Institute for
Interlaboratory Studies

Results of Proficiency Test
Diesel B10 (10% FAME)
May 2022

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

Author: ing. M. Meijer
Correctors: ing. C.M. Nijssen-Wester & ing. A. Ouwerkerk
Approved by: ing. A.S. Noordman-de Neef

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1 INTRODUCTION

Since 2005 the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for the analysis of Diesel B10 containing approximately 10% FAME based on the latest version of EN16734 (0-10% FAME) and ASTM D7467 (6-20% FAME) every year. During the annual proficiency testing program of 2021/2022 it was decided to continue the round robin for the analysis of Diesel B10 (10% FAME).

In this interlaboratory study registered for participation:
- 58 laboratories in 33 countries for regular analyzes in Diesel B10 iis22G04
- 29 laboratories in 16 countries on the Total Contamination analyzes iis22G04TC

In total 59 laboratories in 33 countries registered for participation in one or two proficiency tests, see appendix 3 for the number of participants per country. In this report the results of this Diesel B10 (10% FAME) proficiency tests are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test (PT). Sample analyzes for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC17025 accredited laboratory.
In this proficiency test the participants received, depending on the registration, one or two different samples of Diesel B10 (10% FAME), see table below.

Sample ID	PT ID	Quantity	Purpose
#22080	iis22G04	1 x 1 L + 1 x 0.5 L	Regular analyzes
#22081	iis22G04TC	1 x 1 L	Total Contamination

Table 1: Diesel B10 (10% FAME) samples used in PTs iis22G04 and iis22G04TC

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

2.1 ACCREDITATION

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

2.2 PROTOCOL

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

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

A batch of approximately 170 liters of Diesel was obtained from the local market. To reach a final FAME concentration of approximately 10% V/V Biodiesel B100 was added to the Diesel batch. After homogenization 94 amber glass bottles of 1 L and 94 amber glass bottles of 0.5 L were filled and labelled #22080.
The homogeneity of the subsamples was checked by determination of Density at 15 °C in accordance with ISO12185 on 8 stratified randomly selected subsamples.

	Density at 15 °C in kg/m^3
sample #22080-1	844.37
sample #22080-2	844.36
sample #22080-3	844.34
sample #22080-4	844.35
sample #22080-5	844.36
sample #22080-6	844.35
sample #22080-7	844.36
sample #22080-8	844.35

Table 2: homogeneity test results of subsamples #22080

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)	0.03
reference test method	ISO12185:96
0.3 x R (reference test method)	0.15

Table 3: evaluation of the repeatability of subsamples #22080

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 Diesel B10 Total Contamination a batch of approximately 100 liters Diesel was obtained from the local market. The Diesel batch was spiked with B100 to have approximately a final FAME concentration of 10%. A defined volume of freshly prepared and well shaken dust suspension of Arizona Dust material in an oil suspension was added to a 1 L empty bottle by means of a calibrated pipette. The addition was checked by weighing the bottle before and after addition. In total 55 bottles were prepared and subsequently filled up to 1 L with Diesel. Finally, the subsamples were labelled #22081.

Depending on the registration of the participant the appropriate set of PT samples was sent on April 20, 2022. An SDS was added to the sample package.

2.5 STABILITY OF THE SAMPLES

The stability of Diesel B10 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 #22080: Total Acid Number, Aromatics by FIA, Ash content, Calculated Cetane Index (two and four variables), Cloud Point, Cold Filter Plugging Point (CFPP), Carbon Residue (micro method) on 10% distillation 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 and Volume at 250 °C and 350 °C), FAME, Flash Point PMcc, Kinematic Viscosity at 40 °C, Lubricity by HFRR at 60 °C, Oxidation Stability (stability and induction period), Polycyclic-, Mono-, Di-, Tri+- and Total Aromatic Hydrocarbons, Pour Point (Manual and Automated 3 °C interval), Sulfur and Water.
On sample #22081 it was requested to determine Total Contamination.

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

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

3 RESULTS

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

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

3.1 STATISTICS

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

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

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

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

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

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

3.2 GRAPHICS

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

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

3.3 Z-SCORES

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

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

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

The z-scores were calculated according to:

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

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

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

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

4 EVALUATION

In this proficiency test some problems were encountered with the dispatch of the samples. For the regular Diesel B10 PT three participants reported test results after the final reporting date and five other participants were not able to report any test results. Not all participants were able to report all tests requested.
For the Total Contamination PT three participants reported test results after the final reporting date and six other participants were not able to report any test results.
In total 54 participants reported 985 numerical test results. Observed were 20 outlying test results, which is 2.0%. 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 4.

In the iis PT reports ASTM test methods are referred to with a number (e.g. D524) and an added designation for the year that the test method was adopted or revised (e.g. D524:15). When a method has been reapproved an “R” will be added and the year of approval (e.g. D524:15R19).

sample #22080

Total Acid Number: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D664-B:18e2.

Aromatics by FIA: This determination was problematic. No statistical evaluation has been performed due to the large variation and the limited number of test results. Two participants reported test results which deviated strongly when compared to previous iis PTs.

Ash content: This determination was not problematic. All reporting participants agreed on a consensus value <0.01. Therefore, no z-scores are calculated.

Calc. Cetane Index, two variables: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D976:21.

Calc. Cetane Index, four variables: 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).
This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the estimated target reproducibility over previous PTs, see iis memo 1904.

Cloud Point: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO3015:19.

CFPP: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of EN116:15.

Carbon Residue (micro method) on 10% residue: This determination may not be problematic. The consensus value of the group was below the application range of ISO10370:14. Therefore, no z-scores are calculated.

Ramsbottom Carbon Residue on 10% residue: Only one test result was reported, hence no z-scores could be calculated.

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

Density at 15 °C: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO12185:96.

Distillation at 760 mmHg: This determination was not problematic. In total four statistical outliers were observed over eight parameters. All calculated reproducibilities after rejection of the statistical outliers are in agreement with the requirements of the automated mode of ISO3405:19, except at 10% recovered. When evaluated against the requirements of the manual mode of ISO3409:19, all calculated reproducibilities after rejection of the statistical outliers are not in agreement, except for 50% recovery.

FAME: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of EN14078-B:14.

Flash Point PMcc: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO2719-A:16+A1:21.

Kinematic Viscosity at 40 °C: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ISO3104:20.

Lubricity by HFRR: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ISO12156:18 mode A (Digital Camera) and mode B (Visual).

Oxidation Stability: This determination was not problematic. All reporting participants agreed on a consensus value <6. Therefore, no z-scores are calculated.

Oxidation Stability Induction period: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of EN15751:14.

Polycyclic Aromatics: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of EN12916:19.

Mono-Aromatics: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN12916:19.

Di-Aromatics: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN12916:19.

Tri+-Aromatics: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of EN12916:19.

Total Aromatics: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of EN12916:19.

Pour Point Manual: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ISO3016:19.

Pour Point Automated: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D5950:14R20.

Sulfur: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of ISO20846:19.

Water: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO12937:00.

sample #22081

Total Contamination: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of EN12662:14.

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	20	0.06	0.05	0.06
Aromatics by FIA	%V/V	6	n.e.	n.e.	n.e.
Ash content	%M/M	25	<0.01	n.e.	n.e.
Calc. Cetane Index two variables		20	53.74	0.63	2
Calc. Cetane Index four variables		32	52.76	1.01	0.91
Cloud Point	°C	39	-2.6	3.5	4
Cold Filter Plugging Point	°C	37	-7.1	2.7	3.4
Carbon Residue (micro method)	%M/M	26	<0.1	n.e.	n.e.
Ramsbottom Carbon Residue	%M/M	1	n.e.	n.e.	n.e.
Copper Corrosion 3 hrs at 50 °C		31	1(1a/b)	n.a.	n.a.
Density at 15 °C	kg/m^3	47	844.4	0.2	0.5
Initial Boiling Point	°C	46	164.3	9.0	9.0
10% recovery	°C	46	213.3	6.5	4.7
50% recovery	°C	45	291.6	2.9	3
90% recovery	°C	45	340.6	4.2	5.1
95% recovery	°C	45	353.9	6.5	8.8
Final Boiling Point	°C	46	362.3	4.8	7.1
Volume at 250 °C	%V/V	41	22.9	1.7	2.7
Volume at 350 °C	%V/V	40	93.9	2.0	2.7
Fatty Acid Methyl Esters (FAME)	%V/V	37	9.9	1.3	0.7
Flash Point PMcc	°C	45	63.1	3.2	4.5
Kinematic Viscosity at 40 °C	mm^2/s	40	3.180	0.042	0.034

Parameter	unit	n	average	2.8 * sd	R(lit)
Lubricity by HFRR at 60 °C	µm	22	194	63	80
Oxidation Stability	g/m^3	9	<6	n.e.	n.e.
Oxidation Stability Induct. period	hours	15	28.8	9.2	5.9
Polycyclic Aromatic Hydrocarb.	%M/M	17	4.50	1.11	1.30
Mono-Aromatic Hydrocarbons	%M/M	16	19.8	1.8	2.5
Di-Aromatic Hydrocarbons	%M/M	16	4.10	1.07	1.40
Tri+-Aromatic Hydrocarbons	%M/M	16	0.48	0.75	0.68
Total Aromatic Hydrocarbons	%M/M	14	24.3	2.3	3.1
Pour Point Manual	°C	25	-13.1	4.7	6.6
Pour Point Automated	°C	13	-12.3	4.5	6.1
Sulfur	mg/kg	36	8.6	2.2	2.1
Water	mg/kg	39	85.3	25.5	63.5
Total Contamination	mg/kg	22	27.1	13.4	8.6

Table 4: reproducibilities of tests on samples #22080 and #22081

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 INTERLABORATORY STUDY OF MAY 2022 WITH PREVIOUS PTS

	May 2022	May 2021	May 2020	June 2019	June 2018
Number of reporting laboratories	54	71	63	68	66
Number of test results	985	1351	1261	1349	1343
Number of statistical outliers	20	40	37	41	40
Percentage of statistical outliers	2.0%	3.0%	2.9%	3.0%	3.0%

Table 5: 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	May 2022	May 2021	May 2020	June 2019	June 2018
Total Acid Number	+	+	+	+/-	+/-
Aromatics by FIA	n.e.	(--)	n.e.	n.e.	n.e.
Ash content	n.e.	n.e.	+	++	++
Calc. Cetane Index two variables	++	++	++	++	++
Calc. Cetane Index four variables	-	+/-	+	++	++
Cloud Point	+	+	+	+	+
Cold Filter Plugging Point	+	-	+/-	+/-	-
Carbon Residue (micro method)	n.e.	(-)	(-)	(--)	(-)
Ramsbottom Carbon Residue	n.e.	--	-	--	-
Density at 15 °C	++	+	++	++	++
Distillation at 760 mmHg	+	+	+	+	+
Fatty Acid Methyl Esters (FAME)	-	+/-	+/-	+	+
Flash Point PMcc	+	+	+	+/-	+
Kinematic Viscosity at 40 °C	-	+/-	-	-	+
Lubricity by HFRR at 60 °C	+	+	+	++	+/-
Oxidation Stability	n.e.	+	+	+	+
Oxidation Stability Induct. period	-	-	-	-	+
Aromatic Hydrocarbons	+	+/-	+	+	+/-
Pour Point Manual	+	+	-	+	+
Pour Point Automated	+	+	+	+	+
Sulfur	+/-	+	+/-	-	+
Water	++	++	++	++	+
Total Contamination	-	+	-	--	-

Table 6: comparison of determinations to the reference test methods

For results between brackets no z-scores are calculated.

The following performance categories were used:

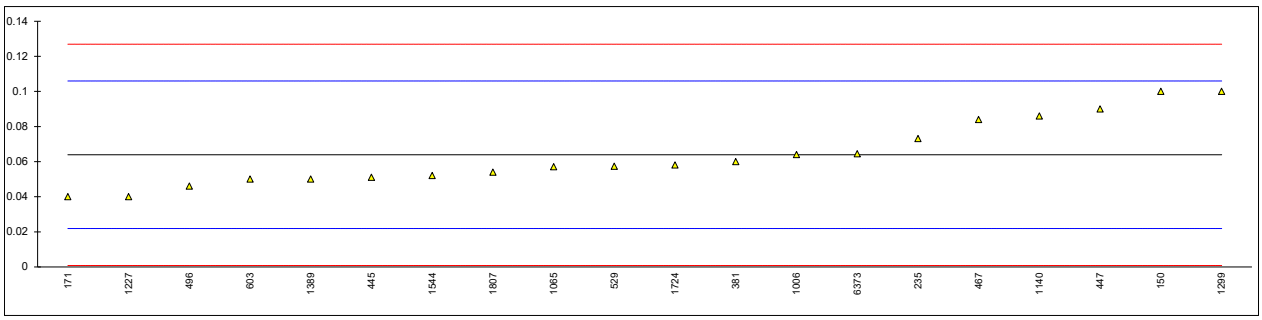
- ++ : group performed much better than the reference test method
- + : group performed better than the reference test method
- +/- : group performance equals the reference test method
- - : group performed worse than the reference test method
- -- : group performed much worse than the reference test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

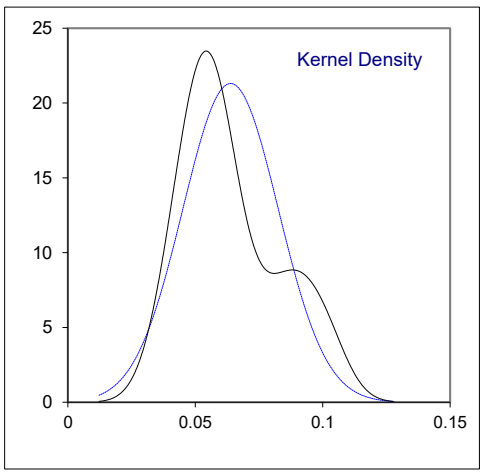
APPENDIX 1

Determination of Total Acid Number on sample #22080; result in mg KOH/g

lab	method	value	mark	z(targ)	remarks
62	D664-B	<0.1		-----	
120		-----		-----	
140		-----		-----	
150	D664-B	0.10		1.72	
171	D664-B	0.04		-1.13	
175		-----		-----	
235	D664-B	0.0731		0.44	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334	D664-B	<0.1		-----	
335		-----		-----	
338		-----		-----	
365		-----		-----	
381	D974	0.06		-0.18	
445	D664-B	0.051		-0.61	
447	D974	0.09		1.24	
460		-----		-----	
467	D664-A	0.084		0.96	
496	D664-B	0.046		-0.85	
529	D664-B	0.0574		-0.31	
541		-----		-----	
603	D664-A	0.050		-0.66	
633		-----		-----	
663		-----		-----	
1006	D664-B	0.064		0.01	
1017		-----		-----	
1059		-----		-----	
1065	D664-B	0.057		-0.33	
1126		-----		-----	
1134		-----		-----	
1140	D974	0.086		1.05	
1146		-----		-----	
1194		-----		-----	
1205		-----		-----	
1227	D664-B	0.04		-1.13	
1233		-----		-----	
1237		-----		-----	
1259		-----		-----	
1299	D664-B	0.100		1.72	
1316		-----		-----	
1389	D664-B	0.05		-0.66	
1459		-----		-----	
1544	D974	0.052		-0.56	
1706		-----		-----	
1724	D664-B	0.058		-0.28	
1728		-----		-----	
1807	D664-B	0.054		-0.47	
1833		-----		-----	
2146		-----		-----	
6075		-----		-----	
6168		-----		-----	
6257		-----		-----	
6373	D974	0.0645		0.03	
6452		-----		-----	
6453		-----		-----	
6461		-----		-----	

normality	OK
n	20
outliers	0
mean (n)	0.0639
st.dev. (n)	0.01872
R(calc.)	0.0524
st.dev.(D664-B:18e2)	0.02103
R(D664-B:18e2)	0.0589


0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
171
1227
496
603
1389
445
1544
1807
1065
529
1724
381
1006
6373
235
467
1140
447
150
1299


Kernel Density
25
20
15
10
5
0
0
0.05
0.1
0.15

Determination of Aromatics by FIA (without Oxygenates correction) on sample #22080; result in %V/V

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
235		-----		-----	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
365		-----		-----	
381		-----		-----	
445	D1319	5.8		-----	possibly a false negative test result?
447	D1319	27.8		-----	
460		-----		-----	
467	D1319	24.9		-----	
496	D1319	24.6		-----	
529		-----		-----	
541		-----		-----	
603		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1017		-----		-----	
1059		-----		-----	
1065		-----		-----	
1126		-----		-----	
1134		-----		-----	
1140		-----		-----	
1146		-----		-----	
1194		-----		-----	
1205		-----		-----	
1227		-----		-----	
1233		-----		-----	
1237		-----		-----	
1259	D1319	26.4		-----	
1299		-----		-----	
1316		-----		-----	
1389		-----		-----	
1459		-----		-----	
1544		-----		-----	
1706		-----		-----	
1724		-----		-----	
1728		-----		-----	
1807		-----		-----	
1833		-----		-----	
2146		-----		-----	
6075		-----		-----	
6168		-----		-----	
6257	EN15553	50	C	-----	first reported 41 / possibly a false positive test result?
6373		-----		-----	
6452		-----		-----	
6453		-----		-----	
6461		-----		-----	
	n	6			

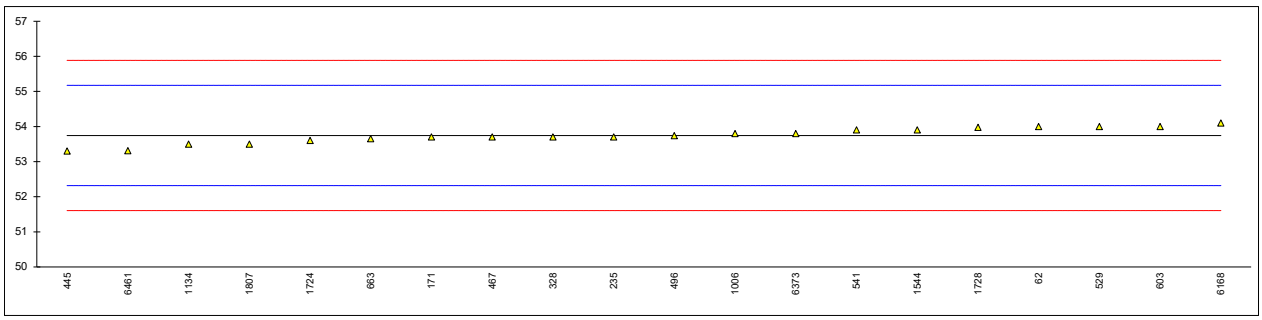
Determination of Ash content on sample #22080; result in %M/M

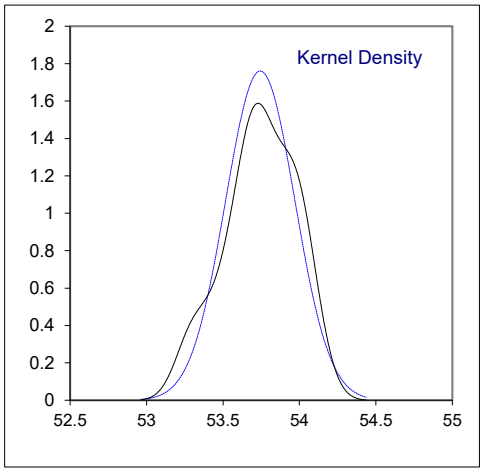
lab	method	value	mark	z(targ)	remarks
62	D482	<0.010		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171	D482	<0.010		-----	
175		-----		-----	
235	D482	0.0006		-----	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334	ISO6245	<0.001		-----	
335		-----		-----	
338		-----		-----	
365	IP4	0.001		-----	
381		-----		-----	
445	ISO6245	<0.001		-----	
447	IP4	0.004		-----	
460		-----		-----	
467	ISO6245	0.0005		-----	
496	D482	0.0003		-----	
529	D482	0.00030		-----	
541	ISO6245	<0.001		-----	
603	D482	<0.001		-----	
633		-----		-----	
663	D482	<0.010		-----	
1006		-----		-----	
1017		-----		-----	
1059	ISO6245	<0,001		-----	
1065		-----		-----	
1126		-----		-----	
1134		-----		-----	
1140	IP4	<0.001		-----	
1146	D482	<0.001		-----	
1194		-----		-----	
1205		-----		-----	
1227		-----		-----	
1233	ISO6245	0.000		-----	
1237		-----		-----	
1259		-----		-----	
1299	D482	<0.010		-----	
1316	ISO6245	<0.001		-----	
1389		-----		-----	
1459	ISO6245	0.000	C	-----	first reported 0.005
1544	ISO6245	0.0010		-----	
1706		-----		-----	
1724	D482	0.002		-----	
1728	D482	0.0004		-----	
1807		-----		-----	
1833		-----		-----	
2146		-----		-----	
6075		-----		-----	
6168		-----		-----	
6257		-----		-----	
6373	ISO6245	0.001		-----	
6452		-----		-----	
6453		-----		-----	
6461	D482	0.00		-----	
	n	25			
	mean (n)	<0.01			

Determination of Calculated Cetane Index, two variables D976 on sample #22080

lab	method	value	mark	z(targ)	remarks
62	D976	54.0		0.36	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171	D976	53.7		-0.06	
175		-----		-----	
235	D976	53.7		-0.06	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328	D976	53.7		-0.06	
334		-----		-----	
335		-----		-----	
338		-----		-----	
365		-----		-----	
381		-----		-----	
445	D976	53.3		-0.62	
447		-----		-----	
460		-----		-----	
467	D976	53.7		-0.06	
496	D976	53.74		-0.01	
529	D976	54		0.36	
541	D976	53.9		0.22	
603	D976	54.0		0.36	
633		-----		-----	
663	D976	53.65		-0.13	
1006	D976	53.8		0.08	
1017		-----		-----	
1059		-----		-----	
1065		-----		-----	
1126		-----		-----	
1134	D976	53.5	E	-0.34	calculation difference, iis calculated 53.9
1140		-----		-----	
1146		-----		-----	
1194		-----		-----	
1205		-----		-----	
1227		-----		-----	
1233		-----		-----	
1237		-----		-----	
1259		-----		-----	
1299		-----		-----	
1316		-----		-----	
1389		-----		-----	
1459		-----		-----	
1544	D976	53.90		0.22	
1706		-----		-----	
1724	D976	53.6		-0.20	
1728	D976	53.9786		0.33	
1807	D976	53.5		-0.34	
1833		-----		-----	
2146		-----		-----	
6075		-----		-----	
6168	D976	54.1		0.50	
6257		-----		-----	
6373	D976	53.8		0.08	
6452		-----		-----	
6453		-----		-----	
6461	D976	53.3093	E	-0.61	calculation difference, iis calculated 53.69

normality	OK
n	20
outliers	0
mean (n)	53.744
st.dev. (n)	0.2266
R(calc.)	0.635
st.dev.(D976:21)	0.7143
R(D976:21)	2

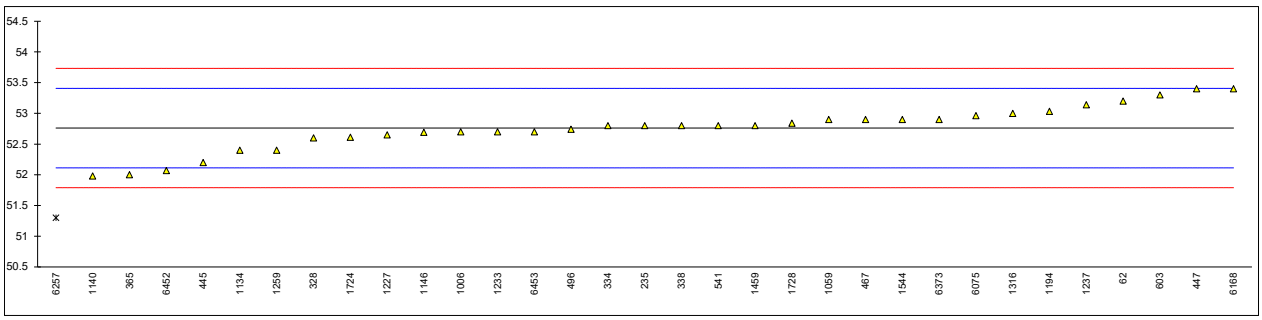

57
56
55
54
53
52
51
50
445
6461
1134
1807
1724
663
171
467
328
235
496
1006
6373
541
1544
1728
62
529
603
6168

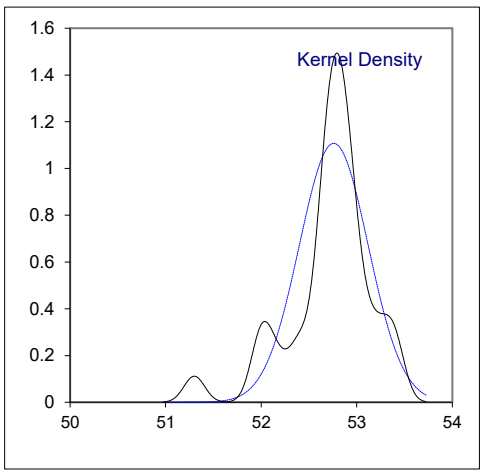

Kernel Density
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
52.5
53
53.5
54
54.5
55

Determination of Calculated Cetane Index, four variables ISO4264 on sample #22080

lab	method	value	mark	z(targ)	remarks
62	D4737-A	53.2		1.36	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
235	ISO4264	52.8		0.12	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328	ISO4264	52.6	E	-0.49	calculation difference, iis calculated 52.5
334	ISO4264	52.8		0.12	
335		-----		-----	
338	ISO4264	52.8		0.12	
365	IP380	52.0		-2.35	
381		-----		-----	
445	IP380	52.2	E	-1.73	calculation difference, iis calculated 52.1
447	IP380	53.4		1.98	
460		-----		-----	
467	ISO4264	52.9		0.43	
496	D4737-A	52.74		-0.06	
529		-----		-----	
541	D4737-A	52.8		0.12	
603	ISO4264	53.3		1.67	
633		-----		-----	
663		-----		-----	
1006	D4737-A	52.7		-0.18	
1017		-----		-----	
1059	ISO4264	52.9		0.43	
1065		-----		-----	
1126		-----		-----	
1134	IP380	52.4	E	-1.11	calculation difference, iis calculated 52.9
1140	IP380	51.98		-2.41	
1146	ISO4264	52.69		-0.22	
1194	D4737-A	53.03		0.83	
1205		-----		-----	
1227	D4737-A	52.65		-0.34	
1233	ISO4264	52.7		-0.18	
1237	ISO4264	53.14		1.17	
1259	ISO4264	52.4		-1.11	
1299		-----		-----	
1316	D4737-A	53.0		0.74	
1389		-----		-----	
1459	ISO4264	52.8		0.12	
1544	D4737-A	52.90	E	0.43	calculation difference, iis calculated 52.99
1706		-----		-----	
1724	D4737-A	52.61		-0.46	
1728	ISO4264	52.8394		0.25	
1807		-----		-----	
1833		-----		-----	
2146		-----		-----	
6075	ISO4264	52.96	E	0.62	calculation difference, iis calculated 53.10
6168	D4737-A	53.4		1.98	
6257	D4737-B	51.3	R(0.05), E	-4.51	calculation difference, iis calculated 51.1
6373	ISO4264	52.9		0.43	
6452	ISO4264	52.07	E	-2.13	calculation difference, iis calculated 52.56
6453	ISO4264	52.70	C	-0.18	first reported 51.87
6461		-----		-----	

normality	OK
n	32
outliers	1
mean (n)	52.760
st.dev. (n)	0.3603
R(calc.)	1.009
st.dev.(iis memo 1904)	0.3239
R(iis memo 1904)	0.907

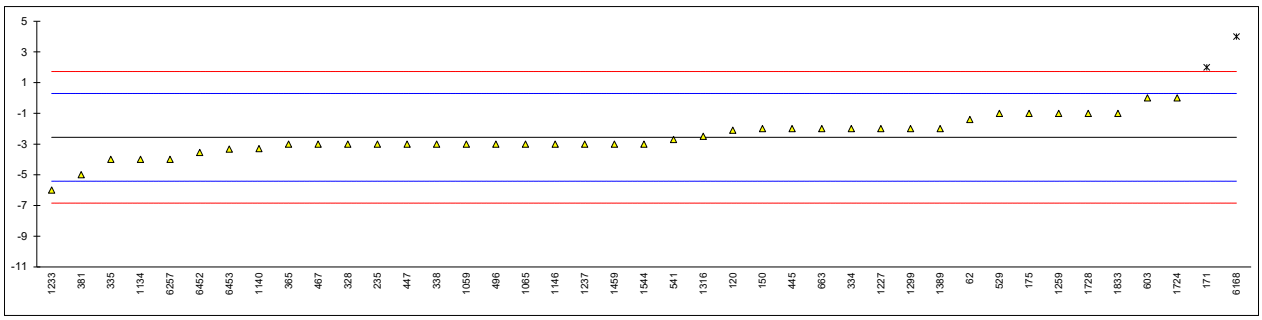

54.5
54
53.5
53
52.5
52
51.5
51
50.5
6257
1140
365
6452
445
1134
1259
328
1724
1227
1146
1006
1233
6453
496
334
235
338
541
1459
1728
1059
467
1544
6373
6075
1316
1194
1237
62
603
447
6168

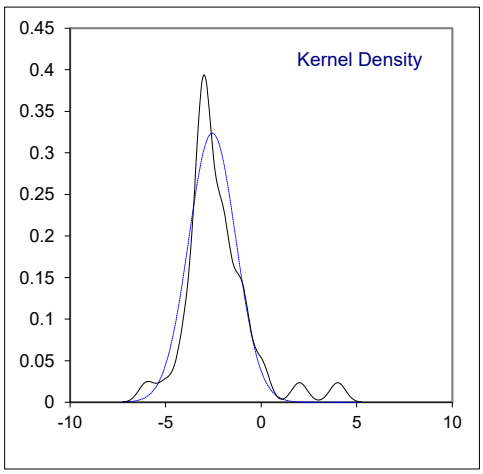

Kernel Density
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
50
51
52
53
54

Determination of Cloud Point on sample #22080; result in °C

lab	method	value	mark	z(targ)	remarks
62	D5773	-1.4		0.81	
120	D5773	-2.1		0.32	
140		-----		-----	
150	D5771	-2		0.39	
171	D2500	2	R(0.05)	3.19	
175	D5771	-1		1.09	
235	D2500	-3		-0.31	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328	ISO3015	-3		-0.31	
334	ISO3015	-2		0.39	
335	ISO3015	-4		-1.01	
338	ISO3015	-3		-0.31	
365	IP219	-3		-0.31	
381	ISO3015	-5		-1.71	
445	D2500	-2		0.39	
447	IP219	-3		-0.31	
460		-----		-----	
467	ISO3015	-3		-0.31	
496	ISO3015	-3		-0.31	
529	D2500	-1		1.09	
541	D5771	-2.7		-0.10	
603	D2500	0		1.79	
633		-----		-----	
663	D2500	-2		0.39	
1006		-----		-----	
1017		-----		-----	
1059	ISO3015	-3		-0.31	
1065	D5771	-3		-0.31	
1126		-----		-----	
1134	ISO3015	-4		-1.01	
1140	D5773	-3.3		-0.52	
1146	D2500	-3		-0.31	
1194		-----		-----	
1205		-----		-----	
1227	D2500	-2		0.39	
1233	ISO3015	-6		-2.41	
1237	ISO3015	-3		-0.31	
1259	EN23015	-1		1.09	
1299	D2500	-2		0.39	
1316	D5771	-2.5		0.04	
1389	D2500	-2		0.39	
1459	ISO3015	-3.0		-0.31	
1544	D2500	-3.0		-0.31	
1706		-----		-----	
1724	D2500	0		1.79	
1728	D2500	-1		1.09	
1807		-----		-----	
1833	D2500	-1		1.09	
2146		-----		-----	
6075		-----		-----	
6168	D2500	4	R(0.01)	4.59	
6257	ISO3015	-4.0		-1.01	
6373		-----		-----	
6452	D5771	-3.55		-0.69	
6453	D5771	-3.33		-0.54	
6461		-----		-----	

normality	OK
n	39
outliers	2
mean (n)	-2.561
st.dev. (n)	1.2322
R(calc.)	3.450
st.dev.(ISO3015:19)	1.4286
R(ISO3015:19)	4

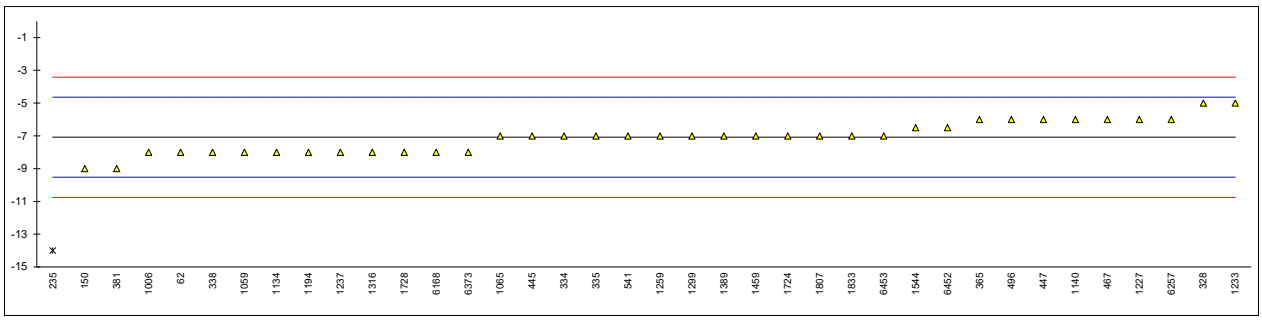

5
3
1
-1
-3
-5
-7
-9
-11
1233
381
335
1134
6257
6452
6453
1140
365
467
328
235
447
338
1059
496
1065
1146
1237
1459
1544
541
1316
120
150
445
663
334
1227
1299
1389
62
529
175
1259
1728
1833
603
1724
171
6168

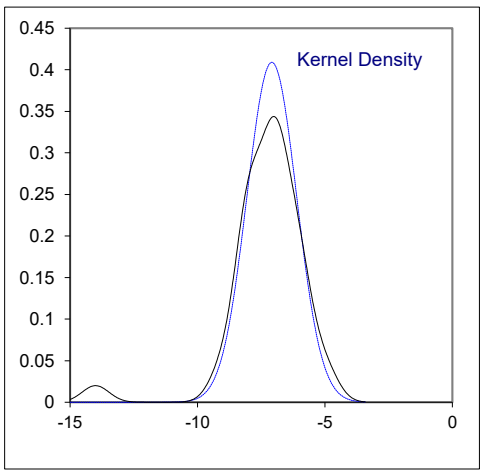

Kernel Density
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-10
-5
0
5
10

Determination of Cold Filter Plugging Point (CFPP) on sample #22080; result in °C

lab	method	value	mark	z(targ)	remarks
62	D6371	-8		-0.75	
120		-----		-----	
140		-----		-----	
150	EN116	-9		-1.57	
171		-----		-----	
175		-----		-----	
235	IP309	-14	C,R(0.01)	-5.66	first reported -15
237		-----		-----	
238		-----		-----	
323		-----		-----	
328	EN116	-5		1.70	
334	EN116	-7		0.07	
335	EN116	-7		0.07	
338	EN116	-8		-0.75	
365	IP309	-6		0.88	
381	EN116	-9	C	-1.57	first reported -13
445	IP309	-7		0.07	
447	IP309	-6		0.88	
460		-----		-----	
467	EN116	-6		0.88	
496	EN116	-6		0.88	
529		-----		-----	
541	D6371	-7		0.07	
603		-----		-----	
633		-----		-----	
663		-----		-----	
1006	D6371	-8		-0.75	
1017		-----		-----	
1059	EN116	-8		-0.75	
1065	D6371	-7		0.07	
1126		-----		-----	
1134	EN116	-8		-0.75	
1140	IP309	-6		0.88	
1146		-----		-----	
1194	EN116	-8		-0.75	
1205		-----		-----	
1227	EN116	-6		0.88	
1233	D6371	-5		1.70	
1237	EN116	-8		-0.75	
1259	EN116	-7		0.07	
1299	EN116	-7		0.07	
1316	EN116	-8		-0.75	
1389	IP309	-7		0.07	
1459	EN116	-7.0		0.07	
1544	EN116	-6.5		0.48	
1706		-----		-----	
1724	IP309	-7		0.07	
1728	D6371	-8		-0.75	
1807	EN116	-7		0.07	
1833	EN116	-7		0.07	
2146		-----		-----	
6075		-----		-----	
6168	D6371	-8		-0.75	
6257	EN116	-6.0		0.88	
6373	EN116	-8		-0.75	
6452	EN116	-6.5		0.48	
6453	EN116	-7		0.07	
6461		-----		-----	

normality	OK
n	37
outliers	1
mean (n)	-7.081
st.dev. (n)	0.9755
R(calc.)	2.731
st.dev.(EN116:15)	1.2232
R(EN116:15)	3.425


-1
-3
-5
-7
-9
-11
-13
-15
235
150
381
1006
62
338
1059
1134
1194
1237
1316
1728
6168
6373
1065
445
334
335
541
1259
1299
1389
1459
1724
1807
1833
6453
1544
6452
365
496
447
1140
467
1227
6257
328
1233


Kernel Density
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-15
-10
-5
0

Determination of Carbon Residue (micro method) on 10% distillation residue on sample #22080; result in %M/M

lab	method	value	mark	z(targ)	remarks
62	D4530	<0.1	C	-----	first reported 0.1
120		-----		-----	
140		-----		-----	
150	D4530	<0.1		-----	
171	D4530	<0.1		-----	
175		-----		-----	
235	ISO10370	0.05	C	-----	first reported 0.14
237		-----		-----	
238		-----		-----	
323		-----		-----	
328	ISO10370	<0.10		-----	
334	ISO10370	<0.10		-----	
335		-----		-----	
338		-----		-----	
365	IP13	0.047		-----	
381		-----		-----	
445	ISO10370	0.04		-----	
447	IP398	0.049		-----	
460		-----		-----	
467	ISO10370	0.029		-----	
496	ISO10370	0.03		-----	
529		-----		-----	
541	D4530	<0.1		-----	
603	D4530	<0.10		-----	
633		-----		-----	
663	D4530	<0.1		-----	
1006		-----		-----	
1017		-----		-----	
1059	ISO10370	0.02		-----	
1065		-----		-----	
1126		-----		-----	
1134		-----		-----	
1140	IP398	0.02		-----	
1146		-----		-----	
1194		-----		-----	
1205		-----		-----	
1227	D4530	0.01		-----	
1233	ISO10370	0.00		-----	
1237		-----		-----	
1259		-----		-----	
1299	D4530	0.03		-----	
1316	ISO10370	0.04		-----	
1389		-----		-----	
1459		-----		-----	
1544	ISO10370	0.0485		-----	
1706		-----		-----	
1724	D4530	<0,1		-----	
1728	ISO10370	0.043		-----	
1807		-----		-----	
1833	ISO10370	<0.1		-----	
2146		-----		-----	
6075	ISO10370	0.043		-----	
6168		-----		-----	
6257		-----		-----	
6373	ISO10370	0.049		-----	
6452		-----		-----	
6453		-----		-----	
6461	D189	0.56858	C	-----	first reported 0.18688 / possibly a false positive test result?
	n	26			
	mean (n)	<0.1			

Determination of Ramsbottom Carbon Residue on 10% distillation residue on sample #22080; result in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171	D524	0.08		-----	
175		-----		-----	
235		-----		-----	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
365		-----		-----	
381		-----		-----	
445		-----		-----	
447		-----		-----	
460		-----		-----	
467		-----		-----	
496		-----		-----	
529		-----		-----	
541		-----		-----	
603		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1017		-----		-----	
1059		-----		-----	
1065		-----		-----	
1126		-----		-----	
1134		-----		-----	
1140		-----		-----	
1146		-----		-----	
1194		-----		-----	
1205		-----		-----	
1227		-----		-----	
1233		-----		-----	
1237		-----		-----	
1259		-----		-----	
1299		-----		-----	
1316		-----		-----	
1389		-----		-----	
1459		-----		-----	
1544		-----		-----	
1706		-----		-----	
1724		-----		-----	
1728		-----		-----	
1807		-----		-----	
1833		-----		-----	
2146		-----		-----	
6075		-----		-----	
6168		-----		-----	
6257		-----		-----	
6373		-----		-----	
6452		-----		-----	
6453		-----		-----	
6461		-----		-----	
	n	1			

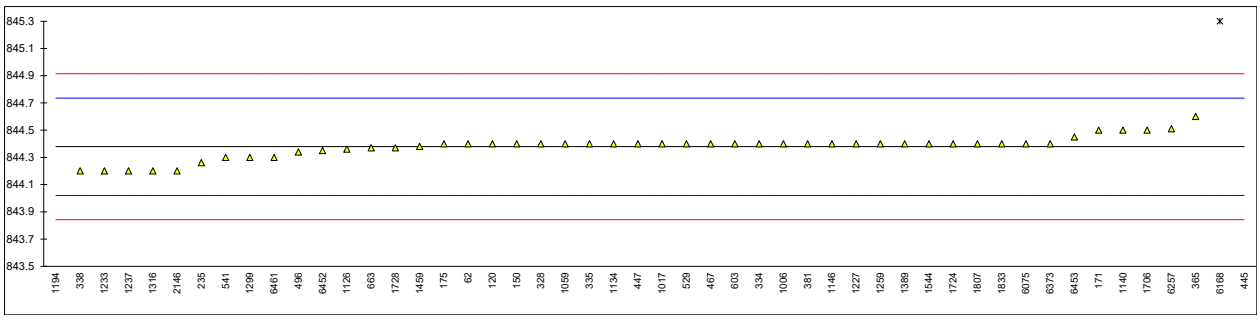
Determination of Copper Corrosion 3 hrs at 50 °C on sample #22080: rating

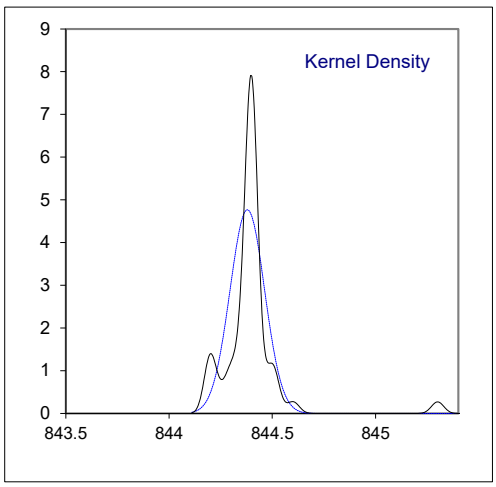
lab	method	value	mark	z(targ)	remarks
62	D130	1a		-----	
120		-----		-----	
140		-----		-----	
150	D130	1A		-----	
171	D130	1a		-----	
175		-----		-----	
235	D130	1b		-----	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328	D130	1		-----	
334	D130	1a		-----	
335		-----		-----	
338		-----		-----	
365	IP154	1a		-----	
381		-----		-----	
445	D130	1a		-----	
447	IP154	1a		-----	
460		-----		-----	
467	ISO2160	1a		-----	
496	D130	1a		-----	
529	D130	1A		-----	
541	D130	1a		-----	
603	D130	1A		-----	
633		-----		-----	
663	D130	1a		-----	
1006	D130	1a		-----	
1017		-----		-----	
1059	ISO2160	1a		-----	
1065		-----		-----	
1126		-----		-----	
1134		-----		-----	
1140	IP154	1A		-----	
1146		-----		-----	
1194		-----		-----	
1205		-----		-----	
1227	D130	1A		-----	
1233		-----		-----	
1237		-----		-----	
1259		-----		-----	
1299	D130	1a		-----	
1316	D130	1a		-----	
1389	D130	1A		-----	
1459		-----		-----	
1544	ISO2160	1a		-----	
1706		-----		-----	
1724	D130	1a		-----	
1728	D130	1A		-----	
1807	ISO2160	1a		-----	
1833		-----		-----	
2146		-----		-----	
6075	ISO2160	1a		-----	
6168	D130	1a		-----	
6257	ISO2160	1a		-----	
6373	D130	1A		-----	
6452		-----		-----	
6453		-----		-----	
6461	D130	1b		-----	
	n	31			
	mean (n)	1(1a/b)			

Determination of Density at 15 °C on sample #22080; result in kg/m^3

lab	method	value	mark	z(targ)	remarks
62	D4052	844.4		0.12	
120	D4052	844.4		0.12	
140		-----		-----	
150	D4052	844.4		0.12	
171	D4052	844.5		0.68	
175	D4052	844.4		0.12	
235	ISO12185	844.26		-0.66	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328	ISO12185	844.4		0.12	
334	ISO12185	844.4		0.12	
335	ISO12185	844.4		0.12	
338	ISO12185	844.2		-1.00	
365	IP365	844.6		1.24	
381	ISO12185	844.4		0.12	
445	D4052	845.5	R(0.01)	6.28	
447	IP365	844.4		0.12	
460		-----		-----	
467	ISO12185	844.40		0.12	
496	ISO12185	844.34		-0.22	
529	D4052	844.40		0.12	
541	ISO12185	844.3		-0.44	
603	D4052	844.4		0.12	
633		-----		-----	
663	D4052	844.37		-0.05	
1006	D4052	844.4		0.12	
1017	D4052	844.4		0.12	
1059	ISO12185	844.4		0.12	
1065		-----		-----	
1126	ISO12185	844.36		-0.10	
1134	D4052	844.4	C	0.12	first reported 0.8455 kg/L
1140	IP365	844.5		0.68	
1146	D4052	844.4	C	0.12	first reported 0.8444 kg/m^3
1194	In house	818.4	R(0.01)	-145.48	
1205		-----		-----	
1227	D4052	844.4		0.12	
1233	ISO12185	844.2	C	-1.00	first reported 884.5
1237	ISO12185	844.2		-1.00	
1259	ISO12185	844.4		0.12	
1299	D4052	844.3		-0.44	
1316	D4052	844.2		-1.00	
1389	D4052	844.4		0.12	
1459	ISO12185	844.38		0.01	
1544	ISO12185	844.40		0.12	
1706	ISO12185	844.5		0.68	
1724	D1298	844.4		0.12	
1728	D4052	844.37		-0.05	
1807	ISO12185	844.4		0.12	
1833	D4052	844.4		0.12	
2146	ISO12185	844.2	C	-1.00	first reported 844.0
6075	ISO12185	844.40	C	0.12	first reported 844.74
6168	D4052	845.3	R(0.01)	5.16	
6257	ISO12185	844.51		0.74	
6373	ISO12185	844.4		0.12	
6452	ISO12185	844.35000		-0.16	
6453	ISO12185	844.45		0.40	
6461	D287	844.3		-0.44	

normality	suspect
n	47
outliers	3
mean (n)	844.379
st.dev. (n)	0.0837
R(calc.)	0.234
st.dev.(ISO12185:96)	0.1786
R(ISO12185:96)	0.5

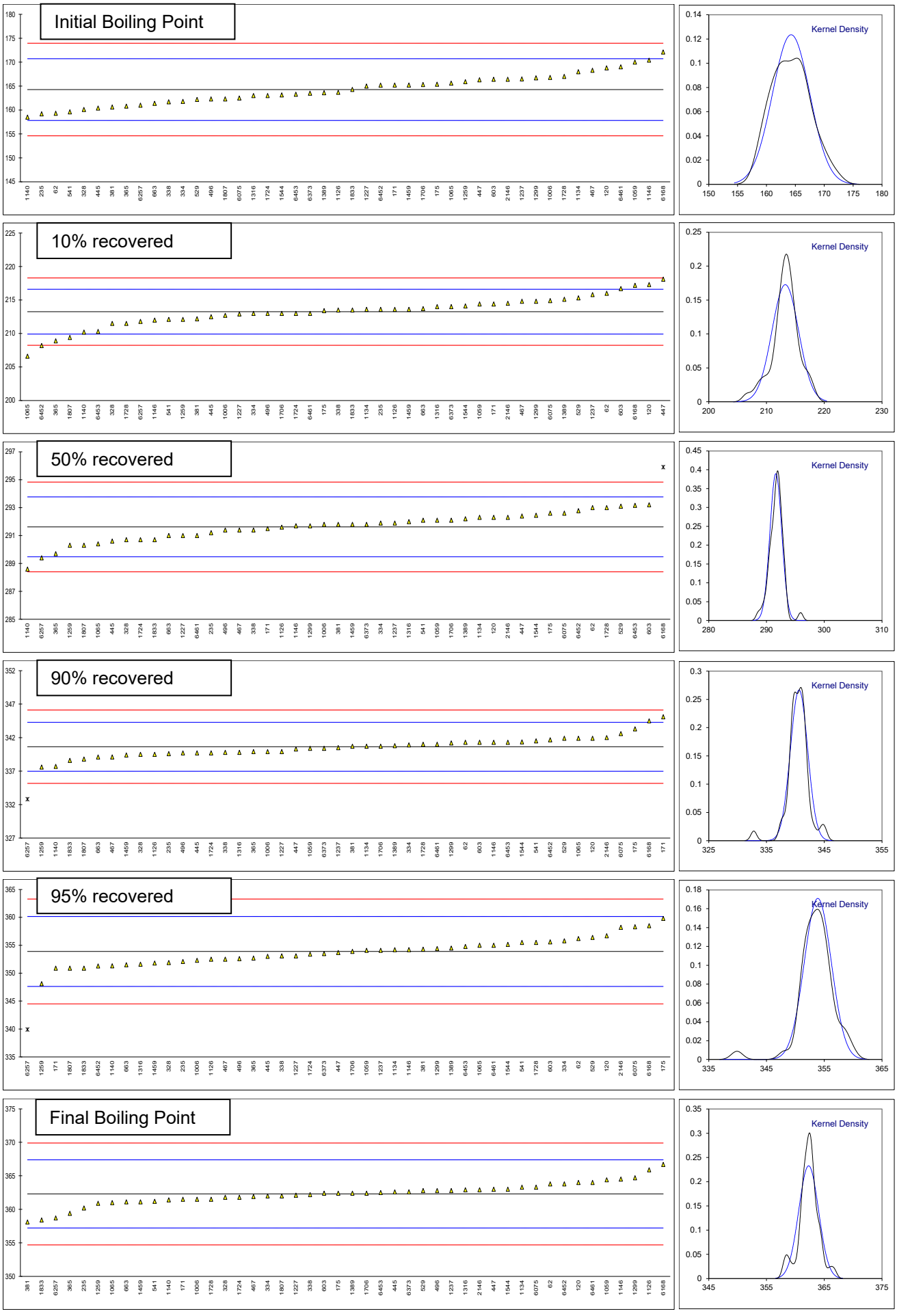

845.3
845.1
844.9
844.7
844.5
844.3
844.1
843.9
843.7
843.5
1194 338 1233 1237 1316 2146 235 541 1299 6461 496 6452 1126 663 1728 1459 175 62 120 150 328 1059 335 1134 447 1017 529 467 603 334 1006 381 1146 1227 1259 1389 1544 1724 1807 1833 6075 6373 6453 171 1140 1706 6257 365 6168 445


Kernel Density
9
8
7
6
5
4
3
2
1
0
843.5
844
844.5
845

Determination of Distillation at 760 mmHg on sample #22080; result in °C

lab	method	IBP	mark	10%rec	mark	50%rec	mark	90%rec	mark	95%rec	mark	FBP	mark
62	D86-automated	159.3		216.0		293.0		341.3		356.2		363.8	
120	D86-automated	168.8		217.3		292.3		341.9		356.7		364.0	
140		-----		-----		-----		-----		-----		-----	
150		-----		-----		-----		-----		-----		-----	
171	D86-automated	165.2		214.4		291.5		345.1		350.9		361.5	
175	D86-automated	165.4		213.4		292.6		343.3		359.8		362.4	
235	D86-automated	159.2		213.6		291.2		339.6		352.1		360.2	
237		-----		-----		-----		-----		-----		-----	
238		-----		-----		-----		-----		-----		-----	
323		-----		-----		-----		-----		-----		-----	
328	ISO3405-automated	160.1		211.5		290.7		339.5		351.9		361.8	
334	ISO3405-automated	161.8		213.0		291.9		340.9		355.8		362.0	
335		-----		-----		-----		-----		-----		-----	
338	ISO3405-automated	161.7		213.5		291.4		339.8		353.1		362.2	
365	IP123-automated	160.8		208.9		289.7		339.9		352.7		359.4	
381	ISO3405	160.6		212.2		291.8		340.7		354.3		358.1	
445	ISO3405-automated	160.4		212.5		290.6		339.7		353.0		362.6	
447	IP123-automated	166.3		218.1		292.4		340.3		353.7		363.0	
460		-----		-----		-----		-----		-----		-----	
467	ISO3405-automated	168.3		214.8		291.4		339.1		352.5		361.9	
496	ISO3405-automated	162.3		213.0		291.4		339.7		352.6		362.8	C
529	D86-automated	162.2		215.3		293.1		341.9		356.4		362.8	
541	ISO3405-automated	159.6		212.1		292.1		341.5		355.5		361.2	
603	D86-automated	166.4		216.7		293.2		341.3		355.6		362.4	
633		-----		-----		-----		-----		-----		-----	
663	D86-automated	161.4		213.7		291.0		339.1		351.5		361.1	
1006	D86-automated	166.8		212.7		291.8		339.9		352.3		361.5	
1017		-----		-----		-----		-----		-----		-----	
1059	ISO3405-automated	170.0		214.4		292.1		340.4		354.1		364.4	
1065		165.6		206.6		290.4		341.9		355.0		361.0	
1126		163.7		213.6		291.6		339.5		352.5		365.9	
1134	D86-automated	168.0		213.6		292.3		340.7		354.2		363.3	
1140	IP123-automated	158.5		210.2		288.6		337.7		351.3		361.4	
1146	D86-automated	170.4		212.0		291.7		341.3		354.2		364.5	
1194		-----		-----		-----		-----		-----		-----	
1205		-----		-----		-----		-----		-----		-----	
1227	D86-automated	165		212.9		291		339.9		353.1		362.1	
1233		-----		-----		-----		-----		-----		-----	
1237	ISO3405-automated	166.5		215.8		291.9		340.5		354.1		362.8	
1259	ISO3405-automated	165.9		212.1		290.3		337.6		348.1		360.9	
1299	D86-automated	166.7		214.8		291.7		341.2		354.4		364.7	
1316	D86-automated	163.0		214.0		292.0		339.8		351.6		362.9	
1389	D86-automated	163.6		215.1	C	292.2		340.8		354.5		362.4	
1459	ISO3405-automated	165.2		213.6		291.8		339.4		351.8		361.1	
1544	ISO3405-automated	163.15		214.10		292.45		341.35		355.15		363.00	
1706	ISO3405-automated	165.3		213.0		292.1		340.7		353.9		362.4	
1724	D86-automated	163		213		290.7		339.7		353.4		361.8	
1728	ISO3405-manual	167		211.5		293		341		355.5		361.5	
1807	ISO3405-automated	162.3		209.4		290.3		338.8		350.9		362.0	
1833	D86-automated	164.3		213.5		290.7		338.6		350.9		358.4	
2146	ISO3405-automated	166.4		214.5		292.3		342.0		358.2		362.9	
6075	ISO3405-automated	162.5		214.9		292.6		342.6		358.3		363.3	
6168	D86-automated	172.1		217.2		295.9	R(1)	344.5		358.5		366.7	
6257	ISO3405-automated	161.0		211.8		289.4		332.8	C,R(1)	339.9	C,R(1)	358.7	
6373	ISO3405-automated	163.5		214.0		291.8		340.4		353.5		362.6	
6452	ISO3405-automated	165.17		208.19		292.78		341.67		351.29		363.8	C
6453	ISO3405-automated	163.27		210.3	C	293.17		341.3	C	354.78		362.50	
6461	D86-manual	169		213		291		341		355		364	
	normality	OK		suspect		OK		suspect		OK		suspect	
	n	46		46		45		45		45		46	
	outliers	0		0		1		1		1		0	
	mean (n)	164.28		213.26		291.62		340.64		353.88		362.30	
	st.dev. (n)	3.230		2.309		1.024		1.495		2.334		1.715	
	R(calc.)	9.04		6.47		2.87		4.19		6.53		4.80	
	st.dev.(ISO3405-A:19)	3.227		1.676		1.071		1.825		3.136		2.536	
	R(ISO3405-A:19)	9.04		4.69		3		5.11		8.78		7.1	
Compare:													
	R(ISO3405-M:19)	7.36		5.19		3.92		3.64		4.68		3.81	

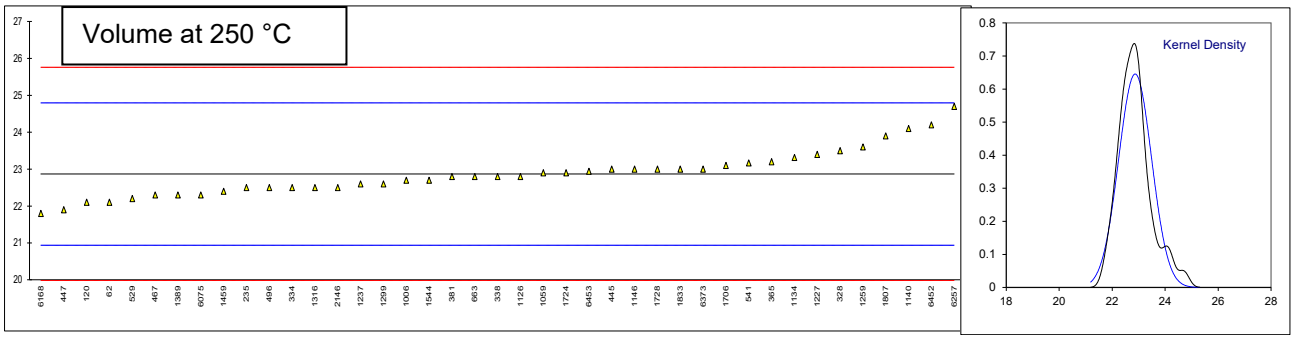
Lab 496 first reported 36.8 for FBP
Lab 1389 first reported 194.8 for 10% recovered
Lab 6257 first reported 335.5 for 90% and 343.7 for 95% recovered
Lab 6452 first reported 355.22 for FBP
Lab 6453 first reported 198.43 for 10% and 345.72 for 90% recovered

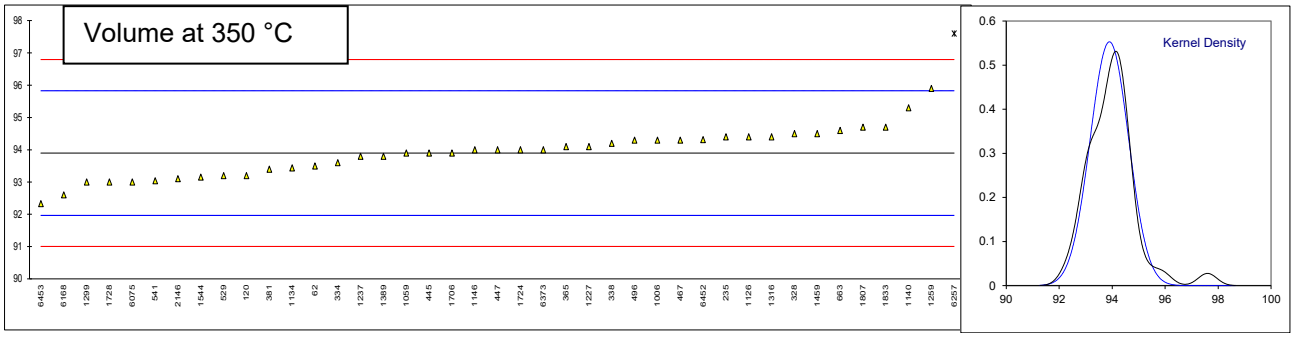

Initial Boiling Point
Kernel Density
10% recovered
Kernel Density
50% recovered
Kernel Density
90% recovered
Kernel Density
95% recovered
Kernel Density
Final Boiling Point
Kernel Density

Determination of Distillation at 760 mmHg on sample #22080; result in %V/V

lab	method	Vol at 250°C	mark	z(targ)	Vol at 350°C	mark	z(targ)	% residue	remark
62	D86-automated	22.1		-0.80	93.5		-0.41	0.6	
120	D86-automated	22.1		-0.80	93.2		-0.72	1.4	
140		-----		-----	-----		-----	-----	
150		-----		-----	-----		-----	-----	
171		-----		-----	-----		-----	0.8	
175		-----		-----	-----		-----	1.4	
235	D86-automated	22.5		-0.38	94.4		0.52	1.4	
237		-----		-----	-----		-----	-----	
238		-----		-----	-----		-----	-----	
323		-----		-----	-----		-----	-----	
328	ISO3405-automated	23.5		0.65	94.5		0.63	1.4	
334	ISO3405-automated	22.5		-0.38	93.6		-0.31	1.4	
335		-----		-----	-----		-----	-----	
338	ISO3405-automated	22.8		-0.07	94.2		0.31	1.4	
365	IP123-automated	23.2		0.34	94.1		0.21	1.2	
381	ISO3405	22.8		-0.07	93.4		-0.52	1.2	
445	ISO3405-automated	23.0		0.14	93.9		0.00	1.5	
447	IP123-automated	21.9		-1.00	94.0		0.11	1.4	
460		-----		-----	-----		-----	-----	
467	ISO3405-automated	22.3		-0.59	94.3		0.42	1.4	
496	ISO3405-automated	22.5		-0.38	94.3		0.42	1.0	
529	D86-automated	22.2		-0.69	93.2		-0.72	2.1	
541	ISO3405-automated	23.17		0.31	93.04		-0.89	1.4	
603		-----		-----	-----		-----	-----	
633		-----		-----	-----		-----	-----	
663	D86-automated	22.8		-0.07	94.6		0.73	-----	
1006	D86-automated	22.7		-0.18	94.3		0.42	1.4	
1017		-----		-----	-----		-----	-----	
1059	ISO3405-automated	22.9		0.03	93.9		0.00	1.4	
1065		-----		-----	-----		-----	1.8	
1126		22.8		-0.07	94.4		0.52	1.0	
1134	D86-automated	23.317		0.46	93.44		-0.47	1.4	
1140	IP123-automated	24.1		1.28	95.3		1.46	1.4	
1146	D86-automated	23		0.14	94		0.11	0.8	
1194		-----		-----	-----		-----	-----	
1205		-----		-----	-----		-----	-----	
1227	D86-automated	23.4		0.55	94.1		0.21	0.5	
1233		-----		-----	-----		-----	-----	
1237	ISO3405-automated	22.6		-0.28	93.8		-0.10	1.4	
1259	ISO3405-automated	23.6		0.76	95.9		2.08	1.4	
1299	D86-automated	22.6		-0.28	93.0		-0.93	1.4	
1316	D86-automated	22.5		-0.38	94.4		0.52	1.4	
1389	D86-automated	22.3		-0.59	93.8		-0.10	1.4	
1459	ISO3405-automated	22.4		-0.49	94.5		0.63	1.4	
1544	ISO3405-automated	22.70		-0.18	93.15		-0.77	1.4	
1706	ISO3405-automated	23.1		0.24	93.9		0.00	1.4	
1724	D86-automated	22.9		0.03	94		0.11	1.9	
1728	ISO3405-manual	23		0.14	93		-0.93	1.7	
1807	ISO3405-automated	23.9		1.07	94.7		0.83	1.4	
1833	D86-automated	23		0.14	94.7		0.83	1.8	
2146	ISO3405-automated	22.5		-0.38	93.1		-0.83	1.4	
6075	ISO3405-automated	22.3		-0.59	93.0		-0.93	1.3	
6168	D86-automated	21.8		-1.11	92.6		-1.34	1.4	
6257	ISO3405-automated	24.7	C	1.90	97.6	C,R(0.01)	3.84	1.4	
6373	ISO3405-automated	23.0		0.14	94.0		0.11	1.4	
6452	ISO3405-automated	24.20		1.38	94.31		0.43	1.7	
6453	ISO3405-automated	22.94	C	0.07	92.33		-1.62	2.1	
6461		-----		-----	-----		-----	2.05	
	normality	suspect			OK				
	n	41			40				
	outliers	0			1				
	mean (n)	22.87			93.90				
	st.dev. (n)	0.618			0.721				
	R(calc.)	1.73			2.02				
	st.dev.(ISO3405-A:19)	0.964			0.964				
	R(ISO3405-A:19)	2.7			2.7				
Compare:									
	R(ISO3405-M:19)	6.03			5.36				

Lab 6257 first reported 24.8 for Vol 250 °C and 98.5 for Vol 350 °C
Lab 6453 first reported 27.91 for Vol 250 °C

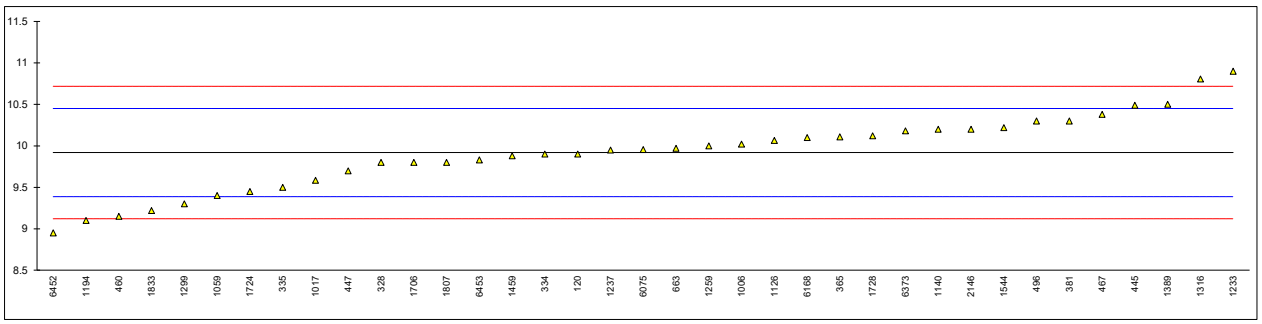

Volume at 250 °C
Kernel Density

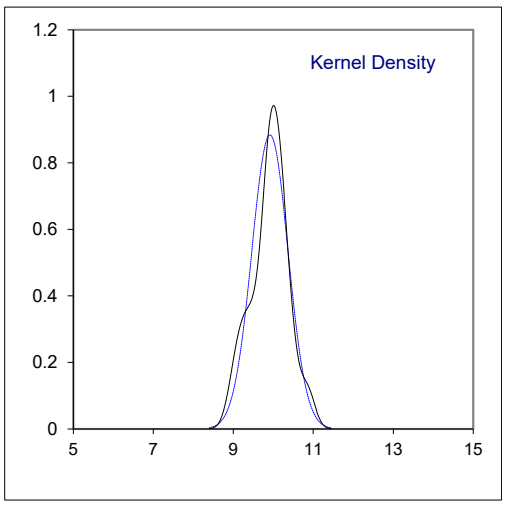

Volume at 350 °C
Kernel Density

Determination of Fatty Acid Methyl Esters (FAME) on sample #22080; result in %V/V

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D7371	9.90		-0.07	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
235		-----		-----	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328	EN14078-B	9.8		-0.45	
334	EN14078-B	9.9		-0.07	
335	EN14078-B	9.5		-1.58	
338		-----		-----	
365	EN14078-B	10.108		0.71	
381	EN14078-B	10.3		1.43	
445	EN14078-B	10.49		2.14	
447	EN14078-B	9.7		-0.83	
460	EN14078-B	9.15		-2.89	
467	EN14078-B	10.38		1.73	
496	EN14078-B	10.3		1.43	
529		-----		-----	
541		-----		-----	
603		-----		-----	
633		-----		-----	
663	EN14078-B	9.97		0.19	
1006	EN14078-A	10.02		0.38	
1017	EN14078-A	9.5845		-1.26	
1059	EN14078-B	9.4		-1.95	
1065		-----		-----	
1126	EN14078-A	10.066		0.55	
1134		-----		-----	
1140	EN14078-A	10.2		1.05	
1146		-----		-----	
1194	In house	9.1		-3.08	
1205		-----		-----	
1227		-----		-----	
1233	EN14078-C	10.9		3.68	
1237	EN14078-B	9.95		0.11	
1259	EN14078-A	10.0		0.30	
1299	EN14078-B	9.3		-2.33	
1316	EN14078-B	10.806		3.33	
1389	EN14078-A	10.5		2.18	
1459	EN14078-B	9.88		-0.15	
1544	EN14078-B	10.22		1.13	
1706	EN14078-B	9.8		-0.45	
1724	EN14078-A	9.45		-1.76	
1728	EN14078-B	10.12		0.75	
1807	EN14078-B	9.8		-0.45	
1833	EN14078-A	9.22		-2.63	
2146	In house	10.20		1.05	
6075	EN14078-B	9.955		0.13	
6168	EN14078-B	10.1		0.68	
6257		-----		-----	
6373	EN14078-B	10.18		0.98	
6452	EN14078-B	8.95		-3.64	
6453	EN14078-B	9.83		-0.34	
6461		-----		-----	

	normality	OK
	n	37
	outliers	0
	mean (n)	9.920
	st.dev. (n)	0.4514
	R(calc.)	1.264
	st.dev.(EN14078-B:14)	0.2662
	R(EN14078-B:14)	0.745
Compare:		
	R(D7371:14R22)	1.184

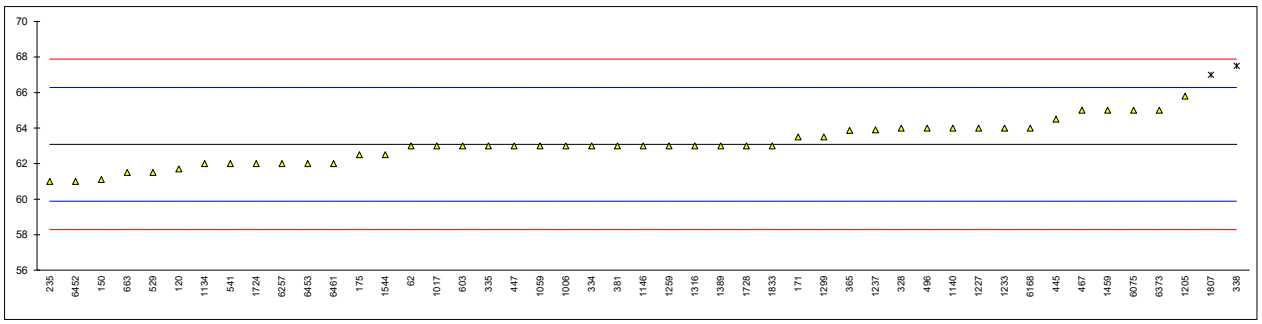

11.5
11
10.5
10
9.5
9
8.5
6452
1194
460
1833
1299
1059
1724
335
1017
447
328
1706
1807
6453
1459
334
120
1237
6075
663
1259
1006
1126
6168
365
1728
6373
1140
2146
1544
496
381
467
445
1389
1316
1233

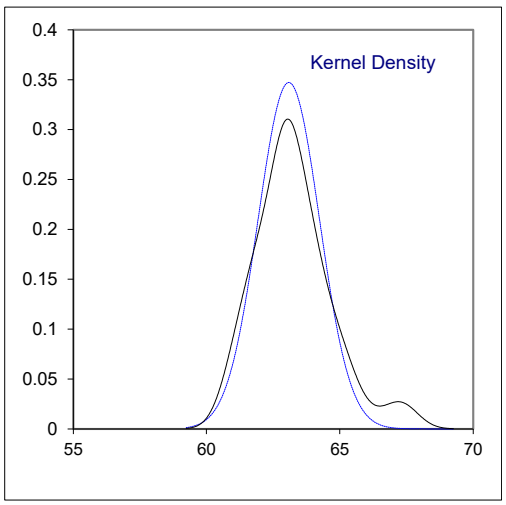

Kernel Density
1.2
1
0.8
0.6
0.4
0.2
0
5
7
9
11
13
15

Determination of Flash Point PMcc on sample #22080; result in °C

lab	method	value	mark	z(targ)	remarks
62	D93-A	63.0		-0.05	
120	D93-A	61.7		-0.87	
140		-----		-----	
150	D93-A	61.1		-1.24	
171	ISO2719-A	63.5		0.26	
175	D93-A	62.5		-0.37	
235	D93-A	61		-1.30	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328	ISO2719-A	64.0		0.57	
334	ISO2719-A	63.0		-0.05	
335	ISO2719-A	63.0		-0.05	
338	ISO2719-A	67.5	C,DG(0.05)	2.76	first reported 71.5
365	IP34-A	63.875		0.49	
381	ISO2719-A	63		-0.05	
445	IP34-A	64.5		0.88	
447	IP34-A	63.0		-0.05	
460		-----		-----	
467	ISO2719-A	65.0		1.20	
496	ISO2719-A	64.0		0.57	
529	D93-A	61.5		-0.99	
541	ISO2719-A	62.0		-0.68	
603	D93-A	63.0		-0.05	
633		-----		-----	
663	D93-A	61.5		-0.99	
1006	D93-A	63.0		-0.05	
1017	D93-A	63.0		-0.05	
1059	ISO2719-A	63.0		-0.05	
1065		-----		-----	
1126		-----		-----	
1134	D93-A	62.0		-0.68	
1140	IP34-A	64.0		0.57	
1146	D93-A	63.0		-0.05	
1194		-----		-----	
1205	D7215	65.8		1.70	
1227	D93-A	64		0.57	
1233	ISO2719-A	64.0		0.57	
1237	ISO2719-A	63.9		0.51	
1259	ISO2719-A	63.0		-0.05	
1299	D93-A	63.5		0.26	
1316	D93-A	63.0		-0.05	
1389	D93-A	63.0		-0.05	
1459	ISO2719-A	65.0		1.20	
1544	ISO2719-A	62.50		-0.37	
1706		-----		-----	
1724	D93-A	62		-0.68	
1728	D93-A	63		-0.05	
1807	ISO2719-A	67.0	DG(0.05)	2.45	
1833	D93-A	63		-0.05	
2146		-----		-----	
6075	ISO2719-A	65.0		1.20	
6168	D93-A	64.0		0.57	
6257	ISO2719-A	62.0		-0.68	
6373	D93-A	65.0		1.20	
6452	ISO2719-A	61.0		-1.30	
6453	ISO2719-A	62.00		-0.68	
6461	D93-A	62		-0.68	

normality	OK
n	45
outliers	2
mean (n)	63.086
st.dev. (n)	1.1494
R(calc.)	3.218
st.dev.(ISO2719-A:16+A1:21)	1.5997
R(ISO2719-A:16+A1:21)	4.479

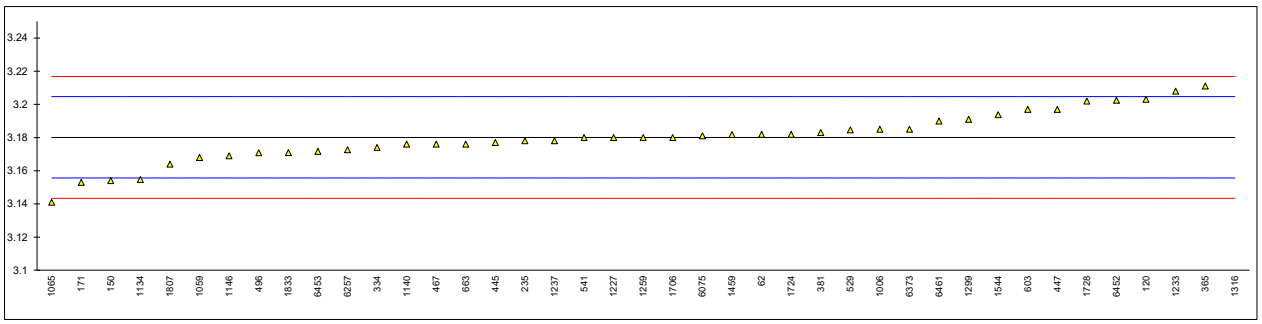

70
68
66
64
62
60
58
56
235
6452
150
663
529
120
1134
541
1724
6257
6453
6461
175
1544
62
1017
603
335
447
1059
1006
334
381
1146
1259
1316
1389
1728
1833
171
1299
365
1237
328
496
1140
1227
1233
6168
445
467
1459
6075
6373
1205
1807
338

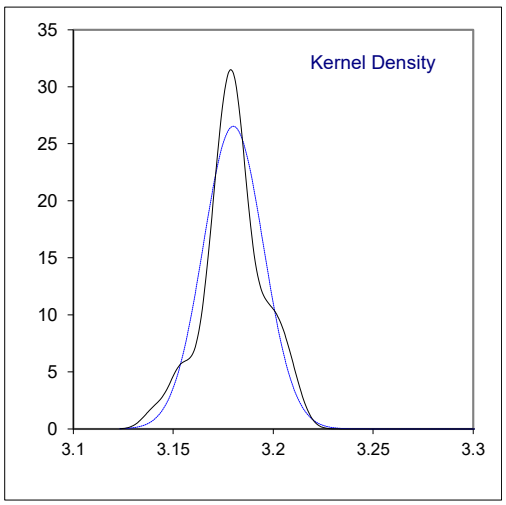

Kernel Density
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
55
60
65
70

Determination of Kinematic Viscosity at 40 °C on sample #22080; result in mm^2/s

lab	method	value	mark	z(targ)	remarks
62	D445	3.182		0.15	
120	D445	3.203		1.87	
140		-----		-----	
150	D445	3.154		-2.13	
171	ISO3104-A	3.153		-2.22	
175		-----		-----	
235	D445	3.178	C	-0.17	first reported 3.233
237		-----		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334	ISO3104-B	3.174		-0.50	
335		-----		-----	
338		-----		-----	
365	IP71	3.211		2.52	
381	D445	3.183		0.24	
445	D445	3.177		-0.25	
447	D445	3.197		1.38	
460		-----		-----	
467	ISO3104-A	3.1761		-0.33	
496	ISO3104-B	3.17075		-0.77	
529	D445	3.1846		0.37	
541	ISO3104-A	3.180		-0.01	
603	D445	3.197		1.38	
633		-----		-----	
663	D445	3.1761		-0.33	
1006	D445	3.185		0.40	
1017		-----		-----	
1059	ISO3104-B	3.168		-0.99	
1065	D445	3.141		-3.20	
1126		-----		-----	
1134	D445	3.1547		-2.08	
1140	IP71	3.176		-0.34	
1146	D445	3.169		-0.91	
1194		-----		-----	
1205		-----		-----	
1227		3.180		-0.01	
1233	ISO3104-B	3.208		2.28	
1237	ISO3104-A	3.178		-0.17	
1259	D7042	3.180		-0.01	
1299	D445	3.191		0.89	
1316	ISO3104-B	3.406	R(0.01)	18.45	
1389		-----		-----	
1459	D7042	3.1818		0.14	
1544	ISO3104-A	3.1938		1.12	
1706	ISO3104-B	3.180		-0.01	
1724	D445	3.182		0.15	
1728	D445	3.202		1.79	
1807	D445	3.164		-1.32	
1833	D445	3.171		-0.74	
2146		-----		-----	
6075	ISO3104-B	3.181		0.07	
6168		-----		-----	
6257	ISO3104-A	3.1727	C	-0.61	first reported 3.2543
6373	D445	3.185		0.40	
6452	D7042	3.2025		1.83	
6453	D7042	3.1716	C	-0.70	first reported 2.6342
6461	D445	3.190		0.81	

normality	OK
n	40
outliers	1
mean (n)	3.18012
st.dev. (n)	0.015041
R(calc.)	0.04211
st.dev.(ISO3104:20)	0.012242
R(ISO3104:20)	0.03428

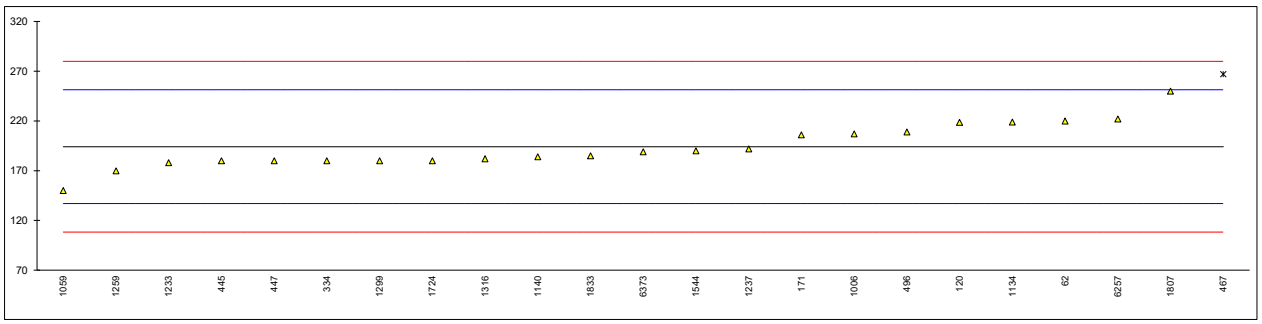

3.24
3.22
3.2
3.18
3.16
3.14
3.12
3.1
1065 171 150 1134 1807 1059 1146 496 1833 6453 6257 334 1140 467 663 445 235 1237 541 1227 1259 1706 6075 1459 62 1724 381 529 1006 6373 6461 1299 1544 603 447 1728 6452 120 1233 365 1316

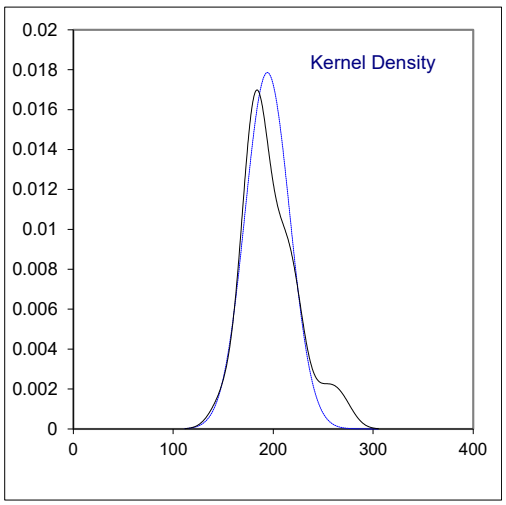

Kernel Density
35
30
25
20
15
10
5
0
3.1
3.15
3.2
3.25
3.3

Determination of Lubricity by HFRR at 60 °C on sample #22080; result in µm

lab	method	value	mark	z(targ)	corrected	remarks
62	D6079	220		0.90	No	
120	D6079	218.5		0.85	No	
140		-----		-----		
150		-----		-----		
171	D6079	206		0.41		
175		-----		-----		
235		-----		-----		
237		-----		-----		
238		-----		-----		
323		-----		-----		
328		-----		-----		
334	ISO12156-1-B	180		-0.50	No	
335		-----		-----		
338		-----		-----		
365		-----		-----		
381		-----		-----		
445	ISO12156-1-B	180		-0.50	No	
447	ISO12156-1-B	180		-0.50	No	
460		-----		-----		
467	ISO12156-1-A	267	D(0.05)	2.55	Yes	
496	ISO12156-1-A	209		0.52	No	
529		-----		-----		
541		-----		-----		
603		-----		-----		
633		-----		-----		
663		-----		-----		
1006	D6079	207		0.45	Yes	
1017		-----		-----		
1059	ISO12156-1-A	150		-1.55		
1065		-----		-----		
1126		-----		-----		
1134	ISO12156-1 (2006)	219		0.87	No	
1140	IP450	184		-0.36	No	
1146		-----		-----		
1194		-----		-----		
1205		-----		-----		
1227		-----		-----		
1233	ISO12156-1-A	178		-0.57	No	
1237	ISO12156-1-A	192		-0.08	No	
1259	ISO12156-1-B	170		-0.85	No	
1299		180		-0.50		
1316	ISO12156-1-B	182		-0.43	Yes	
1389		-----		-----		
1459		-----		-----		
1544	ISO12156-1-A	190		-0.15	No	
1706		-----		-----		
1724	ISO12156-1-A	180		-0.50	No	
1728		-----		-----		
1807	ISO12156-1-A	250		1.95		
1833	IP450	185		-0.32		
2146		-----		-----		
6075		-----		-----		
6168		-----		-----		
6257	ISO12156-1 (2006)	222		0.97	Yes	
6373	ISO12156-1 (2006)	189		-0.18	No	
6452		-----		-----		
6453		-----		-----		
6461		-----		-----		

	normality	OK
	n	22
	outliers	1
	mean (n)	194.16
	st.dev. (n)	22.336
	R(calc.)	62.54
	st.dev.(ISO12156-1-A:18 (Digital Camera))	28.571
	R(ISO12156-1-A:18 (Digital Camera))	80
Compare:		
	R(ISO12156-1-B:18 (Visual))	90


320
270
220
170
120
70
1059
1259
1233
445
447
334
1299
1724
1316
1140
1833
6373
1544
1237
171
1006
496
120
1134
62
6257
1807
467


Kernel Density
0.02
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
0
100
200
300
400

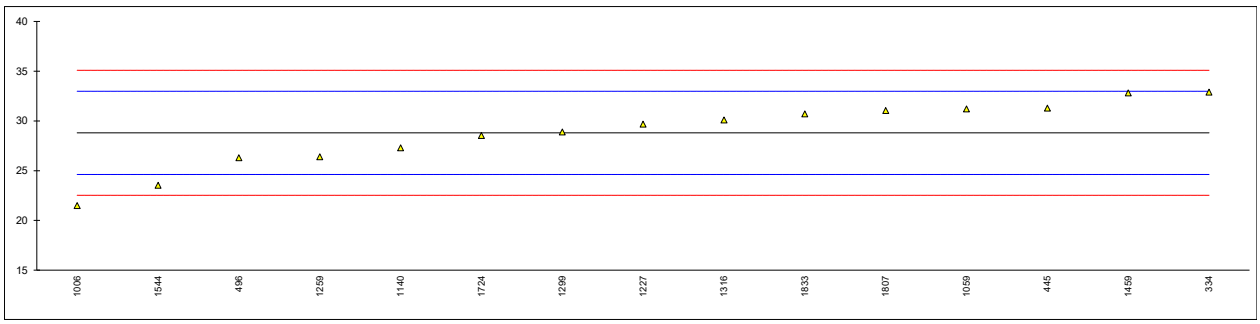
Determination of Oxidation Stability on sample #22080; result in g/m^3

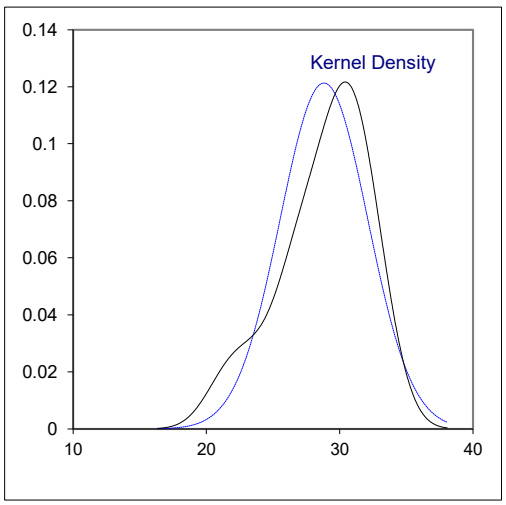
lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
235	ISO12205	3.1		-----	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
365		-----		-----	
381		-----		-----	
445	ISO12205	<1		-----	
447	ISO12205	1.4		-----	
460		-----		-----	
467		-----		-----	
496		-----		-----	
529		-----		-----	
541		-----		-----	
603		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1017		-----		-----	
1059	ISO12205	<1		-----	
1065		-----		-----	
1126		-----		-----	
1134		-----		-----	
1140	IP388	5.7		-----	
1146		-----		-----	
1194		-----		-----	
1205		-----		-----	
1227		-----		-----	
1233		-----		-----	
1237		-----		-----	
1259		-----		-----	
1299	D2274	1		-----	
1316	ISO12205	<1		-----	
1389		-----		-----	
1459		-----		-----	
1544		-----		-----	
1706		-----		-----	
1724		-----		-----	
1728		-----		-----	
1807	ISO12205	0		-----	
1833		-----		-----	
2146		-----		-----	
6075	ISO12205	3.1		-----	
6168		-----		-----	
6257		-----		-----	
6373		-----		-----	
6452		-----		-----	
6453		-----		-----	
6461		-----		-----	
	n	9			
	mean (n)	<6			

Determination of Oxidation Stability Induction period on sample #22080; result in hours

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
235		-----		-----	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334	EN15751	32.9		1.95	
335		-----		-----	
338		-----		-----	
365		-----		-----	
381		-----		-----	
445	EN15751	31.29		1.18	
447	EN15751	>20		-----	
460		-----		-----	
467		-----		-----	
496	EN15751	26.3		-1.20	
529		-----		-----	
541		-----		-----	
603		-----		-----	
633		-----		-----	
663		-----		-----	
1006	EN15751	21.5		-3.50	
1017		-----		-----	
1059	EN15751	31.2		1.14	
1065		-----		-----	
1126		-----		-----	
1134		-----		-----	
1140	EN15751	27.3		-0.72	
1146		-----		-----	
1194		-----		-----	
1205		-----		-----	
1227		29.68		0.41	
1233		-----		-----	
1237		-----		-----	
1259	EN15751	26.4		-1.15	
1299	EN15751	28.9		0.04	
1316	EN15751	30.1		0.61	
1389		-----		-----	
1459	EN15751	32.82		1.91	
1544	EN15751	23.54		-2.52	
1706		-----		-----	
1724	EN15751	28.54		-0.13	
1728		-----		-----	
1807	EN15751	31.05		1.07	
1833	EN15751	30.7		0.90	
2146		-----		-----	
6075		-----		-----	
6168		-----		-----	
6257		-----		-----	
6373		-----		-----	
6452		-----		-----	
6453		-----		-----	
6461		-----		-----	

normality	OK
n	15
outliers	0
mean (n)	28.815
st.dev. (n)	3.2881
R(calc.)	9.207
st.dev.(EN15751:14)	2.0923
R(EN15751:14)	5.858


40
35
30
25
20
15
1006
1544
496
1259
1140
1724
1299
1227
1316
1833
1807
1059
445
1459
334

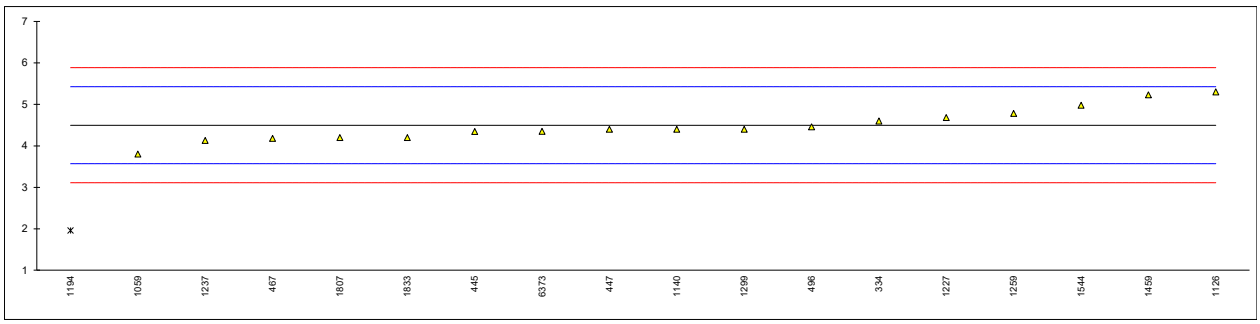

Kernel Density
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
10
20
30
40

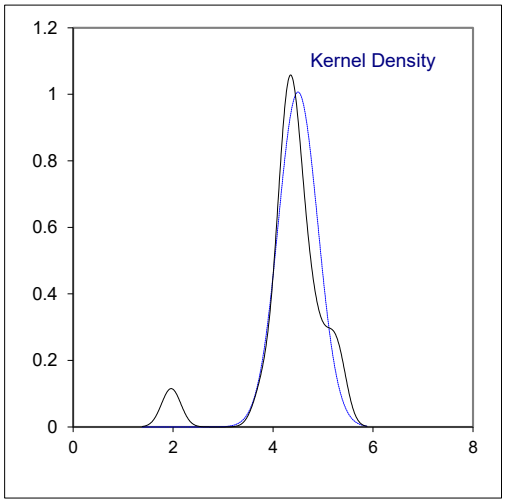
Determination of Polycyclic Aromatic Hydrocarbons *) on sample #22080; result in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
235		-----		-----	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334	EN12916	4.6		0.22	
335		-----		-----	
338		-----		-----	
365		-----		-----	
381		-----		-----	
445	IP391	4.345		-0.33	
447	IP391	4.4		-0.21	
460		-----		-----	
467	EN12916	4.18		-0.68	
496	EN12916	4.46		-0.08	
529		-----		-----	
541		-----		-----	
603		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1017		-----		-----	
1059	EN12916	3.8		-1.50	
1065		-----		-----	
1126		5.3		1.74	
1134		-----		-----	
1140	IP391	4.4		-0.21	
1146		-----		-----	
1194	EN12916	1.96	G(0.01)	-5.48	
1205		-----		-----	
1227		4.68		0.40	
1233		-----		-----	
1237	EN12916	4.13		-0.79	
1259	EN12916	4.783		0.62	
1299	EN12916	4.4		-0.21	
1316		-----		-----	
1389		-----		-----	
1459	EN12916	5.23		1.58	
1544	EN12916	4.98		1.04	
1706		-----		-----	
1724		-----		-----	
1728		-----		-----	
1807	EN12916	4.2		-0.64	
1833	IP391	4.2		-0.64	
2146		-----		-----	
6075		-----		-----	
6168		-----		-----	
6257		-----		-----	
6373		4.35		-0.32	
6452		-----		-----	
6453		-----		-----	
6461		-----		-----	

normality	OK
n	17
outliers	1
mean (n)	4.496
st.dev. (n)	0.3963
R(calc.)	1.110
st.dev.(EN12916:19)	0.4632
R(EN12916:19)	1.297

*) %Polycyclic Aromatic Hydrocarbons = sum of the di-aromatic hydrocarbons and tri+-aromatic hydrocarbons

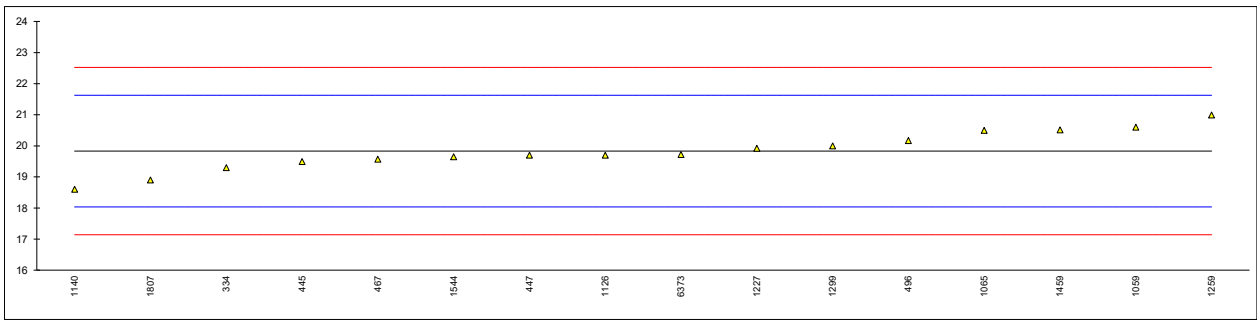

7
6
5
4
3
2
1
1194
1059
1237
467
1807
1833
445
6373
447
1140
1299
496
334
1227
1259
1544
1459
1126

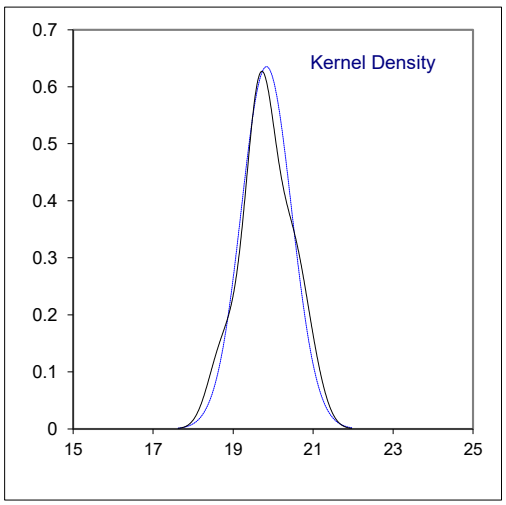

Kernel Density
1.2
1
0.8
0.6
0.4
0.2
0
0
2
4
6
8

Determination of Mono-Aromatic Hydrocarbons on sample #22080; result in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
235		-----		-----	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334	EN12916	19.3		-0.59	
335		-----		-----	
338		-----		-----	
365		-----		-----	
381		-----		-----	
445	IP391	19.495		-0.38	
447	IP391	19.7		-0.15	
460		-----		-----	
467	EN12916	19.57		-0.29	
496	EN12916	20.17		0.38	
529		-----		-----	
541		-----		-----	
603		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1017		-----		-----	
1059	EN12916	20.6		0.86	
1065		20.5		0.74	
1126		19.7		-0.15	
1134		-----		-----	
1140	IP391	18.6		-1.37	
1146		-----		-----	
1194		-----		-----	
1205		-----		-----	
1227		19.92		0.10	
1233		-----		-----	
1237		-----		-----	
1259	EN12916	20.990		1.29	
1299	EN12916	20.0		0.19	
1316		-----		-----	
1389		-----		-----	
1459	EN12916	20.51		0.75	
1544	EN12916	19.65		-0.20	
1706		-----		-----	
1724		-----		-----	
1728		-----		-----	
1807	EN12916	18.9		-1.04	
1833		-----		-----	
2146		-----		-----	
6075		-----		-----	
6168		-----		-----	
6257		-----		-----	
6373		19.72		-0.13	
6452		-----		-----	
6453		-----		-----	
6461		-----		-----	

normality	OK
n	16
outliers	0
mean (n)	19.8328
st.dev. (n)	0.62818
R(calc.)	1.7589
st.dev.(EN12916:19)	0.89712
R(EN12916:19)	2.5119

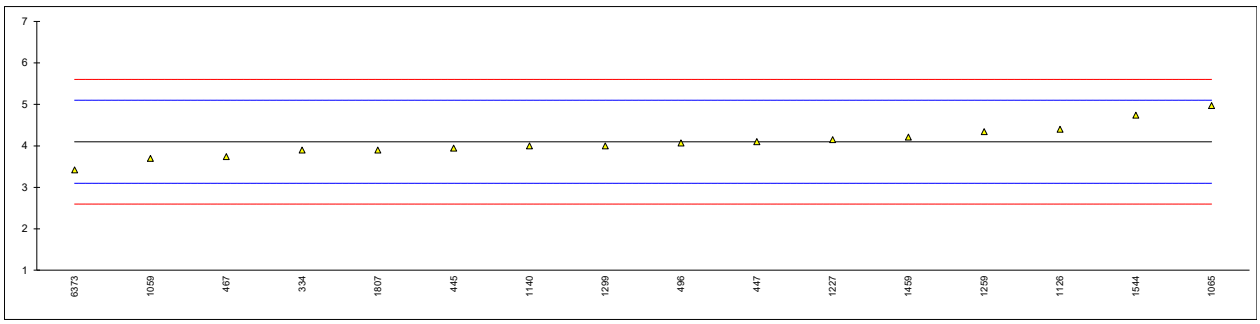

24
23
22
21
20
19
18
17
16
1140
1807
334
445
467
1544
447
1126
6373
1227
1299
496
1065
1459
1059
1259

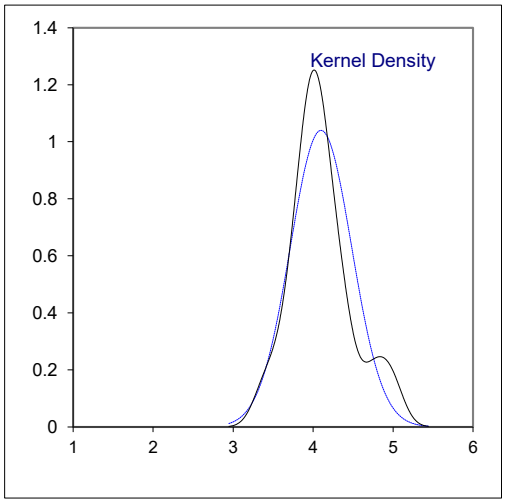

Kernel Density
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
15
17
19
21
23
25

Determination of Di-Aromatic Hydrocarbons on sample #22080; result in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
235		-----		-----	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334	EN12916	3.9		-0.40	
335		-----		-----	
338		-----		-----	
365		-----		-----	
381		-----		-----	
445	IP391	3.944		-0.31	
447	IP391	4.1		0.00	
460		-----		-----	
467	EN12916	3.74		-0.72	
496	EN12916	4.07		-0.06	
529		-----		-----	
541		-----		-----	
603		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1017		-----		-----	
1059	EN12916	3.7		-0.80	
1065		4.97		1.74	
1126		4.4		0.60	
1134		-----		-----	
1140	IP391	4.0		-0.20	
1146		-----		-----	
1194		-----		-----	
1205		-----		-----	
1227		4.15		0.10	
1233		-----		-----	
1237		-----		-----	
1259	EN12916	4.342		0.49	
1299	EN12916	4.0		-0.20	
1316		-----		-----	
1389		-----		-----	
1459	EN12916	4.21		0.22	
1544	EN12916	4.74		1.28	
1706		-----		-----	
1724		-----		-----	
1728		-----		-----	
1807	EN12916	3.9		-0.40	
1833		-----		-----	
2146		-----		-----	
6075		-----		-----	
6168		-----		-----	
6257		-----		-----	
6373		3.42		-1.36	
6452		-----		-----	
6453		-----		-----	
6461		-----		-----	

normality	OK
n	16
outliers	0
mean (n)	4.0991
st.dev. (n)	0.38357
R(calc.)	1.0740
st.dev.(EN12916:19)	0.50035
R(EN12916:19)	1.4010

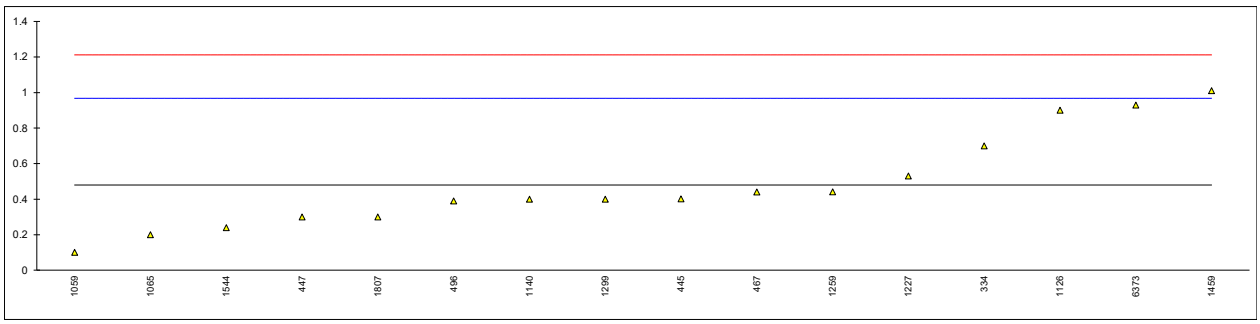

7
6
5
4
3
2
1
6373
1059
467
334
1807
445
1140
1299
496
447
1227
1459
1259
1126
1544
1065

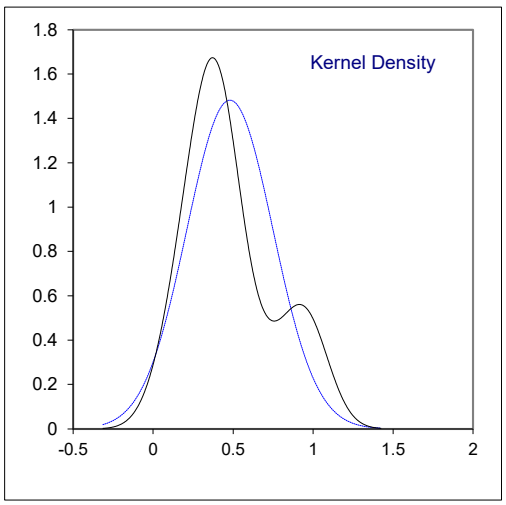

Kernel Density
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1
2
3
4
5
6

Determination of Tri+-Aromatic Hydrocarbons on sample #22080; result in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
235		-----		-----	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334	EN12916	0.7		0.90	
335		-----		-----	
338		-----		-----	
365		-----		-----	
381		-----		-----	
445	IP391	0.401		-0.32	
447	IP391	0.3		-0.74	
460		-----		-----	
467	EN12916	0.44		-0.16	
496	EN12916	0.39		-0.37	
529		-----		-----	
541		-----		-----	
603		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1017		-----		-----	
1059	EN12916	0.1		-1.56	
1065		0.2		-1.15	
1126		0.9		1.72	
1134		-----		-----	
1140	IP391	0.4		-0.33	
1146		-----		-----	
1194		-----		-----	
1205		-----		-----	
1227		0.53		0.20	
1233		-----		-----	
1237		-----		-----	
1259	EN12916	0.441		-0.16	
1299	EN12916	0.4		-0.33	
1316		-----		-----	
1389		-----		-----	
1459	EN12916	1.01		2.17	
1544	EN12916	0.24		-0.98	
1706		-----		-----	
1724		-----		-----	
1728		-----		-----	
1807	EN12916	0.3		-0.74	
1833		-----		-----	
2146		-----		-----	
6075		-----		-----	
6168		-----		-----	
6257		-----		-----	
6373		0.93		1.84	
6452		-----		-----	
6453		-----		-----	
6461		-----		-----	

normality	OK
n	16
outliers	0
mean (n)	0.4801
st.dev. (n)	0.26909
R(calc.)	0.7535
st.dev.(EN12916:19)	0.24401
R(EN12916:19)	0.6832

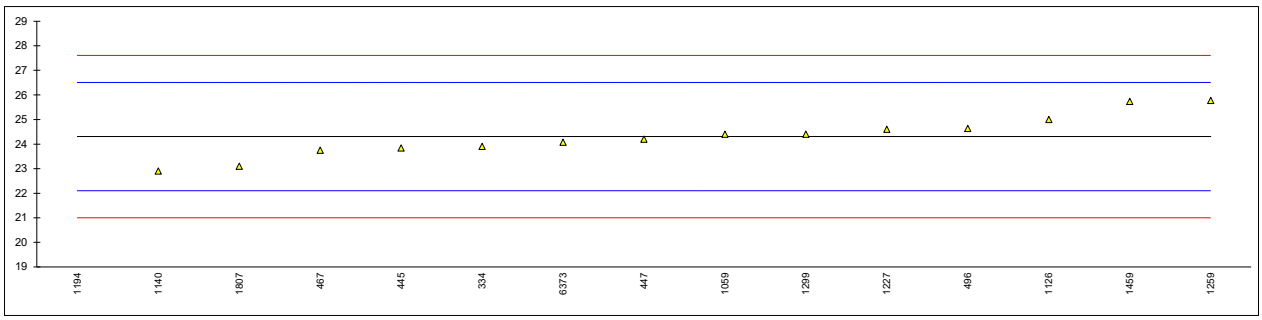

1.4
1.2
1
0.8
0.6
0.4
0.2
0
1059
1065
1544
447
1807
496
1140
1299
445
467
1259
1227
334
1126
6373
1459

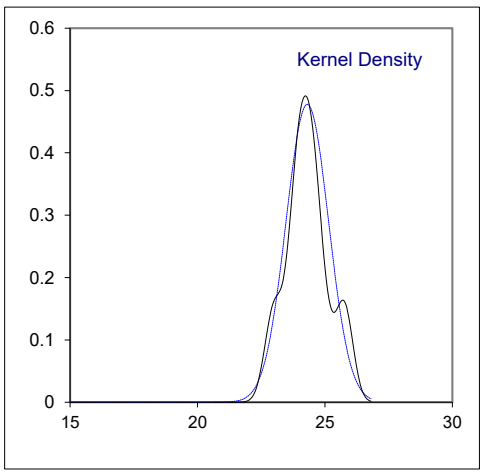

Kernel Density
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-0.5
0
0.5
1
1.5
2

Determination of Total Aromatic Hydrocarbons on sample #22080; result in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
235		-----		-----	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334	EN12916	23.9		-0.37	
335		-----		-----	
338		-----		-----	
365		-----		-----	
381		-----		-----	
445	IP391	23.840		-0.42	
447	IP391	24.2		-0.10	
460		-----		-----	
467	EN12916	23.75		-0.50	
496	EN12916	24.63		0.29	
529		-----		-----	
541		-----		-----	
603		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1017		-----		-----	
1059	EN12916	24.4		0.08	
1065		-----		-----	
1126		25.0		0.63	
1134		-----		-----	
1140	IP391	22.9		-1.28	
1146		-----		-----	
1194	EN12916	13.6	G(0.01)	-9.71	
1205		-----		-----	
1227		24.60		0.27	
1233		-----		-----	
1237		-----		-----	
1259	EN12916	25.773		1.33	
1299	EN12916	24.4		0.08	
1316		-----		-----	
1389		-----		-----	
1459	EN12916	25.73		1.29	
1544		-----		-----	
1706		-----		-----	
1724		-----		-----	
1728		-----		-----	
1807	EN12916	23.1		-1.09	
1833		-----		-----	
2146		-----		-----	
6075		-----		-----	
6168		-----		-----	
6257		-----		-----	
6373		24.07		-0.21	
6452		-----		-----	
6453		-----		-----	
6461		-----		-----	

normality	OK
n	14
outliers	1
mean (n)	24.307
st.dev. (n)	0.8348
R(calc.)	2.337
st.dev.(EN12916:19)	1.1024
R(EN12916:19)	3.087

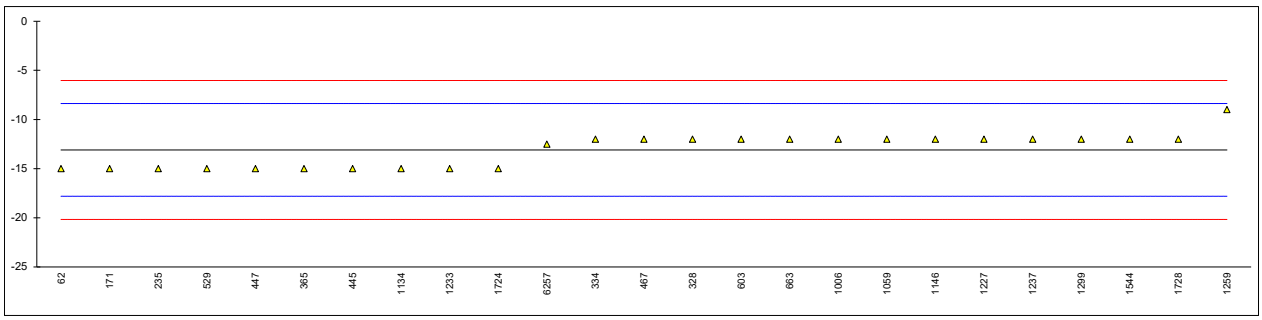

29
28
27
26
25
24
23
22
21
20
19
1194
1140
1807
467
445
334
6373
447
1059
1299
1227
496
1126
1459
1259

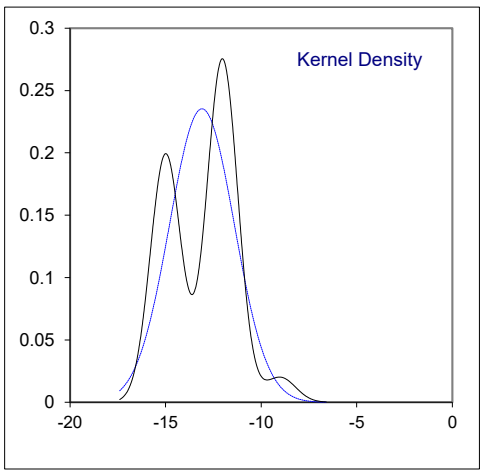

Kernel Density
0.6
0.5
0.4
0.3
0.2
0.1
0
15
20
25
30

Determination of Pour Point Manual on sample #22080; results in °C

lab	method	value	mark	z(targ)	remarks
62	D97	-15		-0.81	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171	D97	-15		-0.81	
175		-----		-----	
235	D97	-15		-0.81	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328	ISO3016-automated	-12		0.47	
334	ISO3016-automated	-12		0.47	
335		-----		-----	
338		-----		-----	
365	IP15	-15		-0.81	
381		-----		-----	
445	D97	-15		-0.81	
447	IP15	-15		-0.81	
460		-----		-----	
467	ISO3016-manual	-12		0.47	
496		-----		-----	
529	D97	-15		-0.81	
541		-----		-----	
603	D97	-12		0.47	
633		-----		-----	
663	D97	-12		0.47	
1006	D97	-12		0.47	
1017		-----		-----	
1059	ISO3016-automated	-12		0.47	
1065		-----		-----	
1126		-----		-----	
1134	IP15	-15		-0.81	
1140		-----		-----	
1146	D97	-12		0.47	
1194		-----		-----	
1205		-----		-----	
1227	D97	-12		0.47	
1233	ISO3016-manual	-15		-0.81	
1237	ISO3016-manual	-12		0.47	
1259	ISO3016-manual	-9		1.74	
1299	D97	-12		0.47	
1316		-----		-----	
1389		-----		-----	
1459		-----		-----	
1544	ISO3016-manual	-12.0		0.47	
1706		-----		-----	
1724	D97	-15		-0.81	
1728	D97	-12		0.47	
1807		-----		-----	
1833		-----		-----	
2146		-----		-----	
6075		-----		-----	
6168		-----		-----	
6257	ISO3016-automated	-12.5		0.25	
6373		-----		-----	
6452		-----		-----	
6453		-----		-----	
6461		-----		-----	

normality	OK
n	25
outliers	0
mean (n)	-13.100
st.dev. (n)	1.6956
R(calc.)	4.748
st.dev.(ISO3016:19)	2.3571
R(ISO3016:19)	6.6

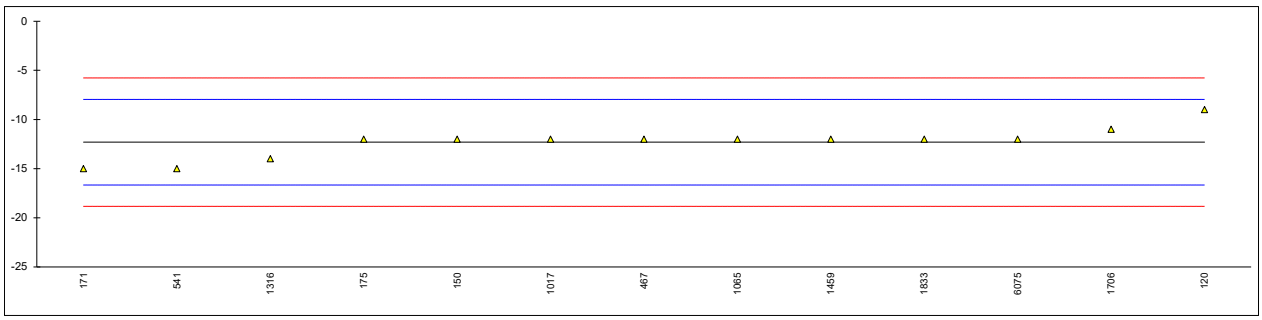

0
-5
-10
-15
-20
-25
62
171
235
529
447
365
445
1134
1233
1724
6257
334
467
328
603
663
1006
1059
1146
1227
1237
1299
1544
1728
1259

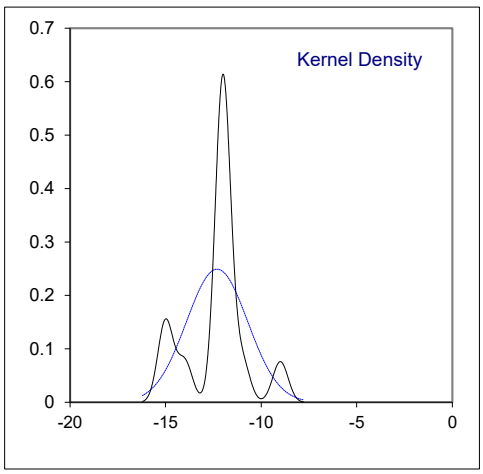

Kernel Density
0.3
0.25
0.2
0.15
0.1
0.05
0
-20
-15
-10
-5
0

Determination of Pour Point Automated 3 °C interval on sample #22080; results in °C

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D5949	-9.0		1.52	
140		-----		-----	
150	D5950	-12		0.14	
171	D5950	-15		-1.24	
175	D5950	-12		0.14	
235		-----		-----	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
365		-----		-----	
381		-----		-----	
445		-----		-----	
447		-----		-----	
460		-----		-----	
467	D6892	-12		0.14	
496		-----		-----	
529		-----		-----	
541	D5950	-15		-1.24	
603		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1017	D5950	-12		0.14	
1059		-----		-----	
1065	D5950	-12		0.14	
1126		-----		-----	
1134		-----		-----	
1140		-----		-----	
1146		-----		-----	
1194		-----		-----	
1205		-----		-----	
1227		-----		-----	
1233		-----		-----	
1237		-----		-----	
1259		-----		-----	
1299		-----		-----	
1316	D5950	-14.0		-0.78	
1389		-----		-----	
1459	In house	-12.0		0.14	
1544		-----		-----	
1706	D5950	-11		0.60	
1724		-----		-----	
1728		-----		-----	
1807		-----		-----	
1833	D5950	-12		0.14	
2146		-----		-----	
6075	NF T60-105	-12		0.14	
6168		-----		-----	
6257		-----		-----	
6373		-----		-----	
6452		-----		-----	
6453		-----		-----	
6461		-----		-----	

normality	suspect
n	13
outliers	0
mean (n)	-12.308
st.dev. (n)	1.6013
R(calc.)	4.484
st.dev.(D5950:14R20)	2.1786
R(D5950:14R20)	6.1

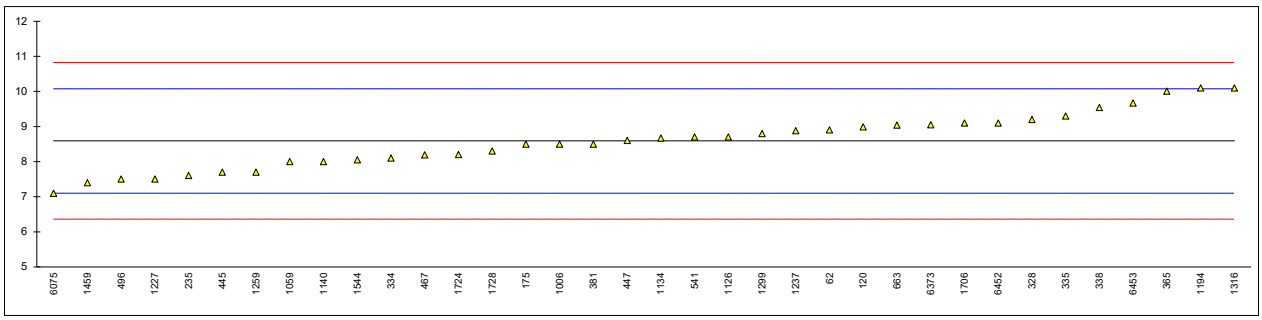

0
-5
-10
-15
-20
-25
171
541
1316
175
150
1017
467
1065
1459
1833
6075
1706
120

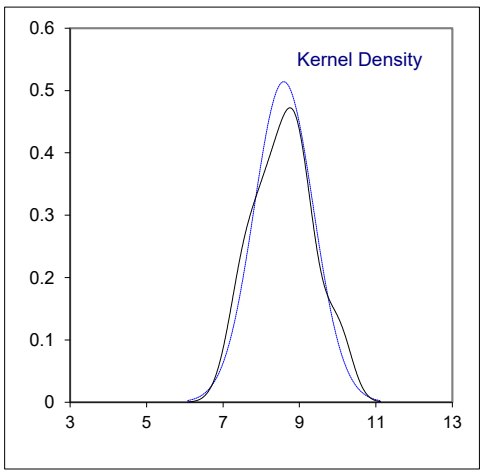

Kernel Density
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-20
-15
-10
-5
0

Determination of Sulfur on sample #22080; result in mg/kg

lab	method	value	mark	z(targ)	remarks
62	D5453	8.9		0.42	
120	D7039	8.99		0.54	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175	D5453	8.5		-0.12	
235	D5453	7.6		-1.33	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328	ISO20846	9.2		0.82	
334	ISO20846	8.1		-0.66	
335	ISO20846	9.3		0.95	
338	ISO20846	9.54		1.28	
365	IP490	10.005		1.90	
381	ISO20846	8.5		-0.12	
445	ISO20846	7.7		-1.20	
447	IP490	8.6		0.01	
460		-----		-----	
467	ISO20846	8.19		-0.54	
496	ISO20846	7.5		-1.47	
529		-----		-----	
541	ISO20846	8.7		0.15	
603		-----		-----	
633		-----		-----	
663	D5453	9.04		0.60	
1006	D5453	8.5		-0.12	
1017		-----		-----	
1059	ISO20846	8.0		-0.80	
1065		-----		-----	
1126	ISO20846	8.7		0.15	
1134	IP490	8.67		0.11	
1140	D5453	8.0		-0.80	
1146	D4294	<100		-----	
1194	D7221	10.1		2.03	
1205		-----		-----	
1227	D5453	7.5		-1.47	
1233		-----		-----	
1237	ISO20846	8.88		0.39	
1259	ISO20846	7.7		-1.20	
1299	ISO20884	8.8		0.28	
1316	ISO13032	10.1		2.03	
1389		-----		-----	
1459	ISO20884	7.4		-1.60	
1544	ISO20846	8.05		-0.73	
1706	ISO20846	9.1		0.68	
1724	D5453	8.2		-0.53	
1728	ISO20846	8.3		-0.39	
1807		-----		-----	
1833		-----		-----	
2146		-----		-----	
6075	ISO20846	7.1		-2.01	
6168		-----		-----	
6257		-----		-----	
6373	ISO20846	9.05		0.62	
6452	ISO20846	9.10		0.68	
6453	ISO20846	9.67		1.45	
6461		-----		-----	

normality	OK
n	36
outliers	0
mean (n)	8.591
st.dev. (n)	0.7761
R(calc.)	2.173
st.dev.(ISO20846:19)	0.7437
R(ISO20846:19)	2.082

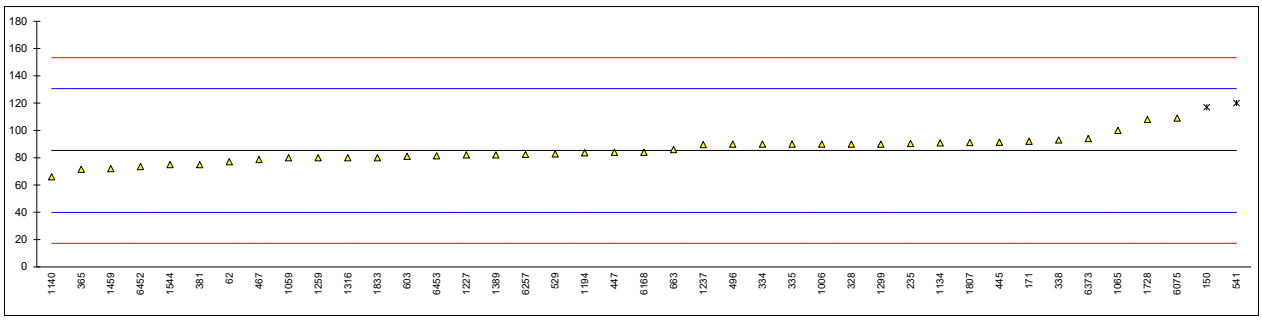

12
11
10
9
8
7
6
5
6075
1459
496
1227
235
445
1259
1059
1140
1544
334
467
1724
1728
175
1006
381
447
1134
541
1126
1299
1237
62
120
663
6373
1706
6452
328
335
338
6453
365
1194
1316

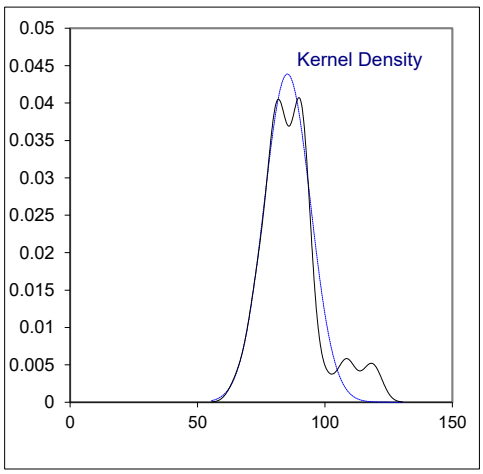

Kernel Density
0.6
0.5
0.4
0.3
0.2
0.1
0
3
5
7
9
11
13

Determination of Water on sample #22080; result in mg/kg

lab	method	value	mark	z(targ)	remarks
62	D6304-A	77		-0.37	
120		-----		-----	
140		-----		-----	
150	E1064	117	C,DG(0.05)	1.40	first reported 141
171	D6304-A	92		0.30	
175		-----		-----	
235	D6304-A	90.4		0.23	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328	ISO12937	90		0.21	
334	ISO12937	90		0.21	
335	ISO12937	90		0.21	
338	ISO12937	92.9		0.34	
365	IP439	71.5		-0.61	
381	ISO12937	75		-0.45	
445	ISO12937	91.3		0.26	
447	IP438	84		-0.06	
460		-----		-----	
467	ISO12937	78.7		-0.29	
496	ISO12937	90		0.21	
529	D6304-A	82.74		-0.11	
541	ISO12937	120	DG(0.05)	1.53	
603	D6304-A	81		-0.19	
633		-----		-----	
663	D6304-A	85.9		0.03	
1006	D6304-A	90		0.21	
1017		-----		-----	
1059	ISO12937	80		-0.23	
1065	D6304-A	100		0.65	
1126		-----		-----	
1134	IP439	90.8		0.24	
1140	IP438	66		-0.85	
1146	D6304	<100		-----	
1194	ISO12937	83.54		-0.08	
1205		-----		-----	
1227	D6304-A	82		-0.15	
1233		-----		-----	
1237	ISO12937	89.5		0.19	
1259	ISO12937	80		-0.23	
1299	ISO12937	90		0.21	
1316	D6304-B	80		-0.23	
1389	ISO12937	82		-0.15	
1459	ISO12937	72		-0.59	
1544	ISO12937	74.9		-0.46	
1706		-----		-----	
1724		-----		-----	
1728	E203	108		1.00	
1807	ISO12937	91	C	0.25	first reported 130
1833	ISO12937	80		-0.23	
2146		-----		-----	
6075	ISO12937	109		1.05	
6168	D6304-A	84		-0.06	
6257	ISO12937	82.3		-0.13	
6373	ISO12937	94		0.38	
6452	ISO12937	73.50		-0.52	
6453	ISO12937	81.34		-0.17	
6461		-----		-----	

normality	OK
n	39
outliers	2
mean (n)	85.290
st.dev. (n)	9.0942
R(calc.)	25.464
st.dev.(ISO12937:00)	22.6825
R(ISO12937:00)	63.511


180
160
140
120
100
80
60
40
20
0
1140
365
1459
6452
1544
381
62
467
1059
1259
1316
1833
603
6453
1227
1389
6257
529
1194
447
6168
663
1237
496
334
335
1006
328
1299
235
1134
1807
445
171
338
6373
1065
1728
6075
150
541

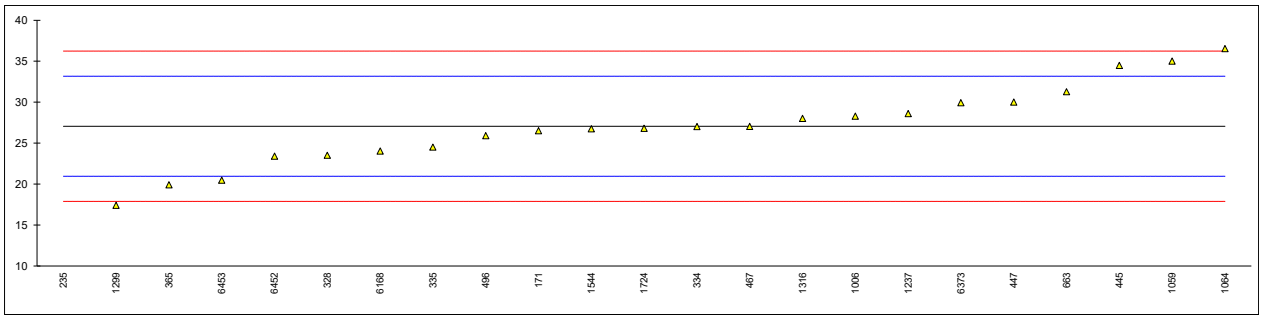

Kernel Density
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
50
100
150

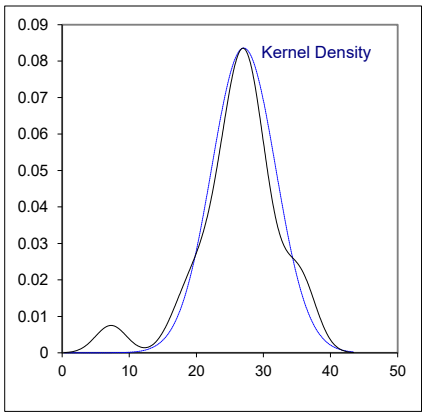
Determination of Total Contamination on sample #22081; result in mg/kg

lab	method	value	mark	z(targ)	Complete filtration	Volume used (mL)	filtration stopped after minutes
120		-----		-----		-----	-----
140		-----		-----		-----	-----
150		-----		-----		-----	-----
171	EN12662:2014	26.5		-0.18		300	-----
235	D6217	7.3	C,R(0.05)	-6.46		500	20
323		-----		-----		-----	-----
328	EN12662:2014	23.5		-1.16		300	-----
334	EN12662:2014	27.0		-0.02	Yes	300	-----
335	EN12662:2014	24.5		-0.84	Yes	-----	-----
365	IP440	19.903		-2.34		400	-----
445	EN12662:2014	34.48		2.43	Yes	300	-----
447	IP440	30		0.96		300	1
467	EN12662	27.05		0.00	Yes	300	1.3
496	EN12662:2014	25.9		-0.38	Yes	-----	-----
663	EN12662:2014	31.26		1.37	Yes	300	-----
1006	EN12622	28.3		0.41	No	250	10
1059	EN12662:2014	35.0		2.60	Yes	-----	-----
1064	EN12662:2014	36.52		3.10	Yes	300	-----
1134		-----		-----		-----	-----
1237	EN12662:2014	28.6		0.50	Yes	-----	-----
1299	EN12662:2014	17.4		-3.16	Yes	300	-----
1316	EN12662:2014	28.0		0.31	Yes	300	-----
1544	EN12662:2014	26.74		-0.10	Yes	300	13:22:10
1724	IP440	26.8		-0.08		-----	-----
1807		-----		-----		-----	-----
6168	D7321	24.03		-0.99	Yes	900	60
6373	EN12662:2014	29.93		0.94	Yes	-----	-----
6452	EN12662:2014	23.40		-1.20		-----	-----
6453	EN12662:2014	20.46		-2.16		239.45	11.3

normality	OK
n	22
outliers	1
mean (n)	27.058
st.dev. (n)	4.7741
R(calc.)	13.368
st.dev.(EN12662:14)	3.0569
R(EN12662:14)	8.559

Lab 235 first reported 13.4





APPENDIX 2

z-scores Distillation

lab	IBP	10% rec	50% rec	90% rec	95% rec	FBP
62	-1.54	1.64	1.29	0.36	0.74	0.59
120	1.40	2.41	0.63	0.69	0.90	0.67
140	-----	-----	-----	-----	-----	-----
150	-----	-----	-----	-----	-----	-----
171	0.29	0.68	-0.11	2.44	-0.95	-0.31
175	0.35	0.09	0.91	1.46	1.89	0.04
235	-1.57	0.21	-0.39	-0.57	-0.57	-0.83
237	-----	-----	-----	-----	-----	-----
238	-----	-----	-----	-----	-----	-----
323	-----	-----	-----	-----	-----	-----
328	-1.29	-1.05	-0.86	-0.62	-0.63	-0.20
334	-0.77	-0.15	0.26	0.14	0.61	-0.12
335	-----	-----	-----	-----	-----	-----
338	-0.80	0.15	-0.21	-0.46	-0.25	-0.04
365	-1.08	-2.60	-1.79	-0.41	-0.38	-1.14
381	-1.14	-0.63	0.17	0.03	0.13	-1.66
445	-1.20	-0.45	-0.95	-0.52	-0.28	0.12
447	0.63	2.89	0.73	-0.19	-0.06	0.28
460	-----	-----	-----	-----	-----	-----
467	1.25	0.92	-0.21	-0.84	-0.44	-0.16
496	-0.61	-0.15	-0.21	-0.52	-0.41	0.20
529	-0.64	1.22	1.38	0.69	0.80	0.20
541	-1.45	-0.69	0.45	0.47	0.52	-0.43
603	0.66	2.06	1.47	0.36	0.55	0.04
633	-----	-----	-----	-----	-----	-----
663	-0.89	0.26	-0.58	-0.84	-0.76	-0.47
1006	0.78	-0.33	0.17	-0.41	-0.51	-0.31
1017	-----	-----	-----	-----	-----	-----
1059	1.77	0.68	0.45	-0.13	0.07	0.83
1065	0.41	-3.97	-1.14	0.69	0.36	-0.51
1126	-0.18	0.21	-0.02	-0.62	-0.44	1.42
1134	1.15	0.21	0.63	0.03	0.10	0.40
1140	-1.79	-1.82	-2.82	-1.61	-0.82	-0.35
1146	1.90	-0.75	0.07	0.36	0.10	0.87
1194	-----	-----	-----	-----	-----	-----
1205	-----	-----	-----	-----	-----	-----
1227	0.22	-0.21	-0.58	-0.41	-0.25	-0.08
1233	-----	-----	-----	-----	-----	-----
1237	0.69	1.52	0.26	-0.08	0.07	0.20
1259	0.50	-0.69	-1.23	-1.67	-1.84	-0.55
1299	0.75	0.92	0.07	0.31	0.16	0.95
1316	-0.40	0.44	0.35	-0.46	-0.73	0.24
1389	-0.21	1.10	0.54	0.09	0.20	0.04
1459	0.29	0.21	0.17	-0.68	-0.66	-0.47
1544	-0.35	0.50	0.77	0.39	0.40	0.28
1706	0.32	-0.15	0.45	0.03	0.00	0.04
1724	-0.40	-0.15	-0.86	-0.52	-0.15	-0.20
1728	0.84	-1.05	1.29	0.20	0.52	-0.31
1807	-0.61	-2.30	-1.23	-1.01	-0.95	-0.12
1833	0.01	0.15	-0.86	-1.12	-0.95	-1.54
2146	0.66	0.74	0.63	0.75	1.38	0.24
6075	-0.55	0.98	0.91	1.07	1.41	0.40
6168	2.42	2.35	3.99	2.12	1.47	1.74
6257	-1.02	-0.87	-2.07	-4.30	-4.46	-1.42
6373	-0.24	0.44	0.17	-0.13	-0.12	0.12
6452	0.28	-3.02	1.08	0.56	-0.83	0.59
6453	-0.31	-1.76	1.44	0.36	0.29	0.08
6461	1.46	-0.15	-0.58	0.20	0.36	0.67

APPENDIX 3

Number of participants per country

1 lab in ARGENTINA
1 lab in AUSTRIA
4 labs in BELGIUM
1 lab in BULGARIA
1 lab in CANADA
1 lab in CROATIA
1 lab in CYPRUS
1 lab in ECUADOR
1 lab in FINLAND
5 labs in FRANCE
2 labs in GERMANY
1 lab in GREECE
1 lab in IRELAND
1 lab in ISRAEL
1 lab in MALAYSIA
1 lab in MARTINIQUE
1 lab in MAURITIUS
1 lab in MEXICO
2 labs in NETHERLANDS
2 labs in NIGERIA
1 lab in PERU
1 lab in PHILIPPINES
1 lab in POLAND
3 labs in ROMANIA
1 lab in SERBIA
2 labs in SLOVENIA
3 labs in SPAIN
2 labs in SWEDEN
1 lab in TAIWAN
1 lab in THAILAND
2 labs in TURKEY
6 labs in UNITED KINGDOM
5 labs in UNITED STATES OF AMERICA

APPENDIX 4

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
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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)
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9 Analytical Methods Committee, Technical Brief, No 4, January 2001
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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)
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