Results of Proficiency Test
Engine Oil (fresh)
June 2020

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

Author: A. Lewinska, MSc.
Correctors: ing. A.S. Noordman-de Neef & ing. M. Meijer

Report: iis20L06 == Revised ==

September 2020

SUMMARY OF CHANGES

This revised report replaces the original report iis20L06 of September 2020.

It was discovered that accidentally a wrong test value was excluded in the evaluation of the Viscosity Index (appendix 1). In the original report iis20L06 test value 142.09 submitted by lab 254 was excluded for having an outlier in Kinematic Viscosity 40°C. This should have been test value 146 submitted by lab 237. Regretfully, this mistake has impact on the mean value and therefore on the calculated z-scores. It is therefore decided to publish a revised report iis20L06-revised in which this mistake has been corrected.

The following in this report has been revised:

- Viscosity Index mean value and calculated R (2.8 * sd) in paragraph 4.2, table 3
- The calculated z-scores, statistical details and pictures of Viscosity Index in appendix 1 on pages 44 and 45 (pages 42 and 43 of the original report)

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1 INTRODUCTION

Since 1997 a proficiency test for fresh Engine Oil (Lubricating Oil) is organized by the Institute for Interlaboratory Studies every year. During the annual proficiency testing program 2019/2020 it was decided to continue the round robin for the analysis of Engine Oil (fresh) in accordance with the latest version of ASTM D4485 and ACEA European Oil Sequences.

In this interlaboratory study 73 laboratories in 44 countries registered for participation. See appendix 2 for the number of participants per country. In this report the results of this proficiency test for Engine Oil (fresh) are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test (PT). Sample analyzes for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC17025 accredited laboratory. It was decided to send to each laboratory one 1L bottle and one 0.5L bottle of the same Engine Oil (fresh), both labelled #20075. The participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 ACCREDITATION

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

2.2 PROTOCOL

The protocol followed in the organization 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 200 liters of an 10W-30 Diesel Engine Oil was obtained from a local supplier. After homogenization 108 amber glass bottles of 1L and 108 amber glass bottles of 0.5L were filled and both labelled #20075.
The homogeneity of the subsamples was checked by determination of Density in accordance with ISO12185 on 8 stratified randomly selected subsamples.

	Density at 15°C in kg/L
Sample #20075-1	0.86751
Sample #20075-2	0.86751
Sample #20075-3	0.86751
Sample #20075-4	0.86750
Sample #20075-5	0.86751
Sample #20075-6	0.86750
Sample #20075-7	0.86751
Sample #20075-8	0.86751

Table 1: homogeneity test results of subsamples #20075

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

	Density at 15°C in kg/L
r (observed)	0.00001
reference test method	ISO12185:96
0.3 * R (reference test method)	0.00015

Table 2: evaluation of the repeatability of the subsamples #20075

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

To each of the participating laboratories one bottle of 1 liter and one bottle of 0.5 liter of Engine Oil (fresh) both labelled #20075 were sent on May 13, 2020. An SDS was added to the sample package.

2.5 STABILITY OF THE SAMPLES

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

2.6 ANALYZES

The participants were requested to determine on sample #20075: Total Acid Number, Base Number ($HClO_4$ titration), Color ASTM, Conradson Carbon Residue, Ramsbottom Carbon Residue, Carbon Residue (micro method), Density at 15°C, Evaporation loss by Noack, Flash Point C.O.C., Flash Point PMcc, Foaming Tendency, Foam Stability, Kinematic Viscosity (40°C and 100°C), Viscosity Index, Viscosity Stabinger (40°C and 100°C), Viscosity Apparent (CCS) at -25°C, Viscosity HTHS, Nitrogen, Pour Point (Manual and Automated), Sulfated Ash, Sulfur, Water, Calcium, Phosphorus and Zinc.
Some additional questions were asked about Total Acid Number and Foaming Characteristics.

It was explicitly requested to treat the 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 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 reported 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 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.

According to ISO5725 the reported test results per determination were submitted to Dixon's, 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. 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 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 or ISO reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation of 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:

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

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

Absolute values for z<2 are very common and absolute values for z>3 are very rare.
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 interlaboratory study some problems were encountered with the dispatch of the samples due to the COVID-19 pandemic. Therefore, the reporting time on the data entry portal was extended with another three weeks. After this period still eleven participants did not report any test results. Not all participants were able to report test results for all requested tests.
In total 62 participants reported 961 numerical test results. Observed were 34 outlying test results, which is 3.5%. 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 are used by the various laboratories, are taken into account for explaining the observed differences when possible and applicable. These test methods are also in the tables together with the reported test results. The abbreviations, used in these tables, are explained in appendix 3.

In the iis PT reports ASTM methods are referred to with a number (e.g. D1500) and an added designation for the year that the method was adopted or revised (e.g. D1500:12). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D1500:12 (2017)). In the results tables of appendix 1 only the method number and year of adoption or revision (e.g. D1500:12) will be used.

Total Acid Number: This determination was very problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not at all in agreement with the requirements of ASTM D664-A:18e2 regardless of which type of end point determination was used (Buffer End Point or Inflection Point) and what volume of titration solvent was used (60 mL or 125 mL).
When evaluated separately for the type of end point the calculated reproducibility of the group using Inflection Point (IP) was still not in agreement with the requirements of inflection point at both titration volumes from test method D664-A:18e2. The calculated reproducibility of the group using BEP (pH 10 and 11) is still not in agreement with the requirements of BEP (pH 10) from test method D664-A:18e2 for 60 mL and 125 mL.
It is observed that seven participants reported to have used pH 11 for BEP. Please note that in method ASTM D664-A version 2018e2 the Buffer End Point has been changed to pH 10. Furthermore, it is remarkable that BEP has been used for a fresh oil. Test method ASTM D664-A advises to use BEP for used oils.

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

Color ASTM: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D1500:12(2017). Please note: the test values reported as “text” were converted to a numerical value before calculating the z-scores (e.g. L3.5 to 3.25, see also appendix 1).

Conradson Carbon Residue: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D189:06(2014).

Ramsbottom Carbon Residue: Only two participants reported a test result. Therefore, no z-scores were calculated.

Carbon Residue (micro method): This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D4530:15.

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

Evaporation loss by Noack: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D5800:19a for procedure B and procedure A.
When evaluated separately for the test results of procedure A and B from ASTM D5800 the calculated reproducibility is also in agreement with the requirements of both procedures from ASTM D5800:19a.

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

Flash Point PMcc: This determination was not problematic. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D93-A:19.

Foaming Tendency: This determination may be problematic dependent on the sequence reported. In total three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outlier for Sequence III is in agreement with the requirements of ASTM D892:13e1. The calculated reproducibilities of Sequence I and II are not in agreement with the requirements of ASTM D892:13e1.
When evaluated separately for the two type of diffusers a difference in mean values between stone and metal diffusers was observed for Sequence I and II (see appendix 1). The group that used a stone diffuser for Sequence I meets the requirements of method ASTM D892:13e1.
A new version of method ASTM D892 was published in 2018. In this version, the precision data has been “changed”. In the 2018 version exponential equations were published for Sequence I and III and a linear equation for Sequence II. After investigation, the 2018 reproducibility equations are based on the same underlying round robin data as the precision chart figure 4 of ASTM D892:13e1. However, the equations of sequence I and III are given as exponential equations without an intercept. The consequences for low Foam values (0 - 10 mL) are that the new exponential equations will result in a reproducibility between 0 and 7 mL, while the 2013 linear plots result in a reproducibility of 15 to 16 mL. The 2018 linear equation published for Sequence II is comparable to the linear plot of 2013. Taking all this into account, iis decided for this PT to use the less strict and more realistic precision data of version 2013 to calculate the z-scores. The precision data of the 2018 version are given as reference.

Foam Stability: All reporting participants agreed on a result of 0 (Nil). Therefore, no z-scores were calculated.

Kinematic Viscosity at 40°C: This determination was not problematic. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D445:19.

Kinematic Viscosity at 100°C: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D445:19.

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

Viscosity Stabinger at 40°C: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of ASTM D7042:19e1.

Viscosity Stabinger at 100°C: 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 ASTM D7042:19e1.

Viscosity Apparent (CCS) at -25°C: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D5293:17a.

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

Nitrogen: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D5762:18a. A possible cause could be that combustion tube temperatures are not adjusted/verified well enough, which can lead to lower temperatures and a low yield.

Pour Point Manual: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of ASTM D97:17b.

Pour Point Automated: This determination was very problematic. No statistical outliers were observed. However, the calculated reproducibility is not at all in agreement with the requirements of ASTM D5950:14.

Sulfated Ash: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in full agreement with the requirements of ASTM D874:13a(2018).

Sulfur: This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D4294:16e1.

Water: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D6304:16e1.

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

Phosphorus: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D5185:18.

Zinc: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5185:18.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

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

Parameter	unit	n	average	2.8 * sd	R(lit)
Total Acid Number	mg KOH/g	37	2.00	1.65	0.71
Base Number ($HClO_4$ titration)	mg KOH/g	36	9.7	0.6	0.7
Color ASTM		48	3.5	0.6	1
Conradson Carbon Residue	%M/M	15	1.01	0.19	0.24
Ramsbottom Carbon Residue	%M/M	2	<1	n.e.	n.e.
Carbon Residue (micro method)	%M/M	20	1.03	0.13	0.19
Density at 15°C	kg/L	49	0.8675	0.0004	0.0005
Evaporation loss by Noack	%M/M	16	10.71	1.20	1.41
Flash Point C.O.C.	°C	44	229.7	18.1	18
Flash Point PMcc	°C	40	198.9	8.6	14.1
Foaming Tendency, Sequence I	mL	27	7.4	22.1	17.2
Foaming Tendency, Sequence II	mL	27	29.3	44.2	26.8
Foaming Tendency, Sequence III	mL	25	4.0	13.4	15.7
Foam Stability, Sequence I	mL	26	0	n.a.	n.a.
Foam Stability, Sequence II	mL	27	0	n.a.	n.a.

Parameter	unit	n	average	2.8 * sd	R(lit)
Foam Stability, Sequence III	mL	26	0	n.a.	n.a.
Kinematic Viscosity at 40°C	mm^2/s	50	79.39	0.53	0.97
Kinematic Viscosity at 100°C	mm^2/s	51	11.77	0.13	0.16
Viscosity Index		47	141.8	2.6	2
Viscosity Stabinger at 40°C	mm^2/s	19	79.57	0.98	0.98
Viscosity Stabinger at 100°C	mm^2/s	18	11.79	0.09	0.12
Viscosity Apparent (CCS) -25°C	mPa·s	19	6601	344	482
Viscosity HTHS	mPa·s	4	3.56	0.20	0.15
Nitrogen	mg/kg	15	1310	531	349
Pour Point Manual	°C	26	-38.8	9.1	9
Pour Point Automated 1°C int.	°C	17	-42.1	9.1	4.5
Sulfated Ash	%M/M	31	0.92	0.13	0.13
Sulfur	mg/kg	29	2167	388	271
Water	mg/kg	32	190	247	394
Calcium as Ca	mg/kg	38	1587	290	217
Phosphorus as P	mg/kg	36	777	133	120
Zinc as Zn	mg/kg	36	882	121	144

Table 3: reproducibilities of tests on sample #20075

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

4.3 COMPARISON OF THE PROFICIENCY TEST OF JUNE 2020 WITH PREVIOUS PTS

	June 2020	June 2019	June 2018	June 2017	June 2016
Number of reporting laboratories	62	75	81	67	69
Number of test results	961	1157	1337	940	1007
Number of statistical outliers	34	49	37	45	25
Percentage of statistical outliers	3.5%	4.2%	2.8%	4.8%	2.5%

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 reference test methods. The conclusions are given in the following table.

Determination	June 2020	June 2019	June 2018	June 2017	June 2016
Total Acid Number	--	--	-	--	--
Base Number ($HClO_4$ titration)	+	+	-	-	-
Color ASTM	+	+	+	-	+
Conradson Carbon Residue	+	+	+/-	+	+
Ramsbottom Carbon Residue	n.e.	(--)	+	+	--
Carbon Residue (micro method)	+	-	+	+/-	+
Density at 15°C	+	+/-	+/-	+	+
Evaporation loss by Noack	+	--	-	+	-
Flash Point C.O.C.	+/-	+/-	+	-	+
Flash Point PMcc	+	+	+	+/-	+
Foaming Tendency	-	+/-	+/-	+/-	+/-
Kinematic Viscosity at 40°C	+	+	+	+	+/-
Kinematic Viscosity at 100°C	+	+/-	+	+	+
Viscosity Index	-	-	+/-	+/-	-
Viscosity Stabinger at 40°C	+/-	+/-	+/-	-	-
Viscosity Stabinger at 100°C	+	+/-	-	-	-
Viscosity Apparent (CCS) -25°C	+	+	-	+/-	+
Viscosity HTHS	-	+/-	+	+	+
Nitrogen	-	--	-	-	-
Pour Point Manual	+/-	+	+/-	-	+
Pour Point Automated 1°C int.	--	+	+/-	-	-
Sulfated Ash	+/-	-	-	+	-
Sulfur	-	(--)	-	-	-
Water	+	+	+	+/-	+
Calcium as Ca	-	+	-	+	--
Phosphorus as P	-	-	-	n.e.	--
Zinc as Zn	+	+/-	+/-	n.e.	--

Table 5: comparison determinations against the reference test methods

For evaluations 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

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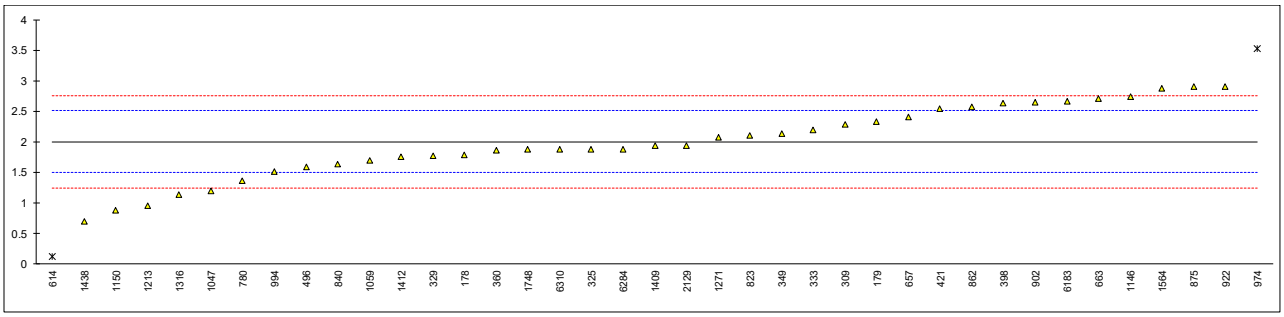
APPENDIX 1

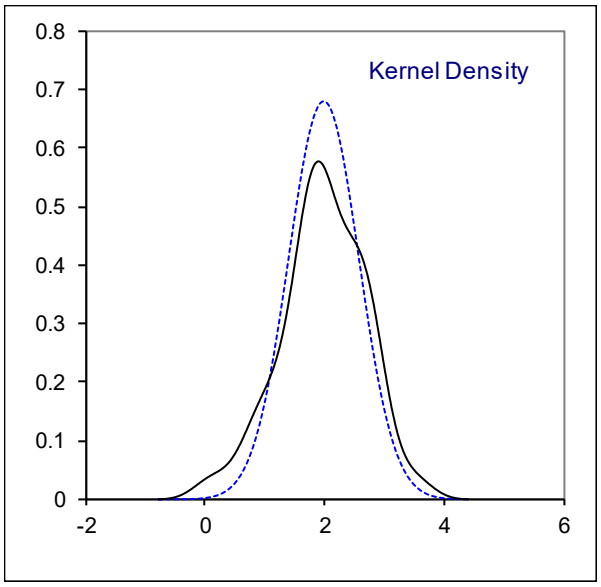
Determination of Total Acid Number on sample #20075; results in mg KOH/g

lab	method	value	mark	z(targ)	end point determination	titration solvent volume
178	D664-A	1.78		-0.86	Buffer End Point (pH 11)	60 mL
179	D664-A	2.33		1.31	Inflection Point	60 mL
211		-----		-----	---	---
219		-----		-----	---	---
237		-----		-----	---	---
254		-----		-----	---	---
255		-----		-----	---	---
257		-----		-----	---	---
309	D664-A	2.29		1.15	Buffer End Point (pH 10)	60 mL
325	D664-A	1.88		-0.47	Buffer End Point (pH 10)	125 mL
329	D664-A	1.77		-0.90	Inflection Point	125 mL
333	D664-A	2.2		0.79	Inflection Point	125 mL
339		-----		-----	---	---
349	D664-A	2.14		0.56	Inflection Point	125 mL
360	D664-A	1.866		-0.52	Inflection Point	60 mL
398	D664-A	2.625		2.47	Inflection Point	60 mL
421	ISO6619	2.54		2.14	---	---
432		-----		-----	---	---
496	D664-A	1.59		-1.61	Buffer End Point (pH 10)	60 mL
614	D664-A	0.13	R(0.01)	-7.37	---	60 mL
621		-----		-----	---	---
633		-----		-----	---	---
634		-----		-----	---	---
657	D664-A	2.41	C	1.62	Inflection Point	125 mL
663	D664-A	2.709		2.80	Buffer End Point (pH 10)	60 mL
780	D664-A	1.37		-2.48	Buffer End Point (pH 10)	125 mL
823	D664-A	2.1		0.40	Inflection Point	125 mL
840	D664-B	1.64		-1.42	Buffer End Point (pH 10)	60 mL
862	D664-A	2.57		2.25	Inflection Point	60 mL
875	D664-A	2.90		3.56	---	---
902	D664-A	2.653		2.58	Inflection Point	60 mL
912		-----		-----	---	---
913		-----		-----	---	---
922	D664-A	2.9		3.56	Inflection Point	125 mL
962		-----		-----	---	---
963		-----		-----	---	---
974	D664-A	3.52	R(0.01)	6.00	Inflection Point	125 mL
994	D664-A	1.52		-1.89	Buffer End Point (pH 11)	60 mL
1011		-----		-----	---	---
1017		-----		-----	---	---
1047	ISO6618	1.2		-3.15	---	60 mL
1059	ISO6619	1.70		-1.18	Buffer End Point (pH 11)	60 mL
1091		-----		-----	---	---
1146	D664-A	2.733		2.90	Buffer End Point (pH 11)	125 mL
1150	In house	0.8838		-4.40	---	---
1173		-----		-----	---	---
1213	D664-A	0.95		-4.14	---	---
1235		-----		-----	---	---
1271	D664-A	2.08		0.32	Inflection Point	125 mL
1316	D664-A	1.14		-3.39	Buffer End Point (pH 11)	60 mL
1320		-----		-----	---	---
1409	D664-A	1.93		-0.27	Buffer End Point (pH 11)	60 mL
1412	D664-A	1.76		-0.94	Buffer End Point (pH 11)	125 mL
1438		0.697		-5.14	---	---
1461		-----		-----	---	---
1510		-----		-----	---	---
1564	D664-A	2.88		3.48	Inflection Point	60 mL
1748	D664-A	1.87		-0.51	Inflection Point	125 mL
1797		-----		-----	---	---
1850		-----		-----	---	---
1877		-----		-----	---	---
1969		-----		-----	---	---
2129	D664-A	1.94		-0.23	---	---
6016		-----		-----	---	---
6032		-----		-----	---	---
6183	D664-A	2.66		2.61	Inflection Point	125 mL
6197		-----		-----	---	---
6253		-----		-----	---	---
6284	D974	1.88		-0.47	---	---
6310	D664-A	1.87		-0.51	Buffer End Point (pH 10)	60 mL
6317		-----		-----	---	---
6320		-----		-----	---	---
6324		-----		-----	---	---

			Inflection Point only	BEP (pH 10 and 11) only
normality	OK		OK	OK
n	37		15	14
outliers	2		1	0
mean (n)	1.9988		2.3369	1.8509
st.dev. (n)	0.58759		0.36838	0.45653
R(calc.)	1.6452		1.0315	1.2783
st.dev.(D664-A:18e2)	0.25345		0.25345	---
R(D664-A:18e2)	0.7097	IP 60mL	0.8067	---
Compare:				
R(D664-A:18e2)	1.0893	BEP (pH 10) 60 mL	---	1.0106
R(D664-A:18e2)	0.4506	IP 125mL	0.5304	---
R(D664-A:18e2)	0.6545	BEP (pH 10) 125mL	---	0.4159

Lab 657 first reported 0.12

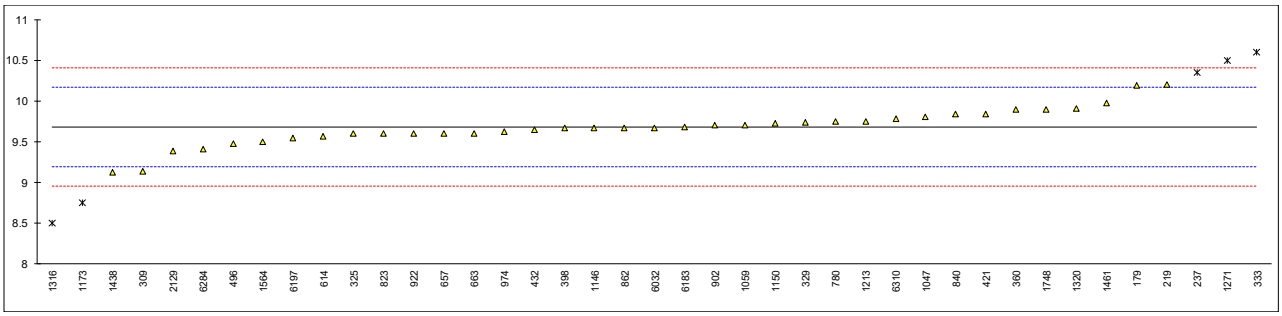


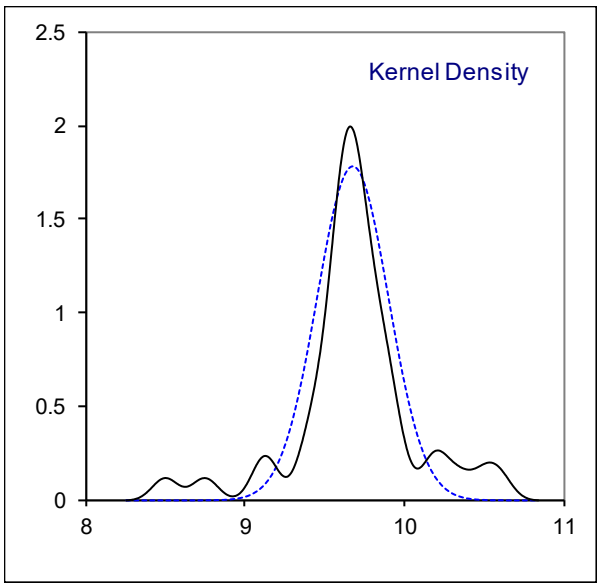


Determination of Base Number ($HClO_4$ titration) on sample #20075; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D2896-A forward	10.19		2.11	
211		-----		-----	
219	D2896-A back	10.2		2.16	
237	D2896-A back	10.343	R(0.05)	2.75	
254		-----		-----	
255		-----		-----	
257		-----		-----	
309	D2896-A back	9.136		-2.24	
325	D2896-B forward	9.6		-0.32	
329	D2896-A forward	9.74		0.25	
333	D4739	10.6	R(0.01)	3.81	
339		-----		-----	
349		-----		-----	
360	D2896-B forward	9.89		0.87	
398	D2896-B forward	9.665		-0.06	
421	ISO3771	9.84		0.67	
432	D2896-B back	9.64		-0.16	
496	D2896-B back	9.47		-0.86	
614	D2896-B forward	9.57		-0.45	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D2896-B forward	9.6		-0.32	
663	D2896-B forward	9.601		-0.32	
780	D2896-B forward	9.75		0.30	
823	D2896-A back	9.6		-0.32	
840	D2896-A forward	9.84		0.67	
862	D2896-B forward	9.67		-0.04	
875		-----		-----	
902	D2896-B forward	9.70		0.09	
912		-----		-----	
913		-----		-----	
922	D2896-B forward	9.6		-0.32	
962		-----		-----	
963		-----		-----	
974	D2896-A forward	9.62		-0.24	
994		-----		-----	
1011		-----		-----	
1017		-----		-----	
1047	ISO3771	9.8		0.50	
1059	ISO3771	9.7		0.09	
1091		-----		-----	
1146	D2896-A forward	9.665		-0.06	
1150	ISO3771	9.723		0.18	
1173	In house	8.75	R(0.01)	-3.84	
1213	D2896-B forward	9.75		0.30	
1235		-----		-----	
1271	ISO3771	10.50	R(0.01)	3.40	
1316	D4739	8.5	R(0.01)	-4.87	
1320	D2896-B forward	9.91		0.96	
1409		-----		-----	
1412		-----		-----	
1438		9.12		-2.31	
1461	In house	9.97		1.20	
1510		-----		-----	
1564	D2896-B back	9.5	C	-0.74	first reported 11.2
1748	D2896-A forward	9.897		0.90	
1797		-----		-----	
1850		-----		-----	
1877		-----		-----	
1969		-----		-----	
2129	D2896-A back	9.39		-1.19	
6016		-----		-----	
6032	D2896-B forward	9.67		-0.04	
6183	D2896-A forward	9.68		0.01	
6197	D2896-B forward	9.54		-0.57	
6253		-----		-----	
6284	D2896-A forward	9.41		-1.11	
6310	D2896-B forward	9.78		0.42	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

normality	suspect
n	36
outliers	5
mean (n)	9.679
st.dev. (n)	0.2244
R(calc.)	0.628
st.dev.(D2896-A:15 forward)	0.2420
R(D2896-A:15 forward)	0.677



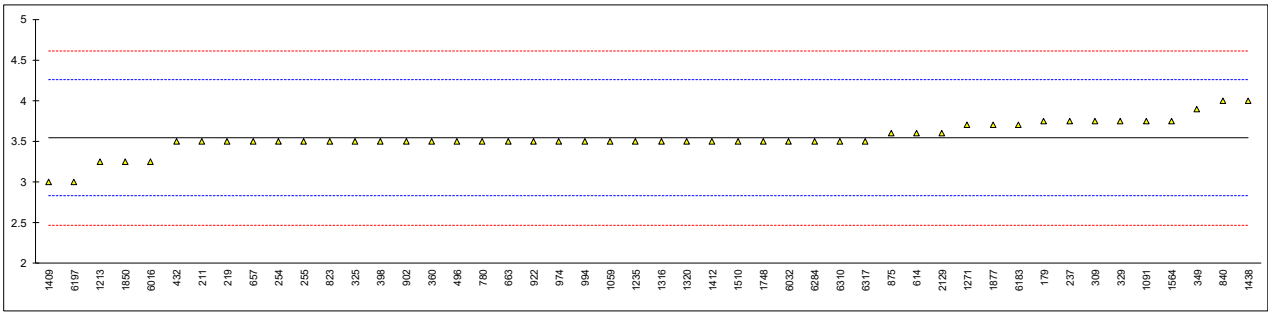


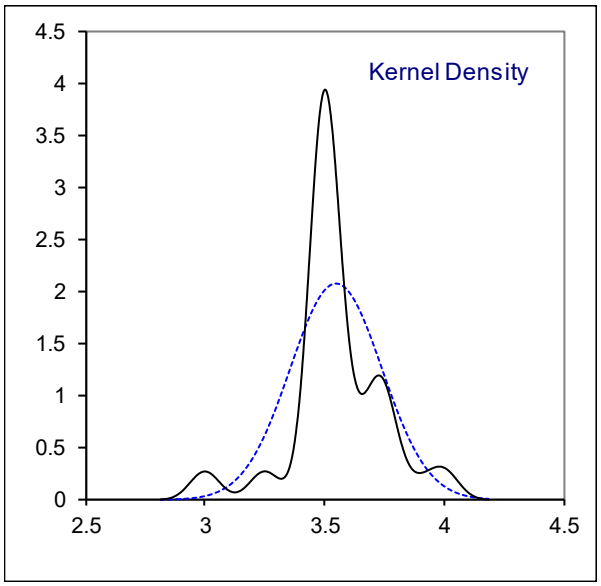
Determination of Color ASTM on sample #20075

lab	method	reported test value	iis conversion *	mark	z(targ)	
178		-----	-----		-----	
179	D1500	L4.0	3.75		0.58	
211	D1500	3.5	3.5		-0.12	
219	D1500	3.5	3.5		-0.12	
237	D1500	L4.0	3.75		0.58	
254	D1500	3.5	3.5		-0.12	
255	D1500	3.5	3.5		-0.12	
257		-----	-----		-----	
309	D1500	L4.0	3.75		0.58	
325	D6045	3.5	3.5		-0.12	
329	D1500	L4.0	3.75		0.58	
333		-----	-----		-----	
339		-----	-----		-----	
349	D6045	3.9	3.9	C	1.00	first reported 4.7
360	D1500	3.5	3.5		-0.12	
398	D1500	3.5	3.5		-0.12	
421		-----	-----		-----	
432	D1500	3.5	3.5		-0.12	
496	D1500	3.5	3.5		-0.12	
614	D1500	3.6	3.6		0.16	
621		-----	-----		-----	
633		-----	-----		-----	
634		-----	-----		-----	
657	D1500	3.5	3.5		-0.12	
663	D1500	3.5	3.5		-0.12	
780	D1500	3.5	3.5		-0.12	
823	D1500	3.5	3.5		-0.12	
840	D6045	4.0	4.0		1.28	
862		-----	-----		-----	
875	D6045	3.6	3.6		0.16	
902	D1500	3.5	3.5		-0.12	
912		-----	-----		-----	
913		-----	-----		-----	
922	D1500	3.5	3.5		-0.12	
962		-----	-----		-----	
963		-----	-----		-----	
974	D1500	3.5	3.5		-0.12	
994	D1500	3.5	3.5		-0.12	
1011		-----	-----		-----	
1017		-----	-----		-----	
1047		-----	-----		-----	
1059	D1500	3.5	3.5		-0.12	
1091	D1500	L4.0	3.75		0.58	
1146		-----	-----		-----	
1150		-----	-----		-----	
1173		-----	-----		-----	
1213	D1500	L 3.5	3.25		-0.82	
1235	ISO2049	3.5	3.5		-0.12	
1271	D6045	3.7	3.7		0.44	
1316	D1500	3.5	3.5		-0.12	
1320	D1500	3.5	3.5		-0.12	
1409	D1500	3.0	3.0		-1.52	
1412	D1500	3.5	3.5		-0.12	
1438		4.0	4.0		1.28	
1461		-----	-----		-----	
1510	D1500	3.5	3.5		-0.12	
1564	D1500	L4	3.75		0.58	
1748	D1500	3.5	3.5		-0.12	
1797		-----	-----		-----	
1850	D1500	L3,5	3.25		-0.82	
1877	D6045	3.7	3.7		0.44	
1969		-----	-----		-----	
2129	D6045	3.6	3.6		0.16	
6016	D1500	<3.5	3.25		-0.82	
6032	D1500	3.5	3.5		-0.12	
6183	D1500	3.7	3.7		0.44	
6197	D1500	3.0	3.0	C	-1.52	first reported 2.0
6253		-----	-----		-----	
6284	D1500	3.5	3.5		-0.12	
6310	D1500	3.5	3.5		-0.12	
6317	D1500	3.5	3.5		-0.12	
6320		-----	-----		-----	
6324		-----	-----		-----	

normality	not OK
n	48
outliers	0
mean (n)	3.54
st.dev. (n)	0.195
R(calc.)	0.55
st.dev.(D1500:12)	0.357
R(D1500:12)	1

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

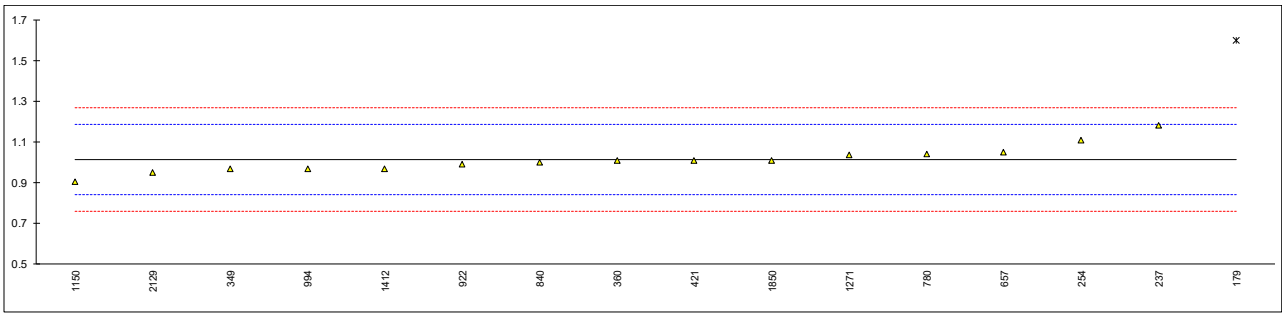


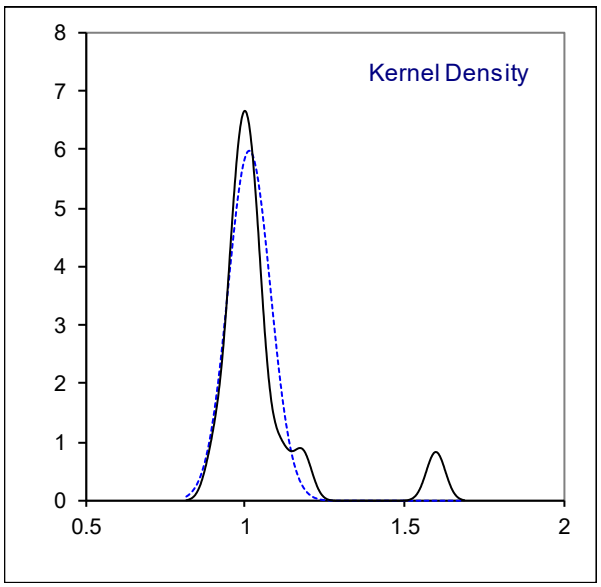


Determination of Conradson Carbon Residue on sample #20075; results in %M/M

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D189	1.60	G(0.01)	6.89	
211		-----		-----	
219		-----		-----	
237	D189	1.18		1.96	
254	D189	1.11		1.14	
255		-----		-----	
257		-----		-----	
309		-----		-----	
325		-----		-----	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349	D189	0.97		-0.51	
360	ISO6615	1.009		-0.05	
398		-----		-----	
421	ISO6615	1.01		-0.04	
432		-----		-----	
496		-----		-----	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D189	1.05		0.43	
663		-----		-----	
780	D189	1.04		0.32	
823		-----		-----	
840	D189	1.000		-0.15	
862		-----		-----	
875		-----		-----	
902		-----		-----	
912		-----		-----	
913		-----		-----	
922	D189	0.99		-0.27	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994	D189	0.97		-0.51	
1011		-----		-----	
1017		-----		-----	
1047		-----		-----	
1059		-----		-----	
1091		-----		-----	
1146		-----		-----	
1150	ISO6615	0.9049		-1.27	
1173		-----		-----	
1213		-----		-----	
1235		-----		-----	
1271	ISO6615	1.035		0.26	
1316		-----		-----	
1320		-----		-----	
1409		-----		-----	
1412	D189	0.97		-0.51	
1438		-----		-----	
1461		-----		-----	
1510		-----		-----	
1564		-----		-----	
1748		-----		-----	
1797		-----		-----	
1850	ISO6615	1.01		-0.04	
1877		-----		-----	
1969		-----		-----	
2129	D189	0.948		-0.76	
6016		-----		-----	
6032		-----		-----	
6183		-----		-----	
6197		-----		-----	
6253		-----		-----	
6284		-----		-----	
6310		-----		-----	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

normality	not OK
n	15
outliers	1
mean (n)	1.013
st.dev. (n)	0.0666
R(calc.)	0.186
st.dev.(D189:06)	0.0852
R(D189:06)	0.238





Determination of Ramsbottom Carbon Residue on sample #20075; results in %M/M

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D524	0.83		-----	
211		-----		-----	
219		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257		-----		-----	
309		-----		-----	
325		-----		-----	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360		-----		-----	
398		-----		-----	
421		-----		-----	
432		-----		-----	
496		-----		-----	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D524	0.75		-----	
663		-----		-----	
780		-----		-----	
823		-----		-----	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902		-----		-----	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		-----		-----	
1011		-----		-----	
1017		-----		-----	
1047		-----		-----	
1059		-----		-----	
1091		-----		-----	
1146		-----		-----	
1150		-----		-----	
1173		-----		-----	
1213		-----		-----	
1235		-----		-----	
1271		-----		-----	
1316		-----		-----	
1320		-----		-----	
1409		-----		-----	
1412		-----		-----	
1438		-----		-----	
1461		-----		-----	
1510		-----		-----	
1564		-----		-----	
1748		-----		-----	
1797		-----		-----	
1850		-----		-----	
1877		-----		-----	
1969		-----		-----	
2129		-----		-----	
6016		-----		-----	
6032		-----		-----	
6183		-----		-----	
6197		-----		-----	
6253		-----		-----	
6284		-----		-----	
6310		-----		-----	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	
	n	2			
	mean (n)	<1			

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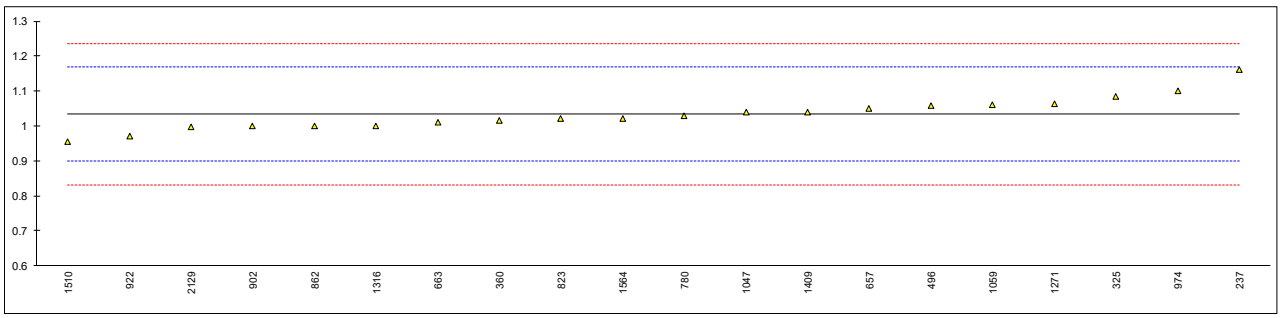
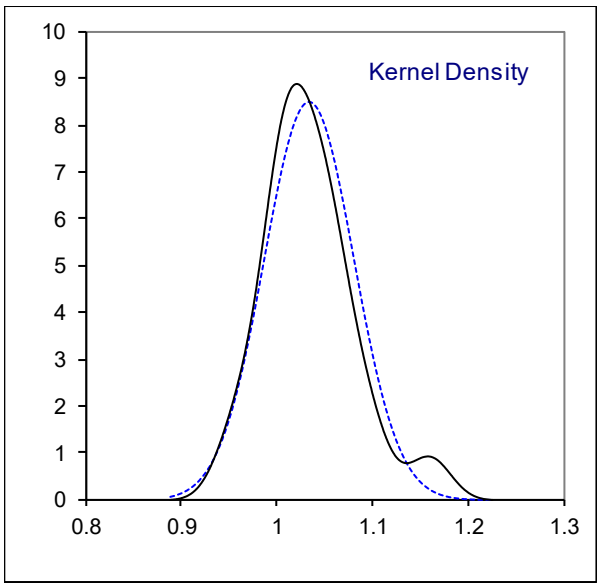
Determination of Carbon Residue (micro method) on sample #20075; results in %M/M

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179		-----		-----	
211		-----		-----	
219		-----		-----	
237	D4530	1.16		1.87	
254		-----		-----	
255		-----		-----	
257		-----		-----	
309		-----		-----	
325	D4530	1.0839		0.74	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360	ISO10370	1.017		-0.25	
398		-----		-----	
421		-----		-----	
432		-----		-----	
496	D4530	1.057		0.35	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D4530	1.05		0.24	
663	D4530	1.0116		-0.33	
780	D4530	1.03		-0.06	
823	ISO10370	1.02		-0.20	
840		-----		-----	
862	D4530	1.00		-0.50	
875		-----		-----	
902	D4530	1.00		-0.50	
912		-----		-----	
913		-----		-----	
922	D4530	0.97		-0.94	
962		-----		-----	
963		-----		-----	
974	D4530	1.10		0.98	
994		-----		-----	
1011		-----		-----	
1017		-----		-----	
1047	ISO10370	1.04		0.09	
1059	ISO10370	1.06		0.39	
1091		-----		-----	
1146		-----		-----	
1150		-----		-----	
1173		-----		-----	
1213		-----		-----	
1235		-----		-----	
1271	ISO10370	1.064		0.45	
1316	D4530	1.00		-0.50	
1320		-----		-----	
1409	D4530	1.04		0.09	
1412		-----		-----	
1438		-----		-----	
1461		-----		-----	
1510	D4530	0.954		-1.18	
1564	D4530	1.02		-0.20	
1748		-----		-----	
1797		-----		-----	
1850		-----		-----	
1877		-----		-----	
1969		-----		-----	
2129	ISO10370	0.997		-0.54	
6016		-----		-----	
6032		-----		-----	
6183		-----		-----	
6197		-----		-----	
6253		-----		-----	
6284		-----		-----	
6310		-----		-----	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

normality	suspect
n	20
outliers	0
mean (n)	1.034
st.dev. (n)	0.0468
R(calc.)	0.131
st.dev.(D4530:15)	0.0674
R(D4530:15)	0.189

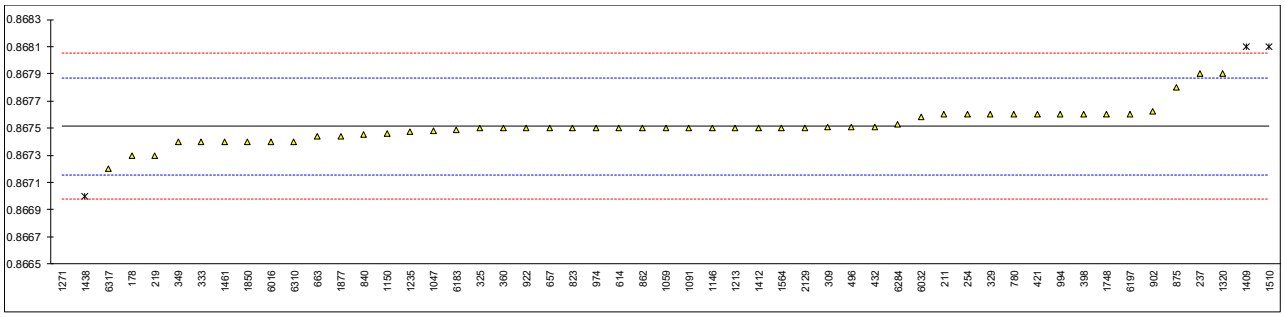


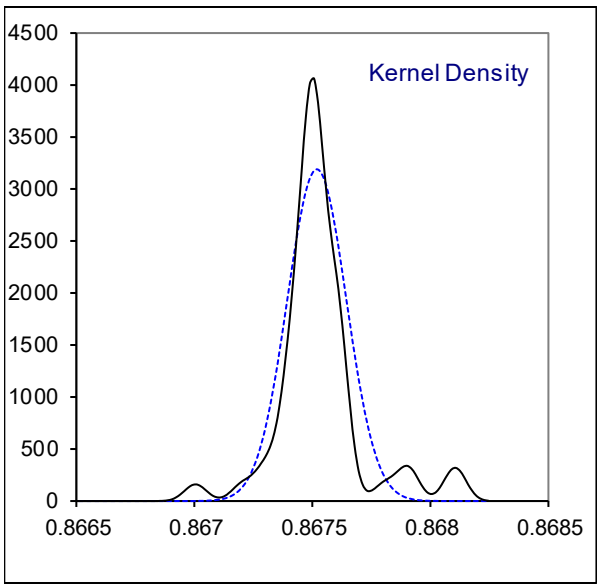


Determination of Density at 15°C on sample #20075; results in kg/L

lab	method	value	mark	z(targ)	remarks
178	D4052	0.8673		-1.20	
179		-----		-----	
211	D4052	0.8676		0.48	
219	D1298	0.8673		-1.20	
237	D4052	0.8679		2.16	
254	D4052	0.8676		0.48	
255		-----		-----	
257		-----		-----	
309	D4052	0.86751		-0.02	
325	D4052	0.8675		-0.08	
329	D4052	0.8676		0.48	
333	D4052	0.8674		-0.64	
339		-----		-----	
349	D4052	0.8674		-0.64	
360	ISO12185	0.8675		-0.08	
398	ISO12185	0.8676		0.48	
421	ISO12185	0.8676		0.48	
432	ISO12185	0.86751		-0.02	
496	ISO12185	0.86751		-0.02	
614	D4052	0.8675		-0.08	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D4052	0.8675		-0.08	
663	D4052	0.86744		-0.42	
780	ISO12185	0.8676	C	0.48	first reported 868.1 kg/m^3
823	D4052	0.8675		-0.08	
840	D4052	0.86745		-0.36	
862	D4052	0.8675		-0.08	
875	D4052	0.8678		1.60	
902	D4052	0.86762		0.59	
912		-----		-----	
913		-----		-----	
922	D4052	0.8675		-0.08	
962		-----		-----	
963		-----		-----	
974	D4052	0.8675		-0.08	
994	ISO12185	0.8676		0.48	
1011		-----		-----	
1017		-----		-----	
1047	ISO12185	0.86748		-0.19	
1059	ISO12185	0.8675		-0.08	
1091	D4052	0.8675		-0.08	
1146	D4052	0.8675		-0.08	
1150	ISO12185	0.86746		-0.30	
1173		-----		-----	
1213	D4052	0.86750		-0.08	
1235	ISO12185	0.867475		-0.22	
1271	D4052	0.8640	C,R(0.01)	-19.68	first reported 868.1 kg/m^3
1316		-----		-----	
1320	ISO12185	0.8679		2.16	
1409	ISO12185	0.8681	C,R(0.01)	3.28	first reported 868.1 without unit
1412	D4052	0.8675		-0.08	
1438	D1298	0.867	C,R(0.01)	-2.88	first reported 0.865
1461	ISO3675	0.8674		-0.64	
1510	ISO12185	0.8681	R(0.01)	3.28	
1564	D4052	0.8675		-0.08	
1748	D4052	0.8676		0.48	
1797		-----		-----	
1850	D4052	0.8674		-0.64	
1877	D4052	0.86744		-0.42	
1969		-----		-----	
2129	D4052	0.8675		-0.08	
6016	D4052	0.8674		-0.64	
6032	D4052	0.86758		0.37	
6183	D4052	0.867488		-0.15	
6197	D4052	0.8676		0.48	
6253		-----		-----	
6284	D4052	0.86753		0.09	
6310	D4052	0.8674		-0.64	
6317	D7042	0.8672		-1.76	
6320		-----		-----	
6324		-----		-----	

normality	not OK
n	49
outliers	4
mean (n)	0.86751
st.dev. (n)	0.000125
R(calc.)	0.00035
st.dev.(ISO12185:96)	0.0002
R(ISO12185:96)	0.0005

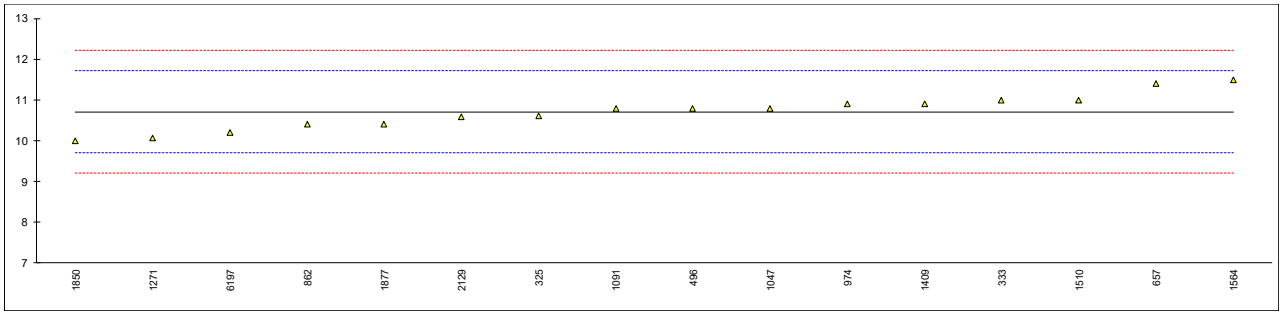


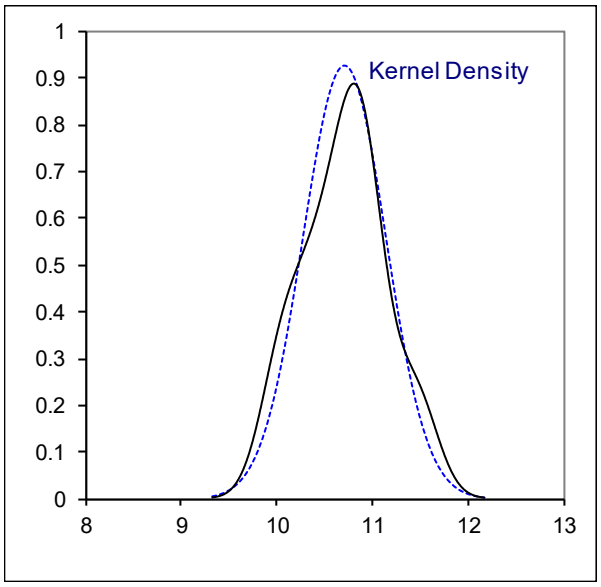


Determination of Evaporation loss by Noack on sample #20075; results in %M/M

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179		-----		-----	
211		-----		-----	
219		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257		-----		-----	
309		-----		-----	
325	CEC L-40-93	10.6		-0.22	
329		-----		-----	
333	CEC L-40-93	11.0		0.58	
339		-----		-----	
349		-----		-----	
360		-----		-----	
398		-----		-----	
421		-----		-----	
432		-----		-----	
496	D5800-B	10.8		0.18	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D5800-B	11.4		1.37	
663		-----		-----	
780		-----		-----	
823		-----		-----	
840		-----		-----	
862	D5800-B	10.4		-0.62	
875		-----		-----	
902		-----		-----	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974	D5800-B	10.9		0.38	
994		-----		-----	
1011		-----		-----	
1017		-----		-----	
1047	DIN51581	10.8		0.18	
1059		-----		-----	
1091	D5800-B	10.8		0.18	
1146		-----		-----	
1150		-----		-----	
1173		-----		-----	
1213		-----		-----	
1235		-----		-----	
1271	DIN51581	10.06		-1.29	
1316		-----		-----	
1320		-----		-----	
1409	D5800-B	10.9		0.38	
1412		-----		-----	
1438		-----		-----	
1461		-----		-----	
1510	D5800-B	11.0		0.58	
1564	DIN51581	11.5		1.57	
1748		-----		-----	
1797		-----		-----	
1850	DIN51581	10.0		-1.41	
1877	CEC L-40-93	10.4		-0.62	
1969		-----		-----	
2129	D5800-A	10.59		-0.24	
6016		-----		-----	
6032		-----		-----	
6183		-----		-----	
6197	D5800-B	10.2		-1.01	
6253		-----		-----	
6284		-----		-----	
6310		-----		-----	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

		D5800-A/DIN1581	D5800-B only:
normality	OK	OK	OK
n	16	5	8
outliers	0	0	0
mean (n)	10.709	10.590	10.800
st.dev. (n)	0.4298	0.6126	0.3665
R(calc.)	1.203	1.715	1.026
st.dev.(D5800-B:19a)	0.5029	---	0.5029
R(D5800-B:19a)	1.408	---	1.417
Compare			
R(D5800-A:19a)	1.960	1.938	---

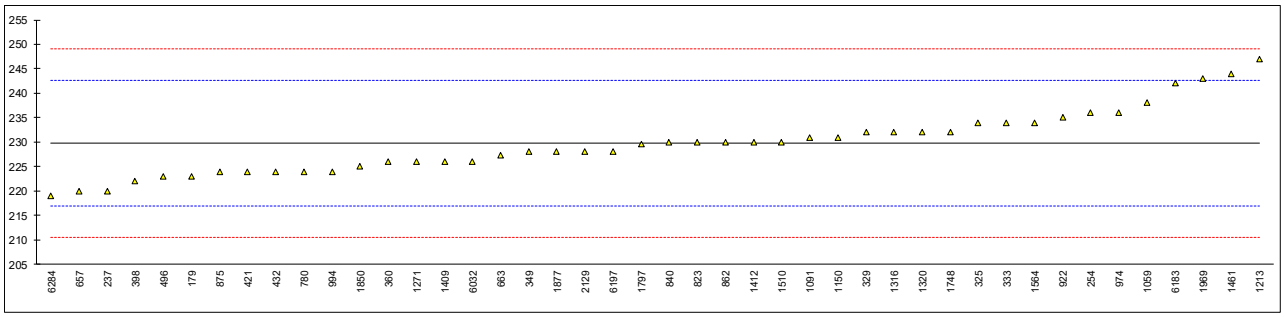


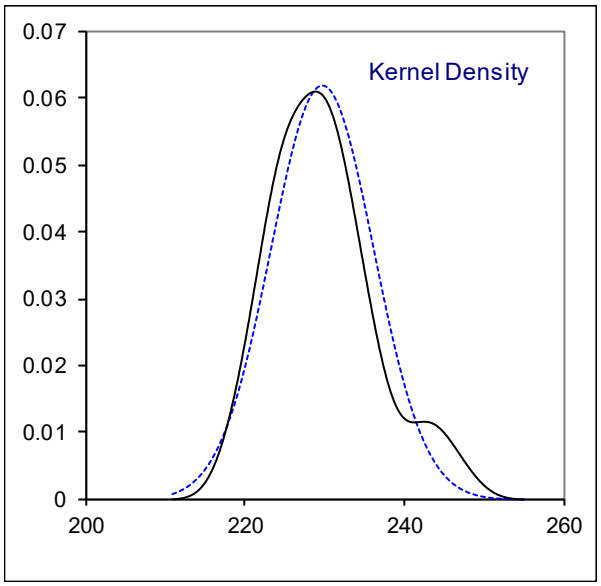


Determination of Flash Point C.O.C. on sample #20075; results in °C

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D92	223		-1.05	
211		-----		-----	
219		-----		-----	
237	D92	220		-1.51	
254	D92	236		0.98	
255		-----		-----	
257		-----		-----	
309		-----		-----	
325	D92	234		0.67	
329	D92	232		0.35	
333	D92	234		0.67	
339		-----		-----	
349	D92	228		-0.27	
360	ISO2592	226		-0.58	
398	D92	222		-1.20	
421	ISO2592	224		-0.89	
432	D92	224		-0.89	
496	D92	223		-1.05	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D92	220		-1.51	
663	D92	227.375		-0.37	
780	D92	224.0		-0.89	
823	D92	230		0.04	
840	D92	230		0.04	
862	D92	230		0.04	
875	D92	224		-0.89	
902		-----		-----	
912		-----		-----	
913		-----		-----	
922	D92	235		0.82	
962		-----		-----	
963		-----		-----	
974	D92	236		0.98	
994	D92	224.0		-0.89	
1011		-----		-----	
1017		-----		-----	
1047		-----		-----	
1059	ISO2592	238		1.29	
1091	D92	231.0		0.20	
1146		-----		-----	
1150	ISO2592	231		0.20	
1173		-----		-----	
1213	D92	247		2.69	
1235		-----		-----	
1271	ISO2592	226		-0.58	
1316	D92	232		0.35	
1320	D92	232		0.35	
1409	ISO2592	226		-0.58	
1412	D92	230.0		0.04	
1438		-----		-----	
1461	ISO2592	244		2.22	
1510	D92	230		0.04	
1564	D92	234		0.67	
1748	D92	232		0.35	
1797	ISO2592	229.5		-0.03	
1850	ISO2592	225		-0.73	
1877	D92	228		-0.27	
1969	ISO2592	242.925		2.05	
2129	D92	228.0		-0.27	
6016		-----		-----	
6032	D92	226		-0.58	
6183	D92	242.0		1.91	
6197	D92	228		-0.27	
6253		-----		-----	
6284	D92	219		-1.67	
6310		-----		-----	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

normality	OK
n	44
outliers	0
mean (n)	229.72
st.dev. (n)	6.461
R(calc.)	18.09
st.dev.(D92:18)	6.429
R(D92:18)	18

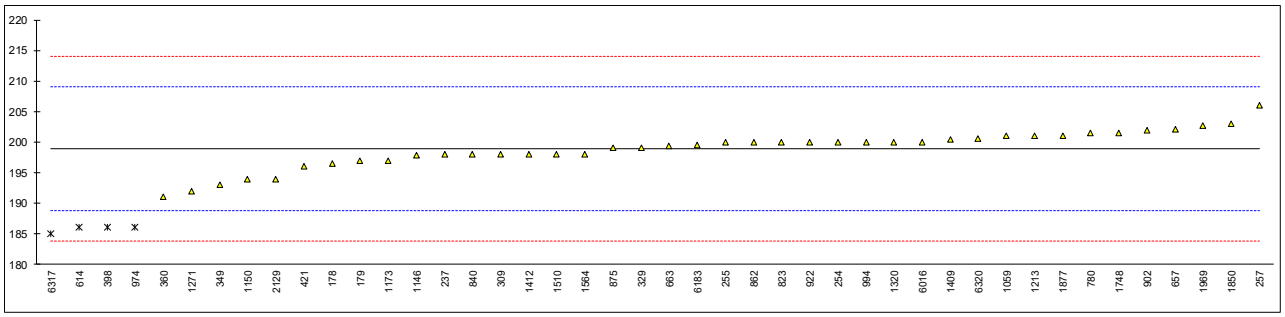


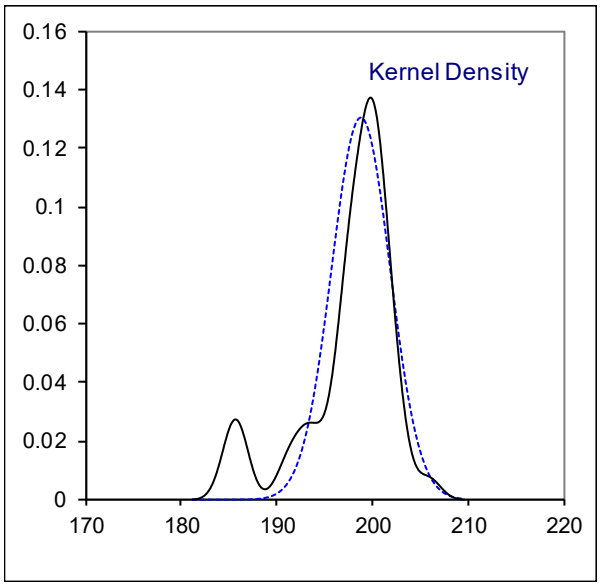


Determination of Flash Point PMcc on sample #20075; results in °C

lab	method	value	mark	z(targ)	remarks
178	D93-A	196.5		-0.48	
179	D93-A	197.0		-0.38	
211		-----		-----	
219		-----		-----	
237	D93-B	198.0		-0.18	
254	D93-A	200		0.22	
255	D93-A	200.0		0.22	
257	D93-A	206.0		1.41	
309	D93-A	198.0		-0.18	
325		-----		-----	
329	D93-A	199		0.02	
333		-----		-----	
339		-----		-----	
349	D93-A	193		-1.17	
360	ISO2719-A	191.0		-1.57	
398	D93-A	186	R(0.01)	-2.56	
421	D93-A	196.0		-0.58	
432		-----		-----	
496		-----		-----	
614	D93-A	186	R(0.01)	-2.56	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D93-A	202.1		0.63	
663	D93-A	199.375		0.09	
780	D93-A	201.5		0.52	
823	D93-B	200		0.22	
840	D93-A	198		-0.18	
862	D93-A	200		0.22	
875	D93-A	199.0		0.02	
902	D93-A	202		0.61	
912		-----		-----	
913		-----		-----	
922	D93-A	200		0.22	
962		-----		-----	
963		-----		-----	
974	D93-A	186	R(0.01)	-2.56	
994	D93-A	200.0		0.22	
1011		-----		-----	
1017		-----		-----	
1047		-----		-----	
1059	ISO2719-A	201.0		0.42	
1091		-----		-----	
1146	D93-A	197.8		-0.22	
1150	ISO2719-A	194.0		-0.97	
1173	D93-A	197.0		-0.38	
1213	D93-A	201		0.42	
1235		-----		-----	
1271	ISO2719-A	192	C	-1.37	first reported 216
1316		-----		-----	
1320	ISO2719-A	200		0.22	
1409	D93-A	200.5		0.32	
1412	D93-A	198.0		-0.18	
1438		-----		-----	
1461		-----		-----	
1510	D93-A	198		-0.18	
1564	D93-A	198		-0.18	
1748	D93-A	201.5		0.52	
1797		-----		-----	
1850	ISO2719-A	203		0.81	
1877	D93-A	201.0		0.42	
1969	ISO2719-A	202.71		0.75	
2129	D93-A	194.0		-0.97	
6016	D93-A	200		0.22	
6032		-----		-----	
6183	D93-A	199.5		0.12	
6197		-----		-----	
6253		-----		-----	
6284		-----		-----	
6310		-----		-----	
6317	D93-B	185	R(0.01)	-2.76	
6320	ISO2719-A	200.6		0.34	
6324		-----		-----	

normality	OK
n	40
outliers	4
mean (n)	198.90
st.dev. (n)	3.057
R(calc.)	8.56
st.dev.(D93-A:19)	5.044
R(D93-A:19)	14.12





Determination of Foaming Tendency, 5 min blowing period on sample #20075; results in mL

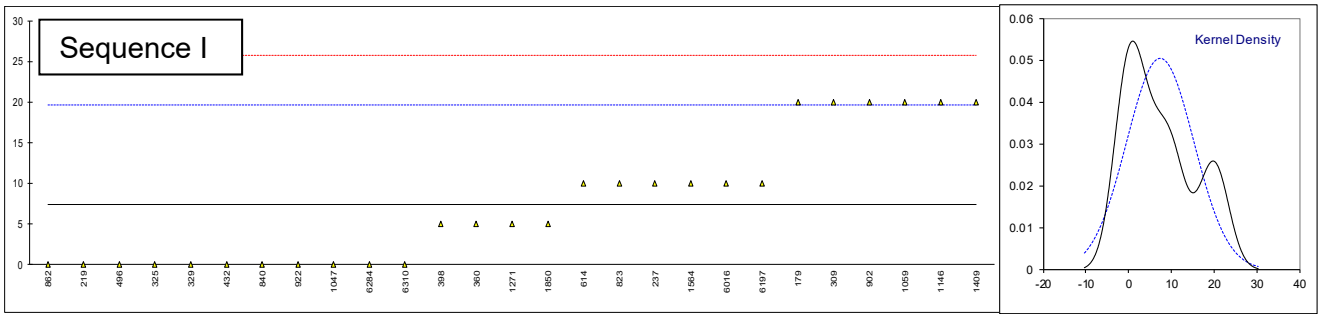
lab	method	sample used	diffuser	Seq. I	mark	z(targ)	Seq. II	mark	z(targ)	Seq. III	mark	z(targ)
178				-----		-----	-----		-----	-----		-----
179	D892	As received	Metal	20		2.05	30		0.08	10		1.07
211		---	---	-----		-----	-----		-----	-----		-----
219	D892	As received	Stone	0		-1.21	20	C	-0.97	0		-0.72
237	D892	After agitation A	Metal	10		0.42	30		0.08	10		1.07
254		---	---	-----		-----	-----		-----	-----		-----
255		---	---	-----		-----	-----		-----	-----		-----
257		---	---	-----		-----	-----		-----	-----		-----
309	D892	After agitation A	Metal	20		2.05	40		1.12	10		1.07
325	D892	As received	Metal	0		-1.21	50		2.17	0		-0.72
329	D892	As received	Stone	0		-1.21	20		-0.97	0		-0.72
333		---	---	-----		-----	-----		-----	-----		-----
339		---	---	-----		-----	-----		-----	-----		-----
349		---	---	-----		-----	-----		-----	-----		-----
360	ISO6247	As received	Stone	5		-0.39	10		-2.01	0		-0.72
398	D892	As received	Stone	5		-0.39	20		-0.97	5		0.18
421		---	---	-----		-----	-----		-----	-----		-----
432	D892	As received	Stone	0		-1.21	30		0.08	0		-0.72
496	D892	As received	Metal	0		-1.21	40		1.12	0		-0.72
614	D892	As received	Metal	10		0.42	10		-2.01	10		1.07
621		---	---	-----		-----	-----		-----	-----		-----
633		---	---	-----		-----	-----		-----	-----		-----
634		---	---	-----		-----	-----		-----	-----		-----
657	D892	As received	Stone	NIL		-----	60		3.21	NIL		-----
663		---	---	-----		-----	-----		-----	-----		-----
780		---	---	-----		-----	-----		-----	-----		-----
823	D892	As received	Stone	10		0.42	20		-0.97	10		1.07
840	D892	As received	Stone	0		-1.21	10		-2.01	0		-0.72
862	D892	As received	Metal	0		-1.21	20		-0.97	0		-0.72
875		---	---	-----		-----	-----		-----	-----		-----
902	D892	After agitation A	Metal	20		2.05	80	R1	5.31	20	R1	2.86
912		---	---	-----		-----	-----		-----	-----		-----
913		---	---	-----		-----	-----		-----	-----		-----
922	D892	As received	Stone	0		-1.21	20	C	-0.97	0		-0.72
962		---	---	-----		-----	-----		-----	-----		-----
963		---	---	-----		-----	-----		-----	-----		-----
974		---	---	-----		-----	-----		-----	-----		-----
994		---	---	-----		-----	-----		-----	-----		-----
1011		---	---	-----		-----	-----		-----	-----		-----
1017		---	---	-----		-----	-----		-----	-----		-----
1047	D892	---	---	0		-1.21	55		2.69	0		-0.72
1059	D892	As received	Metal	20		2.05	60		3.21	nil		-----
1091		---	---	-----		-----	-----		-----	-----		-----
1146	D892	As received	Metal	20		2.05	30		0.08	10		1.07
1150		---	---	-----		-----	-----		-----	-----		-----
1173		---	---	-----		-----	-----		-----	-----		-----
1213		---	---	-----		-----	5		-2.54	-----		-----
1235		---	---	-----		-----	-----		-----	-----		-----
1271	ISO6247	As received	Stone	5		-0.39	20		-0.97	5		0.18
1316		---	---	-----		-----	-----		-----	-----		-----
1320		---	---	-----		-----	-----		-----	-----		-----
1409	D892	After agitation A	Metal	20		2.05	50		2.17	0		-0.72
1412		---	---	-----		-----	-----		-----	-----		-----
1438		---	---	-----		-----	-----		-----	-----		-----
1461		---	---	-----		-----	-----		-----	-----		-----
1510		---	---	-----		-----	-----		-----	-----		-----
1564	D892	As received	Stone	10		0.42	40		1.12	10		1.07
1748		---	---	-----		-----	-----		-----	-----		-----
1797		---	---	-----		-----	-----		-----	-----		-----
1850	ISO6247	As received	Stone	5		-0.39	120	R1	9.49	0		-0.72
1877		---	---	-----		-----	-----		-----	-----		-----
1969		---	---	-----		-----	-----		-----	-----		-----
2129		---	---	-----		-----	-----		-----	-----		-----
6016		**)	Stone	10		0.42	15	C	-1.49	10		1.07
6032		---	---	-----		-----	-----		-----	-----		-----
6183		---	---	-----		-----	-----		-----	-----		-----
6197		After agitation A	Metal	10		0.42	20		-0.97	10		1.07
6253		---	---	-----		-----	-----		-----	-----		-----
6284	D892	**)	Stone	0		-1.21	25		-0.45	0		-0.72
6310	D892	After agitation A	Metal	0		-1.21	40		1.12	0		-0.72
6317		---	---	-----		-----	-----		-----	-----		-----
6320		---	---	-----		-----	-----		-----	-----		-----
6324		---	---	-----		-----	-----		-----	-----		-----

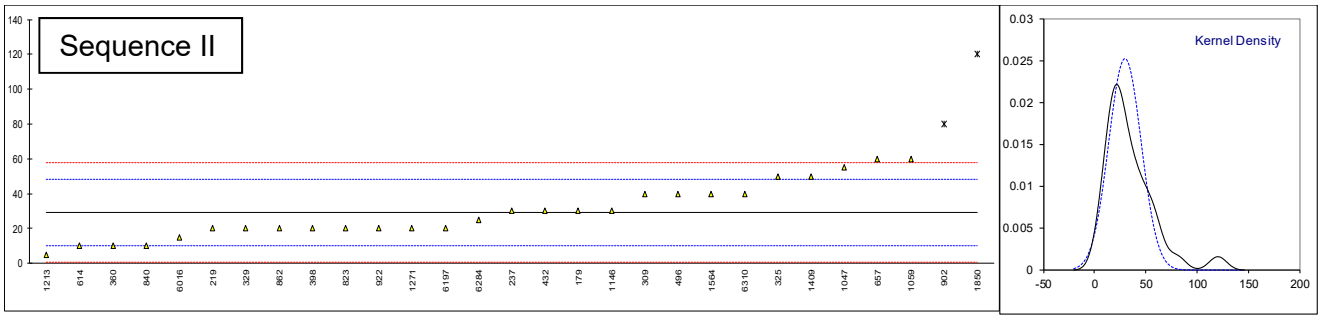
lab	method	sample used	diffuser	Seq. I mark	z(targ)	Seq. II mark	z(targ)	Seq. III mark	z(targ)
	normality			OK		OK		OK	
	n			27		27		25	
	outliers			0		2		1	
	mean (n)			7.41		29.26		4.00	
	st.dev. (n)			7.890		15.793		4.787	
	R(calc.)			22.09		44.22		13.40	
	st.dev.(D892:13e1)*			6.128		9.562		5.593	
	R(D892:13e1)*			17.16		26.77		15.66	
	Compare								
	R(D892:18)*			5.46		24.88		7.00	

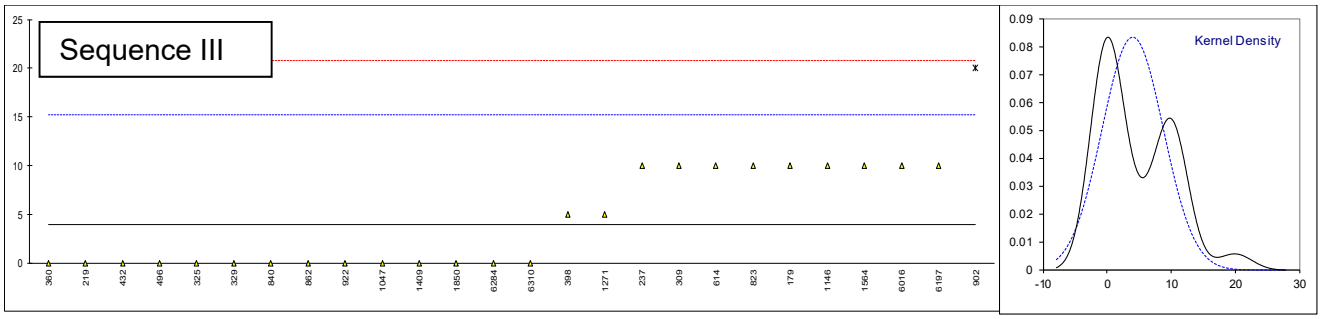
Lab 219 first reported 0
Lab 922 first reported 0
Lab 6016 first reported 100
*) see paragraph 4.1 for explanation for the choice of version 2013e1 for evaluation
**) Lab 6016: Sample for foaming was put in ultrasonic bath, homogenized. Without stirring, 200ml of sample decanted into a beaker, heated to 50ºC and then cooled to 25ºC (ambient temperature)
Lab 6284: Sample was pre heated at 50ºC for 10 mins prior to foaming characteristics testing

Sequence I -stone or metal diffuser:

	Sequence 1		**Sequence II**	
	stone diffuser only	metal diffuser only	stone diffuser only	metal diffuser only
normality	OK	OK	not OK	OK
n	13	13	13	12
outliers	0	0	0	0
mean (n)	3.85	11.54	23.85	35.00
st.dev. (n)	4.160	8.987	13.409	14.460
R(calc.)	11.65	25.16	37.55	40.49
st.dev.(D892:13e1)	6.128	6.128	9.562	9.562
R(D892:13e1)	15.59	18.98	24.394	29.300







Determination of Foam Stability, 10 min settling point on sample #20075; results in mL

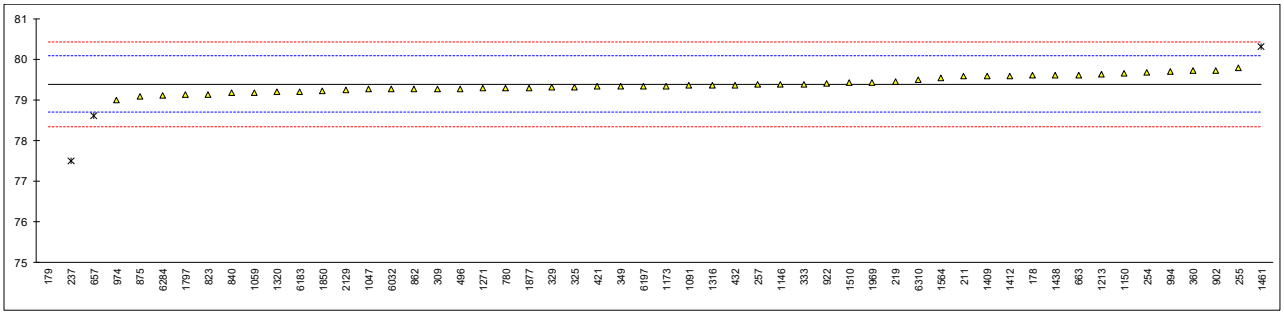
lab	method	Seq. I	mark	z(targ)	Seq. II	mark	z(targ)	Seq. III	mark	z(targ)
178		-----		-----	-----		-----	-----		-----
179	D892	0		-----	0		-----	0		-----
211		-----		-----	-----		-----	-----		-----
219		0		-----	0		-----	0		-----
237	D892	0		-----	0		-----	0		-----
254		-----		-----	-----		-----	-----		-----
255		-----		-----	-----		-----	-----		-----
257		-----		-----	-----		-----	-----		-----
309	D892	0		-----	0		-----	0		-----
325	D892	0		-----	0		-----	0		-----
329	D892	0		-----	0		-----	0		-----
333		-----		-----	-----		-----	-----		-----
339		-----		-----	-----		-----	-----		-----
349		-----		-----	-----		-----	-----		-----
360	ISO6247	0		-----	0		-----	0		-----
398	D892	0		-----	0		-----	0		-----
421		-----		-----	-----		-----	-----		-----
432	D892	0		-----	0		-----	0		-----
496	D892	0		-----	0		-----	0		-----
614	D892	0		-----	0		-----	0		-----
621		-----		-----	-----		-----	-----		-----
633		-----		-----	-----		-----	-----		-----
634		-----		-----	-----		-----	-----		-----
657	D892	NIL		-----	NIL		-----	NIL		-----
663		-----		-----	-----		-----	-----		-----
780		-----		-----	-----		-----	-----		-----
823		-----		-----	-----		-----	-----		-----
840	D892	0		-----	0		-----	0		-----
862	D892	0		-----	0		-----	0		-----
875		-----		-----	-----		-----	-----		-----
902	D892	0		-----	0		-----	0		-----
912		-----		-----	-----		-----	-----		-----
913		-----		-----	-----		-----	-----		-----
922	D892	0		-----	0		-----	0		-----
962		-----		-----	-----		-----	-----		-----
963		-----		-----	-----		-----	-----		-----
974		-----		-----	-----		-----	-----		-----
994		-----		-----	-----		-----	-----		-----
1011		-----		-----	-----		-----	-----		-----
1017		-----		-----	-----		-----	-----		-----
1047	D892	0		-----	0		-----	0		-----
1059	D892	0		-----	0		-----	0		-----
1091		-----		-----	-----		-----	-----		-----
1146	D892	0		-----	0		-----	0		-----
1150		-----		-----	-----		-----	-----		-----
1173		-----		-----	-----		-----	-----		-----
1213		-----		-----	-----		-----	-----		-----
1235		-----		-----	-----		-----	-----		-----
1271	ISO6247	0		-----	0		-----	0		-----
1316		-----		-----	-----		-----	-----		-----
1320		-----		-----	-----		-----	-----		-----
1409	D892	0		-----	0		-----	0		-----
1412		-----		-----	-----		-----	-----		-----
1438		-----		-----	-----		-----	-----		-----
1461		-----		-----	-----		-----	-----		-----
1510		-----		-----	-----		-----	-----		-----
1564	D892	0		-----	0		-----	0		-----
1748		-----		-----	-----		-----	-----		-----
1797		-----		-----	-----		-----	-----		-----
1850	ISO6247	0		-----	0		-----	0		-----
1877		-----		-----	-----		-----	-----		-----
1969		-----		-----	-----		-----	-----		-----
2129		-----		-----	-----		-----	-----		-----
6016		-----		-----	0		-----	-----		-----
6032		-----		-----	-----		-----	-----		-----
6183		-----		-----	-----		-----	-----		-----
6197	D892	0		-----	0		-----	0		-----
6253		-----		-----	-----		-----	-----		-----
6284	D892	0		-----	0		-----	0		-----
6310	D892	0		-----	0		-----	0		-----
6317		-----		-----	-----		-----	-----		-----
6320		-----		-----	-----		-----	-----		-----
6324		-----		-----	-----		-----	-----		-----

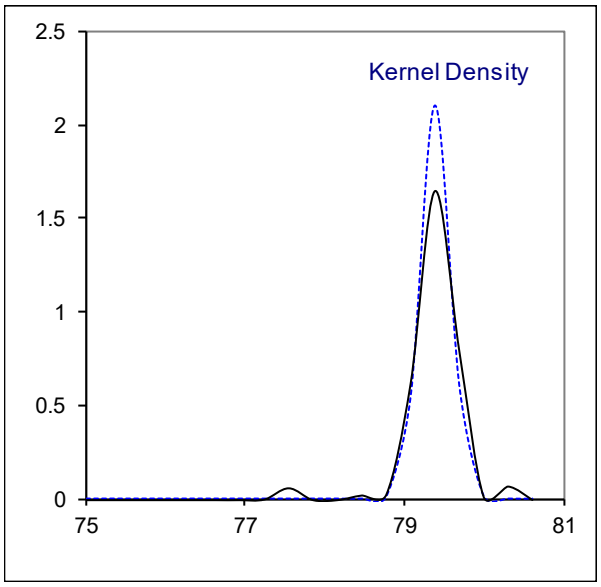
lab	method	Seq. I	mark	z(targ)	Seq. II	mark	z(targ)	Seq. III	mark	z(targ)
	n	26			27			26		
	mean (n)	0			0			0		

Determination of Kinematic Viscosity at 40°C on sample #20075; results in mm²/s

lab	method	value	mark	z(targ)	remarks
178	D445	79.6		0.62	
179	D445	2.93	R(0.01)	-221.04	
211	D445	79.58		0.56	
219	D7279 corr. to D445	79.44		0.16	
237	D445	77.49	R(0.01)	-5.48	
254	D445	79.68		0.85	
255	D7279 corr. to D445	79.78		1.14	
257	D7279 corr. to D445	79.38		-0.01	
309	D445	79.27		-0.33	
325	D445	79.32		-0.19	
329	D445	79.31		-0.22	
333	D445	79.39		0.02	
339		-----		-----	
349	D445	79.34		-0.13	
360	ISO3104	79.727		0.99	
398		-----		-----	
421	ISO3104	79.33		-0.16	
432	D445	79.36		-0.07	
496	D445	79.272		-0.33	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D445	78.61	R(0.01)	-2.24	
663	D445	79.6002		0.62	
780	D445	79.29		-0.27	
823	D445	79.14		-0.71	
840	D445	79.174		-0.61	
862	D445	79.26		-0.36	
875	D445	79.09		-0.85	
902	D445	79.73		1.00	
912		-----		-----	
913		-----		-----	
922	D445	79.40		0.04	
962		-----		-----	
963		-----		-----	
974	D445	79.00		-1.11	
994	D445	79.69		0.88	
1011		-----		-----	
1017		-----		-----	
1047	ISO3104	79.256		-0.37	
1059	ISO3104	79.18		-0.59	
1091	D445	79.35		-0.10	
1146	D445	79.381		-0.01	
1150	ISO3104	79.6591		0.79	
1173	IP71	79.342		-0.12	
1213	D445	79.62		0.68	
1235		-----		-----	
1271	ISO3104	79.287		-0.28	
1316	ISO3104	79.35		-0.10	
1320	ISO3104	79.20		-0.53	
1409	D445	79.58		0.56	
1412	D445	79.59		0.59	
1438	D445	79.6		0.62	
1461	ISO3104	80.2979	C,R(0.01)	2.64	first reported 80.7192
1510	D445	79.43		0.13	
1564	D445	79.53		0.42	
1748		-----		-----	
1797	ISO3104	79.12		-0.77	
1850	ISO3104	79.22		-0.48	
1877	D445	79.29		-0.27	
1969	ISO3104	79.4358		0.15	
2129	D445	79.254		-0.38	
6016		-----		-----	
6032	D7279 corr. to D445	79.257		-0.37	
6183	D445	79.20		-0.53	
6197	D445	79.34		-0.13	
6253		-----		-----	
6284	D445	79.1127		-0.79	
6310	D7279 corr. to D445	79.5		0.33	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

normality	OK
n	50
outliers	4
mean (n)	79.385
st.dev. (n)	0.1898
R(calc.)	0.531
st.dev.(D445:19)	0.3459
R(D445:19)	0.968

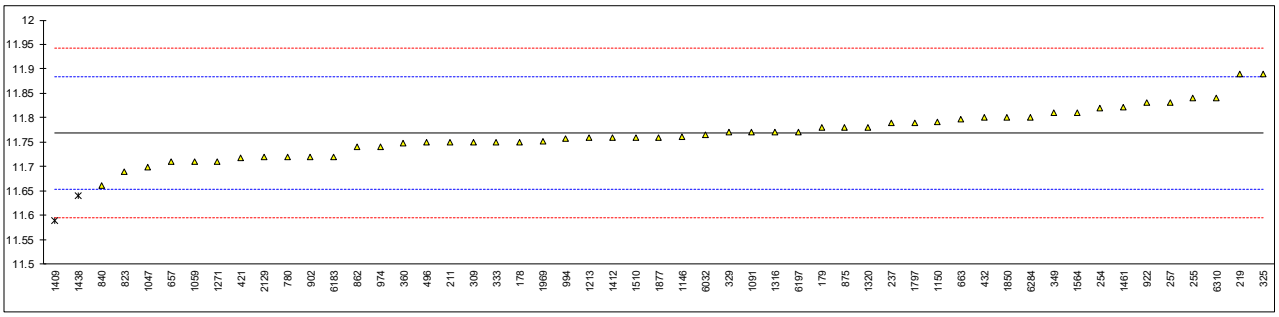


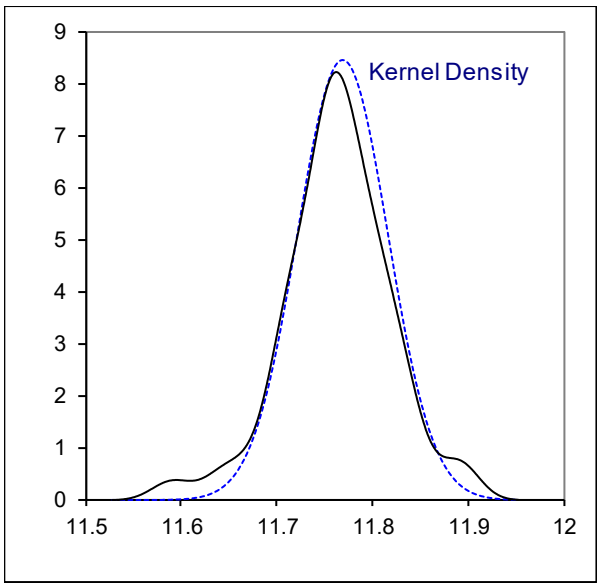


Determination of Kinematic Viscosity at 100°C on sample #20075; results in mm²/s

lab	method	value	mark	z(targ)	remarks
178	D445	11.75		-0.32	
179	D445	11.78		0.20	
211	D445	11.75		-0.32	
219	D7279 corr. to D445	11.89		2.09	
237	D445	11.79		0.37	
254	D445	11.82		0.89	
255	D7279 corr. to D445	11.84		1.23	
257	D7279 corr. to D445	11.83		1.06	
309	D445	11.75		-0.32	
325	D445	11.89		2.09	
329	D445	11.77		0.02	
333	D445	11.75		-0.32	
339		-----		-----	
349	D445	11.81		0.71	
360	ISO3104	11.748		-0.35	
398		-----		-----	
421	ISO3104	11.718	C	-0.87	first reported 11.58
432	D445	11.80		0.54	
496	D445	11.749		-0.34	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D445	11.71		-1.01	
663	D445	11.7967		0.49	
780	D445	11.72		-0.84	
823	ISO3104	11.69		-1.35	
840	D445	11.661		-1.85	
862	D445	11.74		-0.49	
875	D445	11.78		0.20	
902	D445	11.72		-0.84	
912		-----		-----	
913		-----		-----	
922	D445	11.83		1.06	
962		-----		-----	
963		-----		-----	
974	D445	11.74	C	-0.49	first reported 11.53
994	D445	11.758		-0.18	
1011		-----		-----	
1017		-----		-----	
1047	ISO3104	11.698		-1.22	
1059	ISO3104	11.71		-1.01	
1091	D445	11.77		0.02	
1146	D445	11.761		-0.13	
1150	ISO3104	11.7904		0.38	
1173		-----		-----	
1213	D445	11.76		-0.15	
1235		-----		-----	
1271	ISO3104	11.710		-1.01	
1316	ISO3104	11.77		0.02	
1320	ISO3104	11.78		0.20	
1409	D445	11.59	DG(0.05)	-3.08	
1412	D445	11.76		-0.15	
1438	D445	11.64	C,DG(0.05)	-2.22	first reported 11.6
1461	ISO3104	11.8213		0.91	
1510	D445	11.76		-0.15	
1564	D445	11.81		0.71	
1748		-----		-----	
1797	ISO3104	11.79		0.37	
1850	ISO3104	11.80		0.54	
1877	D445	11.76		-0.15	
1969	ISO3104	11.7517		-0.29	
2129	D445	11.719		-0.85	
6016		-----		-----	
6032	D7279 corr. to D445	11.764		-0.08	
6183	D445	11.72		-0.84	
6197	D445	11.77		0.02	
6253		-----		-----	
6284	D445	11.8003	C	0.55	first reported 11.5937
6310	D7279 corr. to D445	11.84		1.23	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

normality	OK
n	51
outliers	2
mean (n)	11.769
st.dev. (n)	0.0472
R(calc.)	0.132
st.dev.(D445:19)	0.0580
R(D445:19)	0.162

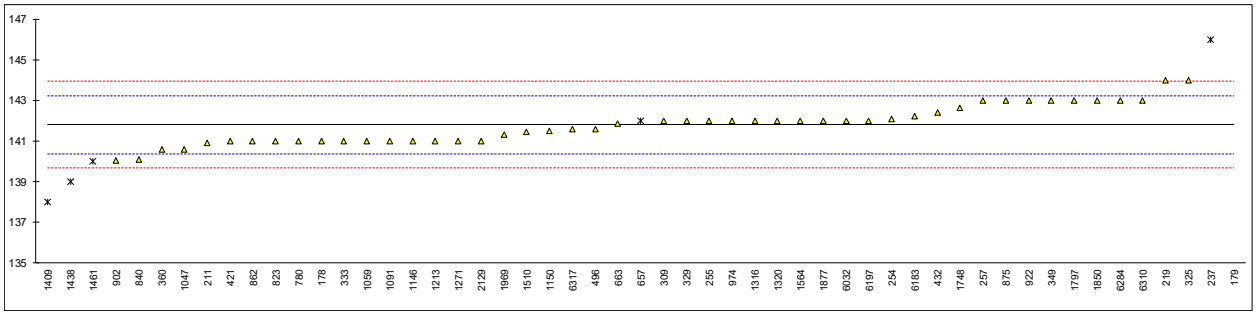


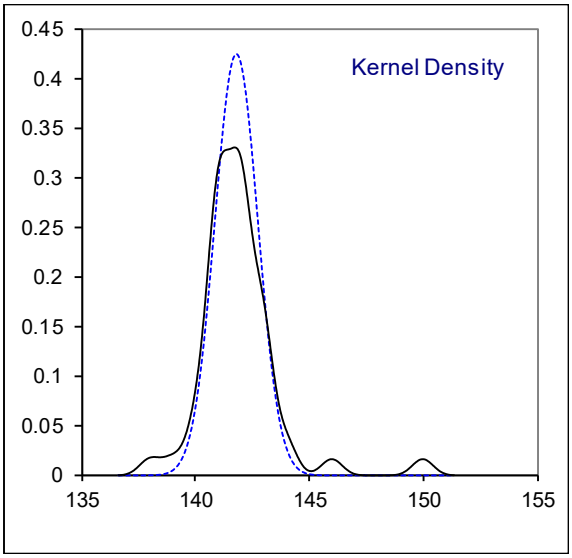


Determination of Viscosity Index on sample #20075;

lab	method	value	mark	z(targ)	remarks
178	D2270	141		-1.13	
179	D2270	3917	ex	5285.27	test result excluded, outlier in KV 40°C
211	D2270	140.9		-1.27	
219	D2270	144		3.07	
237	D2270	146	ex	5.87	test result excluded, outlier in KV 40°C
254	D2270	142.09		0.40	
255	D2270	142		0.27	
257	D2270	143		1.67	
309	D2270	142		0.27	
325	D2270	144		3.07	
329	D2270	142		0.27	
333	D2270	141		-1.13	
339		-----		-----	
349	D2270	143		1.67	
360	ISO2909	140.6		-1.69	
398		-----		-----	
421	ISO2909	141		-1.13	
432	D2270	142.4		0.83	
496	D2270	141.6		-0.29	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D2270	142	ex	0.27	test result excluded, outlier in KV 40°C
663	D2270	141.87		0.09	
780	D2270	141		-1.13	
823	D2270	141		-1.13	
840	D2270	140.1		-2.39	
862	D2270	141		-1.13	
875	D2270	143		1.67	
902	D2270	140.05		-2.46	
912		-----		-----	
913		-----		-----	
922	D2270	143		1.67	
962		-----		-----	
963		-----		-----	
974	D2270	142	C	0.27	first reported 138
994		-----		-----	
1011		-----		-----	
1017		-----		-----	
1047	ISO2909	140.6		-1.69	
1059	ISO2909	141		-1.13	
1091	D2270	141		-1.13	
1146	D2270	141		-1.13	
1150	ISO2909	141.48		-0.46	
1173		-----		-----	
1213	D2270	141		-1.13	
1235		-----		-----	
1271	ISO2909	141		-1.13	
1316	D2270	142		0.27	
1320	D2270	142		0.27	
1409	D2270	138	ex	-5.33	test result excluded, outlier in KV 100°C
1412		-----		-----	
1438		139	ex	-3.93	test result excluded, outlier in KV 100°C
1461	ISO2909	140	ex	-2.53	test result excluded, outlier in KV 40°C
1510	D2270	141.467		-0.47	
1564	D2270	142		0.27	
1748	D2270	142.63		1.15	
1797	ISO2909	143		1.67	
1850	ISO2909	143		1.67	
1877	D2270	142		0.27	
1969	ISO2909	141.29		-0.72	
2129	D2270	141.0		-1.13	
6016		-----		-----	
6032	D2270	142		0.27	
6183	D2270	142.2		0.55	
6197	D2270	142		0.27	
6253		-----		-----	
6284	D2270	143	C	1.67	first reported 138.89
6310	D2270	143		1.67	
6317	D2270	141.57		-0.33	
6320		-----		-----	
6324		-----		-----	

normality	OK
n	47
outliers	0+(6ex)
mean (n)	141.81
st.dev. (n)	0.942
R(calc.)	2.64
st.dev.(D2270:10)	0.714
R(D2270:10)	2

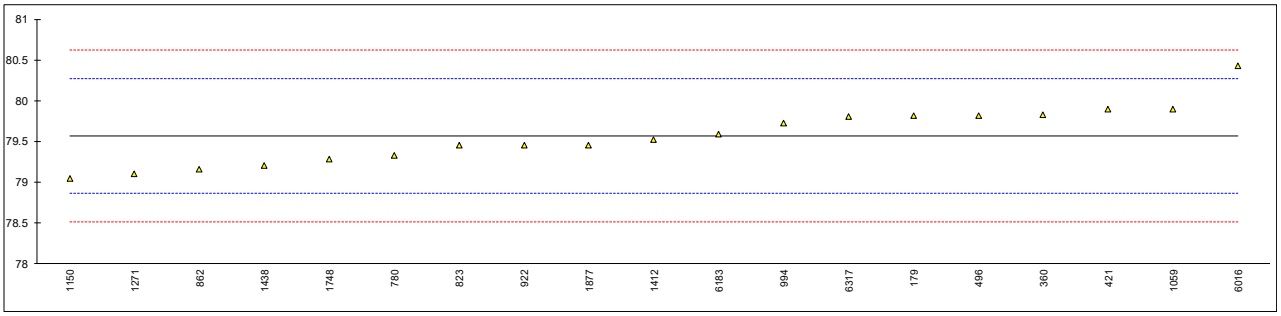


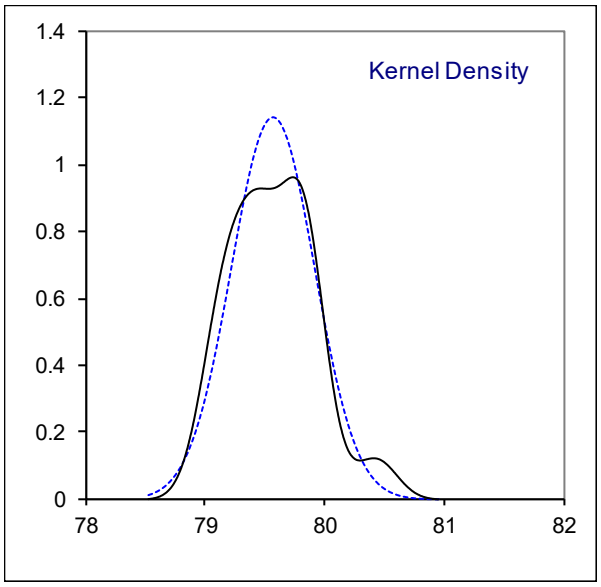


Determination of Viscosity Stabinger at 40°C on sample #20075; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D7042	79.81		0.69	
211		-----		-----	
219		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257		-----		-----	
309		-----		-----	
325		-----		-----	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360	D7042	79.828		0.75	
398		-----		-----	
421	D7042	79.89		0.92	
432		-----		-----	
496	D7042	79.813		0.70	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
780	D7042	79.33		-0.68	
823	D7042	79.45		-0.33	
840		-----		-----	
862	D7042	79.162		-1.16	
875		-----		-----	
902		-----		-----	
912		-----		-----	
913		-----		-----	
922	D7042	79.45		-0.33	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994	D7042	79.72		0.44	
1011		-----		-----	
1017		-----		-----	
1047		-----		-----	
1059	D7042	79.90		0.95	
1091		-----		-----	
1146		-----		-----	
1150	D7042	79.0445		-1.49	
1173		-----		-----	
1213		-----		-----	
1235		-----		-----	
1271	D7042	79.107		-1.31	
1316		-----		-----	
1320		-----		-----	
1409		-----		-----	
1412	D7042	79.52		-0.13	
1438		79.2		-1.05	
1461		-----		-----	
1510		-----		-----	
1564		-----		-----	
1748	D7042	79.281		-0.82	
1797		-----		-----	
1850		-----		-----	
1877	D7042	79.45		-0.33	
1969		-----		-----	
2129		-----		-----	
6016	D7042	80.431		2.47	
6032		-----		-----	
6183	D7042	79.59		0.07	
6197		-----		-----	
6253		-----		-----	
6284		-----		-----	
6310		-----		-----	
6317	D7042	79.8		0.67	
6320		-----		-----	
6324		-----		-----	

normality	OK
n	19
outliers	0
mean (n)	79.567
st.dev. (n)	0.3490
R(calc.)	0.977
st.dev.(D7042:19e1)	0.3500
R(D7042:19e1)	0.980

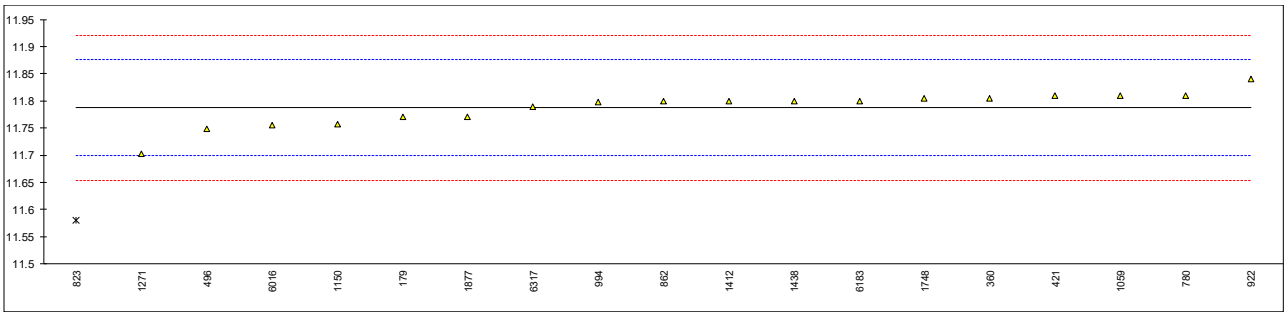


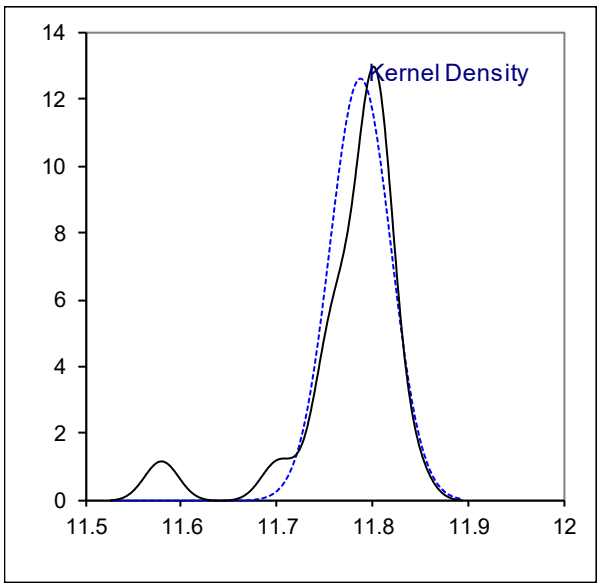


Determination of Viscosity Stabinger at 100°C on sample #20075; results in mm²/s

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D7042	11.77		-0.39	
211		-----		-----	
219		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257		-----		-----	
309		-----		-----	
325		-----		-----	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360	D7042	11.805		0.40	
398		-----		-----	
421	D7042	11.81		0.52	
432		-----		-----	
496	D7042	11.749		-0.86	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
780	D7042	11.81		0.52	
823	D7042	11.58	C,D(0.01)	-4.67	first reported 11.44
840		-----		-----	
862	D7042	11.80		0.29	
875		-----		-----	
902		-----		-----	
912		-----		-----	
913		-----		-----	
922	D7042	11.84		1.19	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994	D7042	11.797		0.22	
1011		-----		-----	
1017		-----		-----	
1047		-----		-----	
1059	D7042	11.81		0.52	
1091		-----		-----	
1146		-----		-----	
1150	D7042	11.7573		-0.67	
1173		-----		-----	
1213		-----		-----	
1235		-----		-----	
1271	D7042	11.702		-1.92	
1316		-----		-----	
1320		-----		-----	
1409		-----		-----	
1412	D7042	11.80		0.29	
1438		11.8		0.29	
1461		-----		-----	
1510		-----		-----	
1564		-----		-----	
1748	D7042	11.804		0.38	
1797		-----		-----	
1850		-----		-----	
1877	D7042	11.77		-0.39	
1969		-----		-----	
2129		-----		-----	
6016	D7042	11.7545	C	-0.74	first reported 11.931
6032		-----		-----	
6183	D7042	11.80		0.29	
6197		-----		-----	
6253		-----		-----	
6284		-----		-----	
6310		-----		-----	
6317	D7042	11.7895		0.05	
6320		-----		-----	
6324		-----		-----	

normality	suspect
n	18
outliers	1
mean (n)	11.787
st.dev. (n)	0.0316
R(calc.)	0.088
st.dev.(D7042:19e1)	0.0443
R(D7042:19e1)	0.124

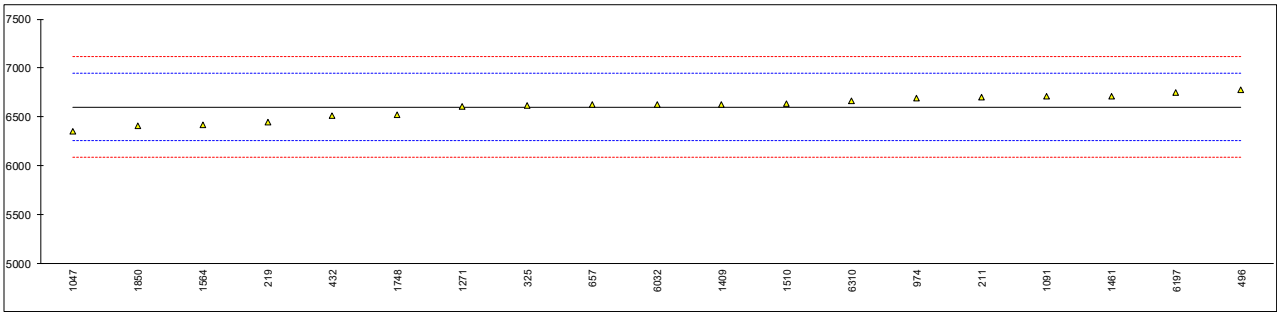


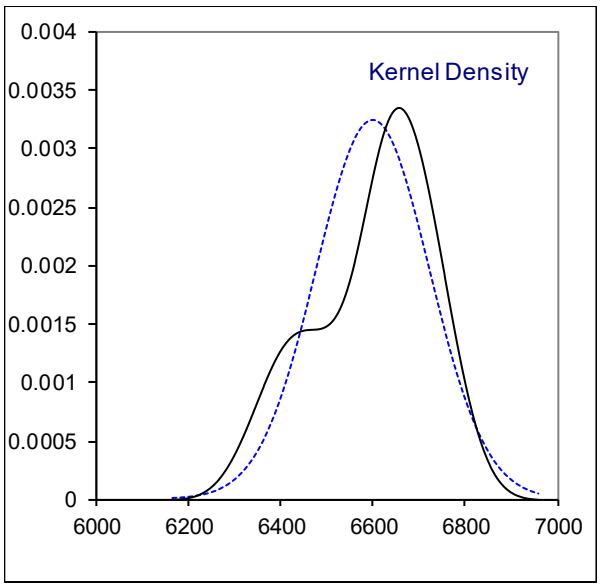


Determination of Viscosity Apparent (CCS) at -25°C on sample #20075; results in mPa·s

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179		-----		-----	
211	D5293	6700		0.58	
219	D5293	6450		-0.88	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257		-----		-----	
309		-----		-----	
325	D5293	6620		0.11	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360		-----		-----	
398		-----		-----	
421		-----		-----	
432	D5293	6511		-0.52	
496	D5293	6776		1.02	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D5293	6623		0.13	
663		-----		-----	
780		-----		-----	
823		-----		-----	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902		-----		-----	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974	D5293	6694		0.54	
994		-----		-----	
1011		-----		-----	
1017		-----		-----	
1047	D5293	6350	C	-1.46	first reported 2780
1059		-----		-----	
1091	D5293	6710		0.64	
1146		-----		-----	
1150		-----		-----	
1173		-----		-----	
1213		-----		-----	
1235		-----		-----	
1271	D5293	6611		0.06	
1316		-----		-----	
1320		-----		-----	
1409	D5293	6627		0.15	
1412		-----		-----	
1438		-----		-----	
1461	In house	6711		0.64	
1510	D5293	6640		0.23	
1564	D5293	6423		-1.03	
1748	D5293	6520		-0.47	
1797		-----		-----	
1850	D5293	6410		-1.11	
1877		-----		-----	
1969		-----		-----	
2129		-----		-----	
6016		-----		-----	
6032	D5293	6626		0.15	
6183		-----		-----	
6197	D5293	6749		0.86	
6253		-----		-----	
6284		-----		-----	
6310	D5293	6661		0.35	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

normality	OK
n	19
outliers	0
mean (n)	6600.6
st.dev. (n)	122.69
R(calc.)	343.5
st.dev.(D5293:17a)	172.09
R(D5293:17a)	481.8

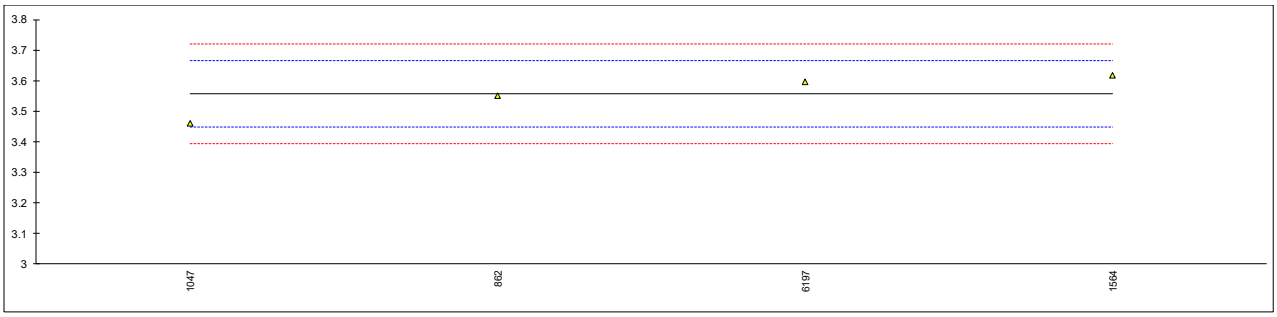




Determination of Viscosity HTHS by Tapered Bearing Simulator on sample #20075; results in mPa·s

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179		-----		-----	
211		-----		-----	
219		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257		-----		-----	
309		-----		-----	
325		-----		-----	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360		-----		-----	
398		-----		-----	
421		-----		-----	
432		-----		-----	
496		-----		-----	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
780		-----		-----	
823		-----		-----	
840		-----		-----	
862	D4741	3.55		-0.11	
875		-----		-----	
902		-----		-----	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		-----		-----	
1011		-----		-----	
1017		-----		-----	
1047	D4741	3.46		-1.76	
1059		-----		-----	
1091		-----		-----	
1146		-----		-----	
1150		-----		-----	
1173		-----		-----	
1213		-----		-----	
1235		-----		-----	
1271		-----		-----	
1316		-----		-----	
1320		-----		-----	
1409		-----		-----	
1412		-----		-----	
1438		-----		-----	
1461		-----		-----	
1510		-----		-----	
1564	D4683	3.618		1.13	
1748		-----		-----	
1797		-----		-----	
1850		-----		-----	
1877		-----		-----	
1969		-----		-----	
2129		-----		-----	
6016		-----		-----	
6032		-----		-----	
6183		-----		-----	
6197	D5481	3.597		0.75	
6253		-----		-----	
6284		-----		-----	
6310		-----		-----	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

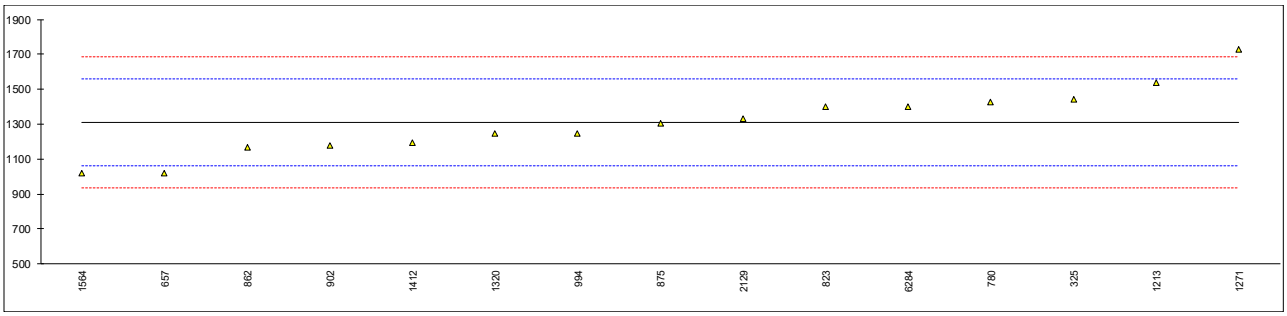
normality	unknown
n	4
outliers	0
mean (n)	3.556
st.dev. (n)	0.0702
R(calc.)	0.197
st.dev.(D4683:17)	0.0546
R(D4683:17)	0.153

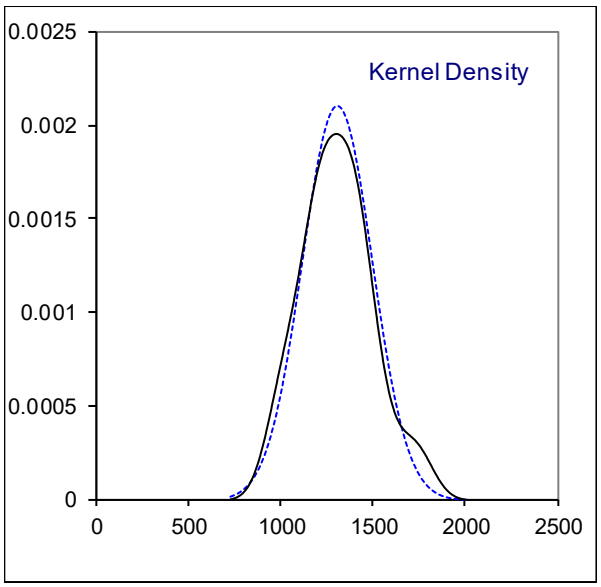


Determination of Nitrogen on sample #20075; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179		-----		-----	
211		-----		-----	
219		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257		-----		-----	
309		-----		-----	
325	D5762	1441		1.05	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360		-----		-----	
398		-----		-----	
421		-----		-----	
432		-----		-----	
496		-----		-----	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D5762	1021		-2.32	
663		-----		-----	
780	D3228	1426		0.93	
823	D5762	1400		0.72	
840		-----		-----	
862	D5762	1168		-1.14	
875	D5762	1306		-0.03	
902	D5762	1179		-1.05	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994	D5762	1249		-0.49	
1011		-----		-----	
1017		-----		-----	
1047		-----		-----	
1059		-----		-----	
1091		-----		-----	
1146		-----		-----	
1150		-----		-----	
1173		-----		-----	
1213	D5762	1539		1.84	
1235		-----		-----	
1271	D3228	1730		3.37	
1316		-----		-----	
1320	D5762	1248		-0.50	
1409		-----		-----	
1412	D5762	1192		-0.95	
1438		-----		-----	
1461		-----		-----	
1510		-----		-----	
1564	D5762	1020		-2.33	
1748		-----		-----	
1797		-----		-----	
1850		-----		-----	
1877		-----		-----	
1969		-----		-----	
2129	D3228	1333		0.18	
6016		-----		-----	
6032		-----		-----	
6183		-----		-----	
6197		-----		-----	
6253		-----		-----	
6284	D3228	1400	C	0.72	first reported 2800
6310		-----		-----	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

normality	OK
n	15
outliers	0
mean (n)	1310.13
st.dev. (n)	189.480
R(calc.)	530.54
st.dev.(D5762:18a)	124.463
R(D5762:18a)	348.50

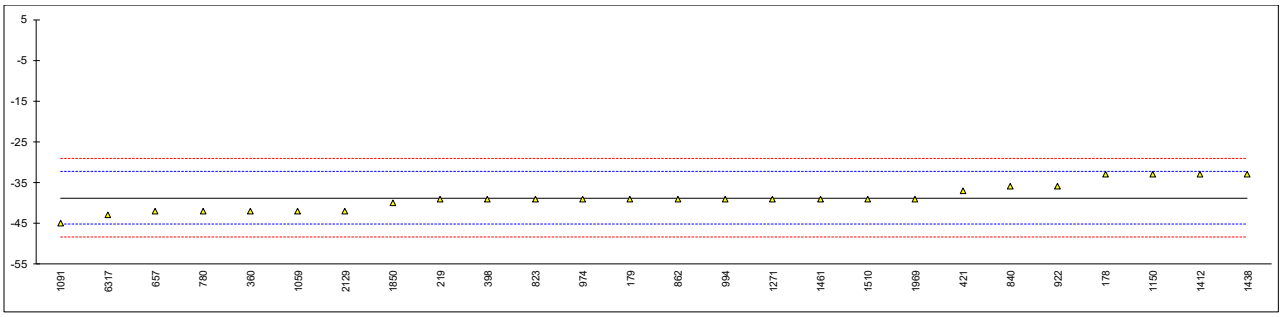


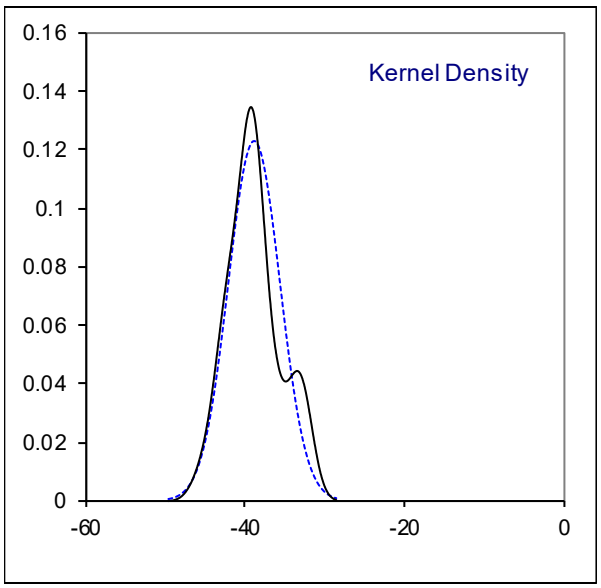


Determination of Pour Point, Manual on sample #20075; results in °C

lab	method	value	mark	z(targ)	remarks
178	D97	-33		1.79	
179	D97	-39		-0.07	
211		-----		-----	
219	D97	-39		-0.07	
237		-----		-----	
254	D97	<-24		-----	
255		-----		-----	
257		-----		-----	
309		-----		-----	
325		-----		-----	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360	ISO3016	-42		-1.01	
398	D97	-39		-0.07	
421	ISO3016	-37		0.55	
432		-----		-----	
496		-----		-----	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D97	-42		-1.01	
663	D97	<-36		-----	
780	D97	-42		-1.01	
823	D97	-39		-0.07	
840	D97	-36		0.86	
862	D97	-39		-0.07	
875		-----		-----	
902		-----		-----	
912		-----		-----	
913		-----		-----	
922	D97	-36		0.86	
962		-----		-----	
963		-----		-----	
974	D97	-39		-0.07	
994	D97	-39		-0.07	
1011		-----		-----	
1017		-----		-----	
1047		-----		-----	
1059	ISO3016	-42		-1.01	
1091	ISO3016	-45		-1.94	
1146		-----		-----	
1150	ISO3016	-33		1.79	
1173		-----		-----	
1213	D97	< -42		-----	
1235		-----		-----	
1271	ISO3016	-39		-0.07	
1316		-----		-----	
1320		-----		-----	
1409		-----		-----	
1412	D97	-33		1.79	
1438		-33		1.79	
1461	ISO3016	-39		-0.07	
1510	D97	-39		-0.07	
1564		-----		-----	
1748		-----		-----	
1797		-----		-----	
1850	ISO3016	-40		-0.38	
1877		-----		-----	
1969	ISO3016	-39		-0.07	
2129	D97	-42.0		-1.01	
6016		-----		-----	
6032		-----		-----	
6183		-----		-----	
6197		-----		-----	
6253		-----		-----	
6284		-----		-----	
6310		-----		-----	
6317	D97	-43		-1.32	
6320		-----		-----	
6324		-----		-----	

normality	OK
n	26
outliers	0
mean (n)	-38.77
st.dev. (n)	3.241
R(calc.)	9.08
st.dev.(D97:17b)	3.214
R(D97:17b)	9

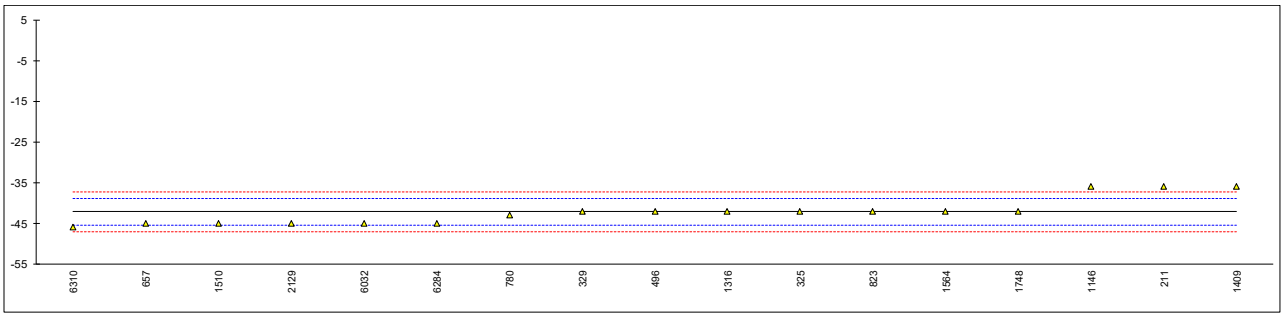


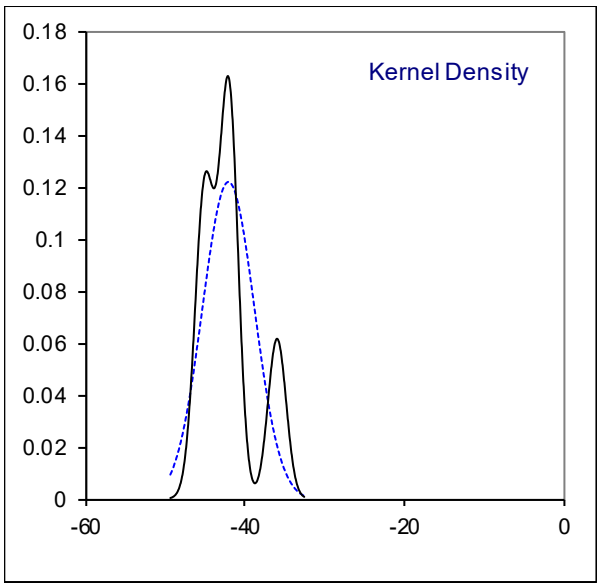


Determination of Pour Point, Automated, 1°C interval on sample #20075; results in °C

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179		-----		-----	
211	D5950	-36		3.81	
219		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257		-----		-----	
309		-----		-----	
325	D5950	-42		0.07	
329	D5950	-42		0.07	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360		-----		-----	
398		-----		-----	
421		-----		-----	
432		-----		-----	
496	D5950	-42		0.07	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D5950	-45		-1.79	
663		-----		-----	
780	D5950	-43		-0.55	
823	D5950	-42		0.07	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902		-----		-----	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		-----		-----	
1011		-----		-----	
1017		-----		-----	
1047		-----		-----	
1059		-----		-----	
1091		-----		-----	
1146	In house	-36		3.81	
1150		-----		-----	
1173		-----		-----	
1213		-----		-----	
1235		-----		-----	
1271		-----		-----	
1316	D5950	-42.0		0.07	
1320		-----		-----	
1409	D5950	-36		3.81	
1412		-----		-----	
1438		-----		-----	
1461		-----		-----	
1510	D5950	-45		-1.79	
1564	D5950	-42		0.07	
1748	D7346	-42		0.07	
1797		-----		-----	
1850		-----		-----	
1877		-----		-----	
1969		-----		-----	
2129	D5950	-45.0		-1.79	
6016		-----		-----	
6032	D5950	-45		-1.79	
6183		-----		-----	
6197		-----		-----	
6253		-----		-----	
6284	D5950	-45		-1.79	
6310	D5950	-46		-2.42	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

normality	suspect
n	17
outliers	0
mean (n)	-42.12
st.dev. (n)	3.257
R(calc.)	9.12
st.dev.(D5950:14)	1.607
R(D5950:14)	4.5

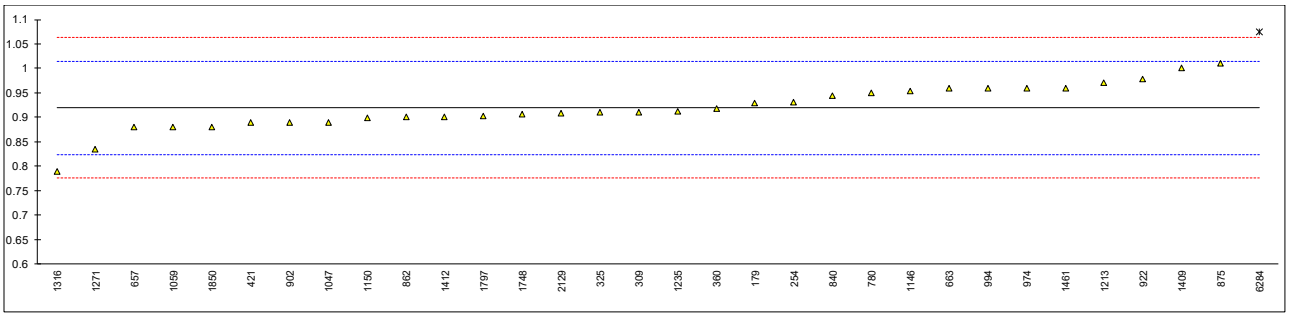


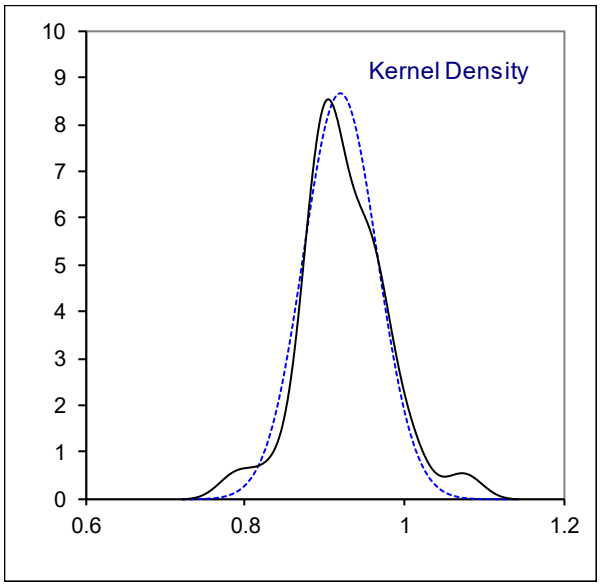


Determination of Sulfated Ash on sample #20075; results in %M/M

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D874	0.929		0.20	
211		-----		-----	
219		-----		-----	
237		-----		-----	
254	D874	0.93		0.22	
255		-----		-----	
257		-----		-----	
309	D874	0.91		-0.20	
325	D874	0.91		-0.20	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360	ISO3987	0.917		-0.05	
398		-----		-----	
421	ISO3987	0.89		-0.62	
432		-----		-----	
496		-----		-----	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D874	0.88		-0.83	
663	D874	0.96		0.85	
780	D874	0.95		0.64	
823		-----		-----	
840	D874	0.944		0.52	
862	D874	0.900		-0.41	
875	D874	1.01		1.90	
902	D874	0.89		-0.62	
912		-----		-----	
913		-----		-----	
922	D874	0.978		1.23	
962		-----		-----	
963		-----		-----	
974	D874	0.96		0.85	
994	D874	0.96		0.85	
1011		-----		-----	
1017		-----		-----	
1047	ISO3987	0.89		-0.62	
1059	ISO3987	0.88		-0.83	
1091		-----		-----	
1146	D874	0.954		0.73	
1150	ISO3987	0.8979		-0.45	
1173		-----		-----	
1213	D874	0.97		1.06	
1235	ISO3987	0.9112		-0.17	
1271	ISO3987	0.835		-1.77	
1316	D874	0.79		-2.72	
1320		-----		-----	
1409	D874	1.00		1.69	
1412	D874	0.90		-0.41	
1438		-----		-----	
1461	ISO3987	0.96		0.85	
1510		-----		-----	
1564		-----		-----	
1748	D874	0.9056		-0.29	
1797	ISO3987	0.903		-0.35	
1850	ISO3987	0.88		-0.83	
1877		-----		-----	
1969		-----		-----	
2129	D874	0.9077		-0.25	
6016		-----		-----	
6032		-----		-----	
6183		-----		-----	
6197		-----		-----	
6253		-----		-----	
6284	D874	1.074	R(0.01)	3.25	
6310		-----		-----	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

normality	suspect
n	31
outliers	1
mean (n)	0.919
st.dev. (n)	0.0460
R(calc.)	0.129
st.dev.(D874:13a)	0.0476
R(D874:13a)	0.133

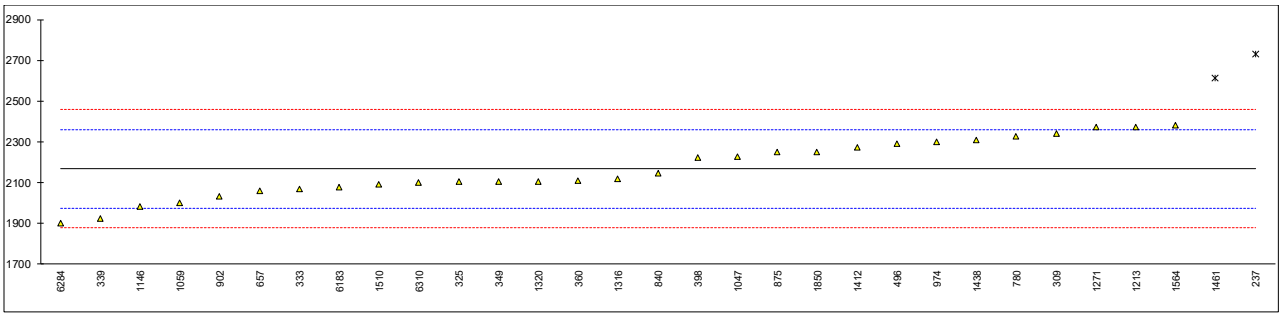


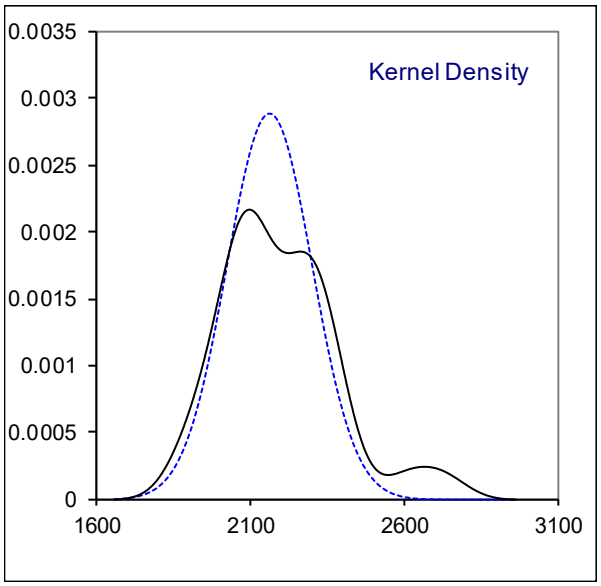


Determination of Sulfur on sample #20075; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179		-----		-----	
211		-----		-----	
219		-----		-----	
237	D4294	2730	R(0.01)	5.82	
254		-----		-----	
255		-----		-----	
257		-----		-----	
309	D2622	2340		1.79	
325	D5185	2105		-0.64	
329		-----		-----	
333	D4294	2070		-1.00	
339	INH-050	1925		-2.49	
349	D2622	2105		-0.64	
360	D4294	2110		-0.58	
398	ISO8754	2220		0.55	
421		-----		-----	
432		-----		-----	
496	D4294	2290		1.28	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D4294	2060		-1.10	
663		-----		-----	
780	D4294	2325		1.64	
823		-----		-----	
840	D5453	2144.7		-0.23	
862		-----		-----	
875	D4294	2250		0.86	
902	D4294	2030		-1.41	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974	D4294	2300		1.38	
994		-----		-----	
1011		-----		-----	
1017		-----		-----	
1047	ISO8754	2228		0.64	
1059	ISO14596Mod.	2000		-1.72	
1091		-----		-----	
1146	In house	1980	C	-1.93	first reported 0.198 mg/kg
1150		-----		-----	
1173		-----		-----	
1213	D4294	2371		2.11	
1235		-----		-----	
1271	D4294	2370		2.10	
1316	D7751	2120		-0.48	
1320	ISO8754	2106	C	-0.62	first reported 2610
1409		-----		-----	
1412	D4294	2273		1.10	
1438		2310		1.48	
1461	ISO8754	2612	C,R(0.01)	4.60	first reported 2587
1510	D4294	2090		-0.79	
1564	D5453	2380		2.21	
1748		-----		-----	
1797		-----		-----	
1850	ISO8754	2250		0.86	
1877		-----		-----	
1969		-----		-----	
2129		-----		-----	
6016		-----		-----	
6032		-----		-----	
6183	D2622	2075.27		-0.94	
6197		-----		-----	
6253		-----		-----	
6284	D5453	1900.2		-2.75	
6310	D7751	2100		-0.69	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

normality	OK
n	29
outliers	2
mean (n)	2166.5
st.dev. (n)	138.40
R(calc.)	387.5
st.dev.(D4294:16e1)	96.82
R(D4294:16e1)	271.1

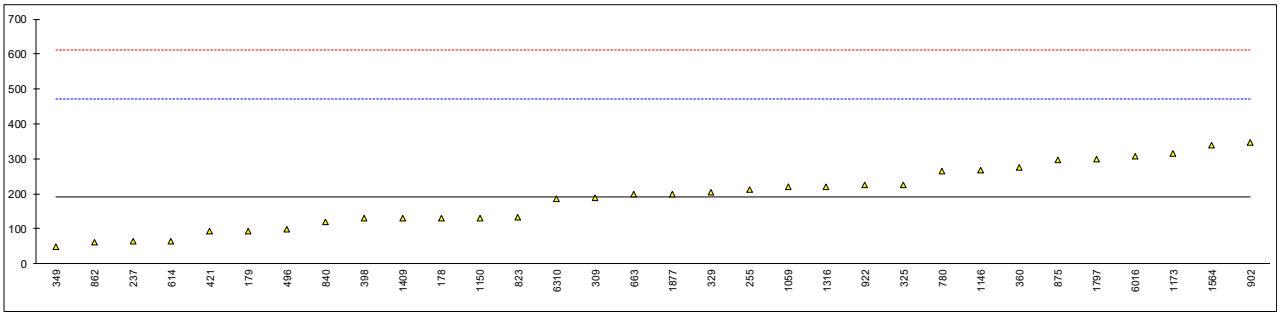


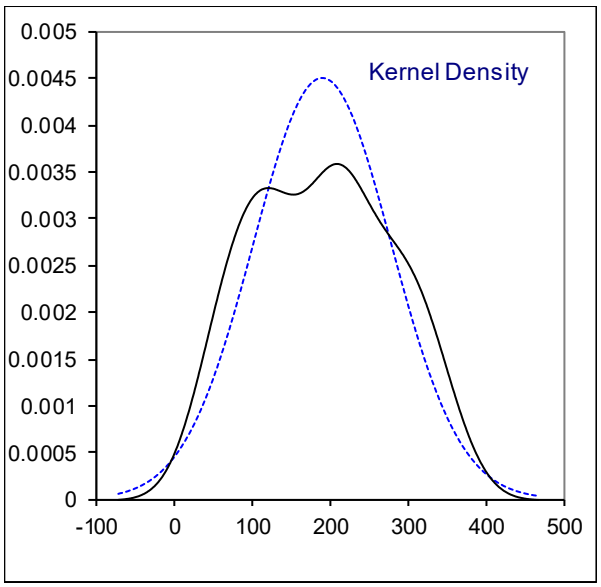


Determination of Water on sample #20075; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D6304-C	131		-0.42	
179	D6304-C	94		-0.68	
211		-----		-----	
219		-----		-----	
237	D6304-C	62.8		-0.91	
254		-----		-----	
255	D6304-A	213		0.16	
257		-----		-----	
309	D6304-C	188		-0.02	
325	D6304-C	225		0.25	
329	D6304-C	203		0.09	
333		-----		-----	
339		-----		-----	
349	D6304-C	48		-1.01	
360	D6304-C	275.2		0.60	
398	ISO12937	130		-0.43	
421	D6304-C	93.03		-0.69	
432		-----		-----	
496	D6304-C	99		-0.65	
614	D6304-C	63		-0.90	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D6304-C	<10		-----	
663	D6304-C	198.3		0.06	
780	D6304-C	264.7		0.53	
823	D6304-C	132		-0.41	
840	D6304-C	120		-0.50	
862	D6304-C	62		-0.91	
875	D6304-A	297		0.76	
902	D6304-C	348		1.12	
912		-----		-----	
913		-----		-----	
922	D6304-A	224		0.24	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		-----		-----	
1011		-----		-----	
1017		-----		-----	
1047		-----		-----	
1059	D6304-C	220		0.21	
1091		-----		-----	
1146	D6304-C	268		0.55	
1150	ISO12937	131	C	-0.42	first reported 0.1309 % M/M
1173	In house	314.0		0.88	
1213		-----		-----	
1235		-----		-----	
1271		-----		-----	
1316	D6304-C	220		0.21	
1320		-----		-----	
1409	D6304-A	130		-0.43	
1412		-----		-----	
1438		-----		-----	
1461		-----		-----	
1510		-----		-----	
1564	D6304-C	339		1.06	
1748		-----		-----	
1797	D95	300		0.78	
1850		-----		-----	
1877	D6304-C	200		0.07	
1969		-----		-----	
2129		-----		-----	
6016		308		0.84	
6032		-----		-----	
6183		-----		-----	
6197		-----		-----	
6253		-----		-----	
6284		-----		-----	
6310	D6304-C	185		-0.04	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

normality	OK
n	32
outliers	0
mean (n)	190.188
st.dev. (n)	88.3899
R(calc.)	247.492
st.dev.(D6304:16e1)	140.6130
R(D6304:16e1)	393.716

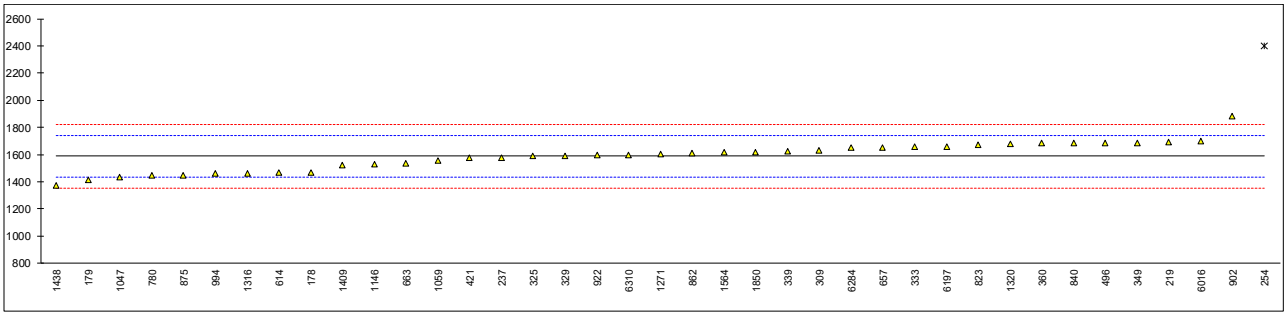


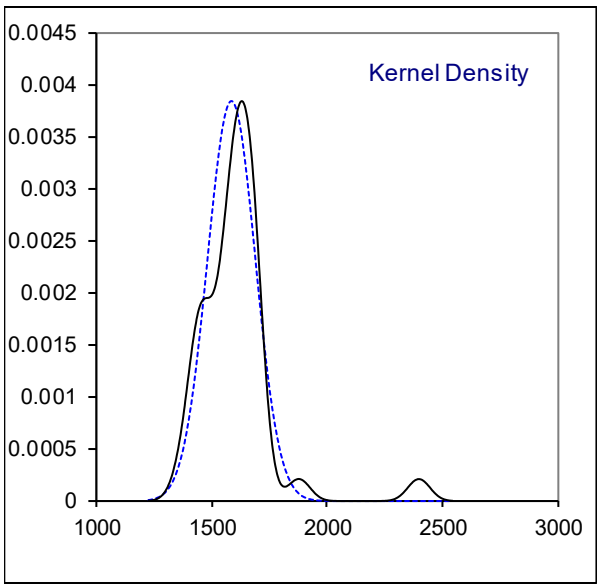


Determination of Calcium as Ca on sample #20075; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178		1469		-1.53	
179		1416		-2.21	
211		-----		-----	
219		1689		1.31	
237		1576		-0.15	
254		2400.58	C,R(0.01)	10.48	first reported 1897.165
255		-----		-----	
257		-----		-----	
309		1632		0.58	
325		1589		0.02	
329		1592		0.06	
333		1655		0.87	
339		1623		0.46	
349		1686		1.27	
360		1683		1.23	
398		-----		-----	
421		1575		-0.16	
432		-----		-----	
496		1685		1.26	
614		1465		-1.58	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657		1653		0.85	
663		1536.95		-0.65	
780		1445		-1.83	
823		1669		1.05	
840		1685		1.26	
862		1609		0.28	
875		1450	C	-1.77	first reported 2380
902		1880		3.77	
912		-----		-----	
913		-----		-----	
922		1597		0.12	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		1460		-1.64	
1011		-----		-----	
1017		-----		-----	
1047		1433.7		-1.98	
1059		1557		-0.39	
1091		-----		-----	
1146		1531		-0.73	
1150		-----		-----	
1173		-----		-----	
1213		-----		-----	
1235		-----		-----	
1271		1601		0.18	
1316		1460		-1.64	
1320		1679		1.18	
1409		1519		-0.88	
1412		-----		-----	
1438		1372	C	-2.78	first reported 1310
1461		-----		-----	
1510		-----		-----	
1564		1614		0.34	
1748		-----		-----	
1797		-----		-----	
1850		1620		0.42	
1877		-----		-----	
1969		-----		-----	
2129		-----		-----	
6016		1700		1.45	
6032		-----		-----	
6183		-----		-----	
6197		1661		0.95	
6253		-----		-----	
6284		1652.1667		0.84	
6310		1600		0.16	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

normality	OK
n	38
outliers	1
mean (n)	1587.36
st.dev. (n)	103.669
R(calc.)	290.27
st.dev.(D5185:18)	77.591
R(D5185:18)	217.26

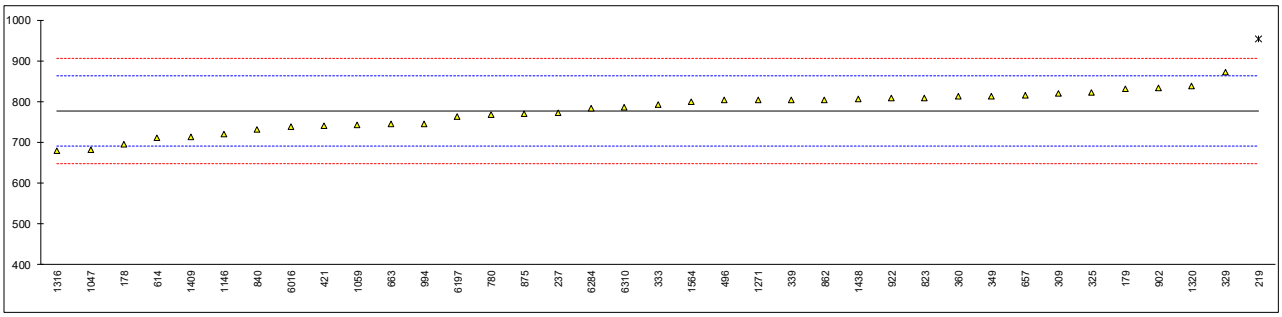


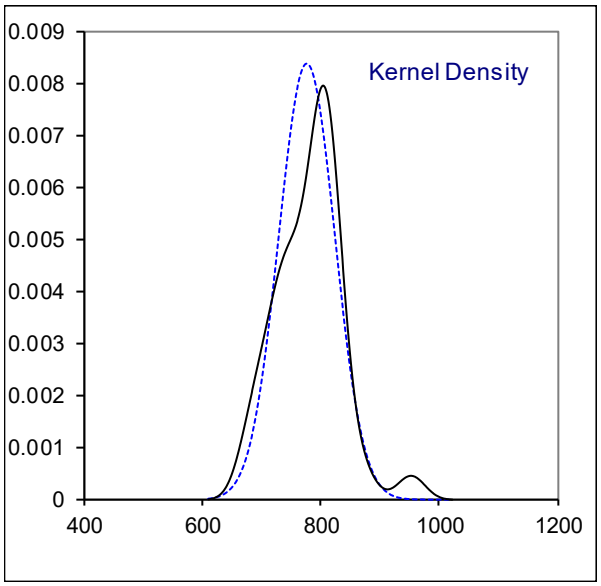


Determination of Phosphorus as P on sample #20075; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178		696		-1.89	
179		832		1.28	
211		-----		-----	
219		954	R(0.05)	4.13	
237		772.7		-0.10	
254		-----		-----	
255		-----		-----	
257		-----		-----	
309		819.9		1.00	
325		821		1.03	
329		872		2.22	
333		792		0.35	
339		804		0.63	
349		813		0.84	
360		813		0.84	
398		-----		-----	
421		740		-0.87	
432		-----		-----	
496		803.1		0.61	
614		711.3		-1.54	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657		816		0.91	
663		744.34		-0.76	
780		767		-0.24	
823		809		0.75	
840		731		-1.08	
862		805		0.65	
875		770	C	-0.17	first reported 1140
902		834		1.33	
912		-----		-----	
913		-----		-----	
922		808		0.72	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		746		-0.73	
1011		-----		-----	
1017		-----		-----	
1047		680.4		-2.26	
1059		743		-0.80	
1091		-----		-----	
1146		719.6		-1.34	
1150		-----		-----	
1173		-----		-----	
1213		-----		-----	
1235		-----		-----	
1271		803.5		0.62	
1316		680		-2.27	
1320		838		1.42	
1409		713		-1.50	
1412		-----		-----	
1438		806	C	0.68	first reported 916
1461		-----		-----	
1510		-----		-----	
1564		800		0.54	
1748		-----		-----	
1797		-----		-----	
1850		-----		-----	
1877		-----		-----	
1969		-----		-----	
2129		-----		-----	
6016		738		-0.91	
6032		-----		-----	
6183		-----		-----	
6197		764		-0.31	
6253		-----		-----	
6284		784.15		0.17	
6310		785		0.18	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

normality	OK
n	36
outliers	1
mean (n)	777.08
st.dev. (n)	47.520
R(calc.)	133.06
st.dev.(D5185:18)	42.810
R(D5185:18)	119.87

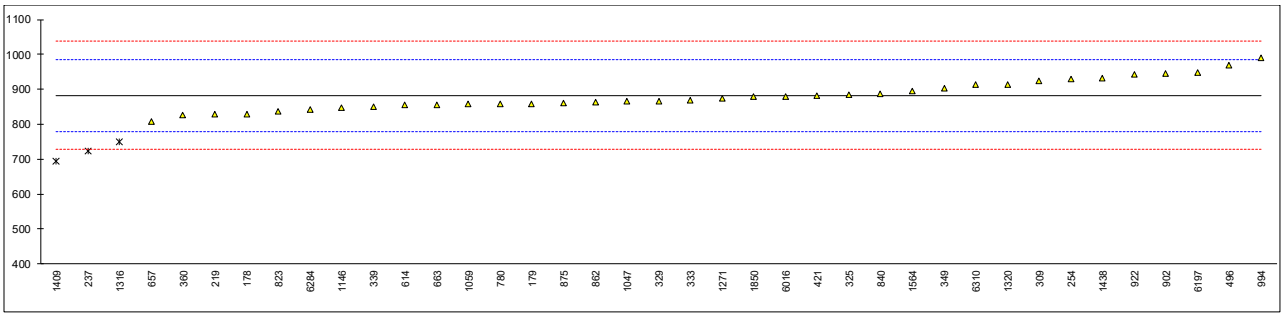


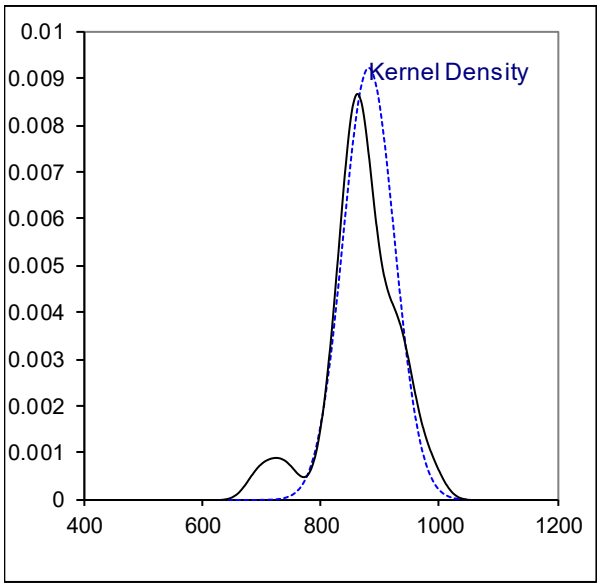


Determination of Zinc as Zn on sample #20075; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178		828		-1.06	
179		859		-0.46	
211		-----		-----	
219		828		-1.06	
237		724	R(0.01)	-3.07	
254		929.458		0.91	
255		-----		-----	
257		-----		-----	
309		923.5		0.80	
325		885		0.05	
329		867		-0.30	
333		868		-0.28	
339		851		-0.61	
349		904		0.42	
360		826		-1.10	
398		-----		-----	
421		881		-0.03	
432		-----		-----	
496		968.7		1.67	
614		854.3		-0.55	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657		807		-1.46	
663		855.66		-0.52	
780		859		-0.46	
823		836		-0.90	
840		888		0.11	
862		864		-0.36	
875		860	C	-0.44	first reported 1300
902		945		1.21	
912		-----		-----	
913		-----		-----	
922		943		1.17	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		991		2.11	
1011		-----		-----	
1017		-----		-----	
1047		865	C	-0.34	first reported 767.1
1059		857		-0.49	
1091		-----		-----	
1146		848.0		-0.67	
1150		-----		-----	
1173		-----		-----	
1213		-----		-----	
1235		-----		-----	
1271		875		-0.15	
1316		750	R(0.01)	-2.57	
1320		914		0.61	
1409		695	R(0.01)	-3.64	
1412		-----		-----	
1438		933	C	0.98	first reported 1037
1461		-----		-----	
1510		-----		-----	
1564		894		0.22	
1748		-----		-----	
1797		-----		-----	
1850		880		-0.05	
1877		-----		-----	
1969		-----		-----	
2129		-----		-----	
6016		880		-0.05	
6032		-----		-----	
6183		-----		-----	
6197		947		1.25	
6253		-----		-----	
6284		841.7		-0.79	
6310		913		0.59	
6317		-----		-----	
6320		-----		-----	
6324		-----		-----	

normality	OK
n	36
outliers	3
mean (n)	882.48
st.dev. (n)	43.329
R(calc.)	121.32
st.dev.(D5185:18)	51.546
R(D5185:18)	144.33





APPENDIX 2

Number of participants per country

1	lab in AUSTRALIA	2	labs in PAKISTAN
1	lab in AUSTRIA	1	lab in PERU
2	labs in AZERBAIJAN	2	labs in PHILIPPINES
7	labs in BELGIUM	2	labs in POLAND
1	lab in BOSNIA and HERZEGOVINA	1	lab in PORTUGAL
3	labs in BULGARIA	1	lab in ROMANIA
1	lab in CHINA, People's Republic	2	labs in RUSSIAN FEDERATION
1	lab in CROATIA	2	labs in SAUDI ARABIA
1	lab in CZECH REPUBLIC	2	labs in SINGAPORE
2	labs in FRANCE	1	lab in SLOVAKIA
2	labs in GERMANY	1	lab in SLOVENIA
2	labs in INDIA	1	lab in SOUTH KOREA
1	lab in INDONESIA	2	labs in SPAIN
1	lab in ISRAEL	1	lab in SWEDEN
1	lab in ITALY	3	labs in TANZANIA
1	lab in JORDAN	1	lab in THAILAND
1	lab in KAZAKHSTAN	1	lab in TUNISIA
1	lab in KENYA	1	lab in TURKEY
3	labs in MOROCCO	1	lab in UNITED ARAB EMIRATES
2	labs in NETHERLANDS	4	labs in UNITED KINGDOM
1	lab in NIGERIA	2	labs in UNITED STATES OF AMERICA
1	lab in OMAN	2	labs in VIETNAM

APPENDIX 3

Abbreviations

C	= final test result after checking of first reported suspect test result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01)	= outlier in Grubbs' outlier test
G(0.05)	= straggler in Grubbs' outlier test
DG(0.01)	= outlier in Double Grubbs' outlier test
DG(0.05)	= straggler in Double Grubbs' outlier test
R(0.01)	= outlier in Rosner's outlier test
R(0.05)	= straggler in Rosner's outlier test
E	= probably an error in calculations
ex	= test result excluded from the statistical evaluation
W	= test result withdrawn on request of participant
fr.	= first reported
n.a.	= not applicable
n.e.	= not evaluated
SDS	= Safety Data Sheet

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