

Results of Proficiency Test
Vacuum Gasoil
December 2017

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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1 INTRODUCTION

Since 2013, the Institute for Interlaboratory Studies (iis) organizes a proficiency test (PT) for Vacuum Gasoil (VGO). During the annual proficiency testing program 2017/2018, it was decided to continue the round robin for the analysis of Vacuum Gasoil in accordance with the latest version of ISO8217.

In this interlaboratory study 77 laboratories from 33 different countries registered for participation. See appendix 2 for the number of participants per country. In this report, the results of the 2017 proficiency test are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SETUP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organiser of this proficiency test (PT). Sample analyses for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC 17025 accredited laboratory. It was decided to send in this proficiency test one sample (1 litre bottle with VGO, labelled #17255) for various analyses. The participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for the statistical evaluation.

2.1 ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in agreement with ISO/IEC 17043:2010 (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 organisation 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 March 2017 (iis-protocol, version 3.4). 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

The necessary bulk material for sample #17255 was obtained from a local supplier. The approximately 110 litres bulk material was homogenised in a pre-cleaned drum. After homogenisation, 108 amber glass bottles of 1 litre were filled with Vacuum Gasoil (VGO) and labelled #17255. The homogeneity of the subsamples #17255 was checked by determination of Density in accordance with ISO12185 on 8 stratified randomly selected samples.

	Density at 15 °C in kg/m ³
Sample #17255-1	923.1
Sample #17255-2	923.0
Sample #17255-3	923.1
Sample #17255-4	923.1
Sample #17255-5	923.0
Sample #17255-6	923.0
Sample #17255-7	923.1
Sample #17255-8	923.1

Table 1: homogeneity test results of subsamples #17255

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

	Density at 15 °C in kg/m ³
r (observed)	0.14
Reference test method	ISO12185:96
0.3 x R(ref. test method)	0.45

Table 2: evaluation of the repeatability of the subsamples #17255

The calculated repeatability was in agreement with 0.3 times the corresponding reproducibility of the reference test method. Therefore, homogeneity of the subsamples #17255 was assumed.

To each of the participating laboratories, one amber glass bottle of 1 litre (labelled #17255) was sent on November 22, 2017. A SDS was added to the package

2.5 STABILITY OF THE SAMPLES

The stability of Vacuum Gasoil (VGO), packed in an amber glass bottle, was checked. The material was found sufficiently stable for the period of the proficiency test.

2.6 ANALYSES

The participants were asked to determine on sample #17255: Acid Number (Total), Aniline Point, Asphaltenes, Carbon Residue (Micro method), Density at 15°C, Flash Point PMcc, Kinematic Viscosity at 50°C and at 100°C, Nitrogen, Pour Point (manual or automatic), Sulphur (Total), Metals (Arsenic, Calcium, Copper, Iron, Nickel, Silicon, Sodium, Vanadium), Simulated Distillation and Distillation (IBP, 10% rec, 30% rec, 50% rec, 70% rec, 90% rec and FBP).

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 calculations.

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 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 reanalysis). Additional or corrected test results are used for data analysis and the original test results are placed under 'Remarks' in the test 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 organisation 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 March 2017 (iis-protocol, version 3.4).

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.

According to ISO 5725 the original test results per determination were submitted to Dixon's and/or Grubbs' and/or Rosner's outlier tests. 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. When the uncertainty passed the evaluation, no remarks are made in the report. However, when the uncertainty failed the evaluation it is mentioned in the report and it will have consequences for the evaluation of the test results.

Finally, the reproducibilities were calculated from the standard deviations by multiplying these 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 analysis 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 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. The Kernel Density Graph 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 was projected over the Kernel Density Graph for reference.

3.3 Z-SCORES

To evaluate the performance of the participating laboratories the z-scores were calculated. As it was decided to evaluate the performance of the participants in this proficiency test (PT) against the literature requirements, e.g. ASTM reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the 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. In some cases, a reproducibility based on former iis proficiency tests could be used.

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:

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

The $Z_{(\text{target})}$ scores are listed in the result tables of 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 to laboratories in Malaysia and Russian Federation.

Three participants did not report any test results. Not all laboratories were able to report all requested parameters. In total 74 participants reported 1237 test results. Observed were 60 outlying test results, which is 4.9% of the numerical test results. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

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

4.1 EVALUATION PER TEST

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

In the iis PT reports, ASTM methods are referred to with a number (e.g. D611) and an added designation for the year that the method was adopted or revised (e.g. D611:12). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D611:12(2016)). In the results tables of Appendix 1 only the method number and year of adoption or revision e.g. D611:12 will be used.

Although VGO is an important feedstock for cracking installations, there are very few analytical standard methods specifically designed for the analysis of VGO. Most parameters are to be determined by using methods that are intended for residual fuel oil and blending components. Where applicable, precision data for Fuel Oil were used.

Acid Number (total): This determination was problematic for a number of laboratories. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D664:17.

Aniline Point: This determination was very problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not at all in agreement with the requirements of ASTM D611:12(2016).

Asphaltenes: No significant conclusions were drawn because the precision data of IP143:04 are applicable to values between 0.50 %M/M and 30.0 %M/M. However, in comparison to the previous round robin (iis16G06), the reproducibility of the current PT is large.

Carbon Residue: (Micro method) This determination was problematic for a number of laboratories. Six statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D4530:15.

Density at 15°C: This determination was problematic for a number of laboratories. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ISO 12185:96.

Flash Point PMcc: This determination was not problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is in agreement with requirements of ASTM D93-B:16a.

- Kin.Visco. at 50°C: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in good agreement with the requirements of ASTM D445:17a.
- Kin.Visco.at 100°C: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in good agreement with the requirements of ASTM D445:17a.
- Nitrogen: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with ASTM D5762:12.
- Pour Point (Manual): This determination was not problematic. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with ASTM D97:17a.
- Pour Point (Automatic): This determination was not problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is in good agreement with ASTM D5950:14.
- Sulphur (Total): This determination was problematic for a number of laboratories. Seven statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ASTM D4294:16e1.
- Arsenic (As): All reported test results were near or below the application range of the used test methods. Therefore, no statistical conclusions were drawn
- Calcium (Ca): This determination may be problematic at a level of 0.6 mg/kg. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of IP501:05.
- Copper (Cu): All reported test results were near or below the application range of used test methods. Therefore, no statistical conclusions were drawn.
- Iron (Fe): This determination was not problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is in good agreement with the requirements of IP621.16.
- Nickel (Ni): This determination was problematic for a number of laboratories. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of IP621:16.

<u>Silicon (Si):</u>	All reported test results were near or below the application range of used test methods. Therefore, no statistical conclusions were drawn
<u>Sodium (Na):</u>	This determination was not problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of IP621:16.
<u>Vanadium (V):</u>	This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of IP621:16.
<u>Sim. Distillation</u>	<p>The Simulated Distillation according to ASTM D6352:15 was problematic. In total seven statistical outliers were observed and three test results were excluded from statistical evaluation as the reported test results are correlated to the other reported test results.</p> <p>Only the calculated reproducibility for Initial Boiling Point after rejection of the suspect data was in agreement with the requirements of ASTM D6352:15. For 10%, 30%, 50%, 70% and 90% recovered and Final Boiling Point the calculated reproducibility is not in agreement with the requirements of ASTM D6352:15.</p>
<u>Distillation</u> <u>Acc. D1160</u>	<p>The distillation according to ASTM D1160 was not problematic.</p> <p>In total eleven statistical outliers were observed and two test results were excluded as four of the six reported test results from one laboratory were statistical outliers. The test results are not independent from each other. However, for Initial Boiling Point, 10%, 30%, 50%, 70% and 90% recovery the calculated reproducibilities after rejection of the suspect data were in agreement with the requirements of ASTM D1160:15. Only for the Final Boiling Point the calculated reproducibility after rejection of the suspect data was not in agreement with the requirements of ASTM D1160:15.</p>

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the relevant standard and the reproducibility as found for the group of participating laboratories that participated. The average results, calculated reproducibilities and target reproducibilities derived from literature standards (in casu ASTM and IP standards) or previous proficiency tests are compared in the next table.

Parameter	unit	n	Average	2.8 * sd	R(lit)
Acid Number (Total)	mg KOH/g	50	0.35	0.13	0.19
Aniline Point	°C	26	79.7	3.2	1.0
Asphaltenes	%M/M	28	0.28	0.22	(0.06)*
Carbon Residue, micro method	%M/M	50	1.02	0.19	0.19
Density at 15 °C	kg/m ³	63	923.3	1.5	1.5
Flash Point PMcc	°C	59	166.3	8.4	10
Kinematic Viscosity at 50 °C	mm ² /s	68	39.466	0.870	3.339
Kinematic Viscosity at 100 °C	mm ² /s	60	7.673	0.206	0.925
Nitrogen	mg/kg	41	1538	542	409
Pour Point, manual	°C	47	32.5	3.2	9
Pour Point, automated, Δ3°C	°C	19	32.0	3.8	6.1
Sulphur Content (Total)	%M/M	66	1.73	0.08	0.10
Calcium (Ca)	mg/kg	26	0.6	0.6	0.5
Iron (Fe)	mg/kg	50	3.0	2.7	3.5
Nickel (Ni)	mg/kg	47	2.1	1.0	2.4
Sodium (Na)	mg/kg	47	3.4	2.5	4.2
Vanadium (V)	mg/kg	47	7.6	1.5	3.5
Simulated distillation D6352					
- Initial Boiling Point	°C	18	241.1	52.9	49.1
- Temp 10% recovered	°C	17	356.4	8.5	7.1
- Temp 30% recovered	°C	18	405.2	11.9	5.9
- Temp 50% recovered	°C	17	436.9	9.2	6.4
- Temp 70% recovered	°C	16	473.3	10.4	7.2
- Temp 90% recovered	°C	15	529.4	14.5	10.5
- Final Boiling Point	°C	16	638.9	125.3	38.1
Distillation D1160					
- Initial Boiling Point	°C	35	243.4	50.5	49.5
- Temp 10% recovered	°C	38	376.3	14.2	18.9
- Temp 30% recovered	°C	39	413.9	9.8	11.5
- Temp 50% recovered	°C	39	442.9	7.8	11.1
- Temp 70% recovered	°C	38	475.2	8.7	9.9
- Temp 90% recovered	°C	36	529.2	13.4	22.3
- Final Boiling Point	°C	36	546.4	33.4	26.9

Table 3: reproducibilities of results of sample #17255

(*)* results between brackets should used with care, because the assigned value was below the application range

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

4.3 COMPARISON OF THE PROFICIENCY TEST OF DECEMBER 2017 WITH PREVIOUS PTS

	<i>December 2017</i>	<i>December 2016</i>	<i>December 2015</i>	<i>December 2014</i>
Number of reporting labs	74	73	54	51
Number of results reported	1275	1241	897	785
Statistical outliers	61	53	22	35
Percentage outliers	4.8%	4.3%	2.5%	4.5%

Table 4: comparison with previous proficiency tests.

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

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

Determination	<i>December 2017</i>	<i>December 2016</i>	<i>December 2015</i>	<i>December 2014</i>
Acid Number (Total)	+	++	+	+
Aniline Point	--	-	--	--
Asphaltenes	(--)*	(--)*	(--)*	(--)*
Carbon Residue, micro method	+/-	-	+/-	--
Density at 15 °C	+/-	+/-	+/-	+/-
Flash Point PMcc	+	++	+	+/-
Kinematic Viscosity at 50 °C	++	++	++	--
Kinematic Viscosity at 100 °C	++	++	++	++
Nitrogen	-	+/-	+/-	-
Pour Point, manual	++	++	n.e.	n.e.
Pour Point, automated Δ3°C	++	++	n.e.	n.e.
Sulphur Content (Total)	+	+	+	+/-
Arsenic (As)	n.e.	n.e.	n.e.	n.e.
Calcium (Ca)	+/-	+/-	+/-	--
Copper (Cu)	n.e.	n.e.	n.e.	n.e.
Iron (Fe)	+	-	+/-	+
Nickel (Ni)	++	++	++	+/-
Silicon (Si)	n.e.	n.e.	--	(--)*
Sodium (Na)	++	+	+/-	+/-
Vanadium (V)	++	++	+	++
Simulated distillation D6352				
- Initial Boiling Point	+/-	++	+	+/-
- Temp 10% recovered	-	+	-	-
- Temp 30% recovered	--	+/-	+/-	-
- Temp 50% recovered	-	+	+/-	-
- Temp 70% recovered	-	+/-	-	+/-
- Temp 90% recovered	-	+/-	-	+/-
- Final Boiling Point	--	--	--	-
Distillation D1160				
- Initial Boiling Point	+/-	--	-	--
- Temp 10% recovered	+	-	-	+
- Temp 30% recovered	+	-	+	+/-
- Temp 50% recovered	+	+/-	+/-	+/-

Determination	<i>December 2017</i>	<i>December 2016</i>	<i>December 2015</i>	<i>December 2014</i>
- Temp 70% recovered	+	-	-	-
- Temp 90% recovered	++	+	+	++
- Final Boiling Point	-	-	+/-	-

Table 5: comparison determinations against the standard

()* results between brackets should used with care, because the assigned value was below the application range

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

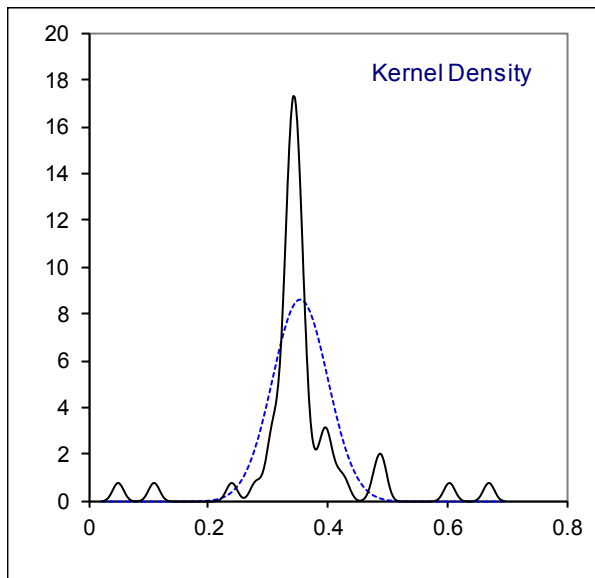
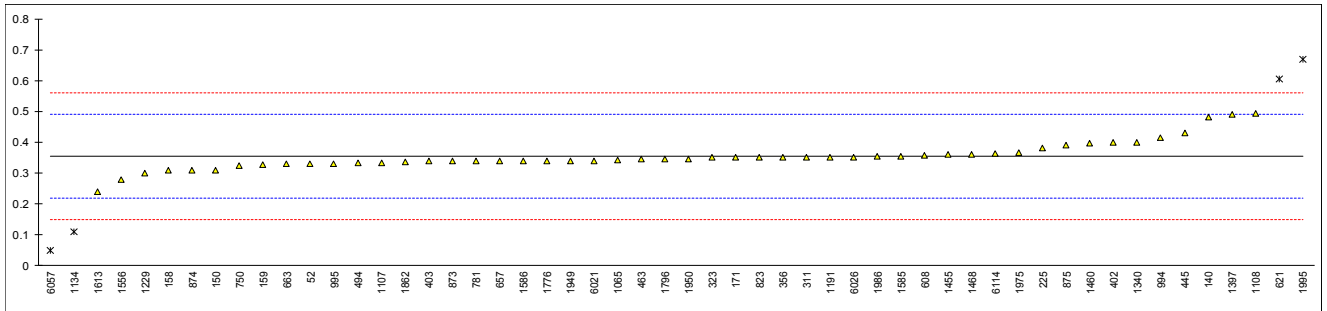
- ++: group performed much better than the standard
- + : group performed better than the standard
- +/-: group performance equals the standard
- : group performed worse than the standard
- : group performed much worse than the standard
- n.e.: not evaluated

APPENDIX 1

Determination of Acid Number (Total) on sample #17255; results in mg KOH/g

lab	Method	value	mark	z(targ)	remarks
52	D664-A	0.33		-0.36	
62		----		----	
120		----		----	
131		----		----	
140	D664-A	0.48		1.84	
150	D664-A	0.31		-0.65	
154		----		----	
158	D664-A	0.31		-0.65	
159	D664-A	0.326		-0.42	
171	D664-A	0.35		-0.07	
225	D664-A	0.38		0.37	
311	D664-A	0.35		-0.07	
313		----		----	
317		----		----	
323	D664-A	0.35		-0.07	
333		----		----	
334		----		----	
356	D664-A	0.35		-0.07	
402	D664-A	0.4		0.67	
403	D664-A	0.34		-0.21	
445	D664-A	0.429		1.09	
463	D664-A	0.345		-0.14	
494	D664-A	0.333		-0.31	
608	D664	0.358		0.05	
621	D664-A	0.604	R(0.01)	3.66	
657	D664-A	0.34		-0.21	
663	D664-A	0.329		-0.37	
732		----		----	
750	D664	0.323		-0.46	
752		----		----	
781	D664-A	0.34		-0.21	
785		----		----	
798		----		----	
823	D664-A	0.35		-0.07	
873	D664-A	0.34		-0.21	
874	D664-A	0.31		-0.65	
875	D664-A	0.39		0.52	
994	D664-A	0.415		0.89	
995	D664-A	0.33		-0.36	
1065	D664-A	0.342		-0.18	
1081		----		----	
1082		----		----	
1107	D664-B	0.333		-0.31	
1108	D664-B	0.492		2.02	
1134	D664-A	0.11	R(0.01)	-3.58	
1191	ISO6619	0.35		-0.07	
1229	ISO6619	0.3		-0.80	
1297		----		----	
1320		----		----	
1340	D664-A	0.40		0.67	
1353		----		----	
1397	D664-A	0.49		1.99	
1455	D664-A	0.36		0.08	
1460	D664-A	0.396		0.61	
1468	D664-B	0.36		0.08	
1510		----		----	
1556	D664-A	0.280		-1.09	
1585	D664-A	0.355		0.01	
1586	D664-A	0.34		-0.21	
1613	D664-A	0.24		-1.68	
1776	D664-A	0.34		-0.21	
1796	D664-A	0.345		-0.14	
1862	D664-A	0.336		-0.27	
1949	D664-A	0.34		-0.21	
1950	D664-A	0.345		-0.14	
1975	D664-A	0.366		0.17	
1986	D664-A	0.353		-0.02	
1995	D664-A	0.67	C,R(0.01)	4.63	First reported 1.18
4043		----		----	
6016		----		----	
6021	D664-A	0.340		-0.21	
6024		----		----	
6026	D664-A	0.35		-0.07	
6051		----		----	
6057	D664-A	0.05	R(0.01)	-4.46	

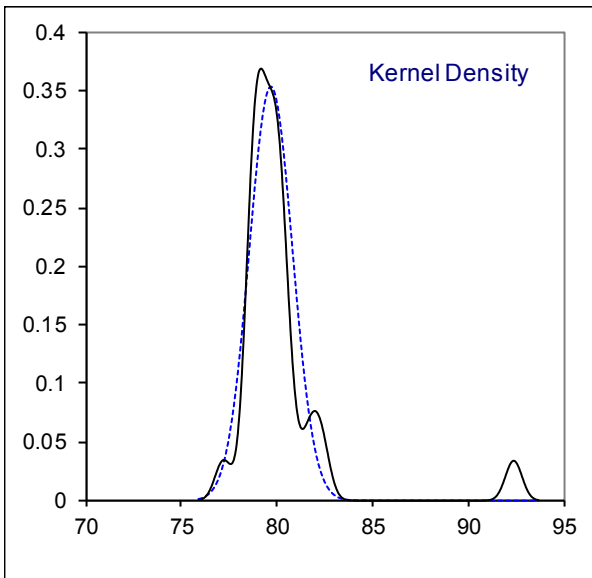
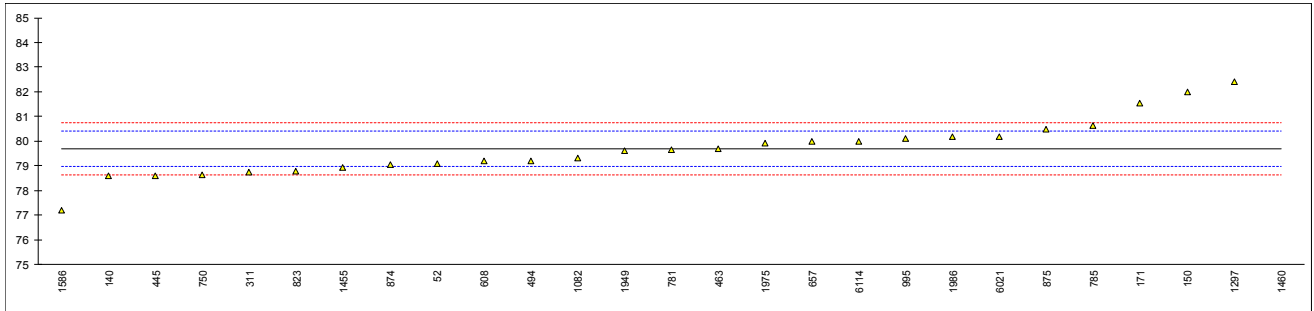
lab	Method	value	mark	z(target)	remarks
6114	D664-A	0.362		0.11	
6143		-----		-----	
	normality	not OK			
	n	50			
	outliers	4			
	mean (n)	0.3545			
	st.dev. (n)	0.04629			
	R(calc.)	0.1296			
	st.dev.(D664:17)	0.06821			
	R(D664:17)	0.1910			



Determination of Aniline Point on sample #17255; results in °C

lab	method	value	mark	z(targ)	Heptane	remarks
52	D611-E	79.1		-1.64	----	
62		----		----	----	
120		----		----	----	
131		----		----	----	
140	D611-B	78.6		-3.04	----	
150	D611-E	82.00		6.48	----	
154		----		----	----	
158		----		----	----	
159		----		----	----	
171	D611-E	81.55		5.22	----	
225		----		----	----	
311	D611-B	78.75		-2.62	69.5	
313		----		----	----	
317		----		----	----	
323		----		----	----	
333		----		----	----	
334		----		----	----	
356		----		----	----	
402		----		----	----	
403		----		----	----	
445	D611-D	78.6		-3.04	69.3	
463	D611-B	79.7		0.04	69.3	
494	D611-E	79.20		-1.36	----	
608	D611	79.2		-1.36	----	
621		----		----	----	
657	D611-B	80.00		0.88	69.80	
663		----		----	----	
732		----		----	----	
750	D611-E	78.65		-2.90	----	
752		----		----	----	
781	D611-E	79.65		-0.10	69.15	
785	D611-B	80.65		2.70	69.30	
798		----		----	----	
823	D611-E	78.8		-2.48	69.3	
873		----		----	69.3	
874	D611-E	79.05		-1.78	----	
875	D611-E	80.50		2.28	69.30	
994		----		----	----	
995	D611-B	80.12		1.21	----	
1065		----		----	----	
1081		----		----	----	
1082	ISO2297	79.3		-1.08	----	
1107		----	W	----	----	Result withdrawn, reported 76
1108		----		----	----	
1134		----		----	----	
1191		----		----	----	
1229		----		----	----	
1297	D611-E	82.4		7.60	69.0	
1320		----		----	----	
1340		----		----	----	
1353		----		----	----	
1397		----		----	----	
1455	D611-B	78.95		-2.06	----	
1460	D611-A	92.4	R(0.01)	35.60	68.1	
1468		----		----	----	
1510		----		----	----	
1556		----		----	----	
1585		----		----	----	
1586	D611-B	77.2		-6.96	----	
1613		----		----	----	
1776		----		----	----	
1796		----		----	----	
1862		----		----	----	
1949	D611-B	79.60		-0.24	----	
1950		----		----	----	
1975	D611-B	79.90		0.60	69.40	
1986	D611-B	80.20		1.44	----	
1995		----		----	----	
4043		----		----	----	
6016		----		----	----	
6021	D611-B	80.20		1.44	69.20	
6024		----		----	----	
6026		----		----	----	
6051		----		----	----	
6057		----		----	----	

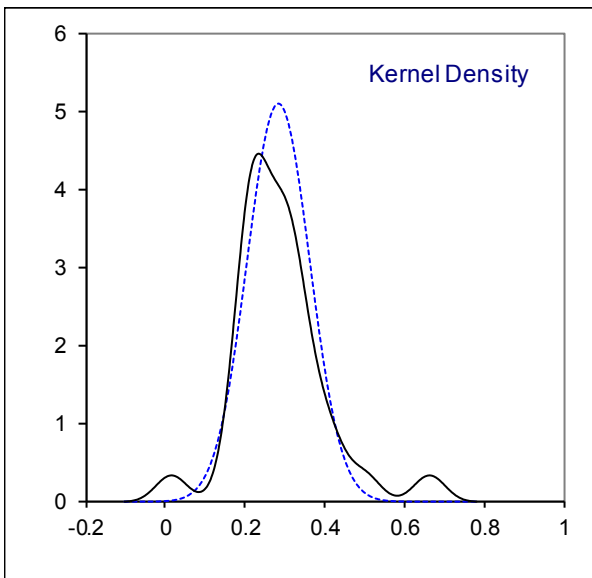
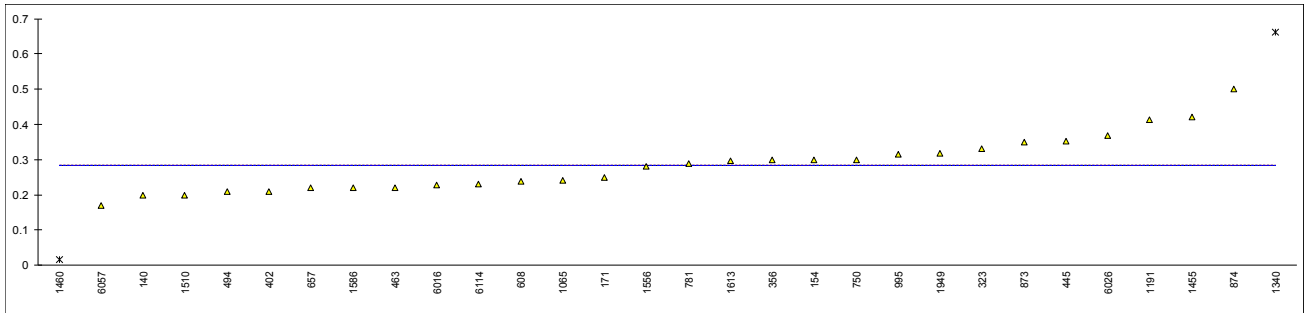
lab	method	value	mark	z(targ)	Heptane	remarks
6114	D611-A	80.0		0.88	69.5	
6143		-----		-----	-----	
	normality	OK				<u>D611-B</u> suspect
	n	26				<u>D611-E</u> OK
	outliers	1				<u>Only Heptane OK</u> not OK
	mean (n)	79.687				12
	st.dev. (n)	1.1303				10
	R(calc.)	3.165				0
	st.dev.(D611:12)	0.3571				79.489
	R(D611:12)	1.0				80.090
						1.0422
						2.684
						3.967
						0.3571
						0.3571
						1.0
						1.0
						1.0



Determination of Asphaltenes on sample #17255; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	IP143	<0.50		----	
62		----		----	
120		----		----	
131		----		----	
140	IP143	0.20		----	
150		----		----	
154	D6560	0.30		----	
158		----		----	
159		----		----	
171	IP143	0.25		----	
225		----		----	
311	IP143	<0.50		----	
313		----		----	
317		----		----	
323	IP143	0.33		----	
333		----		----	
334		----		----	
356	IP143	0.30		----	
402	D6560	0.21	C	----	First reported 2.1
403		----		----	
445	IP143	0.351		----	
463	IP143	0.221		----	
494	IP143	0.209		----	
608	IP143	0.238		----	
621		----		----	
657	IP143	0.22		----	
663		----		----	
732		----		----	
750	IP143	0.30		----	
752		----		----	
781	IP143	0.289		----	
785		----		----	
798		----		----	
823		----		----	
873	IP143	0.35		----	
874	IP143	0.50		----	
875		----		----	
994	IP143	<0.5		----	
995	IP143	0.315		----	
1065	D6560	0.24		----	
1081		----		----	
1082		----		----	
1107		----		----	
1108		----		----	
1134		----		----	
1191	INH-642	0.4120		----	
1229		----		----	
1297		----		----	
1320		----		----	
1340	D6560	0.662	R(0.01)	----	
1353		----		----	
1397	D6560	<0,5		----	
1455	IP143	0.42		----	
1460	IP143	0.0177	R(0.05)	----	
1468		----		----	
1510	IP143	0.2		----	
1556	IP143	0.28		----	
1585		----		----	
1586	IP143	0.22		----	
1613	IP143	0.298		----	
1776		----		----	
1796		----		----	
1862	D6560	Less 0.50		----	
1949	IP143	0.319		----	
1950		----		----	
1975		----		----	
1986		----		----	
1995		----		----	
4043		----		----	
6016	IP143	0.228		----	
6021		----		----	
6024		----		----	
6026	INH-642	0.3692		----	
6051		----		----	
6057	IP143	0.17		----	

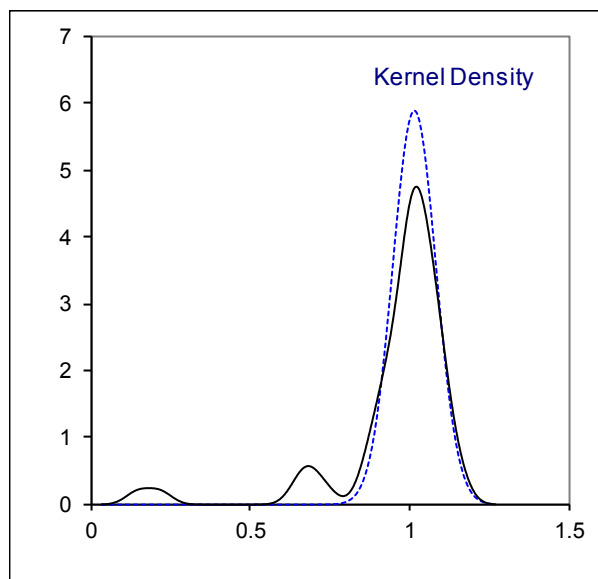
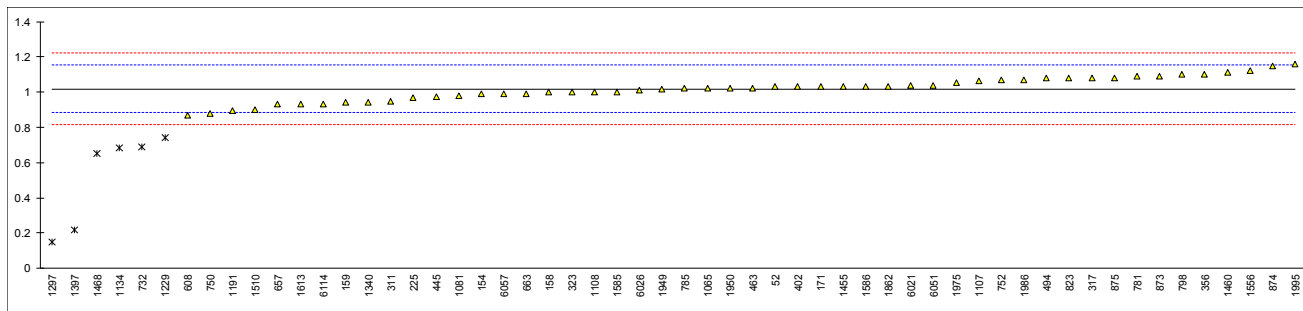
lab	method	value	mark	z(targ)	remarks
6114	IP143	0.23		----	
6143				----	
	normality	OK			
	n	28			
	outliers	2			
	mean (n)	0.2846			
	st.dev. (n)	0.07807			
	R(calc.)	0.2186			
	st.dev.(IP143:04)	(0.02033)			
	R(IP143:04)	(0.0569)			Precision applicable between 0.50 – 30.0 %M/M
Compare					
	R(iis16G06)	(0.1778)			At a mean of 0.1237



Determination of Carbon Residue, Micro method on sample #17255; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D4530	1.03		0.17	
62		----		----	
120		----		----	
131		----		----	
140	D4530	<0.10		<-13.68	False negative test result?
150		----		----	
154	D4530	0.99		-0.43	
158	D4530	1.00		-0.28	
159	D4530	0.94		-1.17	
171	D4530	1.03		0.17	
225	D4530	0.97		-0.73	
311	D4530	0.95		-1.02	
313		----		----	
317	D4530	1.08		0.91	
323	D4530	1.00		-0.28	
333		----		----	
334		----		----	
356	D4530	1.1		1.21	
402	D4530	1.03		0.17	
403		----		----	
445	D4530	0.975		-0.65	
463	ISO10370	1.023		0.06	
494	D4530	1.079		0.90	
608	D4530	0.8687		-2.23	
621		----		----	
657	D4530	0.93		-1.32	
663	D4530	0.991		-0.41	
732	ISO10370	0.69	R(0.01)	-4.89	
750	D4530	0.88		-2.06	
752	D4530	1.067		0.72	
781	D4530	1.09		1.06	
785	D4530	1.02		0.02	
798	D4530	1.10		1.21	
823	D4530	1.08		0.91	
873	D4530	1.091		1.08	
874	D4530	1.15		1.95	
875	D4530	1.08		0.91	
994		----		----	
995		----		----	
1065	D4530	1.02		0.02	
1081	ISO10370	0.98		-0.58	
1082		----		----	
1107	D4530	1.064		0.67	
1108	D4530	1.00		-0.28	
1134	D4530	0.6847	R(0.01)	-4.97	
1191	ISO10370	0.897		-1.81	
1229	ISO10370	0.74	R(0.01)	-4.15	
1297	D4530	0.15	C,R(0.01)	-12.93	First reported 0.37
1320		----		----	
1340	ISO10370	0.94		-1.17	
1353		----		----	
1397	D4530	0.22	R(0.01)	-11.89	
1455	D4530	1.03		0.17	
1460	D4530	1.11436		1.42	
1468	ISO10370	0.654	R(0.01)	-5.43	
1510	D4530	0.9		-1.77	
1556	ISO10370	1.12		1.51	
1585	D4530	1.002		-0.25	
1586	D4530	1.03		0.17	
1613	D4530	0.93		-1.32	
1776		----		----	
1796		----		----	
1862	D4530	1.03		0.17	
1949	D4530	1.019		0.00	
1950	D4530	1.02		0.02	
1975	D4530	1.053		0.51	
1986	ISO10370	1.07		0.76	
1995	D4530	1.16		2.10	
4043		----		----	
6016		----		----	
6021	D4530	1.040		0.32	
6024		----		----	
6026	D4530	1.01		-0.13	
6051	D4530	1.04		0.32	
6057	D4530	0.99		-0.43	

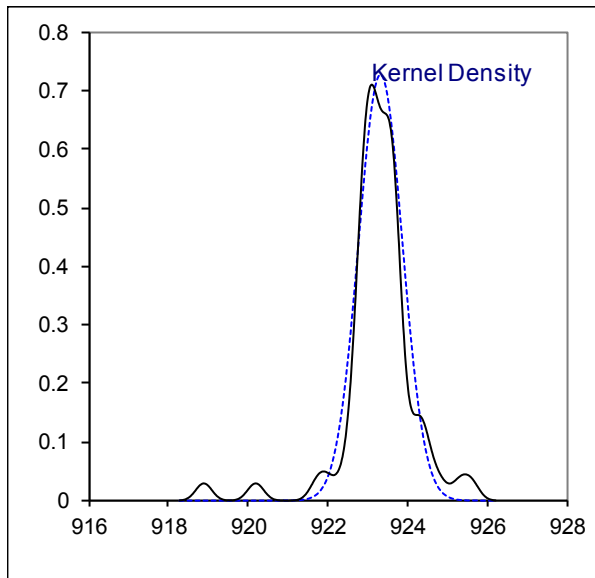
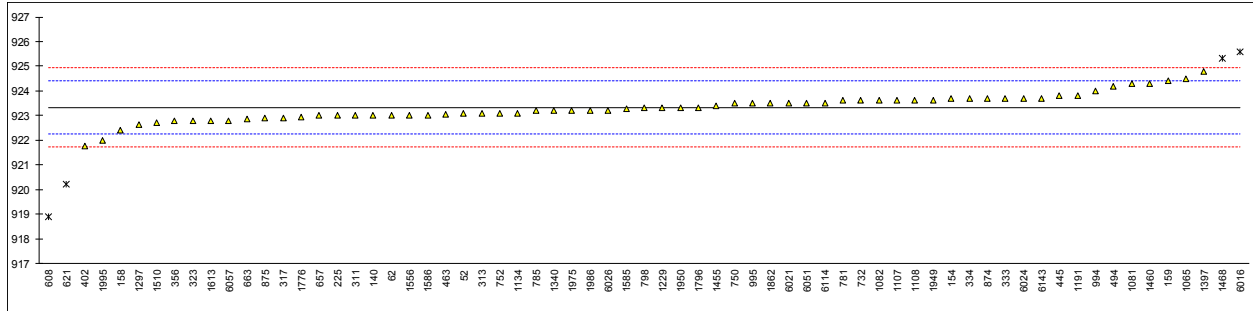
lab	method	value	mark	z(targ)	remarks
6114	ISO10370	0.932		-1.29	
6143		-----		-----	
	normality	OK			
	n	50			
	outliers	6			
	mean (n)	1.0187			
	st.dev. (n)	0.06784			
	R(calc.)	0.1900			
	st.dev.(D4530:15)	0.06718			
	R(D4530:15)	0.1881			



Determination of Density at 15°C on sample #17255; results in kg/m³

lab	method	value	mark	z(targ)	remarks
52	D4052	923.1		-0.42	
62	D4052	923.0		-0.61	
120		----		----	
131		----		----	
140	D4052	923.0		-0.61	
150		----		----	
154	D1298	923.7		0.70	
158	D4052	922.4	C	-1.73	Reported 0.9224 kg/m3 (unit error?)
159	D4052	924.4	C	2.01	First reported 892.3
171		----		----	
225	D4052	923.0		-0.61	
311	ISO12185	923.0		-0.61	
313	ISO12185	923.1		-0.42	
317	ISO12185	922.9		-0.79	
323	ISO12185	922.8		-0.98	
333	ISO12185	923.7		0.70	
334	ISO12185	923.7		0.70	
356	ISO12185	922.8		-0.98	
402	ISO12185	921.75		-2.94	
403		----		----	
445	ISO12185	923.8		0.89	
463	D4052	923.05		-0.51	
494	ISO12185	924.2		1.63	
608	D4052	918.9	R(0.01)	-8.26	
621	D4052	920.2	R(0.01)	-5.83	
657	D4052	923.0		-0.61	
663	D4052	922.85		-0.89	
732	ISO12185	923.6		0.51	
750	D1298	923.5		0.33	
752	ISO12185	923.1		-0.42	
781	ISO12185	923.6		0.51	
785	D1298	923.2		-0.23	
798	D1298	923.3		-0.05	
823		----		----	
873		----		----	
874	ISO12185	923.7		0.70	
875	D1298	922.9		-0.79	
994	ISO12185	924.0		1.26	
995	ISO12185	923.5		0.33	
1065	D4052	924.5		2.19	
1081	D4052	924.3		1.82	
1082	ISO12185	923.6		0.51	
1107	D4052	923.6		0.51	
1108	D1298	923.6		0.51	
1134	D4052	923.1		-0.42	
1191	ISO12185	923.8		0.89	
1229	ISO12185	923.3		-0.05	
1297	D7042	922.64		-1.28	
1320		----		----	
1340	ISO3675	923.2		-0.23	
1353		----		----	
1397	ISO12185	924.8		2.75	
1455	ISO12185	923.4		0.14	
1460	D4052	924.31		1.84	
1468	ISO12185	925.3	R(0.05)	3.69	
1510	IP365	922.7		-1.17	
1556	ISO12185	923.0		-0.61	
1585	ISO12185	923.28		-0.09	
1586	D4052	923.0		-0.61	
1613	D4052	922.8		-0.98	
1776	ISO12185	922.92		-0.76	
1796	ISO12185	923.31		-0.03	
1862	ISO12185	923.5		0.33	
1949	ISO12185	923.6		0.51	
1950	ISO12185	923.3		-0.05	
1975	ISO12185	923.2		-0.23	
1986	ISO12185	923.2		-0.23	
1995	D4052	922.0		-2.47	
4043		----		----	
6016	D4052	925.6	R(0.05)	4.25	
6021	ISO12185	923.5		0.33	
6024	D1298	923.7		0.70	
6026	D1298	923.2		-0.23	
6051	ISO12185	923.5		0.33	
6057	ISO12185	922.8		-0.98	

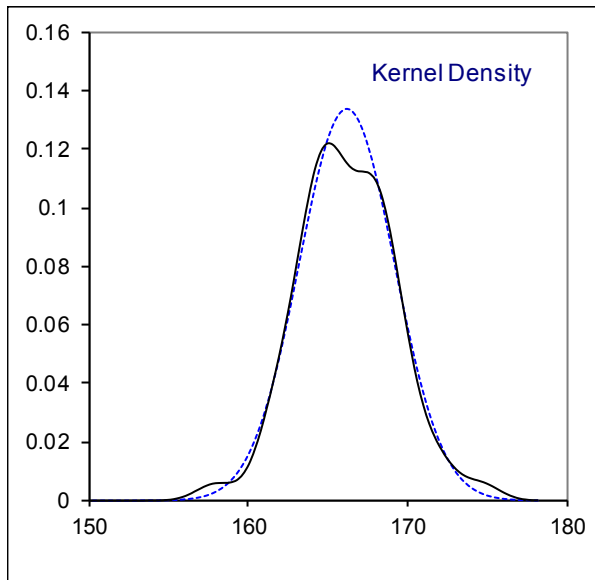
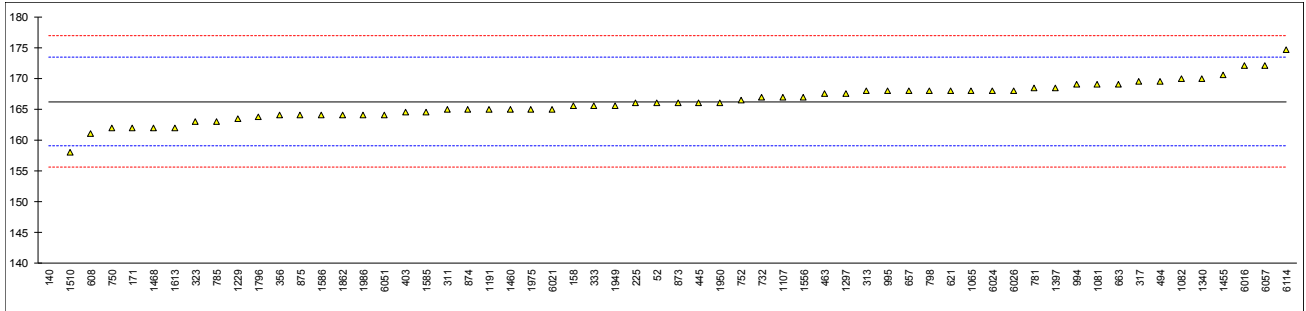
lab	method	value	mark	z(targ)	remarks
6114	D4052	923.5		0.33	
6143	D1298	923.7	C	0.70	First reported 0.9195 kg/L
	normality	suspect			
	n	63			
	outliers	4			
	mean (n)	923.33			
	st.dev. (n)	0.549			
	R(calc.)	1.54			
	st.dev.(ISO12185:96)	0.536			
	R(ISO12185:96)	1.5			



Determination of Flash Point PMcc on sample #17255; results in °C

lab	method	value	mark	z(targ)	remarks
52	D93-B	166.0		-0.07	
62		----		----	
120		----		----	
131		----		----	
140	D93-B	85.5	R(0.01)	-22.61	
150	D93-B	>110.0		----	
154	D93-B	>110.0		----	
158	D93-B	165.5		-0.21	
159	D93-A	>110		----	
171	D93-B	162.0		-1.19	
225	D93-B	166.0		-0.07	
311	D93-B	165.0		-0.35	
313	D93-B	168.0		0.49	
317	D93-B	169.5		0.91	
323	D93-B	163.0		-0.91	
333	D93-B	165.5		-0.21	
334		----		----	
356	D93-B	164.0		-0.63	
402		----		----	
403	D93-B	164.5		-0.49	
445	D93-B	166.0		-0.07	
463	D93-B	167.5		0.35	
494	D93-B	169.5		0.91	
608	D93	161.0		-1.47	
621	D93-A	168.0		0.49	
657	D93-B	168		0.49	
663	D93-B	169.1		0.80	
732	ISO2719	167.0		0.21	
750	D93-B	162.0		-1.19	
752	D93-B	166.5		0.07	
781	D93-B	168.5		0.63	
785	D93-B	163.0		-0.91	
798	D93-B	168.0		0.49	
823		----		----	
873	D93-B	166.0		-0.07	
874	D93-B	165.0		-0.35	
875	D93-B	164.0		-0.63	
994	D93-B	169.0		0.77	
995	D93-B	168.0		0.49	
1065	D93-A	168		0.49	
1081	D93-B	169.0		0.77	
1082	D93-A	170.0		1.05	
1107	D93-A	167.0		0.21	
1108		----		----	
1134		----		----	
1191	ISO2719	165.0		-0.35	
1229	ISO2719	163.5		-0.77	
1297	D93-B	167.5		0.35	
1320		----		----	
1340	D93-A	170.0		1.05	
1353		----		----	
1397	D93-A	168.5		0.63	
1455	D93-A	170.5		1.19	
1460	D93-B	165		-0.35	
1468	ISO2719	162.0		-1.19	
1510	D93-B	158		-2.31	
1556	ISO2719	167.0		0.21	
1585	D93-B	164.5		-0.49	
1586	D93-B	164.0	C	-0.63	First reported 154.0
1613	D93-B	162.0		-1.19	
1776		----		----	
1796	D93-B	163.8		-0.69	
1862	D93-B	164.0		-0.63	
1949	D93-B	165.5		-0.21	
1950	D93-B	166.0		-0.07	
1975	D93-B	165.0		-0.35	
1986	D93-B	164.0		-0.63	
1995		----		----	
4043		----		----	
6016	D93-B	172		1.61	
6021	D93-B	165.0		-0.35	
6024	D93-B	168.0		0.49	
6026	D93-B	168.0		0.49	
6051	D93-B	164.0		-0.63	
6057	D93-B	172.0		1.61	

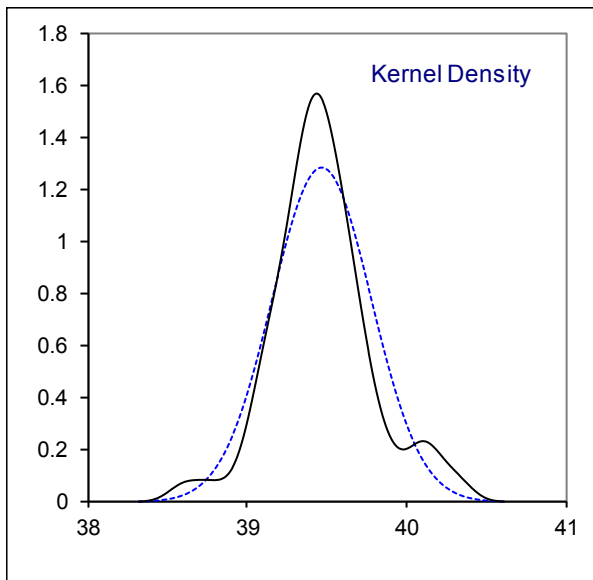
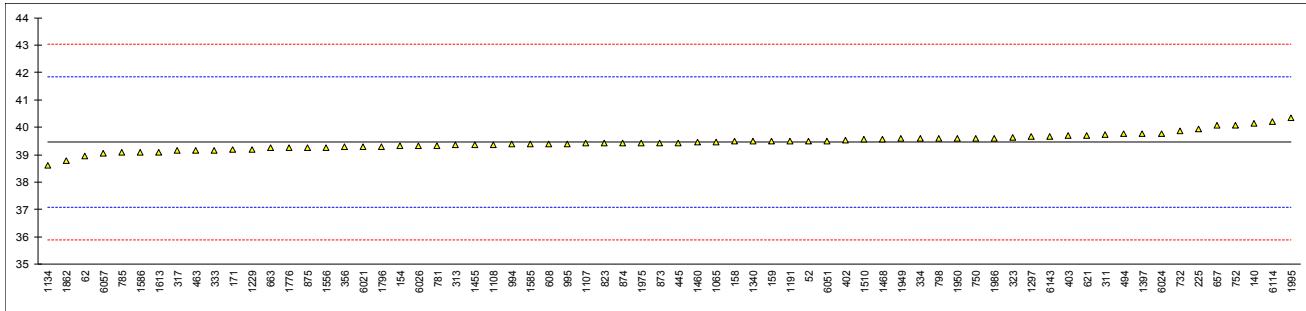
lab	method	value	mark	z(targ)	remarks
6114	D93-B	174.66		2.36	
6143	D93-B	>110		-----	
	normality	OK			
	n	59			
	outliers	1			
	mean (n)	166.25			
	st.dev. (n)	2.987			
	R(calc.)	8.36			
	st.dev.(D93-B:16a)	3.571			
	R(D93-B:16a)	10			



Determination of Kinematic Viscosity at 50°C on sample #17255; results in mm²/s

lab	method	value	mark	z(targ)	remarks
52	D445	39.51		0.04	
62	D445	38.965		-0.42	
120		----		----	
131		----		----	
140	D445	40.13		0.56	
150		----		----	
154	D445	39.32		-0.12	
158	D445	39.48		0.01	
159	D445	39.485		0.02	
171	D445	39.18		-0.24	
225	D445	39.94		0.40	
311	D445	39.72		0.21	
313	D445	39.35		-0.10	
317	D445	39.14		-0.27	
323	D445	39.62		0.13	
333	ISO3104	39.16		-0.26	
334	D445	39.59		0.10	
356	D445	39.28		-0.16	
402	D7042	39.52		0.05	
403	D445	39.69		0.19	
445	D445	39.44		-0.02	
463	D445	39.157		-0.26	
494	D445	39.759		0.25	
608	D445	39.40		-0.06	
621	D445	39.69		0.19	
657	D445	40.07		0.51	
663	D445	39.248		-0.18	
732	D445	39.87		0.34	
750	D445	39.61		0.12	
752	D445	40.086		0.52	
781	D445	39.34		-0.11	
785	D445	39.078		-0.33	
798	D445	39.5928		0.11	
823	D445	39.411		-0.05	
873	D445	39.435		-0.03	
874	D445	39.43		-0.03	
875	D445	39.26		-0.17	
994	D445	39.39		-0.06	
995	D445	39.402		-0.05	
1065	D445	39.466		0.00	
1081		----		----	
1082		----		----	
1107	D445	39.41		-0.05	
1108	D445	39.37		-0.08	
1134	D445	38.60		-0.73	
1191	ISO3104	39.502		0.03	
1229	ISO3104	39.20		-0.22	
1297	D7042	39.65		0.15	
1320		----		----	
1340	ISO3104	39.48		0.01	
1353		----		----	
1397	D7042	39.78		0.26	
1455	D445	39.35		-0.10	
1460	D445	39.464		0.00	
1468	ISO3104	39.551		0.07	
1510	D445	39.55		0.07	
1556	ISO3104	39.27		-0.16	
1585	D445	39.399		-0.06	
1586	D445	39.10		-0.31	
1613	D445	39.1		-0.31	
1776	ISO3104	39.253		-0.18	
1796	D445	39.302		-0.14	
1862	D445	38.77		-0.58	
1949	D445	39.58		0.10	
1950	D445	39.60		0.11	
1975	D445	39.433		-0.03	
1986	D445	39.61		0.12	
1995	D445	40.33		0.72	
4043		----		----	
6016		----		----	
6021	D445	39.300		-0.14	
6024	D445	39.78		0.26	
6026	D445	39.32		-0.12	
6051	D445	39.51		0.04	
6057	D445	39.04		-0.36	

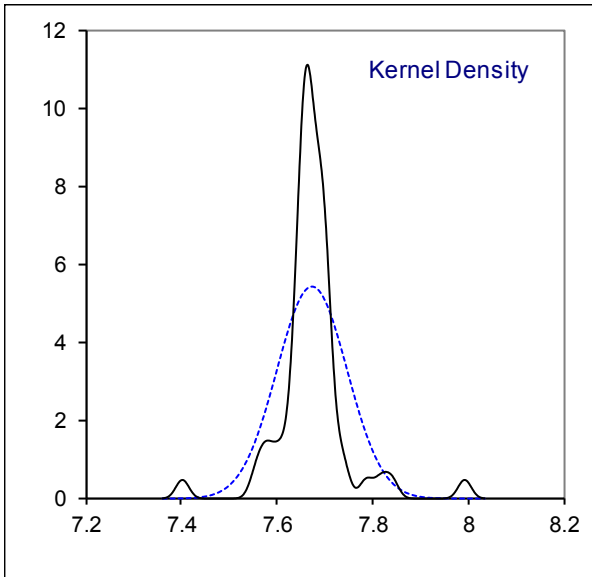
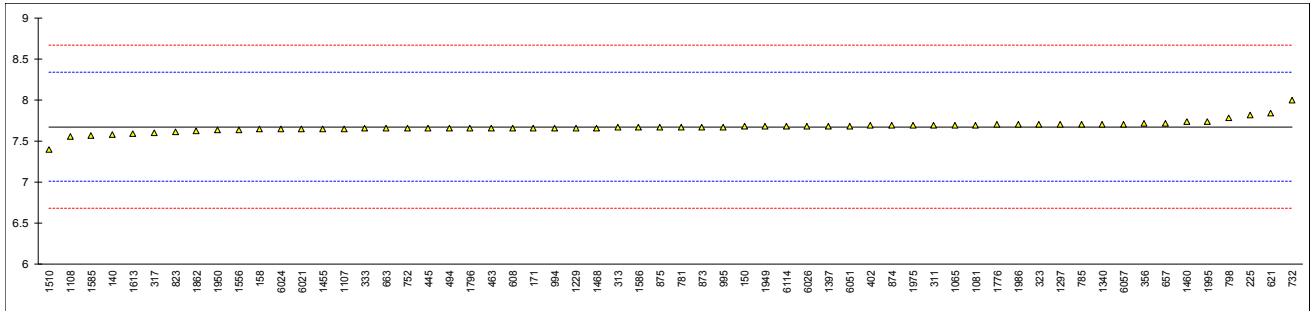
lab	method	value	mark	z(targ)	remarks
6114	D445	40.211		0.62	
6143	D445	39.67		0.17	
	normality	suspect			
	n	68			
	outliers	0			
	mean (n)	39.4662			
	st.dev. (n)	0.31083			
	R(calc.)	0.8703			
	st.dev.(D445:17a)	1.19258			
	R(D445:17a)	3.3392			



Determination of Kinematic Viscosity at 100°C on sample #17255; results in mm²/s

lab	method	value	mark	z(targ)	remarks
52		----		----	
62		----		----	
120		----		----	
131		----		----	
140	D445	7.578		-0.29	
150	D445	7.675		0.01	
154		----		----	
158	D445	7.640		-0.10	
159		----		----	
171	D445	7.660		-0.04	
225	D445	7.817		0.44	
311	D445	7.692		0.06	
313	D445	7.664		-0.03	
317	D445	7.605		-0.21	
323	D445	7.699		0.08	
333	ISO3104	7.652		-0.06	
334		----		----	
356	D445	7.709		0.11	
402	D7042	7.6882		0.05	
403		----		----	
445	D445	7.656		-0.05	
463	D445	7.6585		-0.04	
494	D445	7.6571		-0.05	
608	D445	7.660		-0.04	
621	D445	7.840		0.51	
657	D445	7.716		0.13	
663	D445	7.6525		-0.06	
732	D445	7.993		0.97	
750		----		----	
752	D445	7.654		-0.06	
781	D445	7.668		-0.01	
785	D445	7.702		0.09	
798	D445	7.7865		0.34	
823	D445	7.6061		-0.20	
873	D445	7.6710		-0.01	
874	D445	7.689		0.05	
875	D445	7.666		-0.02	
994	D445	7.661		-0.04	
995	D445	7.672		0.00	
1065	D445	7.694		0.06	
1081	D445	7.696		0.07	
1082		----		----	
1107	D445	7.649		-0.07	
1108	D445	7.554		-0.36	
1134		----		----	
1191		----		----	
1229	ISO3104	7.661		-0.04	
1297	D7042	7.700		0.08	
1320		----		----	
1340	ISO3104	7.704		0.09	
1353		----		----	
1397	D7042	7.680		0.02	
1455	D445	7.647		-0.08	
1460	D445	7.7330		0.18	
1468	ISO3104	7.6614		-0.03	
1510	D445	7.401		-0.82	
1556	ISO3104	7.6364		-0.11	
1585	D445	7.5674		-0.32	
1586	D445	7.664		-0.03	
1613	D445	7.586		-0.26	
1776	ISO3104	7.697		0.07	
1796	D445	7.6572		-0.05	
1862	D445	7.628		-0.14	
1949	D445	7.676		0.01	
1950	D445	7.631		-0.13	
1975	D445	7.6895		0.05	
1986	D445	7.698		0.08	
1995	D445	7.74		0.20	
4043		----		----	
6016		----		----	
6021	D445	7.6468		-0.08	
6024	D445	7.642		-0.09	
6026	D445	7.679		0.02	
6051	D445	7.680		0.02	
6057	D445	7.706		0.10	

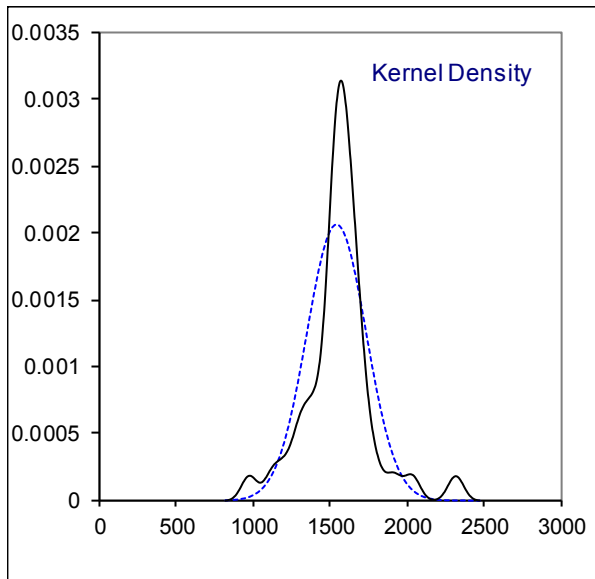
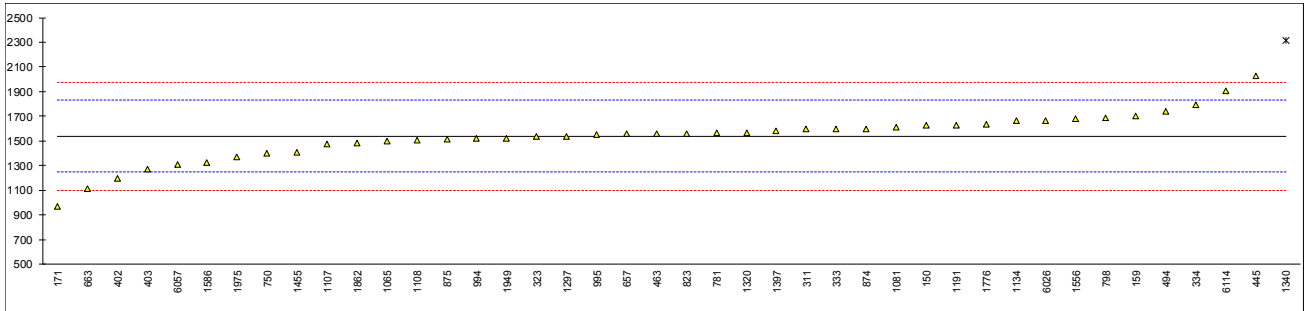
lab	method	value	mark	z(targ)	remarks
6114	D445	7.6776		0.01	
6143		----		----	
	normality	not OK			
	n	60			
	outliers	0			
	mean (n)	7.6728			
	st.dev. (n)	0.07367			
	R(calc.)	0.2063			
	st.dev.(D445:17a)	0.33048			
	R(D445:17a)	0.9253			



Determination of Nitrogen on sample #17255; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52		----		----	
62		----		----	
120		----		----	
131		----		----	
140		----		----	
150	D5762 Volumetric	1627		0.61	
154		----		----	
158		----		----	
159	D4629	1700		1.11	
171	D5762 Volumetric	970		-3.89	
225		----		----	
311	D5762 Volumetric	1600		0.42	
313		----		----	
317		----		----	
323	D5762 Gravimetric	1540		0.01	
333	D5762 Volumetric	1600		0.42	
334	D5762 Volumetric	1794		1.75	
356		----		----	
402	D5762 Gravimetric	1195	C	-2.35	First reported 1095
403	D5762 Gravimetric	1270		-1.84	
445	D5762 Gravimetric	2030		3.36	
463	D5762 Gravimetric	1560		0.15	
494	D5762 Gravimetric	1740		1.38	
608		----		----	
621		----		----	
657	D5762 Gravimetric	1558.38		0.14	
663	D5762 Gravimetric	1117		-2.88	
732		----		----	
750	D5762	1400		-0.95	
752		----		----	
781	D5762 Volumetric	1568		0.20	
785		----		----	
798	D5762 Volumetric	1686		1.01	
823	D5762 Gravimetric	1560		0.15	
873		----		----	
874	D5762 Volumetric	1600		0.42	
875	D5762 Gravimetric	1513		-0.17	
994	D5762 Volumetric	1520		-0.13	
995	D3228	1552		0.09	
1065	D5762 Gravimetric	1500		-0.26	
1081	D4629	1613		0.51	
1082		----		----	
1107	D4629	1473		-0.45	
1108	D5762 Gravimetric	1503		-0.24	
1134	D5762 Gravimetric	1663		0.85	
1191	D5762 Volumetric	1628		0.61	
1229		----		----	
1297	D4629	1540		0.01	
1320	D5762 Gravimetric	1570		0.22	
1340	D5762 Volumetric	2314.82	R(0.05)	5.31	
1353		----		----	
1397	In house	1580		0.29	
1455	D5762 Gravimetric	1410		-0.88	
1460		----		----	
1468		----		----	
1510		----		----	
1556	D5762 Volumetric	1679		0.96	
1585		----		----	
1586	D5762 Volumetric	1324		-1.47	
1613		----		----	
1776	D5762 Gravimetric	1633		0.65	
1796		----		----	
1862	D5762 Gravimetric	1480		-0.40	
1949	D5762 Volumetric	1525		-0.09	
1950		----		----	
1975	D5762 Gravimetric	1370		-1.15	
1986		----		----	
1995		----		----	
4043		----		----	
6016		----		----	
6021		----		----	
6024		----		----	
6026	D5762 Volumetric	1663		0.85	
6051		----		----	
6057	D5762 Gravimetric	1307		-1.58	

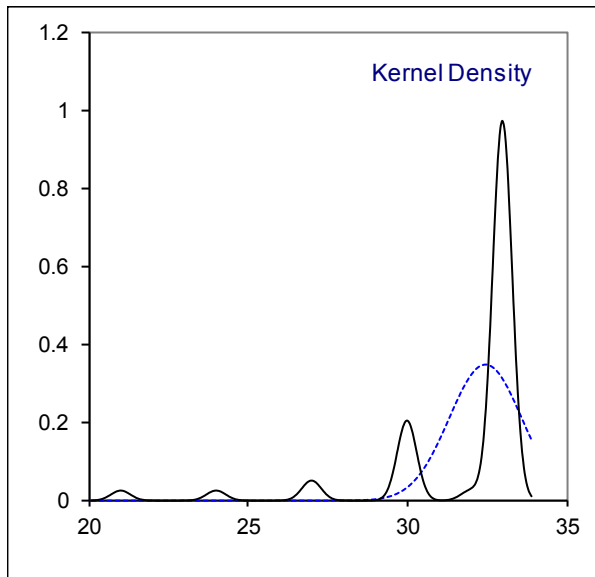
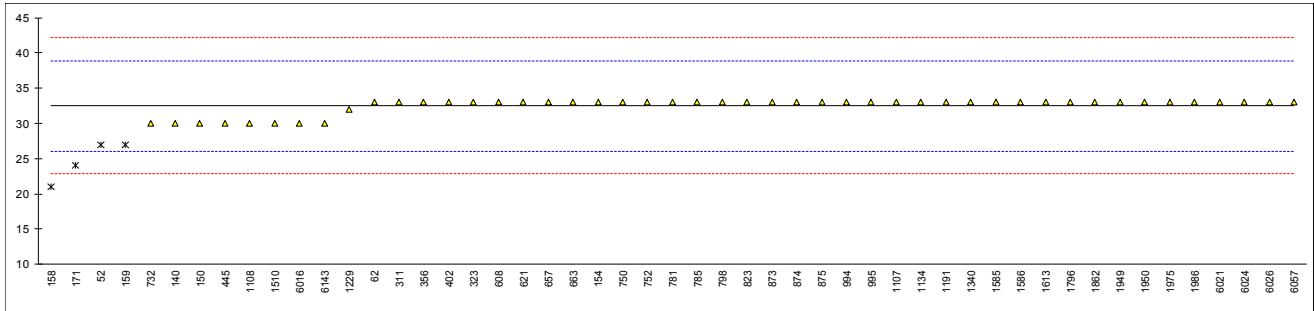
lab	method	value	mark	z(targ)	remarks
6114	D5762 Volumetric	1909		2.54	
6143		-----		-----	
	normality	suspect			<u>D5762-Volumetric</u> <u>D5762-Gravimetric</u>
	n	41		16	not OK suspect
	outliers	1		1	19 0
	mean (n)	1538.30		1578.31	1501.02
	st.dev. (n)	193.412		205.335	204.842
	R(calc.)	541.55		574.94	573.56
	st.dev.(D5762:12)	146.139		149.940	142.597
	R(D5762:12)	409.19		419.83	399.27



Determination of Pour Point, manual on sample #17255; results in °C

lab	method	value	mark	z(targ)	remarks
52	D97	27	R(0.01)	-1.70	
62	D97	33	C	0.17	First reported 0
120		----		----	
131		----		----	
140	D97	30		-0.77	
150	D97	30		-0.77	
154	D97	33		0.17	
158	D97	21.0	R(0.01)	-3.57	
159	D97	27	R(0.01)	-1.70	
171	D97	24	R(0.01)	-2.63	
225		----		----	
311	D97	33		0.17	
313		----		----	
317		----		----	
323	D97	33		0.17	
333		----		----	
334		----		----	
356	D97	33		0.17	
402	D97	33		0.17	
403		----		----	
445	D97	30		-0.77	
463		----		----	
494		----		----	
608	D97	33		0.17	
621	D97	33.0		0.17	
657	D97	33		0.17	
663	D97	33		0.17	
732	D97	30.0		-0.77	
750	D97	33		0.17	
752	D97	33		0.17	
781	D97	33		0.17	
785	D97	33		0.17	
798	D97	33		0.17	
823	D97	33		0.17	
873	D97	33		0.17	
874	D97	33		0.17	
875	D97	33		0.17	
994	D97	33		0.17	
995	D97	33		0.17	
1065		----		----	
1081		----		----	
1082		----		----	
1107	D97	33		0.17	
1108	D97	30		-0.77	
1134	D97	33		0.17	
1191	D97	33		0.17	
1229	ISO3016	32		-0.15	
1297		----		----	
1320		----		----	
1340	ISO3016	33		0.17	
1353		----		----	
1397		----		----	
1455		----		----	
1460		----		----	
1468		----		----	
1510	D97	30		-0.77	
1556		----		----	
1585	D97	33		0.17	
1586	D97	33.0		0.17	
1613	D97	33		0.17	
1776		----		----	
1796	D97	33		0.17	
1862	D97	33		0.17	
1949	D97	33		0.17	
1950	D97	33		0.17	
1975	D97	33		0.17	
1986	D97	33.0		0.17	
1995		----		----	
4043		----		----	
6016	D97	30		-0.77	
6021	D97	33		0.17	
6024	D97	33		0.17	
6026	D97	33		0.17	
6051		----		----	
6057	D97	33		0.17	

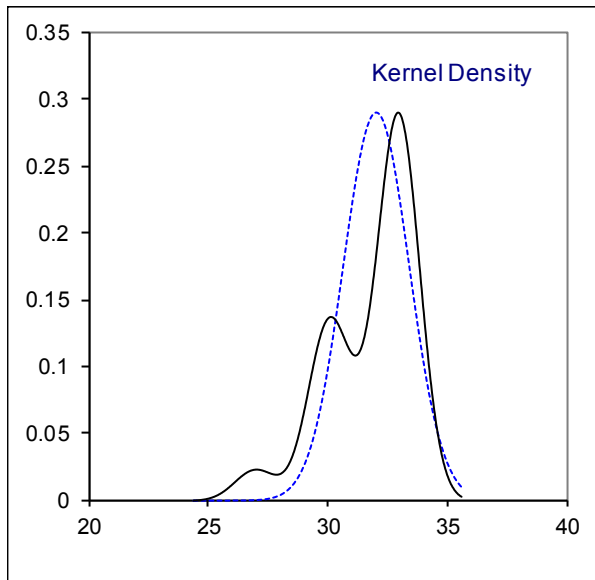
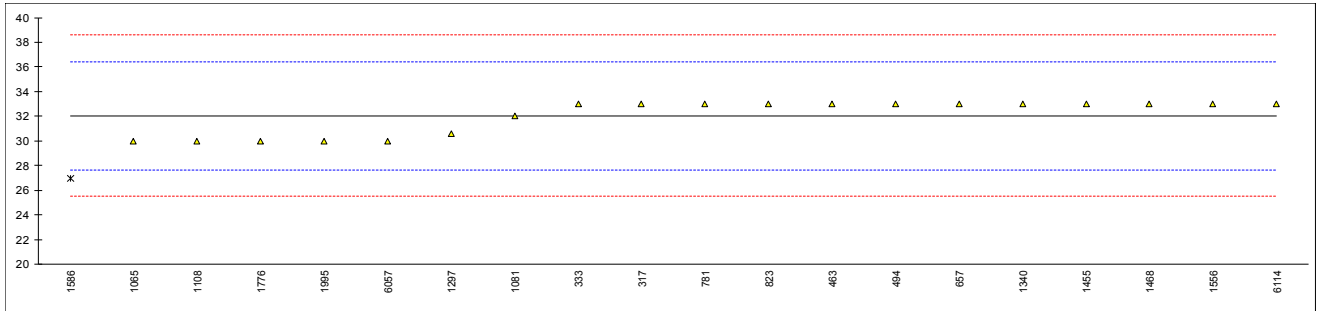
lab	method	value	mark	z(targ)	remarks
6114		---		---	
6143	D97	30		-0.77	
	normality	suspect			
	n	47			
	outliers	4			
	mean (n)	32.468			
	st.dev. (n)	1.1392			
	R(calc.)	3.190			
	st.dev.(D97:17a)	3.2143			
	R(D97:17a)	9			



Determination of Pour Point, automated, 3°C interval on sample #17255; results in °C

lab	method	value	mark	z(targ)	remarks
52		----		----	
62		----		----	
120		----		----	
131		----		----	
140		----		----	
150		----		----	
154		----		----	
158		----		----	
159		----		----	
171		----		----	
225		----		----	
311		----		----	
313		----		----	
317	D6749	33		0.44	
323		----		----	
333	D5950	33		0.44	
334		----		----	
356		----		----	
402		----		----	
403		----		----	
445		----		----	
463	D6892	33		0.44	
494	D6892	33		0.44	
608		----		----	
621		----		----	
657	D5950	33		0.44	
663		----		----	
732		----		----	
750		----		----	
752		----		----	
781	D5950	33		0.44	
785		----		----	
798		----		----	
823	D5950	33		0.44	
873		----		----	
874		----		----	
875		----		----	
994		----		----	
995		----		----	
1065	D5950	30.0		-0.93	
1081	D5950	32		-0.01	
1082		----		----	
1107		----		----	
1108	D5950	30		-0.93	
1134		----		----	
1191		----		----	
1229		----		----	
1297	D5950	30.6		-0.66	
1320		----		----	
1340	ISO3016	33		0.44	
1353		----		----	
1397		----		----	
1455	D5950	33		0.44	
1460		----		----	
1468	ISO3016	33		0.44	
1510		----		----	
1556	ISO3016	33		0.44	
1585		----		----	
1586	D5950	27.0	R(0.05)	-2.31	
1613		----		----	
1776	D6892	30		-0.93	
1796		----		----	
1862		----		----	
1949		----		----	
1950		----		----	
1975		----		----	
1986		----		----	
1995		30		-0.93	
4043		----		----	
6016		----		----	
6021		----		----	
6024		----		----	
6026		----		----	
6051		----		----	
6057	D5950	30		-0.93	

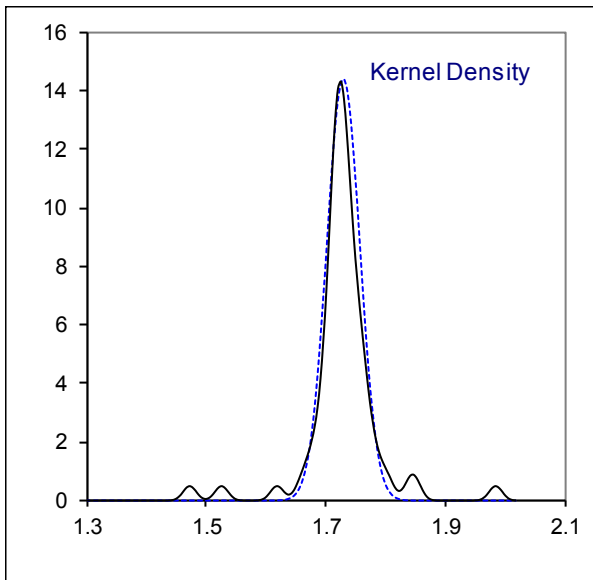
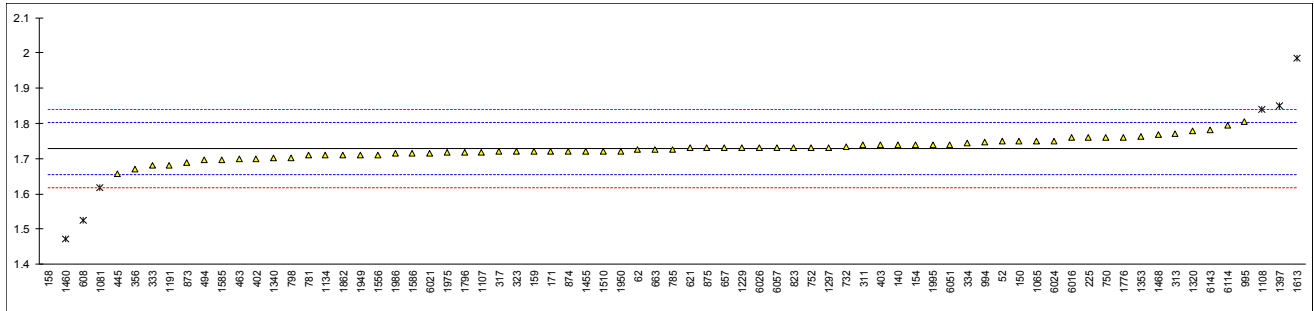
lab	method	value	mark	z(targ)	remarks
6114	D5950	33		0.44	
6143		----		----	
	normality	OK			
	n	19			
	outliers	1			
	mean (n)	32.032			
	st.dev. (n)	1.3732			
	R(calc.)	3.845			
	st.dev.(D5950:14)	2.1786			
	R(D5950:14)	6.1			



Determination of Total Sulphur on sample #17255; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D4294	1.75		0.57	
62	D4294	1.725		-0.11	
120		-----		-----	
131		-----		-----	
140	D4294	1.74		0.30	
150	D4294	1.75		0.57	
154	D4294	1.74		0.30	
158	D4294	0.808	R(0.01)	-24.93	
159	D4294	1.72		-0.24	
171	D4294	1.72		-0.24	
225	D4294	1.76		0.84	
311	D4294	1.74		0.30	
313	D4294	1.77		1.11	
317	D2622	1.72		-0.24	
323	D4294	1.72		-0.24	
333	D4294	1.68		-1.32	
334	D4294	1.743		0.38	
356	D4294	1.67		-1.59	
402	D4294	1.7		-0.78	
403	D4294	1.74		0.30	
445	D4294	1.658		-1.92	
463	D4294	1.70		-0.78	
494	D4294	1.698		-0.84	
608	D4294	1.525	R(0.01)	-5.52	
621	D4294	1.73		0.03	
657	D4294	1.73		0.03	
663	D4294	1.726		-0.08	
732	D4294	1.734		0.14	
750	D4294	1.76		0.84	
752	D4294	1.732		0.08	
781	D4294	1.71		-0.51	
785	D4294	1.727		-0.05	
798	D4294	1.703		-0.70	
823	D4294	1.731		0.06	
873	D4294	1.688		-1.11	
874	D4294	1.72		-0.24	
875	D4294	1.73		0.03	
994	D4294	1.748		0.52	
995	D4294	1.805		2.06	
1065	D4294	1.75		0.57	
1081	D4294	1.618	R(0.05)	-3.00	
1082		-----		-----	
1107	D4294	1.719		-0.27	
1108	D4294	1.84	R(0.05)	3.01	
1134	IP336	1.71		-0.51	
1191	ISO8754	1.681		-1.30	
1229	ISO8754	1.73		0.03	
1297	D4294	1.7320		0.08	
1320	ISO8754	1.78		1.38	
1340	ISO8754	1.702		-0.73	
1353	ISO8754	1.7639		0.95	
1397	D2622	1.85	R(0.05)	3.28	
1455	D2622	1.72		-0.24	
1460	D4294	1.4716	C,R(0.01)	-6.97	First reported 1.4568
1468	ISO8754	1.767		1.03	
1510	D4294	1.72		-0.24	
1556	ISO8754	1.711	C	-0.48	First reported 0.789
1585	D4294	1.698		-0.84	
1586	D4294	1.715		-0.38	
1613	D4294	1.984	R(0.01)	6.91	
1776	ISO8754	1.761		0.87	
1796	D4294	1.718		-0.29	
1862	D4294	1.71		-0.51	
1949	D4294	1.71		-0.51	
1950	D4294	1.72		-0.24	
1975	D4294	1.717		-0.32	
1986	D4294	1.714		-0.40	
1995	D4294	1.74		0.30	
4043		-----		-----	
6016	D4294	1.759		0.82	
6021	D4294	1.716		-0.35	
6024	D4294	1.75		0.57	
6026	D4294	1.73		0.03	
6051	D4294	1.74		0.30	
6057	ISO8754	1.73		0.03	

lab	method	value	mark	z(targ)	remarks
6114	D4294	1.794		1.76	
6143	D4294	1.7808		1.41	
	normality	OK			
	n	66			
	outliers	7			
	mean (n)	1.7289			
	st.dev. (n)	0.02770			
	R(calc.)	0.0776			
	st.dev.(D4294:16e1)	0.03693			
	R(D4294:16e1)	0.1034			



Determination of Arsenic as As on sample #17255; results in mg/kg

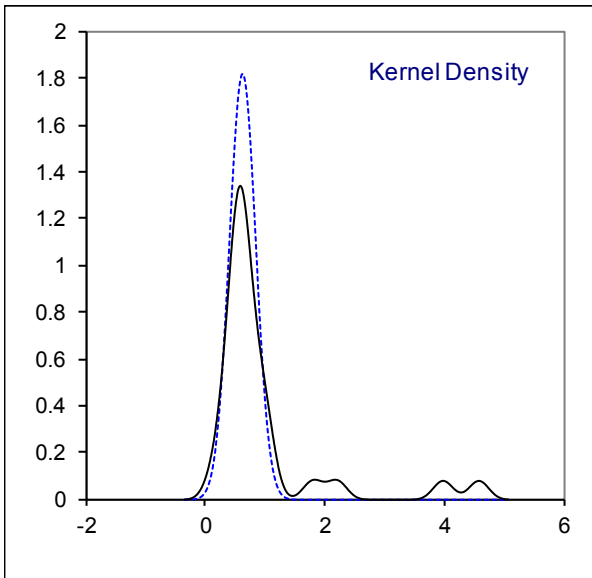
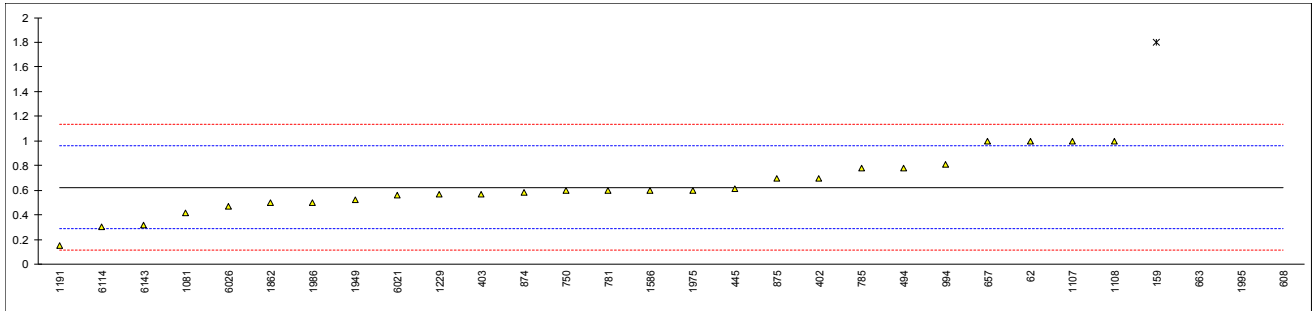
lab	method	value	mark	z(targ)	remarks
52		----		----	
62		----		----	
120		----		----	
131		----		----	
140		----		----	
150		----		----	
154		----		----	
158		----		----	
159	D5708	0.0		----	
171	D5708	<1.00		----	
225		----		----	
311		----		----	
313		----		----	
317		----		----	
323		----		----	
333		----		----	
334		----		----	
356		----		----	
402		----		----	
403	IP470	0.01027		----	
445		<1		----	
463		----		----	
494		----		----	
608		----		----	
621		----		----	
657		----		----	
663		----		----	
732		----		----	
750		----		----	
752		----		----	
781	UOP986	<0.050		----	
785		----		----	
798		----		----	
823	D7111	0		----	
873		----		----	
874		----		----	
875		----		----	
994		----		----	
995		----		----	
1065		----		----	
1081		0.088		----	
1082		----		----	
1107		----		----	
1108		----		----	
1134		----		----	
1191		----		----	
1229		----		----	
1297	In house	0.051		----	
1320		----		----	
1340		----		----	
1353		----		----	
1397		----		----	
1455		----		----	
1460	D7111	<1		----	
1468		----		----	
1510		----		----	
1556		----		----	
1585		----		----	
1586		----		----	
1613		----		----	
1776		----		----	
1796		----		----	
1862		----		----	
1949	UOP986	16		----	False positive test result?
1950		----		----	
1975		----		----	
1986		----		----	
1995		----		----	
4043		----		----	
6016		----		----	
6021		----		----	
6024		----		----	
6026		----		----	
6051		----		----	
6057		----		----	

lab	method	value	mark	z(targ)	remarks
6114	In house	<0,1		----	
6143		----		----	

Determination of Calcium as Ca on sample #17255; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52		----		----	
62	IP470	1		2.22	
120		----		----	
131		----		----	
140		----		----	
150	IP501	<3		----	
154		----		----	
158		----		----	
159	D5708	1.8	C,R(0.01)	6.94	First reported 3.5
171	D5708	<1.00		----	
225	IP501	<3		----	
311		----		----	
313		----		----	
317		----		----	
323	IP501	<3		----	
333		----		----	
334		----		----	
356		----		----	
402	IP470	0.7		0.45	
403	IP470	0.57		-0.32	
445	IP621	0.61		-0.08	
463		----		----	
494	IP501	0.78		0.92	
608	IP501	4.568	R(0.01)	23.29	
621		----		----	
657	IP501	1		2.22	
663	IP501	2.2	R(0.01)	9.30	
732		----		----	
750	IP501	0.60		-0.14	
752		----		----	
781	IP501	0.6		-0.14	
785	IP470	0.78		0.92	
798		----		----	
823		----		----	
873		----		----	
874	IP501	0.58		-0.26	
875	IP501	0.7		0.45	
994	IP501	0.81		1.10	
995		----		----	
1065		----		----	
1081		0.417		-1.22	
1082		----		----	
1107	IP501Mod.	1.0		2.22	
1108	D7111	1.0		2.22	
1134		----		----	
1191	D5185	0.15		-2.80	
1229		0.568		-0.33	
1297		----		----	
1320		----		----	
1340		----		----	
1353		----		----	
1397		----		----	
1455		----		----	
1460	D7111	<1		----	
1468		----		----	
1510		----		----	
1556		----		----	
1585		----		----	
1586	IP621	0.6	C	-0.14	First reported 0.7
1613	IP470	<5.0		----	
1776		----		----	
1796		----		----	
1862	IP621	0.5		-0.73	
1949	IP621	0.52		-0.62	
1950		----		----	
1975	IP470	0.6		-0.14	
1986	IP470	0.5		-0.73	
1995	IP501	3.97	R(0.01)	19.76	
4043		----		----	
6016		----		----	
6021	IP621	0.56		-0.38	
6024		----		----	
6026	IP470	0.47		-0.91	
6051		----		----	
6057	IP501	<3		----	

lab	method	value	mark	z(targ)	remarks
6114	IP501	0.3		-1.92	
6143		0.319		-1.80	
	normality	OK			
	n	26			
	outliers	4			
	mean (n)	0.624			
	st.dev. (n)	0.2196			
	R(calc.)	0.615			
	st.dev.(IP501:05)	0.1693			
	R(IP501:05)	0.474			



Determination of Copper as Cu on sample #17255; results in mg/kg

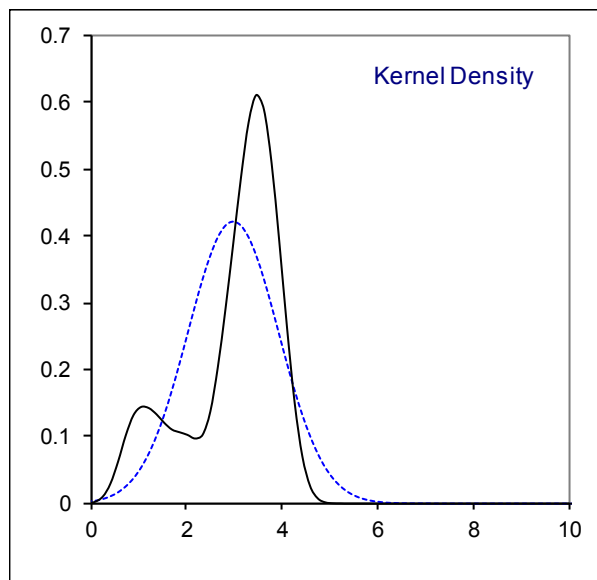
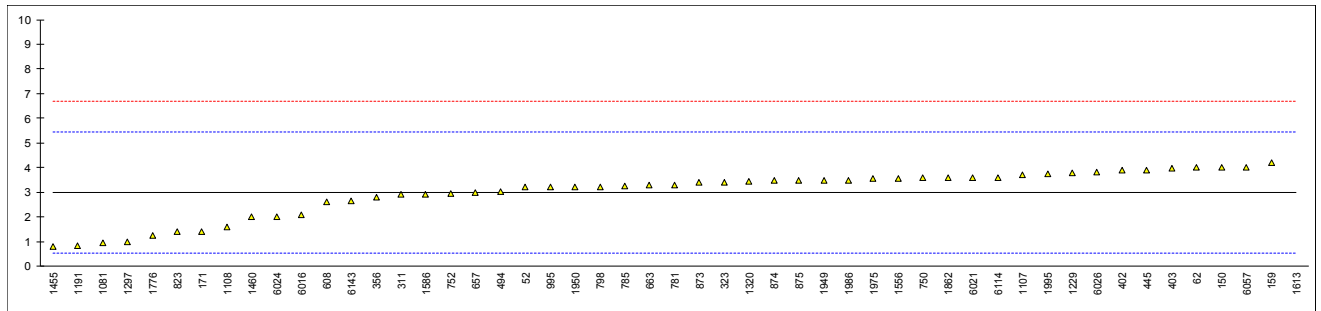
lab	method	value	mark	z(targ)	remarks
52	IP621	<0.5		----	
62		----		----	
120		----		----	
131		----		----	
140		----		----	
150		----		----	
154		----		----	
158		----		----	
159		----		----	
171	D5708	<1.00		----	
225	IP501	<1		----	
311	IP PM CW	<0.1		----	
313		----		----	
317		----		----	
323	IP621	<0.1		----	
333		----		----	
334		----		----	
356	IP621	Below 0.1		----	
402		----		----	
403	IP470	0.12		----	
445	IP621	0.04		----	
463		----		----	
494		----		----	
608	IP501	<0.1		----	
621		----		----	
657	IP501	0.113		----	
663		----		----	
732		----		----	
750	IP501	<1		----	
752	IP621	0.026		----	
781	IP621	<0.1		----	
785		----		----	
798	IP501	0.19		----	
823	D7111	0		----	
873	IP621	<0.1		----	
874	IP621	0.03		----	
875	IP501	<1		----	
994	IP501	<0.1		----	
995	IP621	L 0.1		----	
1065		----		----	
1081		----		----	
1082		----		----	
1107	IP501Mod.	<0.1		----	
1108	D7111	0.1		----	
1134		----		----	
1191	D5185	0.02		----	
1229		0.02		----	
1297		----		----	
1320	IP501	<0.1		----	
1340		----		----	
1353		----		----	
1397		----		----	
1455	IP621	< 0.1		----	
1460	D7111	<1		----	
1468		----		----	
1510		----		----	
1556	IP621	0.050		----	
1585		----		----	
1586	IP621	< 0.2		----	
1613		----		----	
1776		----		----	
1796		----		----	
1862	IP621	Less 0.1		----	
1949	IP621	0.02		----	
1950	IP621	0.04		----	
1975		----		----	
1986		----		----	
1995	IP501	0.08		----	
4043		----		----	
6016		----		----	
6021		----		----	
6024		----		----	
6026		----		----	
6051		----		----	
6057		----		----	

lab	method	value	mark	z(targ)	remarks
6114	IP501	<0,1		----	
6143		0.009		----	

Determination of Iron as Fe on sample #17255; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	IP621	3.2		0.17	
62	IP470	4		0.81	
120		----		----	
131		----		----	
140		----		----	
150	IP501	4		0.81	
154		----		----	
158		----		----	
159	D5708	4.2		0.98	
171	D5708	1.42		-1.27	
225		----		----	
311	IP PM CW	2.9		-0.08	
313		----		----	
317		----		----	
323	IP621	3.4		0.33	
333		----		----	
334		----		----	
356	IP621	2.8		-0.16	
402	IP470	3.89		0.73	
403	IP470	3.98		0.80	
445	IP621	3.90		0.73	
463		----		----	
494	IP501	3.03		0.03	
608	IP501	2.617		-0.30	
621		----		----	
657	IP501	3		0.01	
663	IP501	3.3		0.25	
732		----		----	
750	IP501	3.6		0.49	
752	IP621	2.943		-0.04	
781	IP621	3.3		0.25	
785	IP470	3.24		0.20	
798	IP501	3.21		0.17	
823	D7111	1.41		-1.28	
873	IP621	3.4		0.33	
874	IP621	3.5		0.41	
875	IP501	3.5		0.41	
994		----		----	
995	IP621	3.2		0.17	
1065		----		----	
1081		0.962		-1.64	
1082		----		----	
1107	IP501Mod.	3.7		0.57	
1108	D7111	1.6		-1.13	
1134		----		----	
1191	D5185	0.85		-1.73	
1229		3.8		0.65	
1297	In house	1.000		-1.61	
1320	IP501	3.44		0.36	
1340		----		----	
1353		----		----	
1397		----		----	
1455	IP621	0.8		-1.77	
1460	D7111	2		-0.80	
1468		----		----	
1510		----		----	
1556	IP621	3.575		0.47	
1585		----		----	
1586	IP621	2.9	C	-0.08	First reported 0.9
1613	IP470	40	R(0.01)	29.94	
1776	D5708	1.24		-1.42	
1796		----		----	
1862	IP621	3.6		0.49	
1949	IP621	3.50		0.41	
1950	IP621	3.2		0.17	
1975	IP621	3.55		0.45	
1986	IP PM CW	3.5		0.41	
1995	IP501	3.74		0.60	
4043		----		----	
6016	D5708	2.1		-0.72	
6021	IP621	3.60		0.49	
6024	IP470	2		-0.80	
6026	IP470	3.82		0.67	
6051		----		----	
6057	IP501	4		0.81	

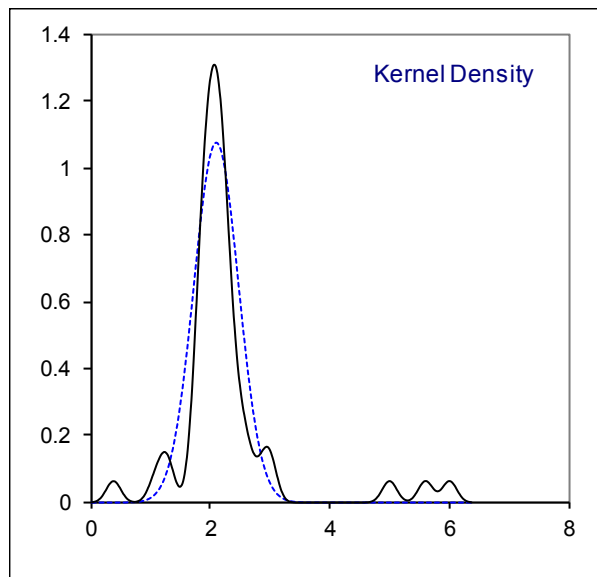
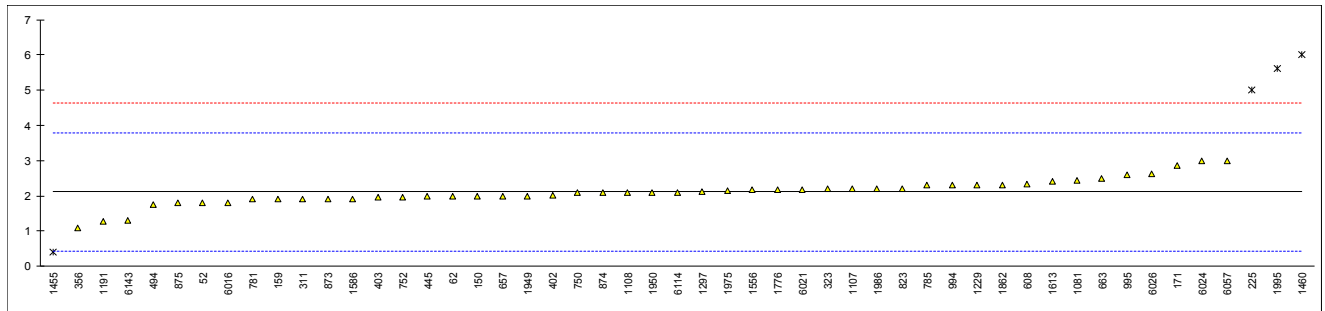
lab	method	value	mark	z(targ)	remarks
6114	IP501	3.6		0.49	
6143		2.67		-0.26	
	normality	OK			
	n	50			
	outliers	1			
	mean (n)	2.994			
	st.dev. (n)	0.9494			
	R(calc.)	2.658			
	st.dev.(IP621:16)	1.2361			
	R(IP621:16)	3.461			



Determination of Nickel as Ni on sample #17255; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	IP621	1.8		-0.37	
62	IP470	2		-0.13	
120		----		----	
131		----		----	
140		----		----	
150	IP501	2		-0.13	
154		----		----	
158		----		----	
159	D5708	1.9		-0.25	
171	D5708	2.85		0.88	
225	IP501	5	R(0.01)	3.44	
311	IP PM CW	1.9		-0.25	
313		----		----	
317		----		----	
323	IP621	2.2		0.10	
333		----		----	
334		----		----	
356	IP621	1.1		-1.20	
402	IP470	2.01		-0.12	
403	IP470	1.95		-0.19	
445	IP621	1.99		-0.15	
463		----		----	
494	IP501	1.76		-0.42	
608	IP501	2.326		0.25	
621		----		----	
657	IP501	2		-0.13	
663	IP501	2.5		0.46	
732		----		----	
750	IP501	2.1		-0.01	
752	IP621	1.966		-0.17	
781	IP621	1.9		-0.25	
785	IP470	2.30		0.22	
798		----		----	
823	D7111	2.21		0.12	
873	IP621	1.9		-0.25	
874	IP621	2.1		-0.01	
875	IP501	1.8		-0.37	
994	IP501	2.3		0.22	
995	IP621	2.6		0.58	
1065		----		----	
1081		2.430		0.38	
1082		----		----	
1107	IP501Mod.	2.2		0.10	
1108	D7111	2.1		-0.01	
1134		----		----	
1191	D5185	1.27		-1.00	
1229		2.3		0.22	
1297	In house	2.110		0.00	
1320		----		----	
1340		----		----	
1353		----		----	
1397		----		----	
1455	IP621	0.4	R(0.01)	-2.04	
1460	D7111	6	R(0.01)	4.63	
1468		----		----	
1510		----		----	
1556	IP621	2.166		0.06	
1585		----		----	
1586	IP621	1.9		-0.25	
1613	IP470	2.4		0.34	
1776	D5708	2.17		0.07	
1796		----		----	
1862	IP621	2.3		0.22	
1949	IP621	2.00		-0.13	
1950	IP621	2.1		-0.01	
1975	IP621	2.14		0.03	
1986	IP PM CW	2.2		0.10	
1995	IP501	5.60	R(0.01)	4.15	
4043		----		----	
6016	D5708	1.8		-0.37	
6021	IP621	2.18		0.08	
6024	IP470	3		1.06	
6026	IP470	2.63		0.62	
6051		----		----	
6057	IP501	3		1.06	

lab	method	value	mark	z(targ)	remarks
6114	IP501	2.1		-0.01	
6143		1.305		-0.96	
	normality	suspect			
	n	47			
	outliers	4			
	mean (n)	2.112			
	st.dev. (n)	0.3713			
	R(calc.)	1.040			
	st.dev.(IP621:16)	0.8405			
	R(IP621:16)	2.353			



Determination of Silicon as Si on sample #17255; results in mg/kg

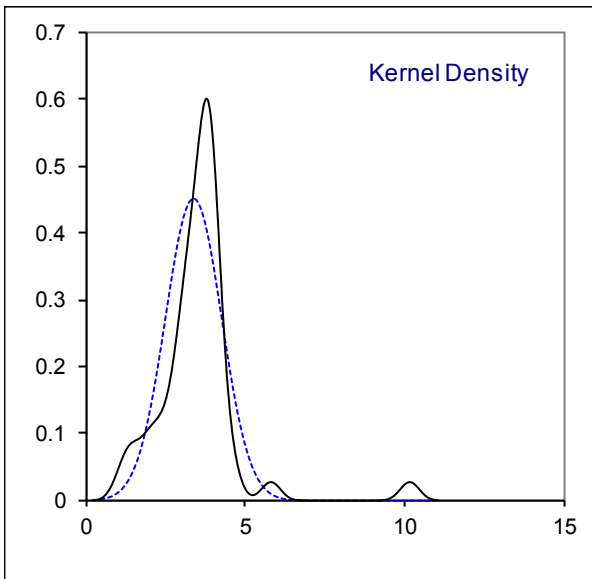
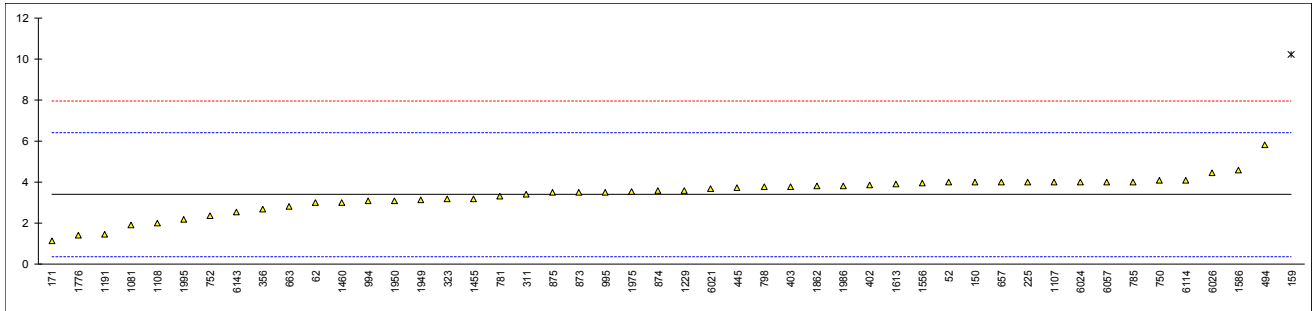
lab	method	value	mark	z(targ)	remarks
52		----		----	
62	IP470	1	C	----	First reported 4
120		----		----	
131		----		----	
140		----		----	
150	IP501	<10		----	
154	D5184	<10		----	
158		----		----	
159		----		----	
171	D5708	<1.00		----	
225		----		----	
311	IP PM CW	<1.0		----	
313		----		----	
317		----		----	
323	IP501	<10		----	
333		----		----	
334		----		----	
356		----		----	
402	IP470	2.78		----	
403	IP470	2.52		----	
445	IP501	0.5		----	
463		----		----	
494	IP501	0.81		----	
608	IP501	<0.1		----	
621		----		----	
657	IP501	1		----	
663	IP501	1.3		----	
732		----		----	
750	IP501	0.92		----	
752		----		----	
781	IP501	<1		----	
785	IP470	0.80		----	
798	IP501	1.31		----	
823		----		----	
873		----		----	
874	IP501	0.34		----	
875	IP501	<10		----	
994	IP501	<10		----	
995	IP621	1.0		----	
1065		----		----	
1081		----		----	
1082		----		----	
1107	IP501Mod.	2.7		----	
1108	D5708	<0.1		----	
1134		----		----	
1191	D5185	0.15		----	
1229		----		----	
1297		----		----	
1320		----		----	
1340		----		----	
1353		----		----	
1397		----		----	
1455		----		----	
1460	D5184	<1		----	
1468		----		----	
1510		----		----	
1556		----		----	
1585		----		----	
1586	IP621	<0.05		----	
1613	IP470	<10.0		----	
1776		----		----	
1796		----		----	
1862		----		----	
1949		----		----	
1950		----		----	
1975		----		----	
1986		----		----	
1995	IP501	8.10		----	
4043		----		----	
6016		----		----	
6021		----		----	
6024		----		----	
6026		----		----	
6051		----		----	
6057	IP501	<10		----	

lab	method	value	mark	z(targ)	remarks
6114	IP501	0.7		----	
6143		0.224		----	

Determination of Sodium as Na on sample #17255; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	IP621	4.0		0.40	
62	IP470	3		-0.26	
120		----		----	
131		----		----	
140		----		----	
150	IP501	4		0.40	
154		----		----	
158		----		----	
159	D5708	10.2	C,R(0.01)	4.51	First reported 8.3
171	D5708	1.12		-1.51	
225	IP501	4		0.40	
311	IP PM CW	3.4		0.00	
313		----		----	
317		----		----	
323	IP621	3.2		-0.13	
333		----		----	
334		----		----	
356	IP621	2.7		-0.46	
402	IP470	3.85		0.30	
403	IP470	3.78		0.26	
445	IP621	3.72		0.22	
463		----		----	
494	IP501	5.83		1.61	
608		----		----	
621		----		----	
657	IP501	4		0.40	
663	IP501	2.8		-0.39	
732		----		----	
750	IP501	4.1		0.47	
752	IP621	2.369		-0.68	
781	IP621	3.3		-0.06	
785	IP470	4.01		0.41	
798	IP501	3.75		0.24	
823		----		----	
873	IP621	3.5		0.07	
874	IP621	3.6		0.14	
875	IP501	3.5		0.07	
994	IP501	3.1		-0.20	
995	IP621	3.5		0.07	
1065		----		----	
1081		1.896		-0.99	
1082		----		----	
1107	IP5001Mod.	4.0		0.40	
1108	D7111	2.0		-0.92	
1134		----		----	
1191	D5185	1.48		-1.27	
1229		3.6		0.14	
1297		----		----	
1320		----		----	
1340		----		----	
1353		----		----	
1397		----		----	
1455	IP621	3.2		-0.13	
1460	D7111	3		-0.26	
1468		----		----	
1510		----		----	
1556	IP621	3.956		0.37	
1585		----		----	
1586	IP621	4.6	C	0.80	First reported 1.1
1613	IP470	3.9		0.33	
1776	EN15944	1.42		-1.31	
1796		----		----	
1862	IP621	3.8		0.27	
1949	IP621	3.14		-0.17	
1950	IP621	3.1		-0.20	
1975	IP621	3.55		0.10	
1986	IP PM CW	3.8		0.27	
1995	IP501	2.18		-0.80	
4043		----		----	
6016		----		----	
6021		3.67		0.18	
6024	IP470	4		0.40	
6026	IP470	4.47		0.71	
6051		----		----	
6057	IP501	4		0.40	

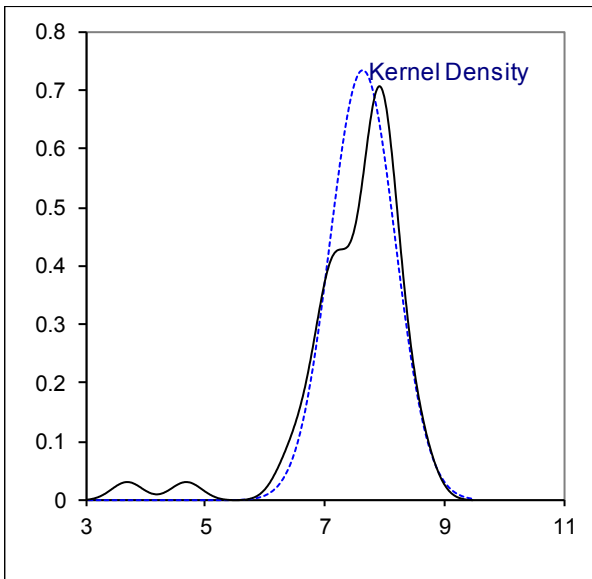
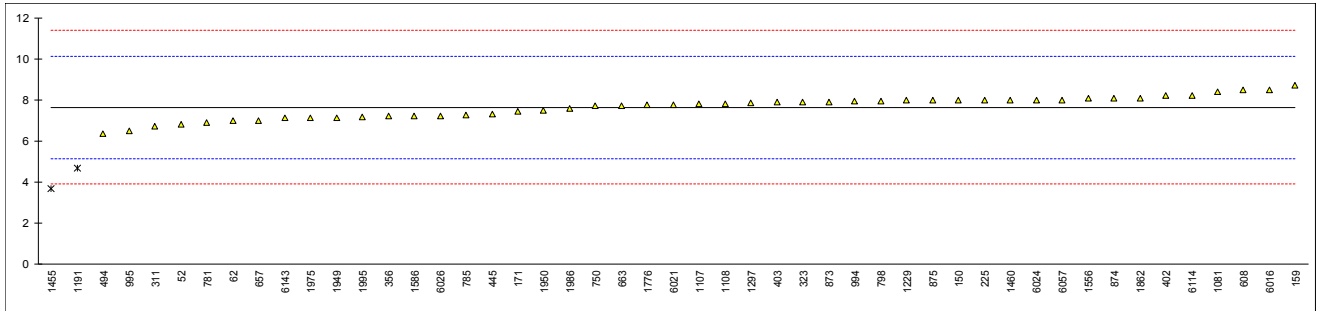
lab	method	value	mark	z(targ)	remarks
6114	IP501	4.1		0.47	
6143		2.555		-0.56	
	normality	suspect			
	n	47			
	outliers	1			
	mean (n)	3.395			
	st.dev. (n)	0.8824			
	R(calc.)	2.471			
	st.dev.(IP621:16)	1.5100			
	R(IP621:16)	4.228			



Determination of Vanadium as V on sample #17255; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	IP621	6.8		-0.68	
62	IP470	7		-0.52	
120		----		----	
131		----		----	
140		----		----	
150	IP501	8		0.29	
154		----		----	
158		----		----	
159	D5708	8.7		0.85	
171	D5708	7.46		-0.15	
225	IP501	8		0.29	
311	IP PM CW	6.7		-0.76	
313		----		----	
317		----		----	
323	IP621	7.9		0.21	
333		----		----	
334		----		----	
356	IP621	7.2		-0.36	
402	IP470	8.2		0.45	
403	IP470	7.89		0.20	
445	IP621	7.29		-0.28	
463		----		----	
494	IP501	6.36		-1.03	
608	IP501	8.484		0.68	
621		----		----	
657	IP501	7		-0.52	
663	IP501	7.7		0.05	
732		----		----	
750	IP501	7.7		0.05	
752		----		----	
781	IP621	6.9		-0.60	
785	IP470	7.26		-0.31	
798	IP501	7.94		0.24	
823		----		----	
873	IP621	7.9		0.21	
874	IP621	8.1		0.37	
875	IP501	8.0		0.29	
994	IP501	7.92		0.22	
995	IP621	6.5		-0.92	
1065		----		----	
1081		8.408		0.61	
1082		----		----	
1107	IP501Mod.	7.8		0.13	
1108	D7111	7.8		0.13	
1134		----		----	
1191	D5185	4.69	R(0.01)	-2.37	
1229		7.971		0.26	
1297	In house	7.860		0.17	
1320		----		----	
1340		----		----	
1353		----		----	
1397		----		----	
1455	IP621	3.7	R(0.01)	-3.17	
1460	D7111	8		0.29	
1468		----		----	
1510		----		----	
1556	IP621	8.090		0.36	
1585		----		----	
1586	IP621	7.2	C	-0.36	First reported 2.2
1613		----		----	
1776	D5708	7.77		0.10	
1796		----		----	
1862	IP621	8.1		0.37	
1949	IP621	7.14		-0.40	
1950	IP621	7.5		-0.11	
1975	IP621	7.12		-0.42	
1986	IP PM CW	7.6		-0.03	
1995	IP501	7.17		-0.38	
4043		----		----	
6016	D5708	8.5		0.69	
6021	IP621	7.77		0.10	
6024	IP470	8		0.29	
6026	IP470	7.21		-0.35	
6051		----		----	
6057	IP501	8		0.29	

lab	method	value	mark	z(targ)	remarks
6114	IP501	8.2		0.45	
6143		7.109		-0.43	
	normality	OK			
	n	47			
	outliers	2			
	mean (n)	7.643			
	st.dev. (n)	0.5442			
	R(calc.)	1.524			
	st.dev.(IP621:16)	1.2445			
	R(IP621:16)	3.485			



Determination of Simulated Distillation acc. to ASTM D6352 on sample #17255; result in °C

lab	method	IBP	10%	30%	50%	70%	90%	FBP	
52	D7213	227.5	361.0	413.5	C 448.0	<u>DG(5)</u> 483.5	C 535.0	646.5	
62		----	----	----	----	----	----	----	
120		----	----	----	----	----	----	----	
131		----	----	----	----	----	----	----	
140		----	----	----	----	----	----	----	
150	D6352	258	358	405	438	473	529	662	
154		----	----	----	----	----	----	----	
158	D7169	270.62	361.86	411.68	449.36	<u>DG(5)</u> 496.17	<u>G(1)</u> 630.28	<u>G(1)</u> 720.99	ex
159		----	----	----	----	----	----	----	
171	D7169	241.5	356.5	405.5	439.5	476.0	540.0	702.5	
225		----	----	----	----	----	----	----	
311	D6352	231	357	405	438	474	530	664	
313		----	----	----	----	----	----	----	
317		----	----	----	----	----	----	----	
323	D6352	232.7	349.7	399.0	432.0	467.7	521.0	614.7	
333		----	----	----	----	----	----	----	
334		----	----	----	----	----	----	----	
356		----	----	----	----	----	----	----	
402	D1160	282.1	374.8	C <u>G(1)</u> 413.1	432.0	475.5	536.1	557.5	C
403		----	----	----	442.2	----	----	----	----
445	D7169	235.8	357.2	405.6	439.4	474.8	531.6	680.0	
463		----	----	----	----	----	----	----	
494		----	----	----	----	----	----	----	
608		----	----	----	----	----	----	----	
621		----	----	----	----	----	----	----	
657		----	----	----	----	----	----	----	
663		----	----	----	----	----	----	----	
732		----	----	----	----	----	----	----	
750		----	----	----	----	----	----	----	
752		----	----	----	----	----	----	----	
781		----	----	----	----	----	----	----	
785		----	----	----	----	----	----	----	
798		----	----	----	----	----	----	----	
823		----	----	----	----	----	----	----	
873		----	----	----	----	----	----	----	
874		----	----	----	----	----	----	----	
875		----	----	----	----	----	----	----	
994		----	----	----	----	----	----	----	
995		----	----	----	----	----	----	----	
1065	D6352	244.4	356.4	404.6	437.8	472.6	523.8	594.6	
1081	IP480	241.4	357.2	404.8	438.2	473.6	529.0	652.6	
1082		----	----	----	----	----	----	----	
1107	D7500	239.8	355.9	402.1	435.3	470.1	523.3	618.8	
1108		----	----	----	----	----	----	----	
1134		----	----	----	----	----	----	----	
1191		----	----	----	----	----	----	----	
1229		----	----	----	----	----	----	----	
1297	D6352	204.2	354.6	401.8	434.4	C 469.8	523.0	607.8	
1320		----	----	----	----	----	----	----	
1340		----	----	----	----	----	----	----	
1353		----	----	----	----	----	----	----	
1397	D6352	268.00	357.00	406.00	440.00	474.00	530.00	641.00	
1455		----	----	----	----	----	----	----	
1460	D2887	221.5	350	397	429.5	461.5	ex 504.5	<u>DG(5)</u> 542	ex
1468	D7500	228.8	355.4	403.4	437.0	473.0	529.0	684.2	
1510		----	----	----	----	----	----	----	
1556		----	----	----	----	----	----	----	
1585		----	----	----	----	----	----	----	
1586		----	----	----	----	----	----	----	
1613		----	----	----	----	----	----	----	
1776	D6352	242.0	358.0	405.0	437.0	468.0	512.0	<u>DG(5)</u> 552.0	
1796		----	----	----	----	----	----	----	
1862		----	----	----	----	----	----	----	
1949	D7169	227.0	356.5	405.5	439.5	475.0	530.0	656.5	
1950		----	----	----	----	----	----	----	
1975		----	----	----	----	----	----	----	
1986		----	----	----	----	----	----	----	
1995		----	----	----	----	----	----	----	
4043		----	----	----	----	----	----	----	
6016	D7169	243.0	356.2	404.1	437.3	472.9	529.6	688.3	
6021		----	----	----	----	----	----	----	
6024		----	----	----	----	----	----	----	
6026		----	----	----	----	----	----	----	
6051		----	----	----	----	----	----	----	
6057		----	----	----	----	----	----	----	

lab	method	IBP	10%	30%	50%	70%	90%	FBP
6114		----	----	----	----	----	----	----
6143		----	----	----	----	----	----	----
	normality	OK	suspect	OK	OK	not OK	OK	OK
	n	18	17	18	17	16	15	16
	outliers	0	1	0	2	1 (+1 excl)	3	0 (+2excl)
	mean (n)	241.07	356.38	405.15	436.89	473.34	529.36	638.94
	st.dev. (n)	18.881	3.046	4.244	3.299	3.698	5.176	44.756
	R(calc.)	52.87	8.53	11.88	9.24	10.35	14.49	125.32
	st.dev.(D6352:15)	17.536	2.536	2.107	2.286	2.571	3.750	13.607
	R(D6352:15)	49.1	7.1	5.9	6.4	7.2	10.5	38.1

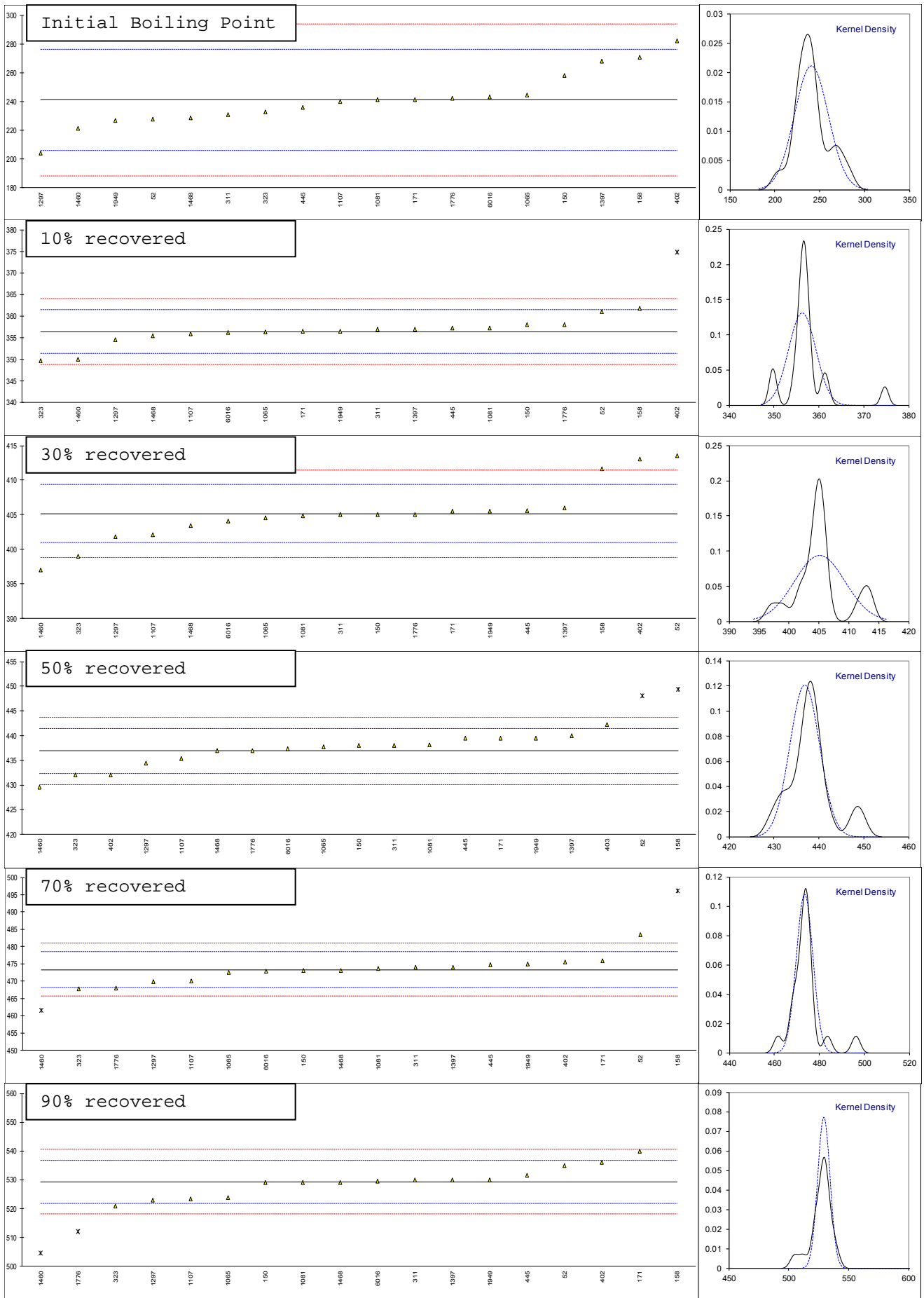
Lab 52: first reported 411.5, 446.5, 482.0

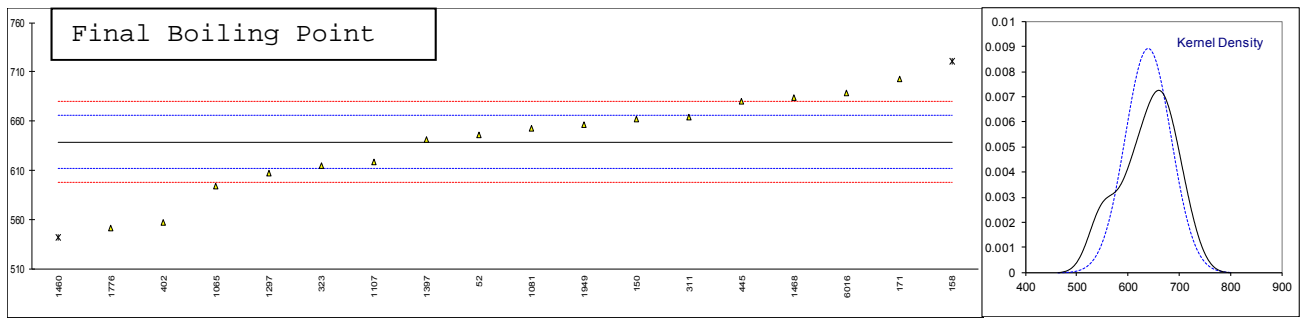
Lab 402: first reported 371.8. 547.5

Lab 1297: first reported 343.5

Z-SCORES

lab	IBP	10%	30%	50%	70%	90%	FBP
52	-0.77	1.82	3.96	4.86	3.95	1.50	0.56
150	0.97	0.64	-0.07	0.49	-0.13	-0.10	1.69
158	1.68	2.16	3.10	5.46	8.88	26.91	6.03
171	0.02	0.05	0.17	1.14	1.03	2.84	4.67
311	-0.57	0.24	-0.07	0.49	0.26	0.17	1.84
323	-0.48	-2.63	-2.92	-2.14	-2.19	-2.23	-1.78
402	2.34	7.26	3.77	-2.14	0.84	1.80	-5.98
445	-0.30	0.32	0.21	1.10	0.57	0.60	3.02
1065	0.19	0.01	-0.26	0.40	-0.29	-1.48	-3.26
1081	0.02	0.32	-0.17	0.57	0.10	-0.10	1.00
1107	-0.07	-0.19	-1.45	-0.69	-1.26	-1.62	-1.48
1297	-2.10	-0.70	-1.59	-1.09	-1.38	-1.70	-2.29
1397	1.54	0.24	0.40	1.36	0.26	0.17	0.15
1460	-1.12	-2.52	-3.87	-3.23	-4.61	-6.63	-7.12
1468	-0.70	-0.39	-0.83	0.05	-0.13	-0.10	3.33
1776	0.05	0.64	-0.07	0.05	-2.08	-4.63	-6.39
1949	-0.80	0.05	0.17	1.14	0.64	0.17	1.29
6016	0.11	-0.07	-0.50	0.18	-0.17	0.06	3.63





Determination of Distillation acc. to ASTM D1160 on sample #17255; result in °C

lab	method	IBP	10%	30%	50%	70%	90%	FBP
52		----	----	----	----	----	----	----
62		----	----	----	----	----	----	----
120		----	----	----	----	----	----	----
131		----	----	----	----	----	----	----
140		----	----	----	----	----	----	----
150	D1160	246 C	385	416	445	475	525	539
154		----	----	----	----	----	----	----
158	D1160	239.3	372.6	412.4	442.1	474.3	533.2	555.6
159		----	----	----	----	----	----	----
171	D1160	314 R(5)	372	413	442	476	540	566
225		----	----	----	----	----	----	----
311	D1160	244	380	411	440	474	531	545
313		----	----	----	----	----	----	----
317		----	----	----	----	----	----	----
323	D1160	----	----	----	----	----	----	----
333		----	----	----	----	----	----	----
334	D1160	223	374	412	441	473	523	531
356	D1160	265	387	420	446	480	533	549
402		----	----	----	----	----	----	----
403		288.1	375.5	413.7	442.2	C 474.6	531.7	552.6
445	D1160	246.8	368.7	409.7	441.4	474.6	526.4	526.4
463	D1160	265 ex	397 R(1)	435 R(1)	463 R(1)	493 R(1)	522 ex	522 ex
494	D1160	266.6	372.5	409.8	441.4	475.1	530.5	541.9
608		----	----	----	----	----	----	----
621		----	----	----	----	----	----	----
657	D1160	244	375	413	443	474	526	538
663		----	----	----	----	----	----	----
732		----	----	----	----	----	----	----
750	D1160	266	380	419	447	480	530	530
752		247	381	419	445	475	522	553
781	D1160	217	373	414	443	477	535	544
785		----	----	----	----	----	----	----
798	D1160	----	378	416	445	476	531	----
823	D1160	----	----	----	----	----	----	----
873	D1160	229.7	371.2	411.7	438.6	470.1	522.9	544.2
874	D1160	249	371	409	440	472	523	545
875	D1160	220.1	370.0	412.0	441.7	475.2	532.6	----
994	D1160	223.1	365.8	409.8	436.8	471.2	525.7	544.0
995	D1160	220.0	372.5	411.5	442.5	471.0	533.0	543.5
1065		----	----	----	----	----	----	----
1081		----	----	----	----	----	----	----
1082		269	375	413	443	476	536	558
1107	D1160	251.4	377.1	414.9	442.8	474.2	527.1	540.5
1108	D1160	269.3	373.6	411.5	442.4	471.0	529.2	558.4
1134		----	----	----	----	----	----	----
1191		----	----	----	----	----	----	----
1229		----	----	----	----	----	----	----
1297		----	----	----	----	----	----	----
1320		----	----	----	----	----	----	----
1340	D1160	267.2	381.0	417.5	447.1	479.2	535.5	554.2
1353		----	----	----	----	----	----	----
1397	D1160	313.0 R(5)	383.6	416.9	444.1	477.6	529.8	577.1
1455	D1160	257	372	407	438	----	----	455 R(1)
1460		----	----	----	----	----	----	----
1468	D1160	241.3	350.1 R(1)	408.9	439.9	472.3	529.3	544.7
1510		----	----	----	----	----	----	----
1556		----	----	----	----	----	----	----
1585	D1160	235.0	376.7	416.3	444.3	474.9	524.1	544.0
1586	D1160	272.2	378.8	410.7	443.1	476.1	524.0	527.0
1613	D1160	325.8 R(5)	384.9	420.0	447.9	480.4	537.6	576.7
1776		----	----	----	----	----	----	----
1796	D1160	239	377	417	444	476	525	543
1862	D1160	233	372	412	440	471	522	538
1949	D1160	236.1	379.2	415.6	442.9	474.9	530.2	542.6
1950	D1160	228	373	411	441	471	523	541
1975	D1160	229	380	417	443	476	532	544
1986	D1160	235	378	415	443	475	527	543
1995		----	----	----	----	----	----	----
4043		----	----	----	----	----	----	----
6016		----	----	----	----	----	----	----
6021	D1160	224	372	413	441	473	527	543
6024		----	----	----	----	----	----	----
6026	D1160	221	373	412	442	478	533	544
6051		----	----	----	----	----	----	----
6057	D1160	236.3	384.6	417.7	449.7	482.9	554.5 R(1)	567.7

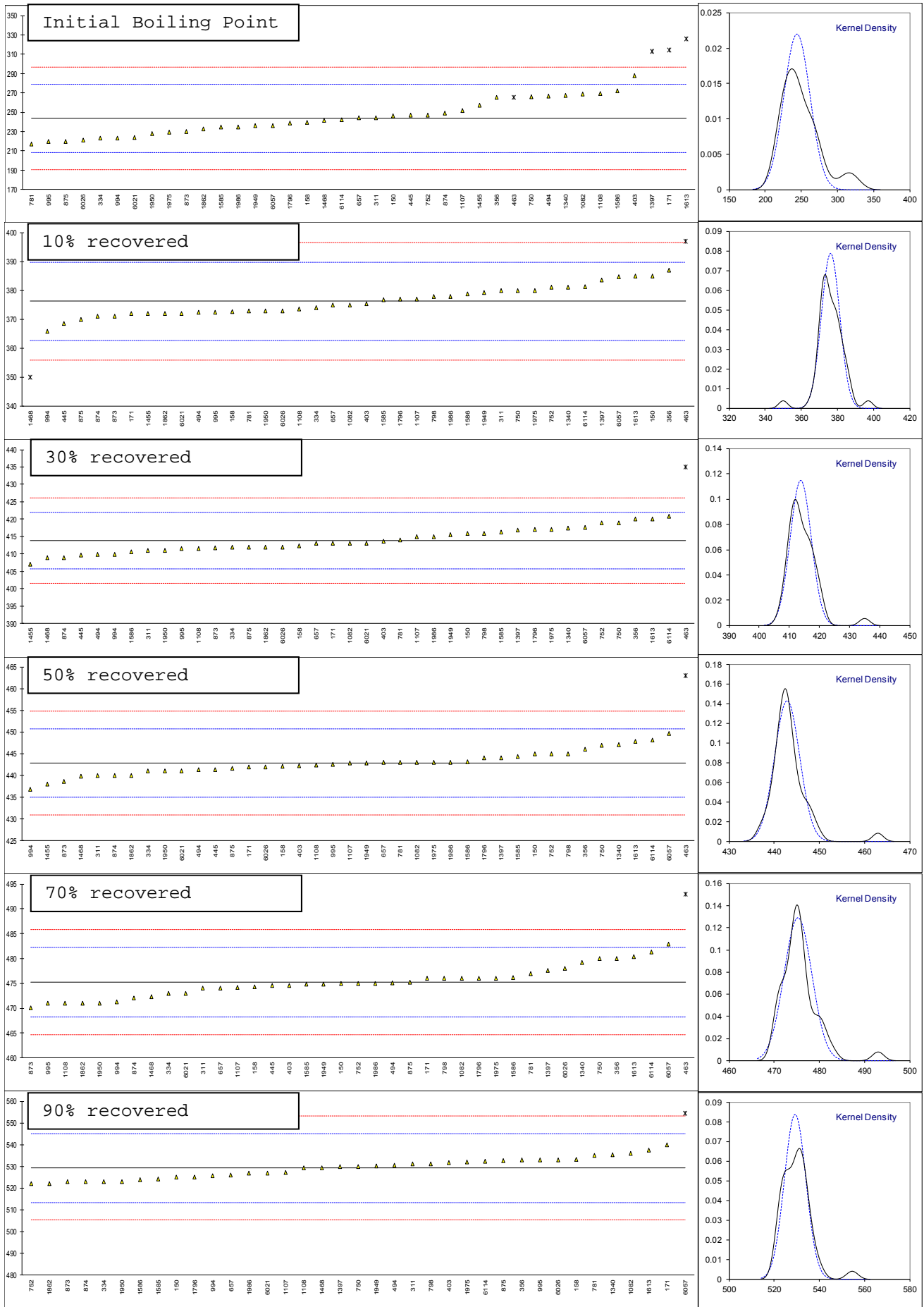
lab	method	IBP	10%	30%	50%	70%	90%	FBP
6114	D1160	241.9	381.4	420.8	448.2	481.3	532.3	536.8
6143		----	----	----	----	----	----	----
	normality	OK	OK	OK	OK	OK	OK	suspect
	n	35	38	39	39	38	36	36
	outliers	3 (+1 excl)	2	1	1	1	1	1 (+1 excl)
	mean (n)	243.44	376.26	413.86	442.85	475.23	529.24	546.44
	st.dev. (n)	18.044	5.059	3.481	2.787	3.089	4.766	11.909
	R(calc.)	50.52	14.16	9.75	7.80	8.65	13.35	33.35
	st.dev.(D6352:15)	17.660	6.754	4.095	3.960	3.523	7.963	9.605
	R(D6352:15)	49.45	18.91	11.46	11.09	9.86	22.30	26.89

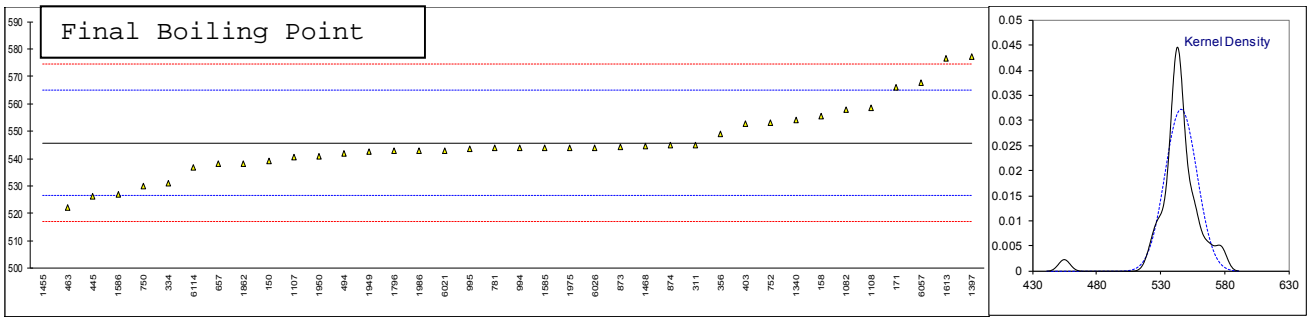
Lab 150 : first reported 332

Lab 403 : first reported 422.2

Z-scores

lab	IBP	10%	30%	50%	70%	90%	FBP
150	0.14	1.29	0.52	0.54	-0.07	-0.53	-0.77
158	-0.23	-0.54	-0.36	-0.19	-0.27	0.50	0.95
171	4.00	-0.63	-0.21	-0.21	0.22	1.35	2.04
311	0.03	0.55	-0.70	-0.72	-0.35	0.22	-0.15
334	-1.16	-0.33	-0.45	-0.47	-0.63	-0.78	-1.61
356	1.22	1.59	1.50	0.80	1.35	0.47	0.27
403	2.53	-0.11	-0.04	-0.16	-0.18	0.31	0.64
445	0.19	-1.12	-1.02	-0.37	-0.18	----	-2.09
463	1.22	3.07	5.16	5.09	5.04	----	-2.54
494	1.31	-0.56	-0.99	-0.37	-0.04	0.16	-0.47
657	0.03	-0.19	-0.21	0.04	-0.35	-0.41	-0.88
750	1.28	0.55	1.26	1.05	1.35	0.10	-1.71
752	0.20	0.70	1.26	0.54	-0.07	-0.91	0.68
781	-1.50	-0.48	0.04	0.04	0.50	0.72	-0.25
798	----	0.26	0.52	0.54	0.22	0.22	----
873	-0.78	-0.75	-0.53	-1.07	-1.46	-0.80	-0.23
874	0.31	-0.78	-1.19	-0.72	-0.92	-0.78	-0.15
875	-1.32	-0.93	-0.45	-0.29	-0.01	0.42	----
994	-1.15	-1.55	-0.99	-1.53	-1.15	-0.44	-0.25
995	-1.33	-0.56	-0.58	-0.09	-1.20	0.47	-0.31
1082	1.45	-0.19	-0.21	0.04	0.22	0.85	1.20
1107	0.45	0.13	0.25	-0.01	-0.29	-0.27	-0.62
1108	1.46	-0.39	-0.58	-0.11	-1.20	-0.01	1.24
1340	1.35	0.70	0.89	1.07	1.13	0.79	0.81
1397	3.94	1.09	0.74	0.32	0.67	0.07	3.19
1455	0.77	-0.63	-1.67	-1.22	----	----	-9.52
1468	-0.12	-3.87	-1.21	-0.74	-0.83	0.01	-0.18
1585	-0.48	0.07	0.60	0.37	-0.09	-0.65	-0.25
1586	1.63	0.38	-0.77	0.06	0.25	-0.66	-2.02
1613	4.66	1.28	1.50	1.28	1.47	1.05	3.15
1796	-0.25	0.11	0.77	0.29	0.22	-0.53	-0.36
1862	-0.59	-0.63	-0.45	-0.72	-1.20	-0.91	-0.88
1949	-0.42	0.44	0.43	0.01	-0.09	0.12	-0.40
1950	-0.87	-0.48	-0.70	-0.47	-1.20	-0.78	-0.57
1975	-0.82	0.55	0.77	0.04	0.22	0.35	-0.25
1986	-0.48	0.26	0.28	0.04	-0.07	-0.28	-0.36
6021	-1.10	-0.63	-0.21	-0.47	-0.63	-0.28	-0.36
6026	-1.27	-0.48	-0.45	-0.21	0.79	0.47	-0.25
6057	-0.40	1.24	0.94	1.73	2.18	3.17	2.21
6114	-0.09	0.76	1.70	1.35	1.72	0.38	-1.00





APPENDIX 2**Number of participants per country**

1 lab in AUSTRIA
1 lab in AZERBAIJAN
2 labs in BELGIUM
1 lab in BOSNIA and HERZEGOVINA
2 labs in CANADA
1 lab in COTE D'IVOIRE
1 lab in CROATIA
1 lab in DENMARK
1 lab in EGYPT
3 labs in FINLAND
3 labs in FRANCE
1 lab in GEORGIA
3 labs in GERMANY
2 labs in GREECE
1 lab in INDONESIA
1 lab in IRAQ
1 lab in ISRAEL
1 lab in JORDAN
2 labs in KAZAKHSTAN
1 lab in MALAYSIA
2 labs in MALTA
5 labs in NETHERLANDS
2 labs in ROMANIA
17 labs in RUSSIAN FEDERATION
1 lab in SAUDI ARABIA
1 lab in SINGAPORE
1 lab in SLOVAKIA
1 lab in SOUTH KOREA
3 labs in SWEDEN
1 lab in THAILAND
2 labs in UKRAINE
3 labs in UNITED KINGDOM
8 labs in UNITED STATES OF AMERICA

APPENDIX 3**Abbreviations**

C	= final test result after checking of first reported suspect test result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01),G(1)	= outlier in Grubbs' outlier test
G(0.05),G(5)	= 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	= probably an error in calculations
U	= test result probably reported in a different unit
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
SDS	= safety data sheet

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