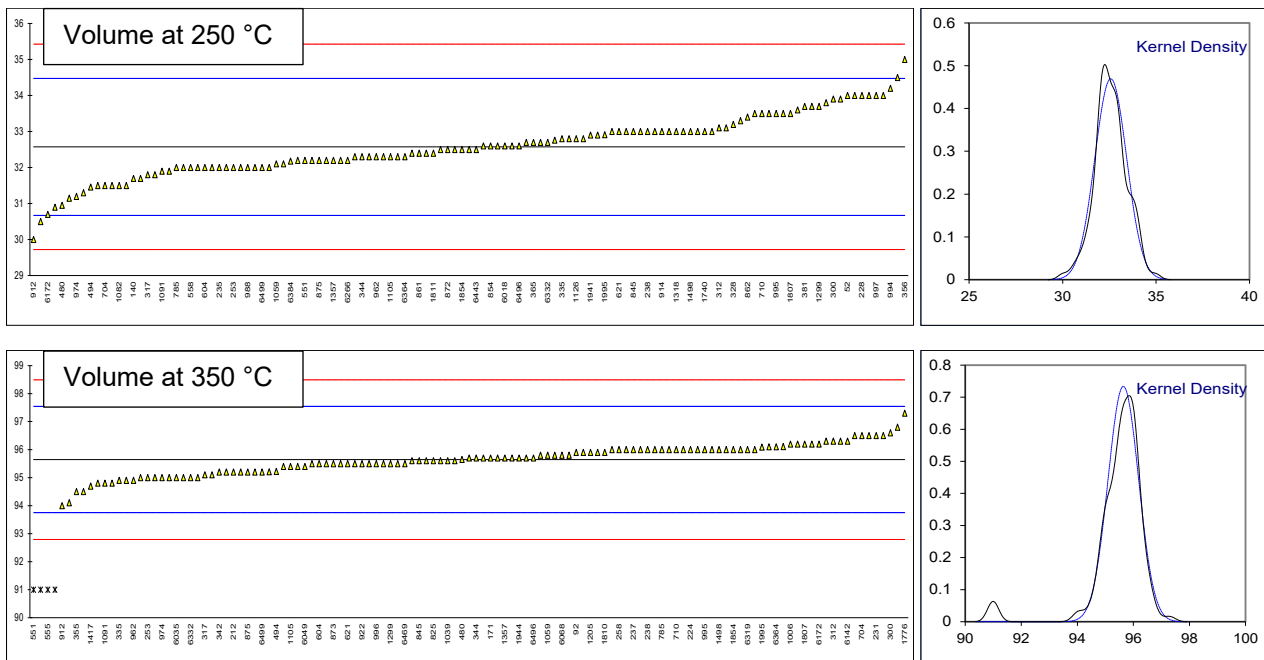
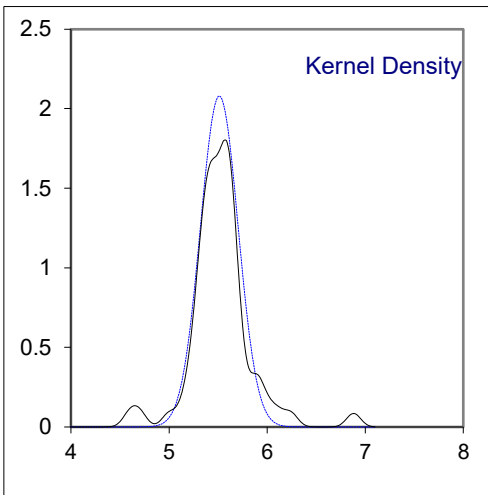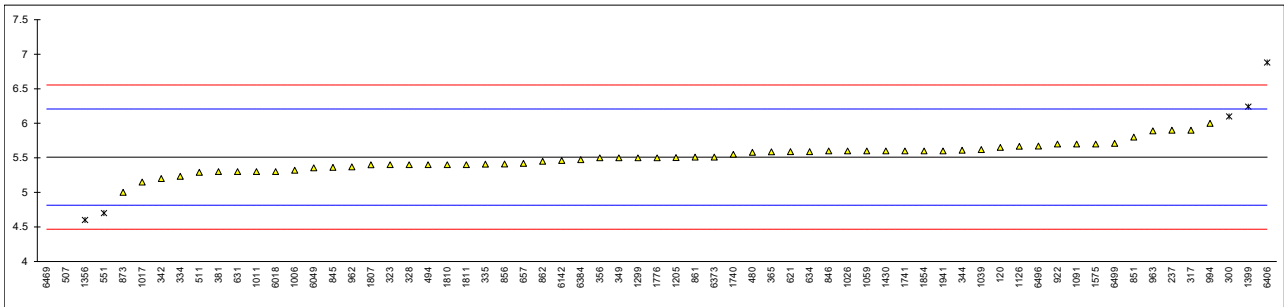## Determination of FAME content on sample #23170; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	736		-----		-----
53		-----		-----	750		-----		-----
62		-----		-----	779		-----		-----
90		-----		-----	785		-----		-----
92		-----		-----	825		-----		-----
120	D7371	5.65		0.40	845	D7371	5.362		-0.43
140		-----		-----	846	G/T23801	5.6		0.26
150		-----		-----	851	EN14078-B	5.8		0.83
158		-----		-----	854		-----		-----
159		-----		-----	856	EN14078	5.41		-0.29
169		-----		-----	861	D7371	5.51		0.00
171		-----		-----	862	D7371	5.45		-0.18
194		-----		-----	864		-----		-----
203		-----		-----	872		-----		-----
212		-----		-----	873	EN14078	5.00		-1.47
215		-----		-----	874		-----		-----
217		-----		-----	875		-----		-----
221		-----		-----	886		-----		-----
224		-----		-----	887		-----		-----
225		-----		-----	912		-----		-----
228		-----		-----	914		-----		-----
231		-----		-----	922	EN14078-B	5.7		0.54
235		-----		-----	962	EN14078-A	5.37		-0.41
237	D7371	5.90		1.12	963	D7371	5.89		1.09
238		-----		-----	970		-----		-----
253		-----		-----	971		-----		-----
254		-----		-----	974		-----		-----
256		-----		-----	988		-----		-----
258		-----		-----	994	EN14078-A	6.0		1.41
273		-----		-----	995		-----		-----
300	EN14078-A	6.1	R(0.01)	1.69	996		-----		-----
312		-----		-----	997		-----		-----
317	EN14078-A	5.9		1.12	1006	EN14078-A	5.32		-0.55
323	EN14078-B	5.4		-0.32	1011	EN14078	5.3		-0.61
328	EN14078-B	5.4		-0.32	1017	EN14078-A	5.1475		-1.05
333		-----		-----	1026	EN14078-A	5.6		0.26
334	EN14078-A	5.23225		-0.80	1039	EN14078-A	5.62		0.31
335	EN14078-B	5.408		-0.30	1059	EN14078-B	5.6		0.26
337		-----		-----	1082		-----		-----
339		-----		-----	1091	EN14078-A	5.70		0.54
342	D7371	5.2		-0.89	1105		-----		-----
344	EN14078-A	5.61		0.28	1121		-----		-----
349	EN14078-A	5.5		-0.03	1126	EN14078-A	5.667		0.45
355		-----		-----	1146		-----		-----
356	EN14078-A	5.5		-0.03	1186		-----		-----
365	EN14078-A	5.588		0.22	1191		-----		-----
381	EN14078-A	5.3		-0.61	1199		-----		-----
433		-----		-----	1205	EN14078-A	5.5033	C	-0.02
480	EN14078-A	5.58		0.20	1227		-----		-----
494	D7371	5.4		-0.32	1299	EN14078-B	5.5		-0.03
498		-----		-----	1318		-----		-----
507	D7371	1.30	C,R(0.01)	-12.11	1356	EN14078	4.60	R(0.01)	-2.62
511	D7371	5.29		-0.64	1357		-----		-----
551	EN14078	4.70	R(0.01)	-2.33	1399	EN14078	6.24	R(0.01)	2.10
554		-----		-----	1417		-----		-----
555		-----		-----	1429		-----		-----
558		-----		-----	1430	EN14078-A	5.6		0.26
562		-----		-----	1498		-----		-----
575		-----		-----	1575	In house	5.7		0.54
603		-----		-----	1588		-----		-----
604		-----		-----	1629		-----		-----
608		-----		-----	1650		-----		-----
614		-----		-----	1709		-----		-----
621	EN14078-A	5.59		0.23	1720		-----		-----
631	D7371	5.30		-0.61	1740	EN14078-A	5.55		0.11
633		-----		-----	1741	EN14078-A	5.60		0.26
634	EN14078-A	5.59		0.23	1776	EN14078-A	5.5		-0.03
657	EN14078-A	5.42		-0.26	1807	EN14078-A	5.39875		-0.32
704		-----		-----	1810	EN14078-A	5.4		-0.32
710		-----		-----	1811	D7371	5.4		-0.32

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854	EN14078-A	5.60		0.26	6332		-----		-----
1906		-----		-----	6346		-----		-----
1941	EN14078-A	5.6		0.26	6364		-----		-----
1944		-----		-----	6373		5.51		0.00
1995		-----		-----	6384	EN14078-A	5.474		-0.11
6018	EN14078-A	5.3		-0.61	6406	EN14078-B	6.88	R(0.01)	3.94
6035		-----		-----	6416		-----		-----
6049	EN14078-A	5.355		-0.45	6443		-----		-----
6068		-----		-----	6447		-----		-----
6142	EN14078-A	5.4613		-0.14	6469	D7371	0.3	R(0.01)	-14.98
6172		-----		-----	6479		-----		-----
6266		-----		-----	6496	EN14078-A	5.67		0.46
6284		-----		-----	6499	EN14078-A	5.71		0.57
6302		-----		-----	6540		-----		-----
6317		-----		-----	6546		-----		-----
6319		-----		-----					

normality	OK	
n	58	
outliers	7	
mean (n)	5.511	
st.dev. (n)	0.1917	
R(calc.)	0.537	
st.dev.(D7371:14R22)	0.3478	
R(D7371:14R22)	0.974	Range 1-20 %V/V
Compare		
R(EN14078-A:14)	0.298	Range 0.05-3 %V/V
R(EN14078-B:14)	0.396	Range 3-20 %V/V

Lab 507 first reported 2.482
Lab 1205 first reported 6.2120

Kernel Density

Determination of Flash Point PMcc on sample #23170; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D93-A	63.0		-0.48	736	D93-A	63.0		-0.48
53	D93-A	62.5		-0.79	750		-----		-----
62	D93-A	64.0		0.14	779	D93	63.5		-0.17
90	D93-A	60.9		-1.78	785	D93-A	63.5		-0.17
92	D93-A	63.0		-0.48	825		-----		-----
120		-----		-----	845	D93-A	64.0		0.14
140	D93-A	64.0		0.14	846	GB/T261	63.0		-0.48
150	D93-A	63.0		-0.48	851	D93-A	63.0	C	-0.48
158	D93-A	64.0		0.14	854	D93-A	62.0		-1.10
159		-----		-----	856	D93-A	64.0		0.14
169		-----		-----	861	D93-A	63.5		-0.17
171	D93-A	63.5		-0.17	862	D93-A	64.0		0.14
194		-----		-----	864	D93-A	65.0		0.76
203	D93-A	63.5		-0.17	872	D93-A	63.0		-0.48
212	ISO2719-A	63.8		0.02	873	D93-A	63.0		-0.48
215	D93-A	63.67		-0.06	874	D93-A	63.0		-0.48
217	D93-A	64.0		0.14	875	D93-A	63.5		-0.17
221		-----		-----	886		-----		-----
224	D93-A	64.5		0.45	887	D93-A	63.5		-0.17
225	D93-A	62.0		-1.10	912	D93	62.0		-1.10
228	D93-A	65.0		0.76	914	D93	64.0		0.14
231	D93-A	62.0		-1.10	922	D93-A	64.0		0.14
235	D93-A	62.0		-1.10	962	D93-A	64.0		0.14
237	D93-A	65.0		0.76	963	D93-A	63.0		-0.48
238	D93	64		0.14	970		-----		-----
253	D93-A	63.5		-0.17	971	D93-A	63.0		-0.48
254	D93-A	64.0		0.14	974	D93-A	63.0		-0.48
256	D93-A	65.0		0.76	988	D93	64.0		0.14
258	D93-A	64.0		0.14	994	D93-A	63.0		-0.48
273		-----		-----	995	D93-A	63.0		-0.48
300	D93-A	64.0		0.14	996	D93-A	62.0		-1.10
312	D93-A	64.5		0.45	997	D93-A	64.0		0.14
317	D93-A	64.5		0.45	1006		-----		-----
323	D93-A	63.0		-0.48	1011	ISO2917-A	64.0		0.14
328	D93-A	65.0		0.76	1017	D93-A	65.0		0.76
333	D93	64.0		0.14	1026	D93-A	65.0		0.76
334	D93-A	64.0		0.14	1039	ISO2719-A	64.0		0.14
335	ISO2719-A	63.5		-0.17	1059	ISO2719-A	63.5		-0.17
337		-----		-----	1082	ISO2719-A	63.0		-0.48
339	D93-A	64.4		0.39	1091	D93-A	65.0		0.76
342	D93-A	64.2		0.27	1105	D93-A	63.0		-0.48
344	D93-A	65		0.76	1121	D93-A	61.98		-1.11
349	D93-A	64		0.14	1126	D93-A	62.0		-1.10
355	D93-A	63.5		-0.17	1146	D93-A	65.2		0.88
356	D93-A	64.0		0.14	1186		-----		-----
365	IP34-A	64.0		0.14	1191	ISO2719-A	63.5		-0.17
381	ISO2719-A	63		-0.48	1199		-----		-----
433	ISO2719-A	64.0		0.14	1205	D93-A	65.0		0.76
480	D93-A	64.0		0.14	1227	D93-A	66.9		1.94
494	D93-A	70.0	R(0.01)	3.85	1299	D93-A	64.5		0.45
498	ISO2719-B	62.35		-0.88	1318	D93-A	63.0		-0.48
507	D93-A	62.5		-0.79	1356	ISO2719	68	R(0.05)	2.62
511	D93-A	64.5		0.45	1357	D93-A	64		0.14
551	D93-A	65.0		0.76	1399	D93-A	65		0.76
554	D93-A	66.0		1.38	1417	D93-A	62		-1.10
555	D93-A	66.0		1.38	1429	D93-A	62.0		-1.10
558	D93-A	66.0		1.38	1430	D93-A	64		0.14
562		-----		-----	1498	D93-A	64.5		0.45
575	D93-A	64.0		0.14	1575	D93-A	62.3		-0.91
603	D93-A	64		0.14	1588		-----		-----
604	D93-A	65.0		0.76	1629	D93	63.2		-0.35
608	D93-A	60.0		-2.33	1650	D93-A	63.7		-0.04
614	D93-A	63		-0.48	1709		-----		-----
621	D93-A	60.5	C	-2.02	1720		-----		-----
631	D93-A	64.0		0.14	1740	D93-A	65.5		1.07
633	D93-A	64.0		0.14	1741	ISO2719-A	64.0		0.14
634	D93-A	65.0		0.76	1776	ISO2719-A	64.0		0.14
657	D93-A	65.0		0.76	1807	D93-A	65.5		1.07
704	ISO2719-A	64.0		0.14	1810	D93-A	62.5		-0.79
710	D93-A	64.0		0.14	1811	D93-A	63.4		-0.23

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854	D93-A	65		0.76	6332	D93-A	62.0		-1.10
1906		-----		-----	6346		-----		-----
1941	ISO2719-A	63.5		-0.17	6364	D93-A	66.0		1.38
1944	D93-A	63.5		-0.17	6373	D93-A	65.0		0.76
1995	D93-A	65		0.76	6384	D93-A	63.5		-0.17
6018	ISO2719-A	63.0		-0.48	6406		-----		-----
6035	ISO2719-A	63.5		-0.17	6416	D93-A	63.5		-0.17
6049	D93-A	67.0		2.00	6443	D93-A	65.95		1.35
6068	ISO2719-A	65.0		0.76	6447		-----		-----
6142	ISO2719-A	63		-0.48	6469	D93-A	62.5		-0.79
6172	D93-A	63		-0.48	6479		-----		-----
6266	D93-A	65.5		1.07	6496	ISO2719-A	63.5		-0.17
6284		-----		-----	6499	D93-A	64.5		0.45
6302		-----		-----	6540	D93-A	64.0		0.14
6317		-----		-----	6546		-----		-----
6319	D93-A	63.0		-0.48					

normality	OK
n	142
outliers	2
mean (n)	63.771
st.dev. (n)	1.1460
R(calc.)	3.209
st.dev.(D93-A:20)	1.6170
R(D93-A:20)	4.528

Lab 621 first reported 69.5
Lab 851 first reported 69.0

Kernel Density
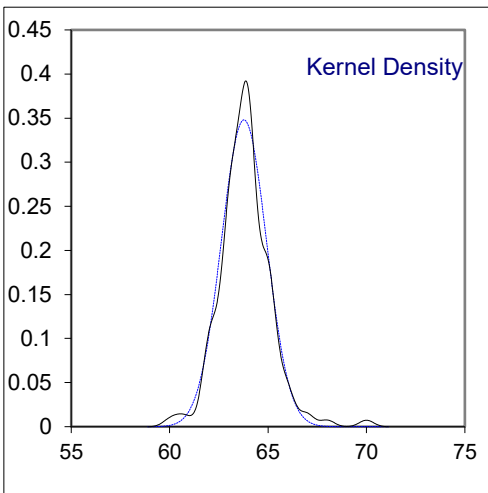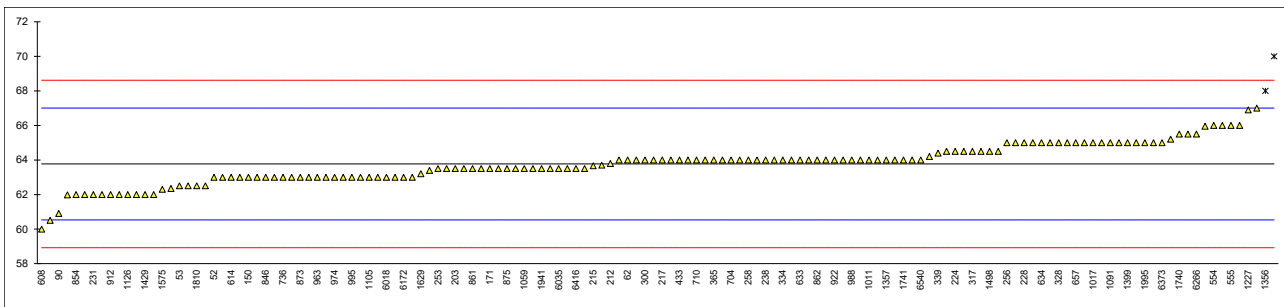
Determination of Kinematic Viscosity at 40 °C, on sample #23170; results in mm^2/s

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D445	2.796		-0.31	736	D445	2.790		-0.85
53		-----		-----	750		-----		-----
62	D445	2.799		-0.04	779	D445	2.801		0.14
90	D445	2.8158		1.47	785	D445	2.811		1.04
92	D445	2.8071		0.68	825	D445	2.794		-0.49
120	D445	2.790		-0.85	845	D445	2.79557		-0.35
140	D445	2.80125		0.16	846	GB/T265	2.806		0.59
150	D445	2.798		-0.13	851	D445	2.79192		-0.68
158		-----		-----	854	D445	2.8006		0.10
159		-----		-----	856	D445	2.788		-1.03
169		-----		-----	861	D445	2.797		-0.22
171	D445	2.798		-0.13	862	D445	2.800		0.05
194		-----		-----	864	ISO3104	2.797		-0.22
203	D445	2.7989		-0.05	872	D445	2.802		0.23
212	ISO3104	2.7995		0.00	873	D445	2.791		-0.76
215		-----		-----	874	D445	2.793		-0.58
217	D445	2.7941		-0.48	875	D445	2.793		-0.58
221	D445	2.802		0.23	886		-----		-----
224		-----		-----	887	D445	2.811		1.04
225	D445	2.806		0.59	912	D445	2.7327	R(0.01)	-6.00
228	D445	2.82		1.84	914	D445	2.799		-0.04
231	D445	2.822		2.02	922	D445	2.800		0.05
235	D445	2.792		-0.67	962	D445	2.815		1.39
237	D445	2.804		0.41	963	D445	2.806		0.59
238		-----		-----	970		-----		-----
253	D445	2.7961		-0.30	971	D445	2.801		0.14
254	D445	2.815	C	1.39	974	D445	2.799		-0.04
256	D445	2.825		2.29	988	D445	2.819		1.75
258	D445	2.829		2.65	994	D445	2.787		-1.12
273		-----		-----	995	D445	2.797		-0.22
300	D445	2.791		-0.76	996	D445	2.7816		-1.61
312		-----		-----	997	D445	2.800		0.05
317	D445	2.790		-0.85	1006	D445	2.815		1.39
323	D445	2.793		-0.58	1011	ISO3104	2.800		0.05
328	D445	2.796		-0.31	1017		-----		-----
333	D445	2.793		-0.58	1026	ISO3104	2.794		-0.49
334	D445	2.798		-0.13	1039	ISO3104	2.7911		-0.75
335	D445	2.813		1.22	1059	ISO3104	2.794		-0.49
337	D445	2.816		1.48	1082	ISO3104	2.7924		-0.64
339		-----		-----	1091	ISO3104	2.808		0.77
342	D445	2.8030		0.32	1105	D445	2.8013		0.16
344		-----		-----	1121	D445	2.8263		2.41
349	D445	2.805		0.50	1126		-----		-----
355	D445	2.797		-0.22	1146	D445	2.7896		-0.89
356	ISO3104	2.793		-0.58	1186		-----		-----
365	IP71	2.7974		-0.19	1191	ISO3104	2.78935		-0.91
381	ISO3104	2.797		-0.22	1199		-----		-----
433		-----		-----	1205	D7042	2.7981		-0.12
480		-----		-----	1227	D445	2.791		-0.76
494	D445	2.792		-0.67	1299		-----		-----
498		-----		-----	1318	D7042	2.7950		-0.40
507	D445	2.796		-0.31	1356	ISO3104	2.789		-0.94
511	D445	2.809		0.86	1357	D445	2.803		0.32
551	D445	2.809		0.86	1399		-----		-----
554		-----		-----	1417	D445	2.803		0.32
555	D445	2.785		-1.30	1429	D445	2.78865		-0.97
558		-----		-----	1430		2.802		0.23
562		-----		-----	1498	D445	2.793		-0.58
575	D445	2.805		0.50	1575		-----		-----
603		-----		-----	1588		-----		-----
604	D445	2.8019		0.22	1629		-----		-----
608	D445	2.751	R(0.01)	-4.36	1650	D445	2.799		-0.04
614	D445	2.791		-0.76	1709		-----		-----
621	D445	2.717	C,R(0.01)	-7.41	1720		-----		-----
631	D445	2.8062		0.60	1740	D445	2.793		-0.58
633	D445	2.792		-0.67	1741	ISO3104	2.800		0.05
634	D445	2.790		-0.85	1776	D7042	2.7846		-1.34
657	D445	2.781		-1.66	1807		-----		-----
704	D445	2.800		0.05	1810	D445	2.8015		0.18
710	D445	2.791		-0.76	1811	D445	2.803		0.32

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854	ISO3104	2.794		-0.49	6332	D445	2.808		0.77
1906		-----		-----	6346		-----		-----
1941	ISO3104	2.810		0.95	6364	D445	2.7463	R(0.01)	-4.78
1944	D445	2.8114		1.07	6373	D445	2.7878		-1.05
1995	D445	2.801		0.14	6384	D445	2.800		0.05
6018		-----		-----	6406	D445	2.773		-2.38
6035	ISO3104	2.792		-0.67	6416		-----		-----
6049	D445	2.796		-0.31	6443	D445	2.7900		-0.85
6068	ISO3104	2.799		-0.04	6447		-----		-----
6142	ISO3104	2.81		0.95	6469	D445	2.803		0.32
6172	D445	2.7958		-0.33	6479		-----		-----
6266	D7042	2.799		-0.04	6496	D445	2.812		1.13
6284	D445	2.795		-0.40	6499		-----		-----
6302		-----		-----	6540	D445	2.813	C	1.22
6317	D7042	2.7941		-0.48	6546		-----		-----
6319		-----		-----					

normality	OK
n	123
outliers	4
mean (n)	2.7995
st.dev. (n)	0.00959
R(calc.)	0.0268
st.dev.(D445:23)	0.01113
R(D445:23)	0.0312

Lab 254 first reported 2.834
Lab 621 first reported 2.771
Lab 6540 first reported 2.833
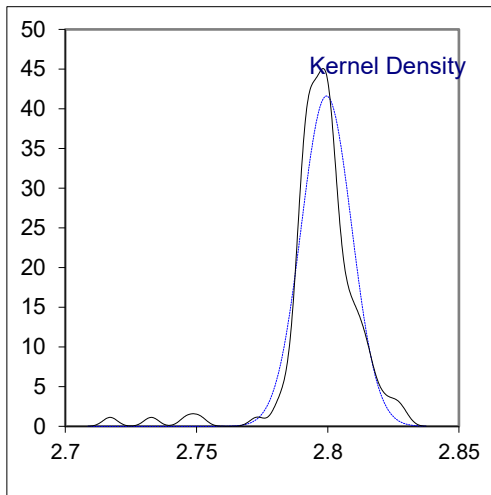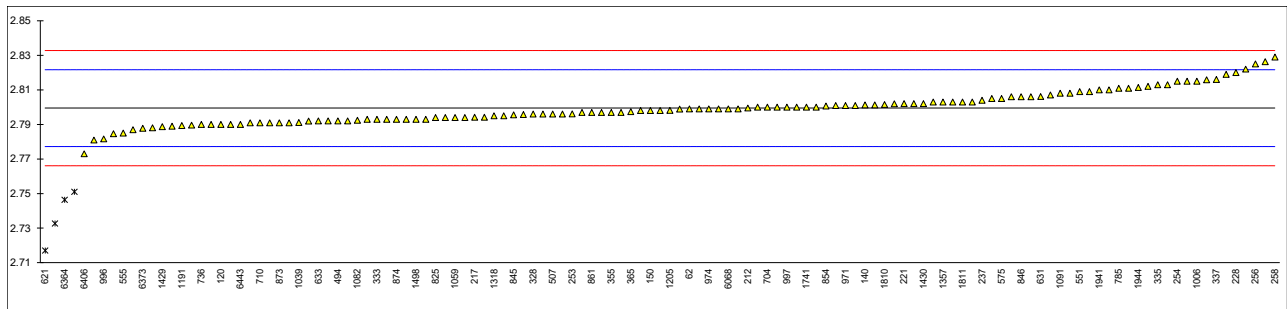
Determination of Lubricity by HFRR at 60 °C, rel. humidity 30-85% on sample #23170; results in µm

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D6079	190		-0.36	736	D6079	202		0.06
53		-----		-----	750		-----		-----
62	D6079	210	C	0.34	779		-----		-----
90		-----		-----	785		-----		-----
92		-----		-----	825		-----		-----
120	D6079	247.0	C	1.64	845	D6079	210		0.34
140	D6079	200		-0.01	846	NB/SH/T0765	200		-0.01
150	D6079	258.5	C,R(0.05)	2.04	851		-----		-----
158	D6079	220		0.69	854	D6079	187.5		-0.44
159		-----		-----	856	D6079	218		0.62
169		-----		-----	861	D6079	200		-0.01
171	D6079	270	R(0.05)	2.44	862	D6079	210		0.34
194		-----		-----	864	ISO12156	224		0.83
203		-----		-----	872		-----		-----
212		-----		-----	873	D6079	190		-0.36
215		-----		-----	874		-----		-----
217		-----		-----	875		-----		-----
221		-----		-----	886		-----		-----
224		-----		-----	887		-----		-----
225		-----		-----	912	D6079	234		1.18
228		-----		-----	914	D6079	195		-0.18
231		-----		-----	922		-----		-----
235		-----		-----	962	D6079	210		0.34
237	D6079	190		-0.36	963	D6079	200		-0.01
238		-----		-----	970		-----		-----
253		-----		-----	971		-----		-----
254		-----		-----	974	D6079	203		0.10
256		-----		-----	988		-----		-----
258		-----		-----	994		-----		-----
273		-----		-----	995	D6079	192	C	-0.29
300	ISO12156-1 (2006)	188		-0.43	996		-----		-----
312		-----		-----	997		-----		-----
317		-----		-----	1006	D6079	180		-0.71
323	ISO12156-1-A	200		-0.01	1011	ISO12156-1	220		0.69
328	D6079	180		-0.71	1017		-----		-----
333		-----		-----	1026	ISO12156-1-A	192		-0.29
334	D6079	178		-0.78	1039	ISO12156-1-A	260	R(0.05)	2.09
335		-----		-----	1059	ISO12156-1-A	190		-0.36
337		-----		-----	1082	ISO12156-1 (2006)	202.0		0.06
339		-----		-----	1091	ISO12156-1-A	190		-0.36
342	D6079	226		0.90	1105	D6079	188		-0.43
344		-----		-----	1121		-----		-----
349		-----		-----	1126		-----		-----
355		-----		-----	1146		-----		-----
356		-----		-----	1186		-----		-----
365		-----		-----	1191		-----		-----
381		-----		-----	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227		-----		-----
494	D6079	209		0.31	1299		-----		-----
498		-----		-----	1318	ISO12156-1-A	199		-0.04
507	D6079	198		-0.08	1356	ISO12156	234		1.18
511		-----		-----	1357	D6079	183		-0.60
551	D6079	187.5		-0.44	1399		-----		-----
554		-----		-----	1417		-----		-----
555		-----		-----	1429		-----		-----
558		-----		-----	1430		-----		-----
562		-----		-----	1498		-----		-----
575		-----		-----	1575		-----		-----
603		-----		-----	1588		-----		-----
604		-----		-----	1629		-----		-----
608		-----		-----	1650	ISO12156-1	221		0.73
614		-----		-----	1709		-----		-----
621		-----		-----	1720		-----		-----
631	D7688	210		0.34	1740	ISO12156-1	190		-0.36
633		-----		-----	1741	ISO12156-1-A	198		-0.08
634		-----		-----	1776	ISO12156-1-A	208		0.27
657	D6079	190		-0.36	1807	ISO12156-1 (2006)	180		-0.71
704	ISO12156-1 (2006)	182		-0.64	1810	ISO12156-1 (2006)	190		-0.36
710		-----		-----	1811	D6079	190		-0.36

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854	ISO12156-1-A	196		-0.15	6332		-----		-----
1906		-----		-----	6346		-----		-----
1941	ISO12156-1-A	202		0.06	6364		-----		-----
1944		-----		-----	6373	ISO12156-1-A	201.5		0.05
1995		-----		-----	6384		-----		-----
6018		-----		-----	6406	D6079	200		-0.01
6035		-----		-----	6416		-----		-----
6049		-----		-----	6443		-----		-----
6068		-----		-----	6447		-----		-----
6142	ISO12156-1-A	200		-0.01	6469	D6079	181		-0.67
6172		-----		-----	6479		-----		-----
6266		-----		-----	6496	D6079	194		-0.22
6284		-----		-----	6499		-----		-----
6302		-----		-----	6540		-----		-----
6317		-----		-----	6546		-----		-----
6319		-----		-----					

				D6079 only:	ISO12156 only:
normality	OK			not OK	not OK
n	56			33	21
outliers	3			2	1
mean (n)	200.2			199.8	200.4
st.dev. (n)	15.00			16.08	14.14
R(calc.)	42.0			45.0	39.6
st.dev.(D6079:22)	28.57			28.57	-----
R(D6079:22)	80			80	-----
Compare					
R(ISO12156-1A:18)	80	(digital camera)		-----	80
R(ISO12156-1B:18)	90	(visual observation)		-----	90
R(ISO12156-1:23)	111.6			-----	111.6

Lab 62 first reported 260
Lab 120 first reported 252.5
Lab 150 first reported 250
Lab 995 first reported 292

Kernel Density
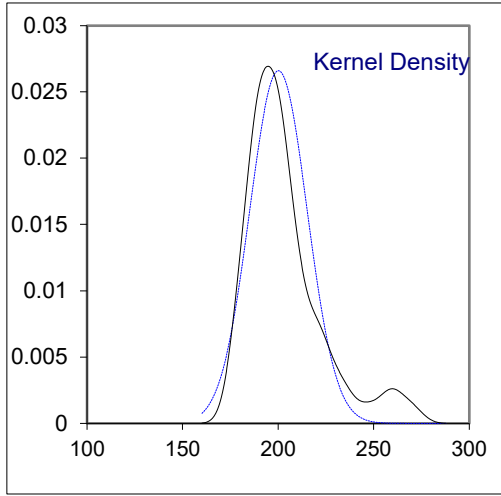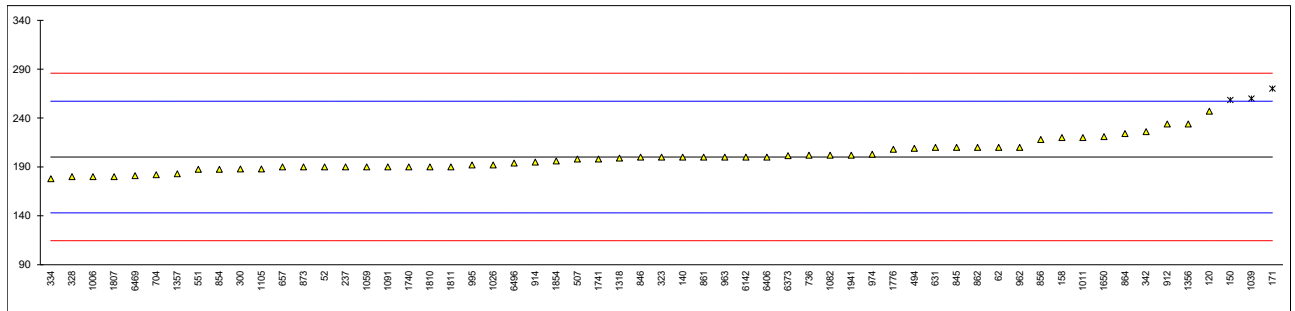
Determination of Nitrogen on sample #23170; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4629	12		0.48	736	D4629	12.14		0.62
53		-----		-----	750		-----		-----
62		-----		-----	779		-----		-----
90		-----		-----	785		-----		-----
92		-----		-----	825	D4629	13		1.47
120		-----		-----	845		-----		-----
140	D4629	14.46		2.90	846		-----		-----
150	D4629	11		-0.50	851		-----		-----
158		-----		-----	854		-----		-----
159		-----		-----	856		-----		-----
169		-----		-----	861	D4629	11.6		0.09
171	D4629	12		0.48	862	D4629	10.4		-1.09
194		-----		-----	864	D4629	10.0		-1.48
203		-----		-----	872		-----		-----
212		-----		-----	873	D4629	10		-1.48
215		-----		-----	874		-----		-----
217		-----		-----	875	D4629	11		-0.50
221		-----		-----	886		-----		-----
224		-----		-----	887		-----		-----
225		-----		-----	912		-----		-----
228		-----		-----	914		-----		-----
231		-----		-----	922	D4629	9.6		-1.88
235		-----		-----	962	D4629	9.6		-1.88
237	D4629	11		-0.50	963	D4629	9.6		-1.88
238		-----		-----	970		-----		-----
253		-----		-----	971	D4629	12		0.48
254		-----		-----	974		-----		-----
256		-----		-----	988		-----		-----
258		-----		-----	994	D4629	11		-0.50
273		-----		-----	995		-----		-----
300		-----		-----	996		-----		-----
312		-----		-----	997		-----		-----
317	D4629	12		0.48	1006		-----		-----
323	D4629	11		-0.50	1011		-----		-----
328	D4629	11		-0.50	1017		-----		-----
333	D4629	11		-0.50	1026	D4629	10.4		-1.09
334	D4629	13.1		1.56	1039	D4629	10.4		-1.09
335		-----		-----	1059	D4629	12		0.48
337		-----		-----	1082		-----		-----
339		-----		-----	1091	D4629	10		-1.48
342		-----		-----	1105	D4629	13.58		2.04
344		-----		-----	1121	D4629	12.7		1.17
349		-----		-----	1126		-----		-----
355		-----		-----	1146		-----		-----
356		-----		-----	1186		-----		-----
365	D4629	11.747		0.23	1191	D4629	9.60		-1.88
381		-----		-----	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227	D4629	13.10		1.56
494	D4629	12.1		0.58	1299		-----		-----
498		-----		-----	1318		-----		-----
507		-----		-----	1356		-----		-----
511		-----		-----	1357		-----		-----
551		-----		-----	1399	D4629	11.865		0.35
554		-----		-----	1417		-----		-----
555		-----		-----	1429		-----		-----
558		-----		-----	1430		-----		-----
562		-----		-----	1498		-----		-----
575		-----		-----	1575	D3228	<150		-----
603		-----		-----	1588		-----		-----
604		-----		-----	1629		-----		-----
608	D4629	12.67		1.14	1650		-----		-----
614		-----		-----	1709		-----		-----
621		-----		-----	1720		-----		-----
631		-----		-----	1740	D4629	12.3		0.78
633		-----		-----	1741		-----		-----
634		-----		-----	1776	D4629	11.43		-0.08
657	D4629	12.8		1.27	1807		-----		-----
704	D4629	11.9		0.38	1810		-----		-----
710		-----		-----	1811		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854	D4629	10.8		-0.70	6332		-----		-----
1906		-----		-----	6346		-----		-----
1941		-----		-----	6364		-----		-----
1944		-----		-----	6373	D4629	12.95		1.42
1995	D5762	10.5		-0.99	6384		-----		-----
6018		-----		-----	6406		-----		-----
6035		-----		-----	6416		-----		-----
6049		-----		-----	6443		-----		-----
6068		-----		-----	6447	D5762	9.9		-1.58
6142	ISO20846	13.44		1.90	6469		-----		-----
6172		-----		-----	6479		-----		-----
6266		-----		-----	6496	D5762	11.73		0.22
6284		-----		-----	6499		-----		-----
6302		-----		-----	6540		-----		-----
6317		-----		-----	6546		-----		-----
6319		-----		-----					

|	
normality	OK
n	44
outliers	0
mean (n)	11.51
st.dev. (n)	1.225
R(calc.)	3.43
st.dev.(D4629:17)	1.017
R(D4629:17)	2.85

Kernel Density
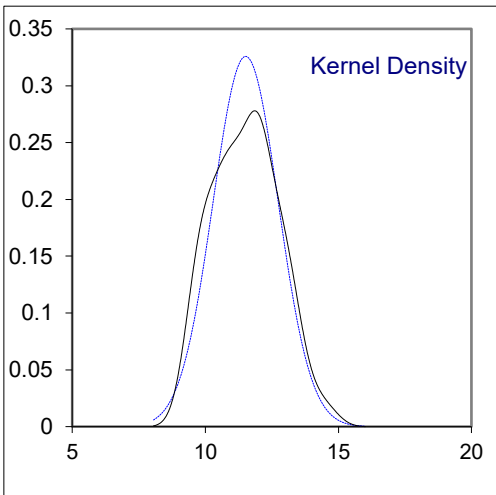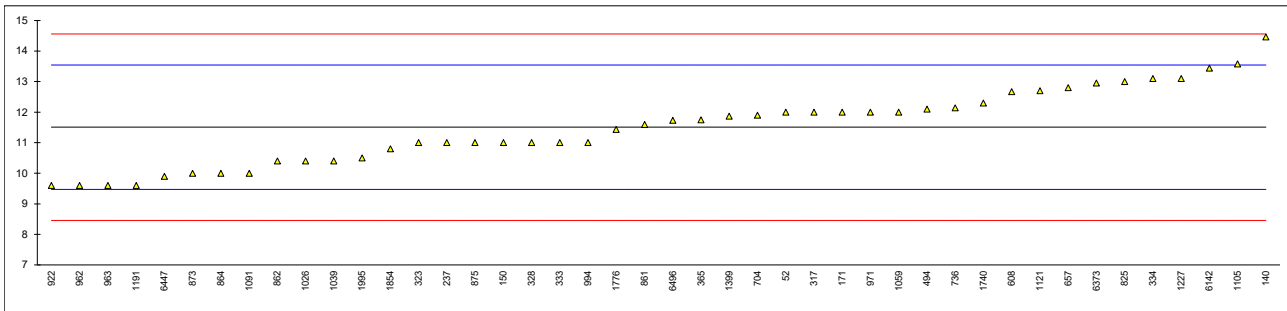
Determination of Pour Point Manual on sample #23170; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D97	-27		1.36	736	D97	-33		-0.50
53		-----		-----	750		-----		-----
62	D97	-30		0.43	779	D97	-33		-0.50
90	D97	-36		-1.44	785	D97	-30		0.43
92	D97	-33		-0.50	825	D97	-33		-0.50
120	D97	-27.0	C	1.36	845	D97	-30		0.43
140	D97	-30		0.43	846	GB/T3535	-29		0.74
150	D97	-30		0.43	851	D97	<-21		-----
158		-----		-----	854	D97	-30		0.43
159		-----		-----	856	D97	-33		-0.50
169		-----		-----	861	D97	-33		-0.50
171	D97	-30		0.43	862	D97	-33		-0.50
194		-----		-----	864	D97	-33		-0.50
203	D97	-35		-1.13	872		-----		-----
212		-----		-----	873	D97	-33		-0.50
215		-----		-----	874	D97	-30		0.43
217	D97	-30		0.43	875	D97	-30		0.43
221	D97	<-21		-----	886		-----		-----
224	D97	-33	C	-0.50	887	D97	---		-----
225	D97	-33		-0.50	912	D97	-33		-0.50
228	D97	<-30		-----	914	D97	-30		0.43
231	D97	<-24		-----	922	D97	-33		-0.50
235	D97	-30.0		0.43	962	D97	-30		0.43
237	D97	<-21		-----	963	D97	-33		-0.50
238	D97	-30		0.43	970		-----		-----
253	D97	-33.0		-0.50	971	D97	-33		-0.50
254		-----		-----	974	D97	-33		-0.50
256	D97	-33.0		-0.50	988	D97	-33		-0.50
258		-----		-----	994	D97	-33		-0.50
273		-----		-----	995	D97	-33		-0.50
300	D97	-30		0.43	996	D97	-30		0.43
312		-----		-----	997	D97	-30		0.43
317		-----		-----	1006	D97	-30		0.43
323		-----		-----	1011		-----		-----
328		-----		-----	1017		-----		-----
333		-----		-----	1026		-----		-----
334		-----		-----	1039	ISO3016	-30		0.43
335		-----		-----	1059	ISO3016	-33		-0.50
337		-----		-----	1082		-----		-----
339		-----		-----	1091		-----		-----
342	ISO3016	-30		0.43	1105	D97	-30.0		0.43
344		-----		-----	1121	D97	-32.5		-0.35
349		-----		-----	1126		-----		-----
355		-----		-----	1146		-----		-----
356		-----		-----	1186		-----		-----
365	IP15	-30		0.43	1191		-----		-----
381		-----		-----	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227	D97	-30		0.43
494		-----		-----	1299	D97	-30		0.43
498		-----		-----	1318		-----		-----
507	D97	<-30		-----	1356	ISO3016	<-35		-----
511		-----		-----	1357		-----		-----
551		-----		-----	1399		-----		-----
554		-----		-----	1417		-----		-----
555		-----		-----	1429	D97	<-33		-----
558		-----		-----	1430		-----		-----
562		-----		-----	1498	D97	-36		-1.44
575		-----		-----	1575		-----		-----
603	D97	-33		-0.50	1588		-----		-----
604	D97	-33		-0.50	1629		-----		-----
608	D97	<-42	f-?	<-3.30	1650		-----		-----
614	D97	-30		0.43	1709		-----		-----
621	D97	<-24.0		-----	1720		-----		-----
631	D97	-30		0.43	1740	D97	-30		0.43
633		-----		-----	1741	ISO3016	-30		0.43
634	D97	>-24		-----	1776		-----		-----
657	D97	-30		0.43	1807		-----		-----
704	D97	-33		-0.50	1810		-----		-----
710	D97	-30		0.43	1811		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854	ISO3016	-30		0.43	6332		-----		-----
1906		-----		-----	6346		-----		-----
1941	ISO3016	-30		0.43	6364	D97	-42	R(0.01)	-3.30
1944	D97	-33		-0.50	6373	D97	-30		0.43
1995	D97	-33		-0.50	6384		-----		-----
6018		-----		-----	6406		-----		-----
6035		-----		-----	6416		-----		-----
6049	D97	-30		0.43	6443		-----		-----
6068		-----		-----	6447		-----		-----
6142		-----		-----	6469		-----		-----
6172		-----		-----	6479		-----		-----
6266		-----		-----	6496	D97	-30		0.43
6284		-----		-----	6499		-----		-----
6302		-----		-----	6540		-----		-----
6317		-----		-----	6546		-----		-----
6319	D97	-33		-0.50					

normality	OK
n	70
outliers	1
mean (n)	-31.38
st.dev. (n)	1.870
R(calc.)	5.24
st.dev.(D97:17b)	3.214
R(D97:17b)	9

Lab 120 first reported -21.0
Lab 224 first reported -39

Kernel Density
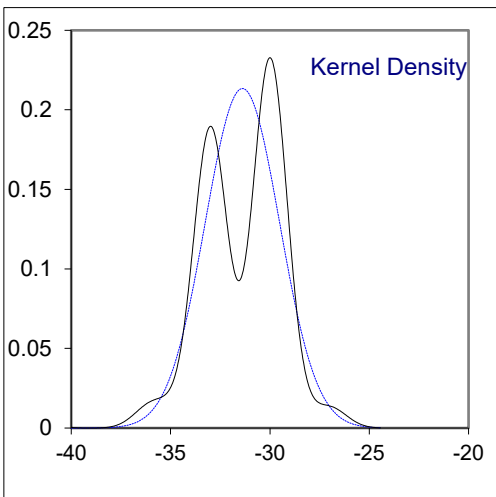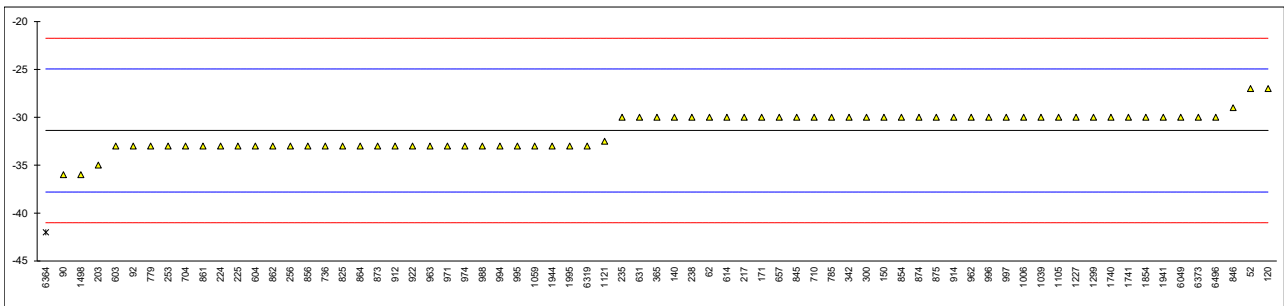
Determination of Pour Point Automated 3 °C interval on sample #23170; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5949	-27		1.45	736		-----		-----
53		-----		-----	750		-----		-----
62		-----		-----	779		-----		-----
90		-----		-----	785	D6749	-30		0.07
92		-----		-----	825		-----		-----
120	D5949	-27.0	C	1.45	845		-----		-----
140	D5949	-30		0.07	846		-----		-----
150	D5950	-30		0.07	851		-----		-----
158		-----		-----	854		-----		-----
159		-----		-----	856		-----		-----
169		-----		-----	861		-----		-----
171	D5950	-30		0.07	862	D5950	-33		-1.30
194		-----		-----	864		-----		-----
203		-----		-----	872		-----		-----
212		-----		-----	873		-----		-----
215		-----		-----	874		-----		-----
217		-----		-----	875		-----		-----
221		-----		-----	886	D5950	-39	R(0.01)	-4.06
224		-----		-----	887	D6749	-30		0.07
225		-----		-----	912		-----		-----
228		-----		-----	914	D5950	-30		0.07
231		-----		-----	922		-----		-----
235		-----		-----	962	D5950	-30		0.07
237		-----		-----	963	D5950	-33		-1.30
238		-----		-----	970		-----		-----
253		-----		-----	971		-----		-----
254		-----		-----	974		-----		-----
256		-----		-----	988		-----		-----
258		-----		-----	994		-----		-----
273		-----		-----	995		-----		-----
300		-----		-----	996		-----		-----
312		-----		-----	997		-----		-----
317	D6749	-30		0.07	1006		-----		-----
323	D5950	-33		-1.30	1011		-----		-----
328	D5950	-30		0.07	1017		-----		-----
333		-----		-----	1026	D5950	-30		0.07
334	D5950	-30		0.07	1039		-----		-----
335	D5950	-30		0.07	1059		-----		-----
337		-----		-----	1082	D5950	-32.0		-0.85
339		-----		-----	1091	ISO3016	-30		0.07
342		-----		-----	1105	D5950	-30.0		0.07
344		-----		-----	1121		-----		-----
349		-----		-----	1126		-----		-----
355		-----		-----	1146	D6892	-36	R(0.01)	-2.68
356		-----		-----	1186		-----		-----
365		-----		-----	1191		-----		-----
381		-----		-----	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227		-----		-----
494	D5950	-30		0.07	1299		-----		-----
498		-----		-----	1318	D7346	-30.0		0.07
507		-----		-----	1356		-----		-----
511		-----		-----	1357	D5950	-30		0.07
551	D5950	-30		0.07	1399		-----		-----
554		-----		-----	1417	D5950	-30		0.07
555		-----		-----	1429		-----		-----
558		-----		-----	1430		-30		0.07
562		-----		-----	1498		-----		-----
575		-----		-----	1575		-----		-----
603		-----		-----	1588		-----		-----
604		-----		-----	1629		-----		-----
608		-----		-----	1650	D5950	-30		0.07
614		-----		-----	1709		-----		-----
621		-----		-----	1720		-----		-----
631	D5949	-30		0.07	1740		-----		-----
633		-----		-----	1741		-----		-----
634		-----		-----	1776	D5950	-30		0.07
657	D5950	-30		0.07	1807		-----		-----
704		-----		-----	1810		-----		-----
710		-----		-----	1811	D5950	-32		-0.85

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854		-----		-----	6332		-----		-----
1906		-----		-----	6346		-----		-----
1941		-----		-----	6364		-----		-----
1944		-----		-----	6373	D7346	-30		0.07
1995	D5950	-33		-1.30	6384	D5950	-28		0.99
6018		-----		-----	6406		-----		-----
6035		-----		-----	6416		-----		-----
6049		-----		-----	6443		-----		-----
6068		-----		-----	6447		-----		-----
6142	D5950	-30		0.07	6469	D5950	-30		0.07
6172		-----		-----	6479		-----		-----
6266		-----		-----	6496		-----		-----
6284	D5949	-30		0.07	6499	D6749	-28		0.99
6302		-----		-----	6540		-----		-----
6317		-----		-----	6546		-----		-----
6319		-----		-----					

normality	suspect
n	38
outliers	2
mean (n)	-30.16
st.dev. (n)	1.366
R(calc.)	3.83
st.dev.(D5950:14R20)	2.179
R(D5950:14R20)	6.1

lab 120 first reported -21.0
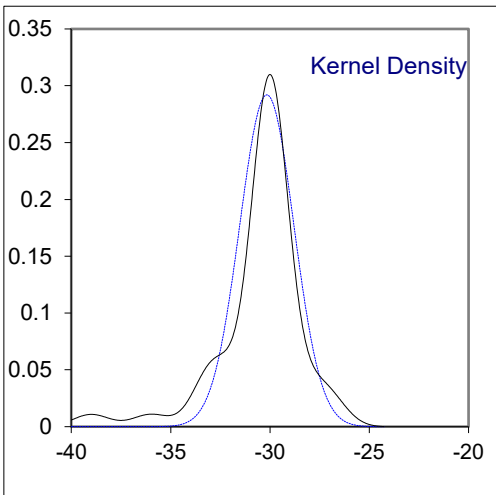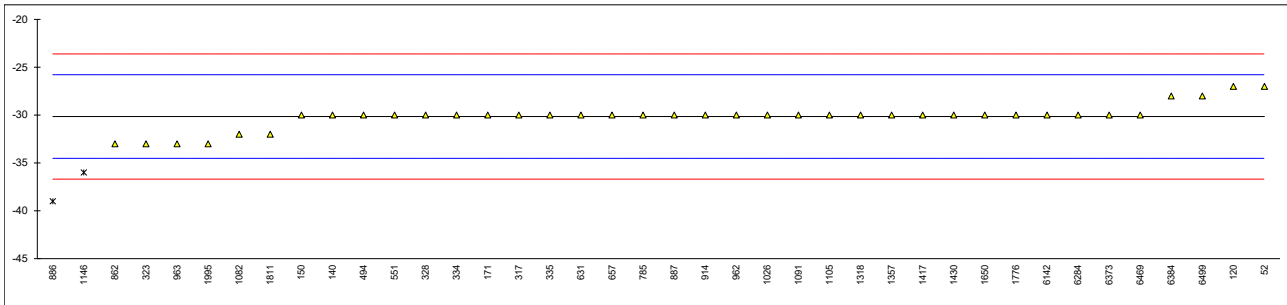
Determination of Total Sulfur on sample #23170; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5453	7.5		-0.30	736	ISO20884	7.5		-0.30
53	D5453	8.353		0.59	750		-----		-----
62	D5453	8.3		0.53	779	D2622	7.7		-0.09
90		-----		-----	785	ISO20846	8.5		0.74
92	D5453	8.575		0.82	825	D5453	7.1		-0.71
120	D7039	8.22		0.45	845	D5453	8.56		0.80
140	D5453	8.24		0.47	846	SH/T8.4	8.4		0.63
150		-----		-----	851	D2622	7.3		-0.51
158	D2622	7.4		-0.40	854	D5453	8.2		0.43
159		-----		-----	856	D5453	8.27		0.50
169		-----		-----	861	D5453	8.1		0.32
171	D5453	7.6		-0.19	862	D5453	8.3		0.53
194		-----		-----	864	D5453	8.0		0.22
203		-----		-----	872		-----		-----
212	ISO3032	6.5		-1.33	873	ISO20846	7.9		0.12
215		-----		-----	874	D5453	7.4		-0.40
217	D5453	8.28		0.51	875	ISO20846	7.9		0.12
221		-----		-----	886		-----		-----
224		-----		-----	887		-----		-----
225		-----		-----	912	D5453	7.0		-0.82
228	D2622	8.0	C	0.22	914	D5453	8.3		0.53
231	D4294	<50		-----	922	D5453	7.9		0.12
235	D5453	7.688		-0.10	962	D5453	6.4		-1.44
237	D5453	8.0		0.22	963	D5453	8.3		0.53
238		-----		-----	970		-----		-----
253		-----		-----	971	D5453	7.6		-0.19
254	D4294	<17		-----	974	D5453	7.6		-0.19
256	D5453	7.5		-0.30	988	D4294	7.5		-0.30
258	D5453	7.49		-0.31	994	D5453	7.3		-0.51
273		-----		-----	995	D5453	7.0		-0.82
300		-----		-----	996	D5453	7.8		0.01
312	ISO20884	7.8		0.01	997	D5453	6.7		-1.13
317	D5453	8.8		1.05	1006	D5453	7.8		0.01
323	D5453	7.7		-0.09	1011		-----		-----
328	D5453	8.3		0.53	1017		-----		-----
333	D5453	7.8		0.01	1026	ISO20846	8.40		0.63
334	ISO20846	7.6		-0.19	1039	ISO20884	7.3		-0.51
335	D5453	8.473		0.71	1059	ISO20846	7.2		-0.61
337	D5453	7.1		-0.71	1082		-----		-----
339		-----		-----	1091	D5453	6.9		-0.92
342		-----		-----	1105	D7039	7.35		-0.45
344	D5453	7.835		0.05	1121	D4294	<20		-----
349	D2622	8.48		0.72	1126	ISO20846	7.9		0.12
355	D2622	7.83		0.04	1146		-----		-----
356		-----		-----	1186		-----		-----
365	ISO20846	8.41		0.64	1191	ISO20846	7.91		0.13
381	ISO20846	7.9		0.12	1199		-----		-----
433		-----		-----	1205	ISO20846	8.04		0.26
480	D5453	7.99		0.21	1227	D5453	8.03		0.25
494	D5453	8.47		0.71	1299		-----		-----
498		-----		-----	1318	D5453	8.3		0.53
507	D7220	8.5	C	0.74	1356	ISO8754	<300		-----
511	D5453	7.2		-0.61	1357	D5453	8.1		0.32
551	D5453	7.1		-0.71	1399	D5453	7.13		-0.68
554		-----		-----	1417		-----	W	-----
555		-----		-----	1429		-----		-----
558		-----		-----	1430		11.6	C,R(0.01)	3.95
562	D5453	4.98	R(0.01)	-2.91	1498	D5453	7.6		-0.19
575		-----		-----	1575		-----		-----
603		-----		-----	1588		-----		-----
604		-----		-----	1629		-----		-----
608		-----		-----	1650	D5453	8.07		0.29
614		-----		-----	1709		-----		-----
621	D4294	<20		-----	1720		-----		-----
631	D4294	6.52		-1.31	1740	D5453	7.5		-0.30
633	D4294	<20		-----	1741	D5453	7.55		-0.25
634	D4294	8		0.22	1776	ISO20846	7.39		-0.41
657	D5453	8.1		0.32	1807	D5453	5.92		-1.94
704	ISO20846	7.9		0.12	1810	D5453	8.1		0.32
710	ISO20884	7.7		-0.09	1811	D5453	8.3		0.53

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854	ISO20846	7.6		-0.19	6332		-----		-----
1906		-----		-----	6346		-----		-----
1941	ISO20846	7.703		-0.09	6364	D4294	<20		-----
1944	D5453	8.31		0.54	6373	ISO20846	8.15		0.38
1995	D5453	8.8		1.05	6384	D5453	7.37		-0.43
6018	ISO20846	9.2		1.46	6406	D5453	7.762		-0.03
6035	ISO20846	8.0		0.22	6416	D5453	8.6		0.84
6049	D5453	7.45		-0.35	6443	D4294	4.0	C,R(0.01)	-3.92
6068	ISO20884	7.5		-0.30	6447	D5453	8		0.22
6142	ISO20846	7.81		0.02	6469	D5453	7.39		-0.41
6172	D5453	7.02		-0.80	6479		9.95	C,R(0.05)	2.24
6266		-----		-----	6496	ISO20884	8.16		0.39
6284		-----		-----	6499	D7220	6.9		-0.92
6302		-----		-----	6540	D4294	<17		-----
6317		-----		-----	6546		-----		-----
6319	D5453	7.5		-0.30					

normality	OK
n	105
outliers	4
mean (n)	7.788
st.dev. (n)	0.5618
R(calc.)	1.573
st.dev.(D5453:19a)	0.9652
R(D5453:19a)	2.702

Lab 228 first reported 4.0
Lab 507 first reported 5.1
Lab 1417 test result withdrawn, reported 50
Lab 1430 first reported 5.1
Lab 6443 first reported 5.5
Lab 6479 first reported 5.3
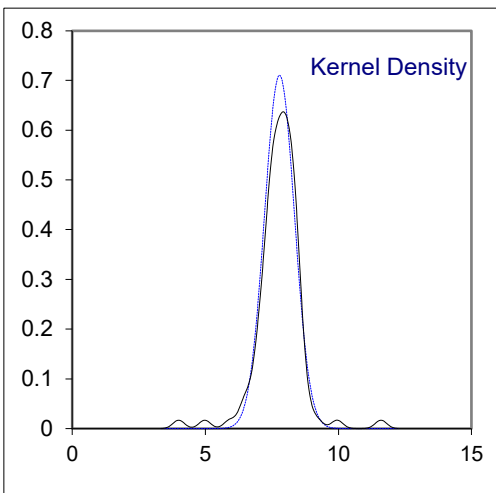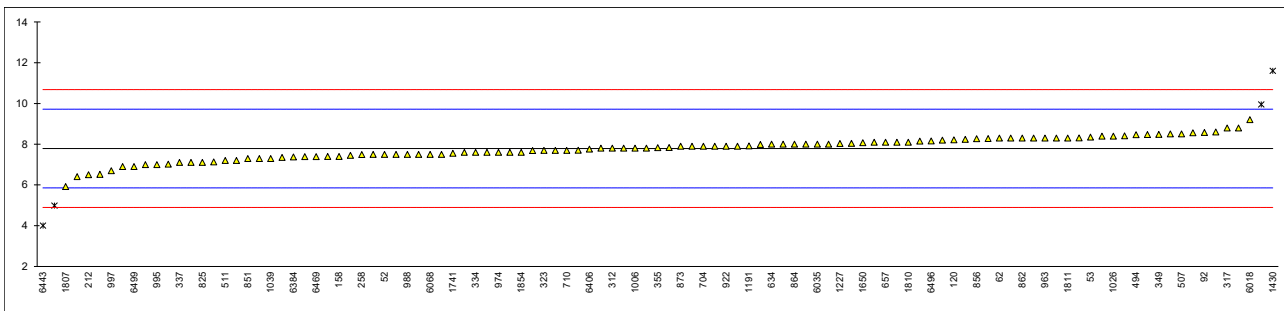
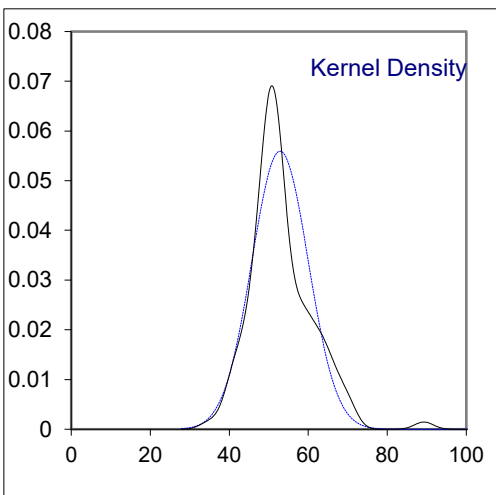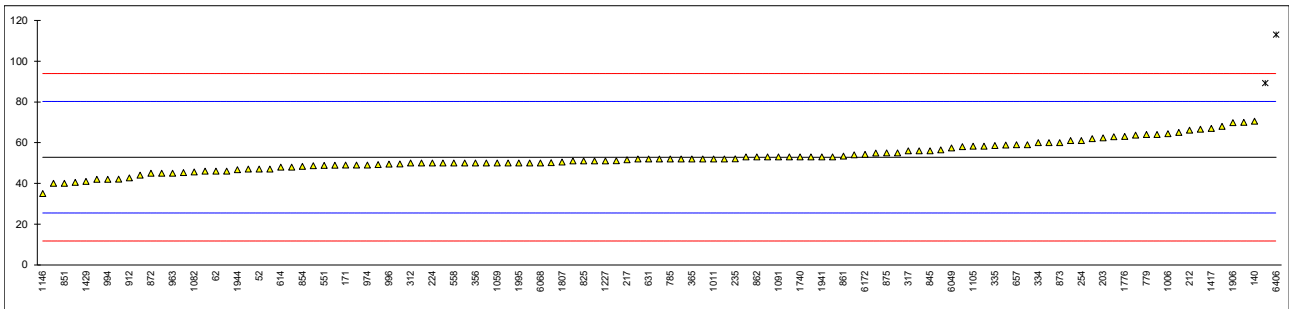Determination of Water on sample #23170; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D6304-A:20	47		-0.43	736	D6304-A:20	59		0.45
53		-----		-----	750		-----		-----
62	D6304-A:20	46		-0.50	779	D6304-A:20	64		0.81
90	D6304-A:20	48		-0.35	785	D6304-A:20	52		-0.06
92		-----		-----	825	D6304-A:20	51		-0.13
120		-----		-----	845	D6304	56		0.23
140	D6304-A:20	70.54		1.29	846		-----		-----
150	D6304-A:16e1	50		-0.21	851	D6304-A:20	40		-0.94
158		-----		-----	854	D6304-A:20	48.4		-0.32
159		-----		-----	856		-----		-----
169		-----		-----	861	D6304-A:20	53.4		0.04
171	D6304-A:16e1	49		-0.28	862	D6304-A	53		0.01
194		-----		-----	864		-----		-----
203	D6304-A:20	62.3604		0.69	872	D6304	45		-0.57
212	D6304-A:20	66.1		0.97	873	D6304-A:20	60		0.52
215		-----		-----	874	D6304-A	51		-0.13
217	D6304-A:20	51.6		-0.09	875	D6304	55		0.16
221		-----		-----	886		-----		-----
224	ISO12937	50		-0.21	887	D6304-A:20	56.41		0.26
225		-----		-----	912	D6304	42.7		-0.74
228		-----		-----	914	D6304	58		0.38
231		-----		-----	922	D6304-A:20	53		0.01
235	D6304-C:20	52.089		-0.05	962	D6304-A:16e1	45		-0.57
237	D6304-C:16e1	50	C	-0.21	963	D6304-A:20	45		-0.57
238		-----		-----	970		-----		-----
253	D6304-A:16e1	65		0.89	971	D6304-A:16e1	49		-0.28
254	D6304-B:20	61.0		0.60	974	D6304-A:20	49		-0.28
256	D6304-B:20	42.0		-0.79	988	D6304	52		-0.06
258	D6304-A:20	61		0.60	994	D6304-A:20	42		-0.79
273		-----		-----	995	D6304-A:20	47		-0.43
300	D6304-A:20	51		-0.13	996	D6304-A:20	49.48		-0.25
312	ISO12937	50		-0.21	997		-----		-----
317	D6304-A:20	56		0.23	1006	D6304-A:20	64.42		0.84
323	ISO12937	50		-0.21	1011	ISO12937	52		-0.06
328	ISO12937	60		0.52	1017		-----		-----
333	D6304	56		0.23	1026	D6304-B:20	55		0.16
334	D6304-A:20	60	C	0.52	1039	ISO12937	50		-0.21
335	ISO12937	58.6		0.42	1059	ISO12937	50		-0.21
337	ISO12937	52		-0.06	1082	ISO12937	45.6		-0.53
339		-----		-----	1091	ISO12937	53		0.01
342	ISO12937	45.3		-0.55	1105	D6304-A:20	58.2		0.39
344	ISO12937	52		-0.06	1121	D6304-A:20	50.2		-0.19
349	D6304-A:20	47		-0.43	1126		-----		-----
355		-----		-----	1146	D6304-B:20	35		-1.30
356	ISO12937	50		-0.21	1186		-----		-----
365	IP438	52		-0.06	1191	ISO12937	48.7		-0.30
381	ISO12937	62		0.67	1199		-----		-----
433		-----		-----	1205		-----		-----
480	D6304-A:20	46.0		-0.50	1227	D6304-A:20	51		-0.13
494	D6304-A:20	52		-0.06	1299	ISO12937	70		1.25
498	ISO12937	66.60		1.00	1318	D6304-B:20	48.9		-0.29
507		-----		-----	1356	D6304	<200		-----
511		-----		-----	1357	D6304-A:20	-----		-----
551	D6304-A:20	48.8		-0.29	1399	IP438	44		-0.65
554		-----		-----	1417	D6304-A:20	67		1.03
555		-----		-----	1429	IP438	40.959		-0.87
558	D6304	50.0		-0.21	1430	D6304-A:20	52		-0.06
562		-----		-----	1498		-----		-----
575		-----		-----	1575	D6304-A:20	63.7		0.79
603	D6304-A:20	40		-0.94	1588		-----		-----
604		-----		-----	1629		-----		-----
608	D6304-A	64		0.81	1650	ISO12937	53		0.01
614	D6304-B:20	48		-0.35	1709		-----		-----
621	D6304-A:20	53		0.01	1720		-----		-----
631	E203	52		-0.06	1740	D6304-A:20	53.0		0.01
633		-----		-----	1741	ISO12937	51.1		-0.13
634	D6304-A:20	68		1.11	1776	ISO12937	63.1		0.75
657	D6304-A:20	59		0.45	1807	ISO12937	50.45		-0.17
704	ISO12937	42.1		-0.78	1810	ISO12937	54		0.08
710	ISO12937	46		-0.50	1811	D6304-A:16e1	53		0.01

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854	D6304-C:16e1	50		-0.21	6332	D6304-A:20	54.9		0.15
1906	D6304-C:20	69.77		1.24	6346		-----		-----
1941	ISO12937	53		0.01	6364	D6304-A:20	89.3	R(0.01)	2.66
1944	D6304-A:20	46.7		-0.45	6373	ISO12937	53		0.01
1995	D4928	50		-0.21	6384	D6304-A:20	58.2		0.39
6018	ISO12937	62.87		0.73	6406	ISO12937	113	R(0.01)	4.39
6035	ISO12937	50		-0.21	6416		-----		-----
6049	D6304-A:20	57.4		0.33	6443		-----		-----
6068	ISO12937	50		-0.21	6447		-----		-----
6142	ISO12937	58.8		0.43	6469		-----		-----
6172	D6304-A:16e1	54.2827		0.11	6479		-----		-----
6266		-----		-----	6496	ISO12937	49.6		-0.24
6284		-----		-----	6499	D6304-A:20	49.24		-0.26
6302		-----		-----	6540	D6304-A:20	40.5		-0.90
6317		-----		-----	6546		-----		-----
6319		-----		-----					

normality	OK	
n	113	
outliers	2	
mean (n)	52.84	
st.dev. (n)	7.134	
R(calc.)	19.97	
st.dev.(D6304-A:20)	13.706	
R(D6304-A:20)	38.38	range: 20-25000 mg/kg

Compare:

R(D6304-B:20)	118.61	range: 30-2100 mg/kg
R(D6304-C:20)	26.72	range: 20-360 mg/kg

Lab 237 first reported 90
Lab 334 first reported 0.006 mg/kg

Determination of Water and Sediment (D2709) on sample #23170; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D2709	<0.010		-----	736	D2709	<0.01		-----
53		-----		-----	750		-----		-----
62		-----		-----	779		-----		-----
90		-----		-----	785		-----		-----
92	D2709	0		-----	825		-----		-----
120	D2709	0		-----	845		-----		-----
140	D2709	0.00		-----	846		-----		-----
150	D2709	<0.01		-----	851	D2709	<0.005		-----
158	D2709	<0.01		-----	854	D2709	<0.01		-----
159		-----		-----	856		-----		-----
169		-----		-----	861	D2709	<0.01		-----
171	D2709	<0.01		-----	862	D2709	<0.05		-----
194		-----		-----	864	D2709	<0.01		-----
203		-----		-----	872		-----		-----
212		-----		-----	873		-----		-----
215		-----		-----	874	D2709	<0.05		-----
217	D2709	0.0		-----	875		-----		-----
221		-----		-----	886		-----		-----
224		-----		-----	887		-----		-----
225		-----		-----	912	D2709	<0.05		-----
228		-----		-----	914	D2709	<0.005		-----
231	D2709	<0.01		-----	922		-----		-----
235		-----		-----	962	D2709	<0.01		-----
237	D2709	<0.01		-----	963	D2709	<0.01		-----
238		-----		-----	970		-----		-----
253		-----		-----	971	D2709	<0.01		-----
254		-----		-----	974	D2709	<0.01		-----
256		-----		-----	988		-----		-----
258		-----		-----	994	D2709	<0.05		-----
273		-----		-----	995		-----		-----
300		-----		-----	996		-----		-----
312		-----		-----	997		-----		-----
317		-----		-----	1006		-----		-----
323	D2709	<0.01		-----	1011		-----		-----
328		-----		-----	1017		-----		-----
333		-----		-----	1026		-----		-----
334		-----		-----	1039		-----		-----
335		-----		-----	1059	D2709	<0,05		-----
337		-----		-----	1082		-----		-----
339		-----		-----	1091		-----		-----
342	D2709	0.00		-----	1105	D2709	<0.05		-----
344	D2709	<0.05		-----	1121		-----		-----
349		-----		-----	1126		-----		-----
355		-----		-----	1146		-----		-----
356		-----		-----	1186		-----		-----
365		-----		-----	1191		-----		-----
381		-----		-----	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227		-----		-----
494		-----		-----	1299		-----		-----
498		-----		-----	1318		-----		-----
507	D2709	0.0		-----	1356		-----		-----
511	D2709	<0.05		-----	1357	D2709	<0.05		-----
551	D2709	<0.05		-----	1399		-----		-----
554		-----		-----	1417		-----		-----
555		-----		-----	1429		-----		-----
558		-----		-----	1430		-----		-----
562		-----		-----	1498	D2709	0.005		-----
575	D2709	<0.05		-----	1575	D2709	<0.01		-----
603		-----		-----	1588		-----		-----
604		-----		-----	1629		-----		-----
608		-----		-----	1650		-----		-----
614		-----		-----	1709		-----		-----
621	D2709	0		-----	1720		-----		-----
631	D2709	0		-----	1740	D2709	0.005		-----
633	D2709	<0.05		-----	1741		-----		-----
634	D2709	0.0		-----	1776		-----		-----
657	D2709	<0.01		-----	1807		-----		-----
704		-----		-----	1810		-----		-----
710		-----		-----	1811		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854		-----		-----	6332		-----		-----
1906		-----		-----	6346		-----		-----
1941		-----		-----	6364		-----		-----
1944	D2709	<0.05		-----	6373		-----		-----
1995	D2709	<0.01		-----	6384	D2709	<0,05		-----
6018		-----		-----	6406		-----		-----
6035		-----		-----	6416		-----		-----
6049		-----		-----	6443	D2709	NILL		-----
6068		-----		-----	6447		-----		-----
6142		-----		-----	6469	D2709	0		-----
6172		-----		-----	6479		-----		-----
6266		-----		-----	6496		-----		-----
6284		-----		-----	6499		-----		-----
6302		-----		-----	6540		-----		-----
6317		-----		-----	6546		-----		-----
6319		-----		-----					

|	
n	47
mean (n)	<0.05

Determination of Water and Sediment (D1796) on sample #23170; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	736		-----		-----
53		-----		-----	750		-----		-----
62	D1796	0		-----	779		-----		-----
90		-----		-----	785		-----		-----
92		-----		-----	825		-----		-----
120	D1796	0		-----	845		-----		-----
140	D1796	0.00		-----	846		-----		-----
150	D1796	<0.025		-----	851		-----		-----
158		-----		-----	854		-----		-----
159		-----		-----	856		-----		-----
169		-----		-----	861		-----		-----
171	D1796	<0.01		-----	862		-----		-----
194		-----		-----	864		-----		-----
203		-----		-----	872		-----		-----
212		-----		-----	873		-----		-----
215		-----		-----	874		-----		-----
217	D1796	0.0		-----	875		-----		-----
221		-----		-----	886		-----		-----
224		-----		-----	887		-----		-----
225		-----		-----	912	D1796	<0.05		-----
228		-----		-----	914		-----		-----
231		-----		-----	922	D1796	0.00		-----
235		-----		-----	962	D1796	<0.01		-----
237		-----		-----	963	D1796	0		-----
238	D1795	<0.05		-----	970		-----		-----
253		-----		-----	971	D1796	0.0		-----
254		-----		-----	974	D1796	0.0		-----
256		-----		-----	988		-----		-----
258		-----		-----	994	D1796	<0.05		-----
273		-----		-----	995		-----		-----
300		-----		-----	996		-----		-----
312		-----		-----	997		-----		-----
317		-----		-----	1006		-----		-----
323	D1796	<0.05		-----	1011		-----		-----
328		-----		-----	1017		-----		-----
333		-----		-----	1026		-----		-----
334		-----		-----	1039		-----		-----
335		-----		-----	1059		-----		-----
337		-----		-----	1082		-----		-----
339		-----		-----	1091		-----		-----
342		-----		-----	1105		-----		-----
344		-----		-----	1121		-----		-----
349		-----		-----	1126		-----		-----
355		-----		-----	1146		-----		-----
356		-----		-----	1186		-----		-----
365		-----		-----	1191		-----		-----
381		-----		-----	1199		-----		-----
433		-----		-----	1205		-----		-----
480		-----		-----	1227		-----		-----
494		-----		-----	1299		-----		-----
498		-----		-----	1318		-----		-----
507	D1796	0.0		-----	1356		-----		-----
511	D1796	<0.05		-----	1357		-----		-----
551		-----		-----	1399		-----		-----
554		-----		-----	1417		-----		-----
555		-----		-----	1429		-----		-----
558		-----		-----	1430		-----		-----
562		-----		-----	1498		-----		-----
575		-----		-----	1575		-----		-----
603		-----		-----	1588		-----		-----
604		-----		-----	1629		-----		-----
608		-----		-----	1650		-----		-----
614		-----		-----	1709		-----		-----
621	D1796	0		-----	1720		-----		-----
631	D1796	0		-----	1740	D1796	0		-----
633	D1796	<0.10		-----	1741	ISO3734	0.00		-----
634	D1796	0.0		-----	1776		-----		-----
657		-----		-----	1807		-----		-----
704		-----		-----	1810		-----		-----
710		-----		-----	1811		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
1854		-----		-----	6332		-----		-----
1906		-----		-----	6346		-----		-----
1941	D1796	< 0.05		-----	6364		-----		-----
1944		-----		-----	6373		-----		-----
1995		-----		-----	6384		-----		-----
6018		-----		-----	6406		-----		-----
6035		-----		-----	6416		-----		-----
6049		-----		-----	6443		-----		-----
6068		-----		-----	6447		-----		-----
6142		-----		-----	6469		-----		-----
6172		-----		-----	6479		-----		-----
6266		-----		-----	6496		-----		-----
6284	D1796	0		-----	6499		-----		-----
6302		-----		-----	6540		-----		-----
6317		-----		-----	6546		-----		-----
6319		-----		-----					

n	24	
mean (n)	<0.05	

Determination of Cetane Number (ASTM D613) of sample #23171

lab	method	value	mark	z(targ)	Remarks
120	D613	51.81		-0.67	
140	D613	52.80		-0.05	
150	D613	52.8	C	-0.05	First reported 49.8
171	D613	50.7	R(0.05)	-1.38	
312	ISO5165	53.2		0.21	
323	D613	52.9		0.02	
328		-----		-----	
356		-----		-----	
381		-----		-----	
494		-----		-----	
551	D613	53.2		0.21	
657	D613	52.3		-0.36	
736	D613	52.2		-0.43	
846	GB/T386	52.8		-0.05	
861	D613	52.6		-0.17	
862	D613	52.5		-0.24	
963	D613	53.0		0.08	
1011	ISO5165	52.0		-0.55	
1026	ISO5165	50.1	R(0.05)	-1.76	
1039		-----		-----	
1059		-----		-----	
1065		-----		-----	
1191		-----		-----	
1299		-----		-----	
1310		-----		-----	
1320	ISO5165	52.7		-0.11	
1356	ISO3405	53		0.08	
1357	D613	54.5	C	1.03	First reported 50.5
1399		-----		-----	
1549	In house	53.9		0.65	
1550	In house	53.7		0.53	
1650	In house	52.7		-0.11	
1709	D613	52.72		-0.10	
1741	D613	52.93		0.04	
1776		-----		-----	
1807		-----		-----	
1941	In house	52.93		0.04	
6142		-----		-----	
6373		-----		-----	
6406		-----		-----	

normality	suspect
n	22
outliers	2
mean (n)	52.87
st.dev. (n)	0.603
R(calc.)	1.69
st.dev.(D613:18ae1)	1.575
R(D613:18ae1)	4.41
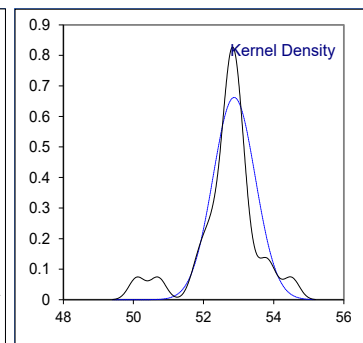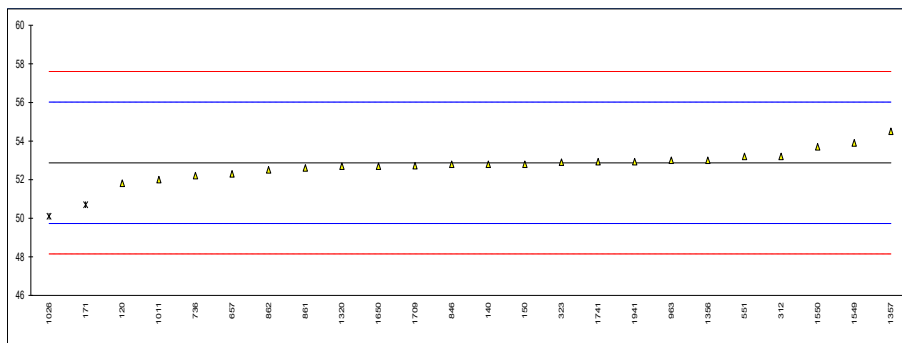
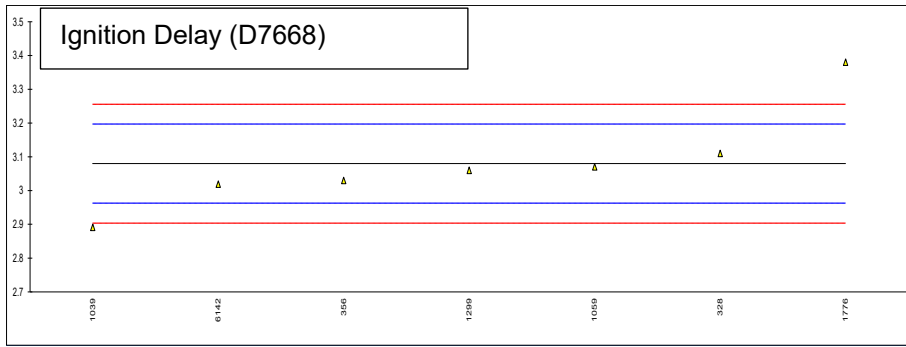## Determination of Derived Cetane Number (D6890) of sample #23171

lab	method	DCN	mark	z(targ)	ID (ms)	mark	z(targ)	Air Temp. (°C)
120		-----		-----	-----		-----	-----
140		-----		-----	-----		-----	-----
150		-----		-----	-----		-----	-----
171		-----		-----	-----		-----	-----
312		-----		-----	-----		-----	-----
323		-----		-----	-----		-----	-----
328		-----		-----	-----		-----	-----
356		-----		-----	-----		-----	-----
381		-----		-----	-----		-----	-----
494		-----		-----	-----		-----	-----
551		-----		-----	-----		-----	-----
657		-----		-----	-----		-----	-----
736		-----		-----	-----		-----	-----
846		-----		-----	-----		-----	-----
861		-----		-----	-----		-----	-----
862		-----		-----	-----		-----	-----
963		-----		-----	-----		-----	-----
1011		-----		-----	-----		-----	-----
1026		-----		-----	-----		-----	-----
1039		-----		-----	-----		-----	-----
1059		-----		-----	-----		-----	-----
1065		-----		-----	-----		-----	-----
1191	EN15195	53.0664		-----	3.839		-----	-----
1299		-----		-----	-----		-----	-----
1310		-----		-----	-----		-----	-----
1320		-----		-----	-----		-----	-----
1356		-----		-----	-----		-----	-----
1357		-----		-----	-----		-----	-----
1399		-----		-----	-----		-----	-----
1549		-----		-----	-----		-----	-----
1550		-----		-----	-----		-----	-----
1650		-----		-----	-----		-----	-----
1709		-----		-----	-----		-----	-----
1741		-----		-----	-----		-----	-----
1776		-----		-----	-----		-----	-----
1807		-----		-----	-----		-----	-----
1941		-----		-----	-----		-----	-----
6142		-----		-----	-----		-----	-----
6373		-----		-----	-----		-----	-----
6406		-----		-----	-----		-----	-----

Determination of Derived Cetane Number (D7668) of sample #23171

lab	method	DCN	mark	z(targ)	ID (ms)	mark	z(targ)	CD (ms)	mark	z(targ)	W.T. (°C)
120		-----		-----	-----		-----	-----		-----	-----
140		-----		-----	-----		-----	-----		-----	-----
150		-----		-----	-----		-----	-----		-----	-----
171		-----		-----	-----		-----	-----		-----	-----
312		-----		-----	-----		-----	-----		-----	-----
323		-----		-----	-----		-----	-----		-----	-----
328	D7668	53.1		-0.65	3.11		0.51	4.48		0.57	591.3
356	D7668	53.1		-0.65	3.03		-0.85	4.48		0.57	600
381		-----		-----	-----		-----	-----		-----	-----
494		-----		-----	-----		-----	-----		-----	-----
551		-----		-----	-----		-----	-----		-----	-----
657		-----		-----	-----		-----	-----		-----	-----
736		-----		-----	-----		-----	-----		-----	-----
846		-----		-----	-----		-----	-----		-----	-----
861		-----		-----	-----		-----	-----		-----	-----
862		-----		-----	-----		-----	-----		-----	-----
963		-----		-----	-----		-----	-----		-----	-----
1011		-----		-----	-----		-----	-----		-----	-----
1026		-----		-----	-----		-----	-----		-----	-----
1039	EN16715	53.29		-0.30	2.8907		-3.23	4.4558		0.04	604.99
1059	D7668	52.5		-1.77	3.07		-0.17	4.53		1.67	593.7
1065		-----		-----	-----		-----	-----		-----	-----
1191		-----		-----	-----		-----	-----		-----	-----
1299	D7668	54.5		1.96	3.06		-0.34	4.37		-1.84	588.4
1310		-----		-----	-----		-----	-----		-----	-----
1320		-----		-----	-----		-----	-----		-----	-----
1356		-----		-----	-----		-----	-----		-----	-----
1357		-----		-----	-----		-----	-----		-----	-----
1399		-----		-----	-----		-----	-----		-----	-----
1549		-----		-----	-----		-----	-----		-----	-----
1550		-----		-----	-----		-----	-----		-----	-----
1650		-----		-----	-----		-----	-----		-----	-----
1709		-----		-----	-----		-----	-----		-----	-----
1741		-----		-----	-----		-----	-----		-----	-----
1776	D7668	53.66	E	0.39	3.38		5.12	4.74	G(0.05)	6.27	586.2
1807		-----		-----	-----		-----	-----		-----	-----
1941		-----		-----	-----		-----	-----		-----	-----
6142	D7668	53.99		1.01	3.019		-1.04	4.408		-1.01	596.43
6373		-----		-----	-----		-----	-----		-----	-----
6406		-----		-----	-----		-----	-----		-----	-----

normality	unknown			unknown			unknown
n	7			7			6
outliers	0			0			1
mean (n)	53.45			3.08			4.45
st.dev. (n)	0.660			0.149			0.057
R(calc.)	1.85			0.42			0.16
st.dev.(D7668:17)	0.537			0.059			0.046
R(D7668:17)	1.50			0.16			0.13

W.T. = Chamber Wall Temperature

Lab 1776 calculation difference, iis calculated 50.42

Derived Cetane Number (D7668)

Ignition Delay (D7668)

Combustion Delay (D7668)
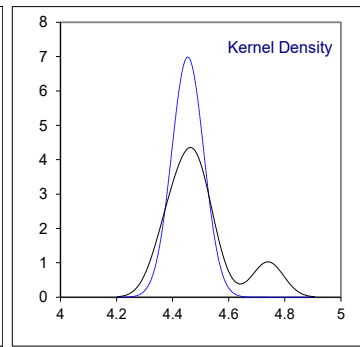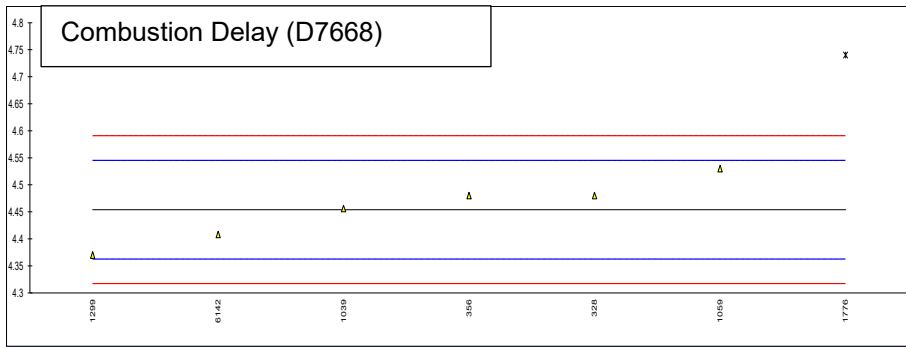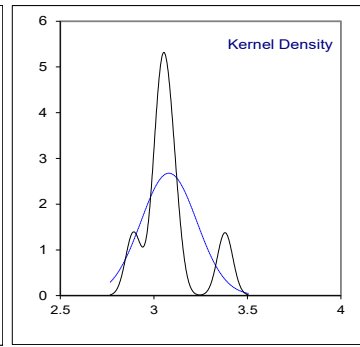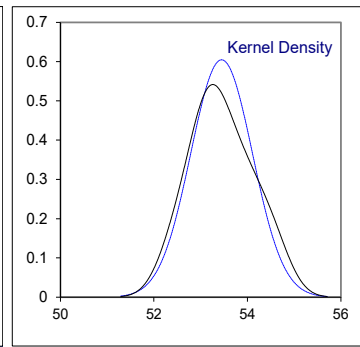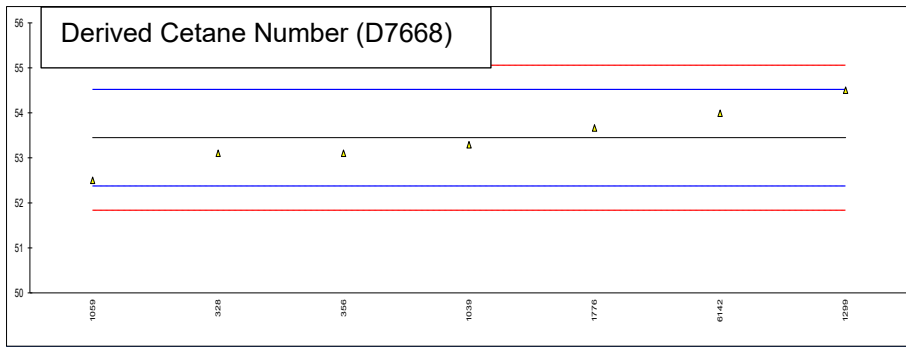
Determination of Indicated Cetane Number (D8183) of sample #23171

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
312		-----		-----	
323		-----		-----	
328		-----		-----	
356		-----		-----	
381	EN17155	52.3		0.20	
494		-----		-----	
551		-----		-----	
657		-----		-----	
736		-----		-----	
846		-----		-----	
861		-----		-----	
862		-----		-----	
963		-----		-----	
1011		-----		-----	
1026		-----		-----	
1039		-----		-----	
1059		-----		-----	
1065		-----		-----	
1191		-----		-----	
1299		-----		-----	
1310	EN17155	51.7		-0.59	
1320		-----		-----	
1356		-----		-----	
1357		-----		-----	
1399		-----		-----	
1549		-----		-----	
1550		-----		-----	
1650		-----		-----	
1709		-----		-----	
1741		-----		-----	
1776	D8183	52.0		-0.20	
1807		-----		-----	
1941		-----		-----	
6142		-----		-----	
6373		-----		-----	
6406	D8183	52.6		0.59	

|	
normality	unknown
n	4
outliers	0
mean (n)	52.15
st.dev. (n)	0.387
R(calc.)	1.08
st.dev.(D8183:22)	0.765
R(D8183:22)	2.14
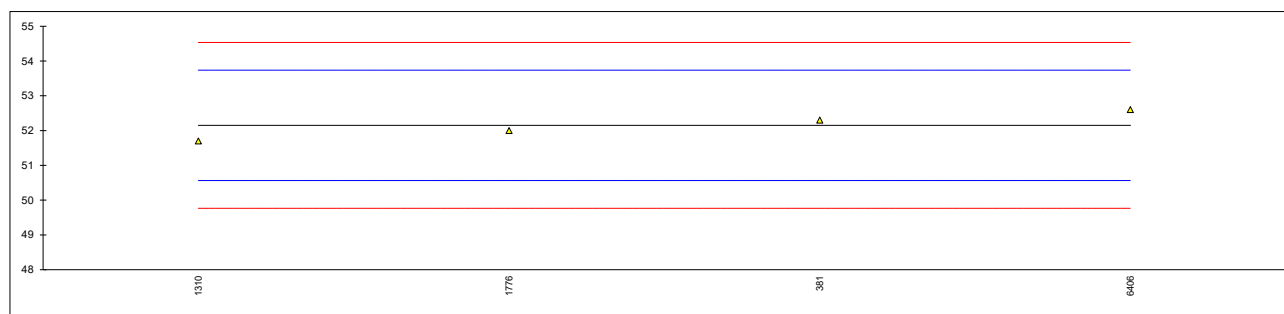
Determination of Particulate Contamination on sample #23172; results in mg/L

lab	method	Part. Cont.	mark	z(targ)	Vol. filtered (mL)	No. of filtrations	remarks
120		-----		-----	-----	-----	
140	D6217	9.1		-1.29	700	1	
150		-----		-----	-----	-----	
171	D6217	8.5		-1.74	1000	2	
235	D6217	12.4		1.20	780	1	
237		-----		-----	-----	-----	
273		-----		-----	-----	-----	
300		-----		-----	-----	-----	
317		-----		-----	-----	-----	
323		-----		-----	-----	-----	
328		-----		-----	-----	-----	
333		-----		-----	-----	-----	
334		-----		-----	-----	-----	
335		-----		-----	-----	-----	
342		-----		-----	900	3	
349		-----		-----	-----	-----	
356		-----		-----	-----	-----	
365		-----		-----	-----	-----	
381		-----		-----	-----	-----	
494		-----		-----	-----	-----	
507	D6217	9.6		-0.91	500	2	
551		-----		-----	-----	-----	
603		-----		-----	-----	-----	
621		-----		-----	-----	-----	
657	D6217	10.27		-0.41	915	2	
736		-----		-----	-----	-----	
750		-----		-----	-----	-----	
825	D6217	11.3		0.37	950	1	
861		-----		-----	-----	-----	
862		-----		-----	-----	-----	
874		-----		-----	-----	-----	
912		-----		-----	-----	-----	
922	D6217	14.9		3.08	930	1	
963		-----		-----	-----	-----	
970		-----		-----	-----	-----	
974		-----		-----	-----	-----	
994	D6217	10.4		-0.31	500	1	
1006		-----		-----	-----	-----	
1011		-----		-----	-----	-----	
1026		-----		-----	-----	-----	
1039		-----		-----	-----	-----	
1059		-----		-----	-----	-----	
1121		-----	W	-----	-----	W	----- W
1191		-----		-----	-----	-----	
1299		-----		-----	-----	-----	
1357		-----		-----	-----	-----	
1399		-----		-----	-----	-----	
1431		-----		-----	-----	-----	
1650		-----		-----	-----	-----	
1740		-----		-----	-----	-----	
1741		-----		-----	-----	-----	
1807		-----		-----	-----	-----	
1854		-----		-----	-----	-----	
1941		-----		-----	-----	-----	
1995		-----		-----	-----	-----	
6018		-----		-----	-----	-----	
6373		-----		-----	-----	-----	
6406		-----		-----	-----	-----	

normality	unknown
n	8
outliers	0
mean (n)	10.81
st.dev. (n)	2.059
R(calc.)	5.77
st.dev.(D6217:21)	1.327
R(D6217:21)	3.72

Lab 1121 test results withdrawn, reported 4.33; 300 and 1 respectively

Kernel Density
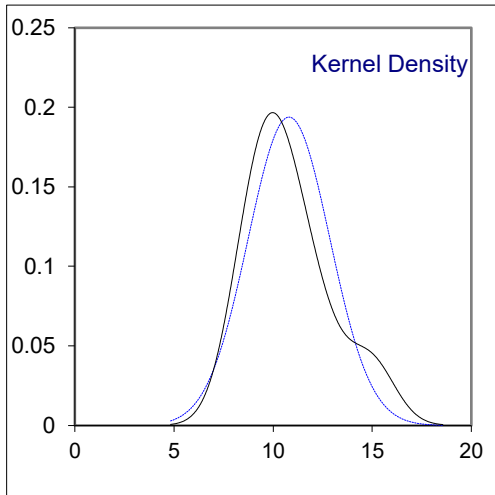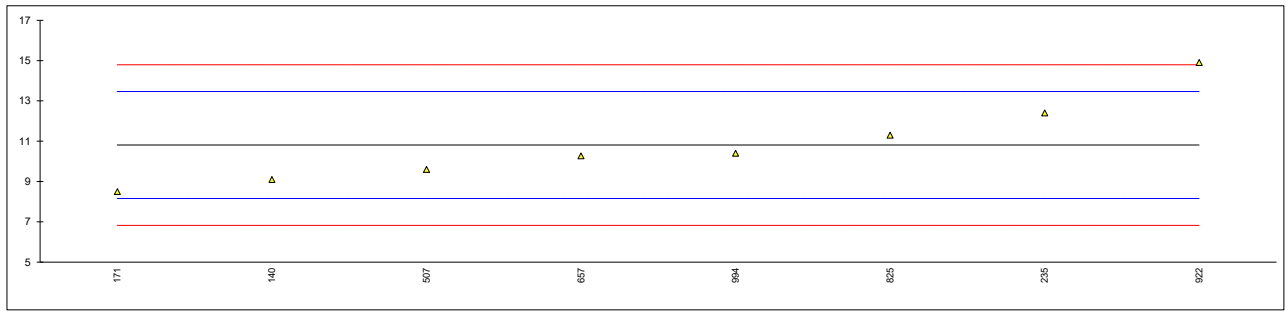
## Determination of Total Contamination on sample #23172; results in mg/kg

lab	method	Total C.	mark	z(targ)	Complete filtration?	Vol. filtered (mL)	Filtration stopped after (min)	remarks
120		-----		-----		-----	-----	
140		-----		-----		-----	-----	
150	EN12662:2014	12.4	C	-2.43	Yes	300	-----	First reported <12.0
171		-----		-----		-----	-----	
235		-----		-----		-----	-----	
237	EN12662:2014	25.6		2.72	Yes	300	1.5	
273		-----		-----		-----	-----	
300		-----		-----		-----	-----	
317	EN12662:2014	18.5		-0.05	Yes	300		
323	EN12662:2014	14.1		-1.77	Yes	-----	-----	
328	EN12662:2014	17.0		-0.63	Yes	300	-----	
333	EN12662:2014	3.2	R(0.01)	-6.02	Yes	300	-----	
334	EN12662:2014	18		-0.24	Yes	300	-----	
335	EN12662:2014	20.5		0.73	Yes	-----	-----	
342	EN12662	18.2		-0.16		-----	-----	
349	EN12662:2014	16.3		-0.91		300	-----	
356	IP440	19.0		0.15		300	-----	
365	IP440	19.934		0.51	Yes	475	-----	
381	EN12662:2014	19.5		0.34		-----	-----	
494	EN12662	24		2.10		-----	-----	
507		-----		-----		-----	-----	
551	EN12662	14.5		-1.61		-----	-----	
603		-----		-----		-----	-----	
621	EN12662:2014	21.6	C	1.16	Yes	300	5	First reported 37
657		-----		-----		-----	-----	
736	EN12662	22		1.32		-----	-----	
750		-----		-----		-----	-----	
825		-----		-----		-----	-----	
861	EN12662:2014	20.5		0.73	Yes	300	5	
862	EN12662	19.5		0.34	Yes	-----	-----	
874		-----		-----		-----	-----	
912		-----		-----		-----	-----	
922		-----		-----		-----	-----	
963		-----		-----		-----	-----	
970		-----		-----		-----	-----	
974	IP440	15.9	C	-1.06	Yes	300	5	First reported 5.9
994		-----		-----		-----	-----	
1006	EN12662:2014	16.9		-0.67	Yes	300	5	
1011	EN12662:2014	20.0		0.54	Yes	-----	-----	
1026	EN12662:2014	21.0		0.93	Yes	-----	-----	
1039	EN12662:2014	17.6		-0.40	Yes	-----	-----	
1059	EN12662:2014	23.5		1.90	Yes	-----	-----	
1121	EN12662:2014	23.0	C	1.71	Yes	300	-----	First reported 37.56
1191		-----		-----		-----	-----	
1299	EN12662:2014	15.2		-1.34	Yes	300		
1357	IP440	21.3		1.05	Yes	-----	-----	
1399	IP440	16		-1.02	Yes	-----	-----	
1431	EN12662:2008	16.27759		-0.91	Yes	300	1.49	
1650	EN12662:2014	18.56		-0.02		300	-----	
1740	EN12662:2014	14.5		-1.61	Yes	300	-----	
1741	EN12662:2014	20.50		0.73	Yes	-----	-----	
1807	EN12662:2014	15.441		-1.24		-----	-----	
1854	EN12662:2014	15.0		-1.41	Yes	300	8	
1941	EN12662:2014	20.84		0.87	Yes	300	-----	
1995	EN12662:2014	16.5		-0.83	Yes	300	25	
6018	EN12662:2014	20.3		0.66	Yes	-----	-----	
6373		-----		-----		-----	-----	
6406	EN12662:2014	18.16		-0.18	Yes	-----	-----	

normality	OK	
n	38	
outliers	1	
mean (n)	18.62	
st.dev. (n)	3.043	
R(calc.)	8.52	
st.dev.(EN12662:14)	2.562	
R(EN12662:14)	7.17	

Kernel Density
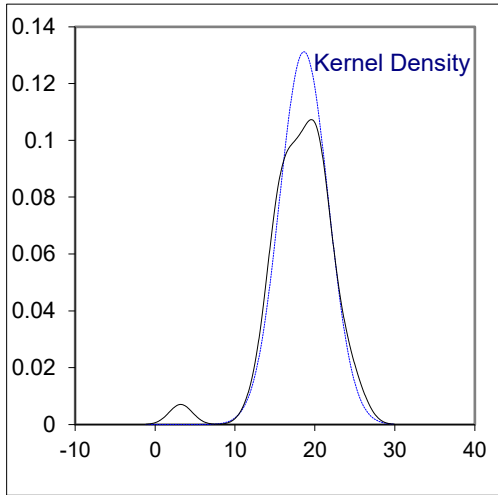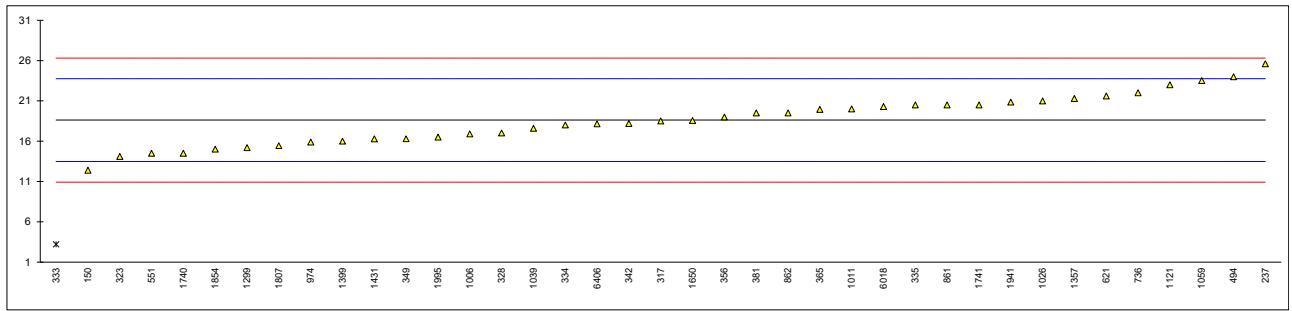
Determination of Oxidation Stability Filterable Insolubles (A) on sample #23173; results in mg/100 mL

lab	method	value	mark	z(targ)	remarks
52	D2274	0.1		-0.29	
120	D2274	0.2		0.21	
140	D2274	0.09	C	-0.34	First reported 0.74
150	D2274	<0.0		-----	
158	D2274	0.0		-0.80	
171	D2274	2.7	R(0.01)	12.79	
235	ISO12205	0.09		-0.34	
237		-----		-----	
300		-----		-----	
312	ISO12205	0.17		0.06	
323	D2274	0.2		0.21	
334	ISO12205	0		-0.80	
344		-----		-----	
494	D2274	17.4	R(0.01)	86.78	
507	D2274	0.257		0.50	
551		-----		-----	
657	D2274	0.4	C	1.22	First reported 0.629
736		-----		-----	
750		-----		-----	
846	SH/T0175	0.06		-0.49	
861	D2274	0.1		-0.29	
862	D2274	0.11		-0.24	
864	D2274	0.1		-0.29	
874		-----		-----	
963	D2274	0.1		-0.29	
970		-----		-----	
974	D2274	0.3		0.71	
1006	D2274	0.29		0.66	
1026		-----		-----	
1059	ISO12205	<1		-----	
1082		-----		-----	
1121	ISO12205	0.51		1.77	
1191		-----		-----	
1299		-----		-----	
1310	ISO12205	0.09		-0.34	
1357		-----		-----	
1399		-----		-----	
1412		-----		-----	
1650	D2274	0.0429		-0.58	
1709	D2274	0.09		-0.34	
1740	D2274	0.29		0.66	
1741	ISO12205	0.11		-0.24	
1807	ISO12205	0		-0.80	
1941	ISO12205	0.114		-0.22	
6018		-----		-----	
6195	D2274	0.30		0.71	
6373		-----		-----	
6406	D2274	<1		-----	

normality	suspect	
n	26	
outliers	2	
mean (n)	0.158	
st.dev. (n)	0.1276	
R(calc.)	0.357	
st.dev.(D2274:14R19)	0.1987	
R(D2274:14R19)	0.556	
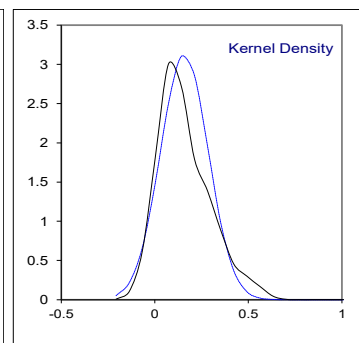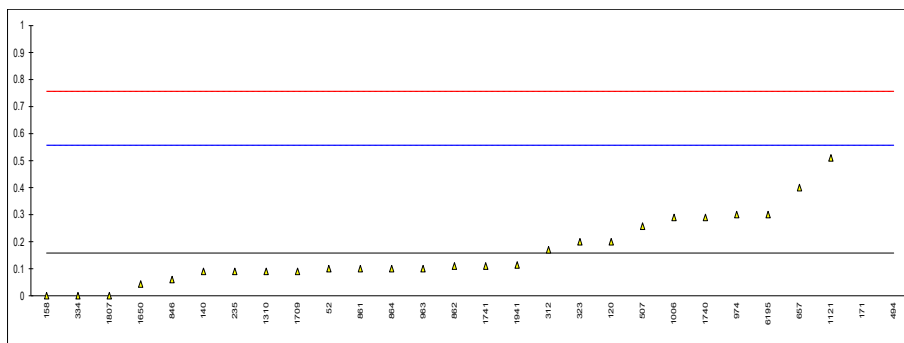
## Determination of Oxidation Stability Adherent Insolubles (B) on sample #23173; results in mg/100 mL

lab	method	value	mark	z(targ)	remarks
52	D2274	0.2		0.58	
120	D2274	0.1		0.08	
140	D2274	0.03		-0.27	
150	D2274	0.7	C,R(0.01)	3.10	First reported 3.0
158	D2274	0.5	R(0.01)	2.09	
171	D2274	0.0		-0.42	
235	ISO12205	0.14		0.28	
237		-----		-----	
300		-----		-----	
312	ISO12205	0.01		-0.37	
323	D2274	0.1		0.08	
334	ISO12205	0		-0.42	
344		-----		-----	
494	D2274	0		-0.42	
507	D2274	0.00		-0.42	
551		-----		-----	
657	D2274	0.1	C	0.08	First reported 0.086
736		-----		-----	
750		-----		-----	
846	SH/T0175	0.23		0.74	
861	D2274	0.1		0.08	
862	D2274	0.09		0.03	
864	D2274	0.1		0.08	
874		-----		-----	
963	D2274	0.2		0.58	
970		-----		-----	
974	D2274	0.1		0.08	
1006	D2274	0.37	R(0.01)	1.44	
1026		-----		-----	
1059	ISO12205	<1		-----	
1082		-----		-----	
1121	ISO12205	0.0		-0.42	
1191		-----		-----	
1299		-----		-----	
1310	ISO12205	0.14		0.28	
1357		-----		-----	
1399		-----		-----	
1412		-----		-----	
1650	D2274	0.0714		-0.06	
1709	D2274	0.11		0.13	
1740	D2274	0.03		-0.27	
1741	ISO12205	0.06		-0.12	
1807	ISO12205	0.0855		0.01	
1941	ISO12205	0.086		0.01	
6018		-----		-----	
6195	D2274	0.10	C	0.08	First reported 0.20
6373		-----		-----	
6406	D2274	<1		-----	

normality	OK	
n	26	
outliers	3	
mean (n)	0.084	
st.dev. (n)	0.0646	
R(calc.)	0.181	
st.dev.(D2274:14R19)	0.1987	
R(D2274:14R19)	0.556	
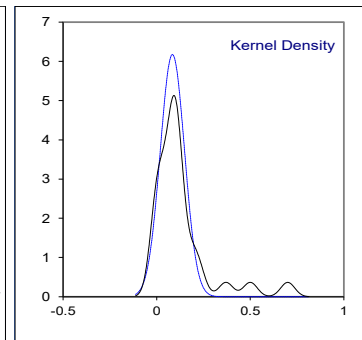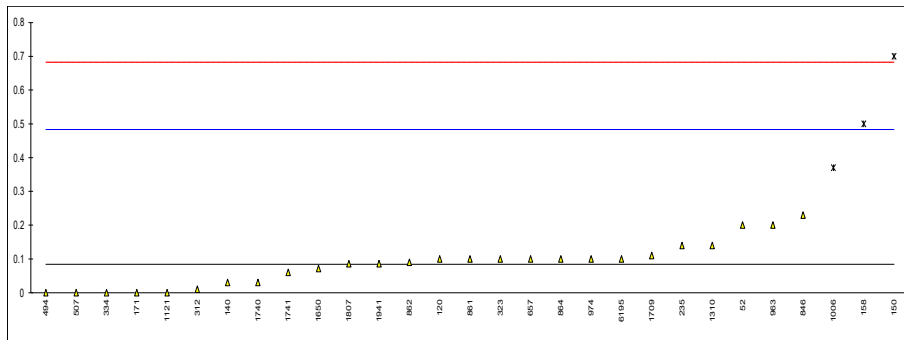
Determination of Oxidation Stability Total Insolubles (A+B) on sample #23173; results in mg/100 mL

lab	method	value	mark	z(targ)	remarks
52	D2274	0.2		-0.37	
120	D2274	0.3		-0.01	
140	D2274	0.77	E	1.66	
150	D2274	0.8	C	1.77	First reported 2.1
158	D2274	0.5		0.70	
171	D2274	2.7	R(0.01)	8.53	
235	ISO12205	0.23		-0.26	
237		-----		-----	
300		-----		-----	
312	ISO12205	0.18		-0.44	
323	D2274	0.3		-0.01	
334	ISO12205	0		-1.08	
344		-----		-----	
494	D2274	17.4	R(0.01)	60.85	
507	D2274	0.257		-0.17	
551		-----		-----	
657	D2274	0.5	C	0.70	First reported 0.715
736		-----		-----	
750		-----		-----	
846	SH/T0175	0.29		-0.05	
861	D2274	0.2		-0.37	
862	D2274	0.20		-0.37	
864	D2274	0.2		-0.37	
874		-----		-----	
963	D2274	0.3		-0.01	
970		-----		-----	
974	D2274	0.4		0.34	
1006	D2274	0.66		1.27	
1026	ISO12205	<1		-----	
1059	ISO12205	<1		-----	
1082	ISO12205	0.174285		-0.46	
1121	ISO12205	0.51		0.74	
1191	ISO12205	0.10857		-0.69	
1299	D2274	2	R(0.01)	6.04	
1310	ISO12205	0.23		-0.26	
1357		-----		-----	
1399		-----		-----	
1412		-----		-----	
1650	D2274	0.1143		-0.67	
1709	D2274	0.20		-0.37	
1740	D2274	0.32		0.06	
1741	ISO12205	0.17		-0.47	
1807	ISO12205	0.0855		-0.78	
1941	ISO12205	0.200		-0.37	
6018		-----		-----	
6195	D2274	0.40	C	0.34	First reported 0.50
6373		-----		-----	
6406	D2274	<1		-----	

	normality	not OK	
	n	29	
	outliers	3	
	mean (n)	0.303	
	st.dev. (n)	0.1955	
	R(calc.)	0.548	
	st.dev.(D2274:14R19)	0.2810	
	R(D2274:14R19)	0.787	

Lab 140 calculation difference, iis calculated 0.12
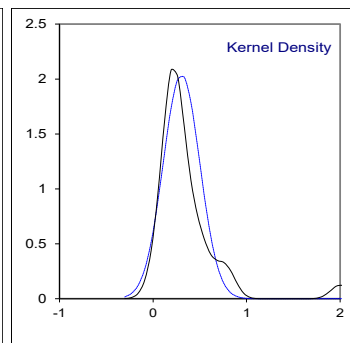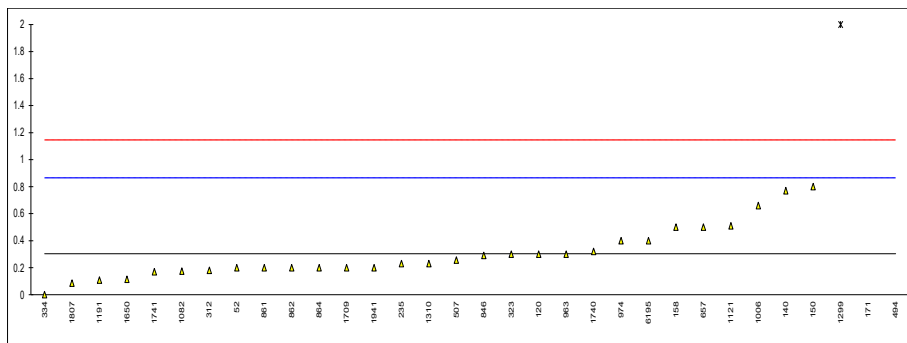
APPENDIX 2

Number of participants per country

1 lab in	ALBANIA		1 lab in	MAURITIUS
1 lab in	AUSTRALIA		1 lab in	MOROCCO
1 lab in	AUSTRIA		1 lab in	MOZAMBIQUE
2 labs in	AZERBAIJAN		9 labs in	NETHERLANDS
5 labs in	BELGIUM		2 labs in	NIGERIA
4 labs in	BRAZIL		1 lab in	NORTH MACEDONIA, Republic of
2 labs in	BULGARIA		2 labs in	NORWAY
5 labs in	CANADA		3 labs in	OMAN
3 labs in	CHILE		2 labs in	PAKISTAN
7 labs in	CHINA, People's Republic		1 lab in	PANAMA
1 lab in	COLOMBIA		1 lab in	PERU
1 lab in	COSTA RICA		3 labs in	PHILIPPINES
1 lab in	COTE D'IVOIRE		3 labs in	POLAND
1 lab in	CYPRUS		2 labs in	PORTUGAL
2 labs in	CZECH REPUBLIC		2 labs in	ROMANIA
1 lab in	DJIBOUTI		8 labs in	RUSSIAN FEDERATION
3 labs in	EGYPT		2 labs in	SAUDI ARABIA
1 lab in	ESTONIA		1 lab in	SENEGAL
1 lab in	ETHIOPIA		3 labs in	SERBIA
2 labs in	FINLAND		1 lab in	SINGAPORE
6 labs in	FRANCE		1 lab in	SLOVAKIA
3 labs in	GEORGIA		1 lab in	SLOVENIA
2 labs in	GERMANY		1 lab in	SOMALIA
6 labs in	GREECE		2 labs in	SOUTH AFRICA
1 lab in	GUINEA REPUBLIC		7 labs in	SPAIN
3 labs in	HONG KONG		1 lab in	SUDAN
2 labs in	INDIA		1 lab in	SWEDEN
1 lab in	INDONESIA		5 labs in	TAIWAN
2 labs in	IRELAND		4 labs in	TANZANIA
2 labs in	ISRAEL		1 lab in	TOGO
2 labs in	KAZAKHSTAN		2 labs in	TUNISIA
3 labs in	KENYA		2 labs in	TURKMENISTAN
1 lab in	KOREA, Republic of		1 lab in	UKRAINE
1 lab in	LIBERIA		4 labs in	UNITED ARAB EMIRATES
3 labs in	MALAYSIA		5 labs in	UNITED KINGDOM
1 lab in	MALTA		8 labs in	UNITED STATES OF AMERICA

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)/R(5)= straggler in Rosner's outlier test
E   = calculation difference between reported test result and result calculated by iis
W   = test result withdrawn on request of participant
ex   = test result excluded from statistical evaluation
n.a.   = not applicable
n.e.   = not evaluated
n.d.   = not detected
fr.   = first reported
f+?   = possibly a false positive test result?
f-?   = possibly a false negative test result?
SDS   = Safety Data Sheet

Literature

1   iis Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, June 2018
2   ISO5725:86
3   ISO5725 parts 1-6:94
4   ISO13528:05
5   M. Thompson and R. Wood, J. AOAC Int, 76, 926, (1993)
6   W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)
7   P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)
8   J.N. Miller, Analyst, 118, 455, (1993)
9   Analytical Methods Committee, Technical Brief, No 4, January 2001
10   P.J. Lowthian and M. Thompson, The Royal Society of Chemistry, Analyst, 127, 1359-1364, (2002)
11   W. Horwitz and R. Albert, J. AOAC Int, 79.3, 589-621, (1996)
12   Bernard Rosner, Percentage Points for a Generalized ESD Many-Outlier Procedure, Technometrics, 25(2), 165-172, (1983)
13   iis memo 1904 Precision data of Calculated Cetane Index Four Variables in Gasoil