Institute for
Interlaboratory Studies

Results of Proficiency Test
Base Oil
May 2023

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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1 INTRODUCTION

Since 2013 the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for the analysis of Base Oil every year. During the annual proficiency testing program 2022/2023 it was decided to continue the round robin for the analysis of Base Oil.

In this interlaboratory study 63 laboratories in 34 countries registered for participation, see appendix 2 for the number of participants per country. In this report the results of the Base Oil proficiency test are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test (PT). Sample analyses for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC17025 accredited laboratory.
It was decided to send one sample Base Oil in a 1 L bottle labelled #23070.
The participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 ACCREDITATION

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

2.2 PROTOCOL

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

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

A batch of approximately 200 liters of Base Oil was obtained from a local supplier. After homogenization 80 amber glass bottles of 1 L were filled and labelled #23070.
The homogeneity of the subsamples was checked by determination of Density at 15 °C in accordance with ISO12185 and Kinematic Viscosity at 40 °C in accordance with ASTM D445 on 8 stratified randomly selected subsamples.

	Density at 15 °C in kg/L	Kinematic Viscosity at 40 °C in mm^2/s
sample #23070-1	0.86487	41.53
sample #23070-2	0.86486	41.49
sample #23070-3	0.86486	41.48
sample #23070-4	0.86486	41.41
sample #23070-5	0.86486	41.45
sample #23070-6	0.86486	41.45
sample #23070-7	0.86486	41.48
sample #23070-8	0.86486	41.50

Table 1: homogeneity test results of subsamples #23070

From the above test results the repeatabilities were calculated and compared with 0.3 times the corresponding reproducibility of the reference test methods in agreement with the procedure of ISO13528, Annex B2 in the next table.

	Density at 15 °C in kg/L	Kinematic Viscosity at 40 °C in mm^2/s
r (observed)	0.00001	0.10
reference test method	ISO12185:96	D445:21e2
0.3 x R (reference test method)	0.00015	0.17

Table 2: evaluation of the repeatabilities of subsamples #23070

The calculated repeatabilities are in agreement with 0.3 times the corresponding reproducibility of the reference test methods. Therefore, homogeneity of the subsamples was assumed.

To each of the participating laboratories one 1 L bottle of Base Oil labelled #23070 was sent on April 19, 2023. An SDS was added to the sample package.

2.5 STABILITY OF THE SAMPLES

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

2.6 ANALYZES

The participants were requested to determine: Total Acid Number, Air Release time at 50 °C, Color ASTM, Conradson Carbon Residue, Ramsbottom Carbon Residue, Density at 15 °C, Evaporation loss by Noack, Flash Point C.O.C., Kinematic Viscosity at 40 °C and 100 °C, Viscosity Index, Kinematic Viscosity Stabinger at 40 °C and 100 °C, Pour Point (Manual and Automated 1 °C interval), Rust Prevention (ASTM D665, proc. B, synthetic seawater), Sulfur, Water and Water Separability at 54 °C.

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

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

3 RESULTS

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

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

3.1 STATISTICS

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

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

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

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

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

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

3.2 GRAPHICS

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

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

3.3 Z-SCORES

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

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

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

The z-scores were calculated according to:

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

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

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

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

4 EVALUATION

In this proficiency test no problems were encountered with the dispatch of the samples. Three participants reported test results after the final reporting date and four other participants did not report any test results. Not all participants were able to report all tests requested.
In total 59 participants reported 498 numerical test results. Observed were 17 outlying test results, which is 3.4%. In proficiency tests outlier percentages of 3% - 7.5% are quite normal.

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

4.1 EVALUATION PER TEST

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

In the iis PT reports ASTM test methods are referred to with a number (e.g. D1500) and an added designation for the year that the test method was adopted or revised (e.g. D1500:12). When a method has been reapproved an “R” will be added and the year of approval (e.g. D1500:12R17).

Total Acid Number: This determination may not be problematic. Most of the participants agreed on a concentration level near or below the limit of detection. Therefore, no z-scores are calculated.

Air Release time at 50 °C: 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 D3427:19.

Color ASTM: This determination was not problematic. Six statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D1500:12R17.

Conradson Carbon Residue: This determination was not problematic. All reporting participants agreed on a test result of less than 0.1 %M/M. Therefore, no z-scores are calculated.

Ramsbottom Carbon Residue: This determination was problematic. Only six participants reported a test result. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D524:15R19.

Density at 15 °C: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ISO12185:96.

Evaporation loss by Noack: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D5800-B:21.

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

Kin. Viscosity at 40 °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 of ASTM D445:21e2.

Kin. Viscosity 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 of ASTM D445:21e2.

Viscosity Index: This determination was problematic. No statistical outliers were observed but one test result was excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ASTM D2270:10R16.

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

Kin. Viscosity Stabinger at 100 °C: 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 D7042:21a.

Pour Point Manual: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D97:17bR22.

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

Rust prevention: This determination may not be problematic. All reporting participants agreed on Fail / Severe rusting.

Sulfur: This determination may not be problematic. The majority of the reporting participants agreed on a concentration level of less than 17 mg/kg. Therefore, no z-scores are calculated.

Water: This determination was problematic depending on the procedure used. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D6304:20 procedure A and B, but is not in agreement with procedure C.

Water Separability: This determination was not problematic. Three statistical outliers were observed over three parameters. All calculated reproducibilities after rejection of the statistical outliers are in agreement with the requirements of ASTM D1401:21.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

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

Parameter	unit	n	average	2.8 * sd	R(lit)
Total Acid Number	mg KOH/g	27	<0.02	n.e.	n.e.
Air Release time at 50 °C	minutes	11	2.40	1.93	1.73
Color ASTM		43	0.24	0.09	1
Conradson Carbon Residue	%M/M	23	<0.1	n.e.	n.e.
Ramsbottom Carbon Residue	%M/M	6	0.039	0.038	0.026
Density at 15 °C	kg/L	55	0.8649	0.0005	0.0005
Evaporation loss by Noack	%M/M	22	8.68	1.45	1.20
Flash Point C.O.C.	°C	41	233	17	18
Kinematic Viscosity at 40 °C	mm^2/s	47	41.55	0.39	0.57
Kinematic Viscosity at 100 °C	mm^2/s	46	6.407	0.059	0.122
Viscosity Index		46	102.9	2.7	2
Kin. Viscosity Stabinger 40 °C	mm^2/s	16	41.57	0.52	0.24
Kin. Viscosity Stabinger 100 °C	mm^2/s	14	6.414	0.052	0.033
Pour Point Manual	°C	34	-19.3	6.3	9
Pour Point Automated 1 °C int.	°C	21	-20.0	4.8	4.5
Rust Prevention (synth seawater)		9	Fail	n.a.	n.a.
Sulfur	mg/kg	29	<17	n.e.	n.e.
Water	mg/kg	38	19.0	20.5	18.7
Water Separability at 54 °C					
Time to reach ≤ 3 mL	minutes	16	3.4	6.8	20
Time to reach 37 mL of water	minutes	13	3.1	5.5	20
Time to complete break	minutes	18	3.7	5.0	20

Table 3: reproducibilities of tests on sample #23070

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 problematic tests have been discussed in paragraph 4.1.

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

	May 2023	May 2022	May 2021	May 2020	May 2019
Number of reporting laboratories	59	60	67	53	59
Number of test results	498	516	599	444	567
Number of statistical outliers	17	16	15	12	15
Percentage of statistical outliers	3.4%	3.1%	2.5%	2.7%	2.6%

Table 4: comparison with previous proficiency tests

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

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

Parameter	May 2023	May 2022	May 2021	May 2020	May 2019
Total Acid Number	n.e.	++	++	++	++
Air Release time at 50 °C	-	+/-	-	n.e.	+/-
Color ASTM	++	++	++	++	++
Conradson Carbon Residue	n.e.	n.e.	n.e.	n.e.	+/-
Ramsbottom Carbon Residue	-	(--)	-	+	+/-
Density at 15 °C	+/-	+/-	+/-	+	+
Evaporation loss by Noack	-	+/-	+/-	-	+/-
Flash Point C.O.C.	+/-	+/-	+/-	+	+
Kinematic Viscosity at 40 °C	+	+	+	++	+
Kinematic Viscosity at 100 °C	++	++	++	++	+
Viscosity Index	-	+	-	-	n.e.
Kin. Viscosity Stabinger 40 °C	--	-	-	+/-	+
Kin. Viscosity Stabinger 100 °C	-	-	--	--	-
Pour Point Manual	+	+	+	--	++
Pour Point Automated 1 °C int.	+/-	+	-	--	+
Sulfur	n.e.	n.e.	n.e.	n.e.	+
Water	+/-	-	-	++	++
Water Separability at 54 °C	++	++	++	++	++

Table 5: comparison of determinations to the reference test methods

For results between brackets no z-scores are calculated.

The following performance categories were used:

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

APPENDIX 1

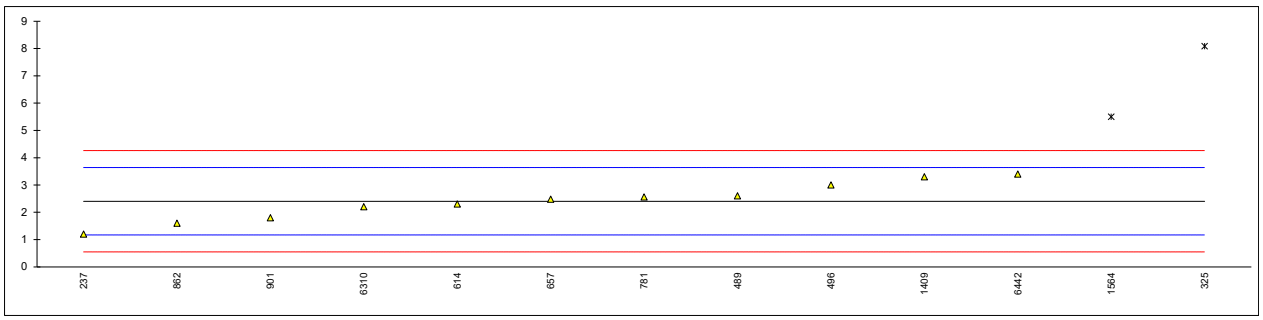
Determination of Total Acid Number on sample #23070; results in mg KOH/g

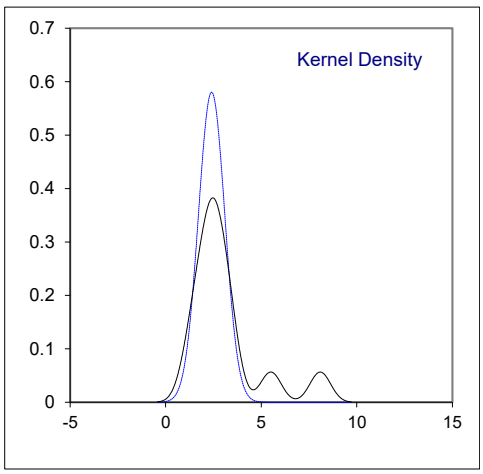
lab	method	value	mark	z(targ)	remarks
150	D974	<0.02		-----	
171	D974	<0.02		-----	
173		-----		-----	
178	D974	0.01		-----	
179		-----		-----	
237	D974	<0.02		-----	
273	D974	0.012		-----	
309	D664-A	<0.1		-----	
311		-----		-----	
323	D974	<0.02		-----	
325	D664-A	<0.02		-----	
329		-----		-----	
333		-----		-----	
349	D664-A	0.01		-----	
369		-----		-----	
371	D974	0.009		-----	
396	D664-A	<0.02		-----	
432		-----		-----	
480		-----		-----	
489	EN12634	< 0,05		-----	
494	D664-A	0.003		-----	
496	D974	0		-----	
551	D974	0.011		-----	
601		-----		-----	
603	D664-A	< 0.05		-----	
614	D974	<0.02	C	-----	first reported 0.05
657	D974	<0.02		-----	
779		-----		-----	
781	D974	0.010		-----	
785		-----		-----	
823	D664-A	0.01	C	-----	first reported 0.04
862	D974	0.01		-----	
874	D974	0.01		-----	
875		-----		-----	
886		-----		-----	
901		-----		-----	
912	D974	<0.01		-----	
922	D664-A	<0.01		-----	
962	D974	<0.02		-----	
963	D974	0.005		-----	
974	D974	0.006		-----	
982		-----		-----	
1081		-----		-----	
1191		-----		-----	
1243	ISO6618	<0,01		-----	
1320		-----		-----	
1349		-----		-----	
1389		-----		-----	
1409	D664-A	< 0.05		-----	
1429		-----		-----	
1564	D664-A	0.02		-----	
1728		-----		-----	
1748		-----		-----	
1833	ISO6618	<0.1		-----	
1877		-----		-----	
1971	ISO6618	<0,1		-----	
6111		-----		-----	
6113		-----		-----	
6310	D664-A	0.01		-----	
6382	D664-A	<0,01		-----	
6442		-----		-----	
6516		-----		-----	
6533	D974	0.00561		-----	
	n	27			
	mean (n)	<0.02			

Determination of Air Release time at 50 °C on sample #23070; results in minutes

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
173		-----		-----	
178		-----		-----	
179		-----		-----	
237	D3427	1.2		-1.95	
273		-----		-----	
309		-----		-----	
311		-----		-----	
323		-----		-----	
325	D3427	8.0833	D(0.01)	9.20	
329		-----		-----	
333		-----		-----	
349		-----		-----	
369		-----		-----	
371		-----		-----	
396		-----		-----	
432		-----		-----	
480		-----		-----	
489	ISO9120	2.6		0.32	
494		-----		-----	
496	ISO9120	3.0		0.97	
551		-----		-----	
601		-----		-----	
603		-----		-----	
614	D3427	2.3		-0.17	
657	D3427	2.48		0.12	
779		-----		-----	
781	D3427	2.56		0.25	
785		-----		-----	
823		-----		-----	
862	D3427	1.6		-1.30	
874		-----		-----	
875		-----		-----	
886		-----		-----	
901	D3427	1.8		-0.98	
912	D3427	1:43		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
982		-----		-----	
1081		-----		-----	
1191		-----		-----	
1243		-----		-----	
1320		-----		-----	
1349		-----		-----	
1389		-----		-----	
1409	D3427	3.3		1.45	
1429		-----		-----	
1564	D3427	5.5	D(0.05)	5.01	
1728		-----		-----	
1748		-----		-----	
1833		-----		-----	
1877		-----		-----	
1971		-----		-----	
6111		-----		-----	
6113		-----		-----	
6310	D3427	2.2		-0.33	
6382		-----		-----	
6442	IP313	3.4		1.61	
6516		-----		-----	
6533		-----		-----	

normality	OK
n	11
outliers	2
mean (n)	2.404
st.dev. (n)	0.6879
R(calc.)	1.926
st.dev.(D3427:19)	0.6176
R(D3427:19)	1.729


9
8
7
6
5
4
3
2
1
0
237
862
901
6310
614
657
781
489
496
1409
6442
1564
325

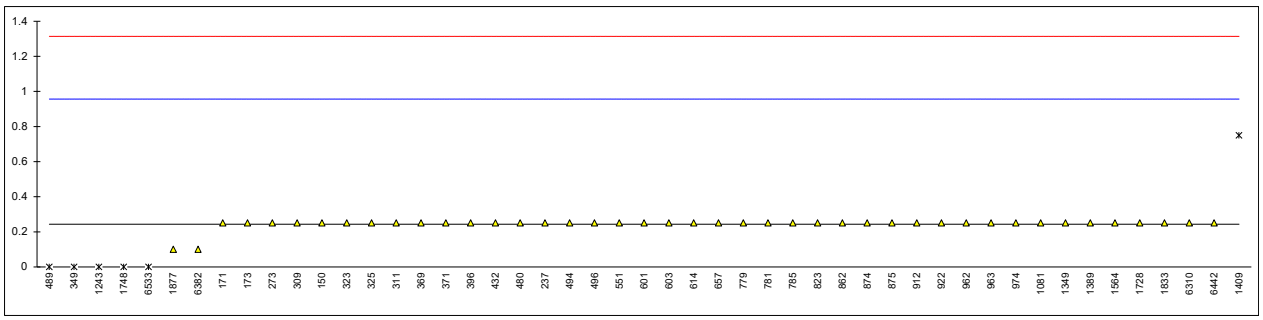

Kernel Density
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-5
0
5
10
15

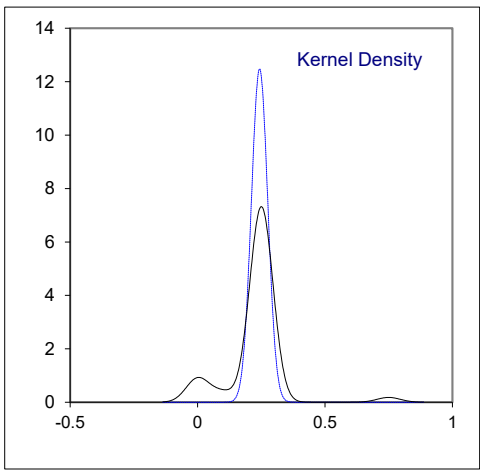
Determination of Color ASTM on sample #23070;

lab	method	reported test value	iis conversion *	mark	z(targ)	remarks
150	D6045	<0.5	0.25		0.02	
171	D1500	L0.5	0.25		0.02	
173	D1500	L0.5	0.25		0.02	
178		-----	-----		-----	
179		-----	-----		-----	
237	D1500	L0.5	0.25		0.02	
273	D1500	L0.5	0.25		0.02	
309	D1500	L0.5	0.25		0.02	
311	D1500	L0.5	0.25		0.02	
323	D1500	L0.5	0.25		0.02	
325	D1500	L0.5	0.25		0.02	
329		-----	-----		-----	
333		-----	-----		-----	
349	D1500	0	0	R(0.01)	-0.68	
369	D1500	<0.5	0.25		0.02	
371	D6045	L0.5	0.25		0.02	
396	D1500	L 0.5	0.25		0.02	
432	D1500	L0,5	0.25		0.02	
480	D1500	L 0.5	0.25		0.02	
489	ISO2049	0.0	0.0	R(0.01)	-0.68	
494	D1500	L0,5	0.25		0.02	
496	D1500	L0.5	0.25		0.02	
551	D1500	<0.5	0.25		0.02	
601	D1500	<0.5	0.25		0.02	
603	D1500	L 0.5	0.25		0.02	
614	D1500	<0.5	0.25		0.02	
657	D1500	<0.5	0.25		0.02	
779	D1500	L0,5	0.25		0.02	
781	D6045	<0.5	0.25		0.02	
785	D6045	<0.5	0.25		0.02	
823	D1500	L0.5	0.25		0.02	
862	D1500	L0.5	0.25		0.02	
874	D1500	L0.5	0.25		0.02	
875	D6045	< 0.5	0.25		0.02	
886		-----	-----		-----	
901		-----	-----		-----	
912	D1500	<0.5	0.25		0.02	
922	D1500	L0.5	0.25		0.02	
962	D1500	L0.5	0.25		0.02	
963	D1500	L0.5	0.25		0.02	
974	D1500	L0.5	0.25		0.02	
982		-----	-----		-----	
1081	D6045	L0.5	0.25		0.02	
1191	D6045	>30	>30		-----	value not in terms of Color ASTM
1243	D1500	0.0	0.0	R(0.01)	-0.68	
1320		-----	-----		-----	
1349	D6045	L0.5	0.25		0.02	
1389	D1500	L0.5	0.25		0.02	
1409	D1500	L1	0.75	R(0.01)	1.42	
1429		-----	-----		-----	
1564	D1500	L0.5	0.25		0.02	
1728	D6045	L0.5	0.25		0.02	
1748	D1500	0	0	R(0.01)	-0.68	
1833	D1500	<0.5	0.25		0.02	
1877	D6045	0.1	0.1		-0.40	
1971		-----	-----		-----	
6111		-----	-----		-----	
6113		-----	-----		-----	
6310	D1500	L0.5	0.25		0.02	
6382	ISO2049	0.1	0.1		-0.40	
6442	D6045	L0.5	0.25		0.02	
6516		-----	-----		-----	
6533	D1500	0.0	0.0	R(0.01)	-0.68	

normality	not OK
n	43
outliers	6
mean (n)	0.243
st.dev. (n)	0.0320
R(calc.)	0.089
st.dev.(D1500:12R17)	0.3571
R(D1500:12R17)	1

* In the calculation of the mean, standard deviation and the reproducibility of this column, a reported value of 'L y' is converted by iis into y-0.25 (for example L0.5 into 0.25)


1.4
1.2
1
0.8
0.6
0.4
0.2
0
489
349
1243
1748
6533
1877
6382
171
173
273
309
150
323
325
311
369
371
396
432
480
237
494
496
551
601
603
614
657
779
781
785
823
862
874
875
912
922
962
963
974
1081
1349
1389
1564
1728
1833
6310
6442
1409


Kernel Density
14
12
10
8
6
4
2
0
-0.5
0
0.5
1

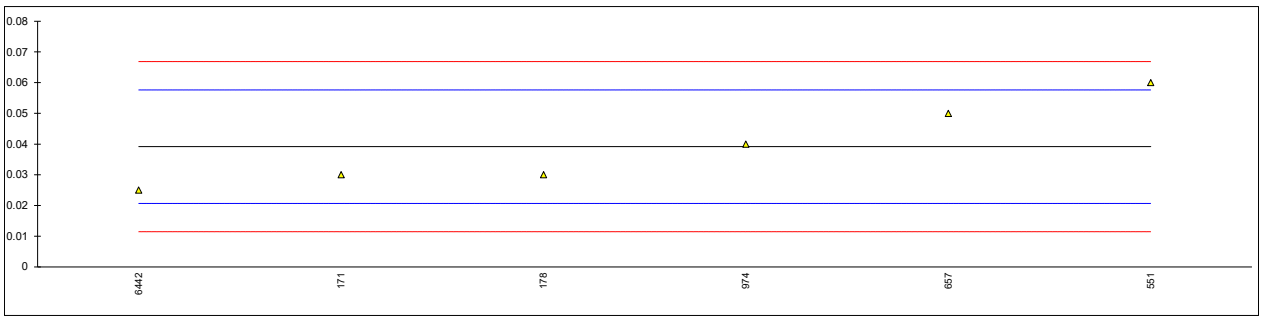
Determination of Conradson Carbon Residue on sample #23070; results in %M/M

lab	method	value	mark	z(targ)	remarks
150	D4530	<0.1		-----	
171	D189	<0.01		-----	
173		-----		-----	
178		-----		-----	
179		-----		-----	
237	D189	<0.1		-----	
273	D189	<0.01		-----	
309		-----		-----	
311		-----		-----	
323		-----		-----	
325	D4530	0.00		-----	
329		-----		-----	
333		-----		-----	
349	D189	0.01		-----	
369	D4530	0.009		-----	
371	D189	0.004		-----	
396		-----		-----	
432		-----		-----	
480		-----		-----	
489		-----		-----	
494		-----		-----	
496	D4530	0.006		-----	
551	D189	0.01		-----	
601		-----		-----	
603		-----		-----	
614	D189	<0.01		-----	
657	D4530	<0.10		-----	
779		-----		-----	
781	D189	0.0035		-----	
785	D4530	0.02		-----	
823	D189	0.01		-----	
862	D4530	<0.10		-----	
874	D4530	<0.10		-----	
875		-----		-----	
886		-----		-----	
901		-----		-----	
912		-----		-----	
922	D189	<0.01		-----	
962	D4530	<0.10		-----	
963		-----		-----	
974	D189	<0.01		-----	
982		-----		-----	
1081		-----		-----	
1191		-----		-----	
1243	ISO6615	0.017		-----	
1320		-----		-----	
1349		-----		-----	
1389	D4530	<0.1		-----	
1409	ISO10370	<0.10		-----	
1429		-----		-----	
1564		-----		-----	
1728		-----		-----	
1748		-----		-----	
1833		-----		-----	
1877		-----		-----	
1971		-----		-----	
6111		-----		-----	
6113		-----		-----	
6310		-----		-----	
6382		-----		-----	
6442		-----		-----	
6516		-----		-----	
6533		-----		-----	
	n	23			
	mean (n)	<0.1			

Determination of Ramsbottom Carbon Residue on sample #23070; results in %M/M

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171	D524	0.03		-0.99	
173		-----		-----	
178	D524	0.03		-0.99	
179		-----		-----	
237		-----		-----	
273		-----		-----	
309		-----		-----	
311		-----		-----	
323		-----		-----	
325		-----		-----	
329		-----		-----	
333		-----		-----	
349		-----		-----	
369		-----		-----	
371		-----		-----	
396		-----		-----	
432		-----		-----	
480		-----		-----	
489		-----		-----	
494		-----		-----	
496		-----		-----	
551	D524	0.06	C	2.25	first reported 0.08
601		-----		-----	
603		-----		-----	
614		-----		-----	
657	D524	0.05		1.17	
779		-----		-----	
781		-----		-----	
785		-----		-----	
823		-----		-----	
862		-----		-----	
874		-----		-----	
875		-----		-----	
886		-----		-----	
901		-----		-----	
912		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974	D524	0.04		0.09	
982		-----		-----	
1081		-----		-----	
1191		-----		-----	
1243		-----		-----	
1320		-----		-----	
1349		-----		-----	
1389		-----		-----	
1409		-----		-----	
1429		-----		-----	
1564		-----		-----	
1728		-----		-----	
1748		-----		-----	
1833		-----		-----	
1877		-----		-----	
1971		-----		-----	
6111		-----		-----	
6113		-----		-----	
6310		-----		-----	
6382		-----		-----	
6442	D524	0.025		-1.53	
6516		-----		-----	
6533		-----		-----	

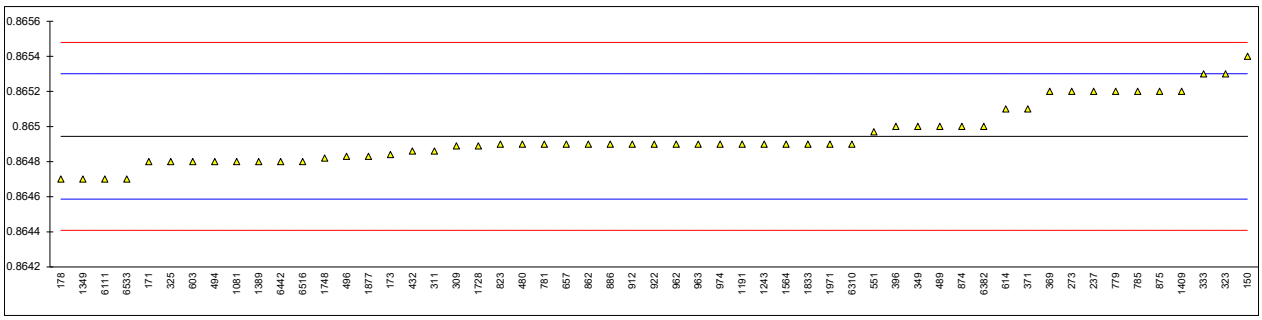
normality	unknown
n	6
outliers	0
mean (n)	0.039
st.dev. (n)	0.0136
R(calc.)	0.038
st.dev.(D524:15R19)	0.0092
R(D524:15R19)	0.026

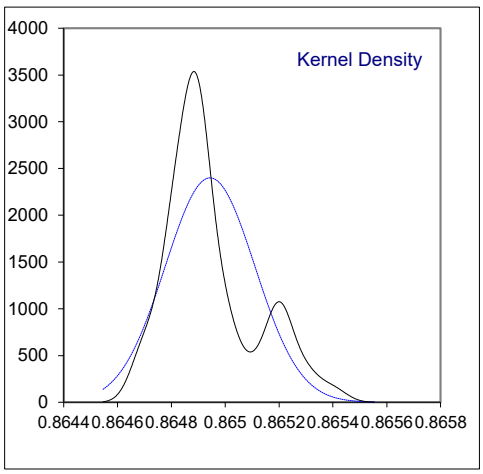

0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
6442
171
178
974
657
551

Determination of Density at 15 °C on sample #23070; results in kg/L

lab	method	value	mark	z(targ)	remarks
150	D4052	0.8654		2.56	
171	D4052	0.8648		-0.80	
173	D4052	0.86484		-0.58	
178	D4052	0.8647	C	-1.36	first reported 0.8856
179		-----		-----	
237	D4052	0.8652		1.44	
273	D4052	0.8652		1.44	
309	D4052	0.86489		-0.30	
311	D4052	0.86486		-0.47	
323	ISO12185	0.8653	C	2.00	first reported 865.3 kg/L
325	D4052	0.8648		-0.80	
329		-----		-----	
333	D4052	0.8653		2.00	
349	D4052	0.8650		0.32	
369	D4052	0.8652		1.44	
371	D4052	0.8651		0.88	
396	D4052	0.8650		0.32	
432	D4052	0.86486		-0.47	
480	ISO12185	0.8649		-0.24	
489	DIN51757	0.86500		0.32	
494	ISO12185	0.8648		-0.80	
496	ISO12185	0.86483		-0.64	
551	D4052	0.86497		0.15	
601		-----		-----	
603	D4052	0.8648		-0.80	
614	D4052	0.8651		0.88	
657	D4052	0.8649		-0.24	
779	ISO12185	0.8652		1.44	
781	ISO12185	0.8649		-0.24	
785	ISO12185	0.8652		1.44	
823	D4052	0.8649		-0.24	
862	D4052	0.8649		-0.24	
874	ISO12185	0.8650		0.32	
875	ISO12185	0.8652		1.44	
886	D4052	0.8649		-0.24	
901		-----		-----	
912	ISO12185	0.8649		-0.24	
922	D4052	0.8649		-0.24	
962	ISO12185	0.8649		-0.24	
963	D4052	0.8649		-0.24	
974	D4052	0.8649		-0.24	
982		-----		-----	
1081	D4052	0.8648		-0.80	
1191	ISO12185	0.8649		-0.24	
1243	ISO12185	0.8649		-0.24	
1320		-----		-----	
1349	IP365	0.8647		-1.36	
1389	D4052	0.8648		-0.80	
1409	ISO12185	0.8652		1.44	
1429		-----		-----	
1564	D4052	0.8649		-0.24	
1728	ISO12185	0.86489		-0.30	
1748	D4052	0.86482		-0.69	
1833	ISO12185	0.8649		-0.24	
1877	D4052	0.86483		-0.64	
1971	D4052	0.8649		-0.24	
6111	D4052	0.8647		-1.36	
6113		-----		-----	
6310	D4052	0.8649		-0.24	
6382	DIN51757	0.865		0.32	
6442	D4052	0.86480		-0.80	
6516	D4052	0.8648	C	-0.80	first reported 866.7 kg/m^3
6533	D1298	0.8647	C	-1.36	first reported 862.1 kg/m^3

normality	OK
n	55
outliers	0
mean (n)	0.86494
st.dev. (n)	0.000166
R(calc.)	0.00047
st.dev.(ISO12185:96)	0.000179
R(ISO12185:96)	0.0005

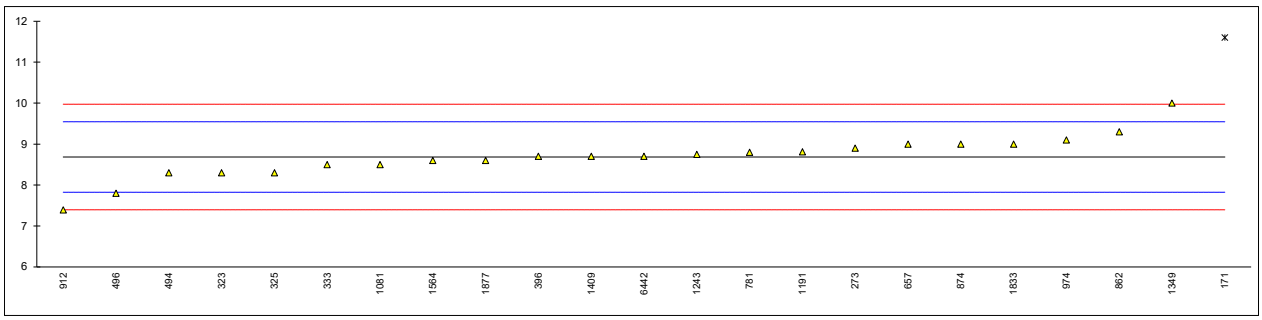

0.8656
0.8654
0.8652
0.865
0.8648
0.8646
0.8644
0.8642
178 1349 6111 6533 171 325 603 494 1081 1389 6442 6516 1748 496 1877 173 432 311 309 1728 823 480 781 657 862 886 912 922 962 963 974 1191 1243 1564 1833 1971 6310 551 396 349 489 874 6382 614 371 369 273 237 779 785 875 1409 333 323 150

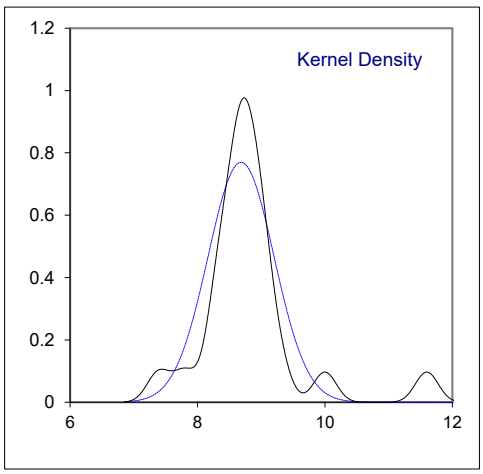

Kernel Density
4000
3500
3000
2500
2000
1500
1000
500
0
0.8644 0.8646 0.8648 0.865 0.8652 0.8654 0.8656 0.8658

Determination of Evaporation loss by Noack on sample #23070; results in %M/M

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171	D5800-B	11.6	R(0.01)	6.78	
173		-----		-----	
178		-----		-----	
179		-----		-----	
237		-----		-----	
273	D5800-B	8.9		0.50	
309		-----		-----	
311		-----		-----	
323	D5800-B	8.3		-0.89	
325	CEC L-40-93	8.3		-0.89	
329		-----		-----	
333	CEC L-40-93	8.5		-0.43	
349		-----		-----	
369		-----		-----	
371		-----		-----	
396	D5800-B	8.7		0.04	
432		-----		-----	
480		-----		-----	
489		-----		-----	
494	D5800-B	8.3		-0.89	
496	D5800-B	7.8		-2.05	
551		-----		-----	
601		-----		-----	
603		-----		-----	
614		-----		-----	
657	D5800-B	9.0		0.73	
779		-----		-----	
781	D5800-B	8.8		0.27	
785		-----		-----	
823		-----		-----	
862	D5800-B	9.3		1.43	
874	D5800-B	9.0		0.73	
875		-----		-----	
886		-----		-----	
901		-----		-----	
912	D5800-A	7.39		-3.01	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974	D5800-B	9.1		0.97	
982		-----		-----	
1081	D5800-B	8.5		-0.43	
1191	CEC L-40-93	8.81		0.29	
1243	DIN51581	8.75		0.15	
1320		-----		-----	
1349	D5800-B	10		3.06	
1389		-----		-----	
1409	D5800-B	8.7		0.04	
1429		-----		-----	
1564	D5800-B	8.6		-0.20	
1728		-----		-----	
1748		-----		-----	
1833	D5800-B	9		0.73	
1877	D5800-B	8.6		-0.20	
1971		-----		-----	
6111		-----		-----	
6113		-----		-----	
6310		-----		-----	
6382		-----		-----	
6442	CEC L-40-93	8.7		0.04	
6516		-----		-----	
6533		-----		-----	

normality	not OK
n	22
outliers	1
mean (n)	8.684
st.dev. (n)	0.5185
R(calc.)	1.452
st.dev.(D5800-B:21)	0.4303
R(D5800-B:21)	1.205

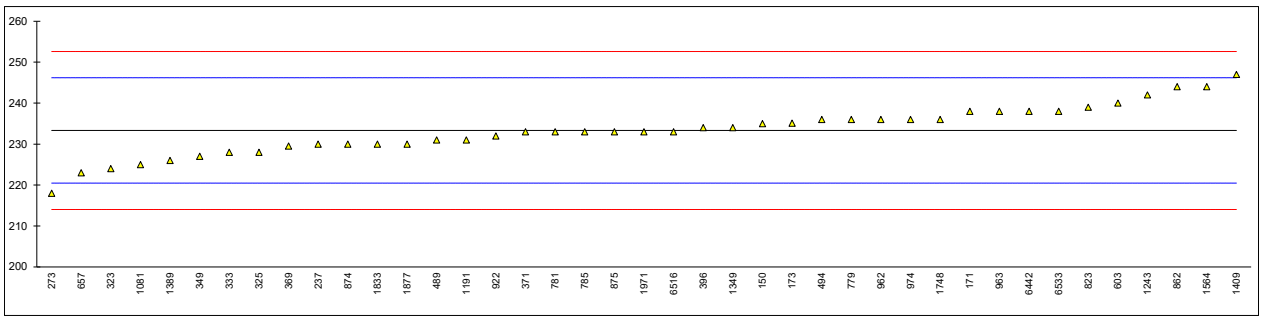

12
11
10
9
8
7
6
912
496
494
323
325
333
1081
1564
1877
396
1409
6442
1243
781
1191
273
657
674
1833
974
862
1349
171

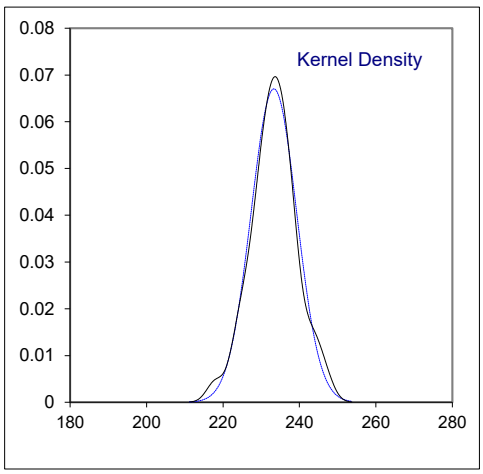

Kernel Density
1.2
1
0.8
0.6
0.4
0.2
0
6
8
10
12

Determination of Flash Point C.O.C. on sample #23070; results in °C

lab	method	value	mark	z(targ)	remarks
150	D92	235		0.26	
171	D92	238		0.73	
173	D92	235.1		0.28	
178		-----		-----	
179		-----		-----	
237	D92	230		-0.52	
273	D92	218.0		-2.38	
309		-----		-----	
311		-----		-----	
323	D92	224		-1.45	
325	D92	228		-0.83	
329		-----		-----	
333	D92	228		-0.83	
349	D92	227		-0.98	
369	D92	229.5		-0.60	
371	D92	233		-0.05	
396	D92	234		0.10	
432		-----		-----	
480		-----		-----	
489	ISO2592	231		-0.36	
494	D92	236.0		0.42	
496		-----		-----	
551		-----		-----	
601		-----		-----	
603	D92	240		1.04	
614		-----		-----	
657	D92	223		-1.61	
779	D92	236		0.42	
781	D92	233		-0.05	
785	D92	233		-0.05	
823	D92	239		0.88	
862	D92	244		1.66	
874	D92	230		-0.52	
875	D92	233.0		-0.05	
886		-----		-----	
901		-----		-----	
912		-----		-----	
922	D92	232		-0.21	
962	D92	236		0.42	
963	D92	238.0		0.73	
974	D92	236		0.42	
982		-----		-----	
1081	D92	225		-1.30	
1191	ISO2592	231		-0.36	
1243	ISO2592	242.0		1.35	
1320		-----		-----	
1349	D92	234		0.10	
1389	D92	226.0		-1.14	
1409	D92	247		2.13	
1429		-----		-----	
1564	D92	244		1.66	
1728		-----		-----	
1748	D92	236		0.42	
1833	ISO2592	230		-0.52	
1877	D92	230		-0.52	
1971	ISO2592	233		-0.05	
6111		-----		-----	
6113		-----		-----	
6310		-----		-----	
6382		-----		-----	
6442	D92	238		0.73	
6516	D92	233		-0.05	
6533	D92	238		0.73	

normality	OK
n	41
outliers	0
mean (n)	233.33
st.dev. (n)	5.952
R(calc.)	16.67
st.dev.(D92:18)	6.429
R(D92:18)	18

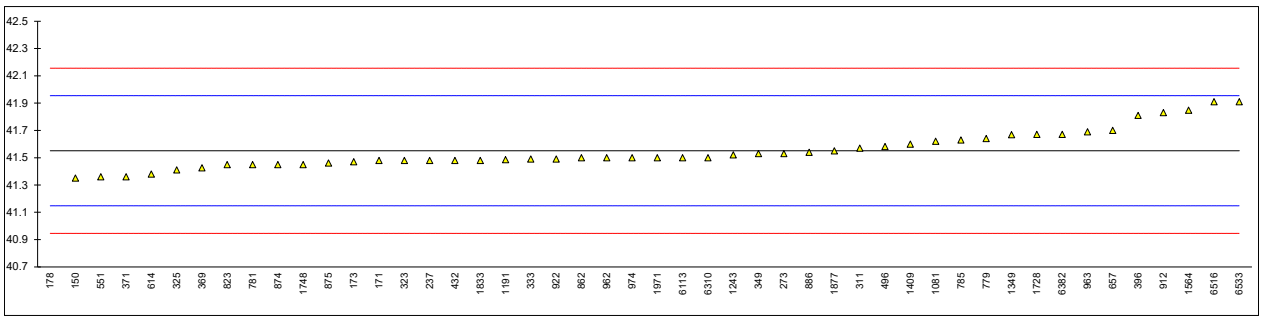

260
250
240
230
220
210
200
273
657
323
1081
1389
349
333
325
369
237
674
1833
1877
489
1191
922
371
781
785
875
1971
6516
396
1349
150
173
494
779
962
974
1748
171
963
6442
6533
823
603
1243
862
1564
1409

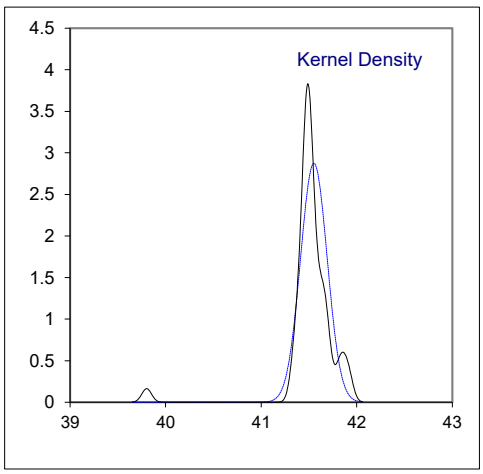

Kernel Density
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
180
200
220
240
260
280

Determination of Kinematic Viscosity at 40 °C on sample #23070; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
150	D445	41.35	C	-1.00	first reported 40.72
171	D445	41.48		-0.35	
173	D445	41.47		-0.40	
178	D445	39.80	C,R(0.01)	-8.68	first reported 117.51
179		-----		-----	
237	D445	41.48		-0.35	
273	D445	41.53	C	-0.10	first reported 39.49
309		-----		-----	
311	D445	41.57		0.09	
323	D445	41.48		-0.35	
325	D445	41.41		-0.70	
329		-----		-----	
333	D445	41.49		-0.30	
349	D445	41.53		-0.10	
369	D445	41.426		-0.62	
371	D445	41.36		-0.95	
396	D445	41.81		1.28	
432	D445	41.48		-0.35	
480		-----		-----	
489		-----		-----	
494		-----		-----	
496	D445	41.581		0.15	
551	D445	41.36		-0.95	
601		-----		-----	
603		-----		-----	
614	D445	41.38		-0.85	
657	D445	41.70		0.74	
779	D445	41.64		0.44	
781	D445	41.45		-0.50	
785	D445	41.63		0.39	
823	D445	41.45		-0.50	
862	D445	41.50		-0.25	
874	D445	41.45		-0.50	
875	D445	41.46		-0.45	
886	D445	41.54		-0.05	
901		-----		-----	
912	D445	41.83		1.38	
922	D445	41.49		-0.30	
962	D445	41.50		-0.25	
963	D445	41.690		0.69	
974	D445	41.50		-0.25	
982		-----		-----	
1081	D445	41.62		0.34	
1191	ISO3104	41.485		-0.33	
1243	D7279 corrected to D445	41.52		-0.15	
1320		-----		-----	
1349	D445	41.668643		0.58	
1389		-----		-----	
1409	D445	41.60		0.24	
1429		-----		-----	
1564	D445	41.848		1.47	
1728	ISO3104	41.67		0.59	
1748	D7042	41.45		-0.50	Stabinger Kinematic viscosity
1833	ISO3104	41.48		-0.35	
1877	D445	41.55		-0.01	
1971	D445	41.50		-0.25	
6111		-----		-----	
6113	D445	41.50		-0.25	
6310	D7279 corrected to D445	41.5		-0.25	
6382	DIN51562-1,2	41.67		0.59	
6442		-----		-----	
6516	D445	41.91		1.78	
6533	D445	41.910		1.78	

normality	suspect
n	47
outliers	1
mean (n)	41.551
st.dev. (n)	0.1387
R(calc.)	0.388
st.dev.(D445:21e2)	0.2018
R(D445:21e2)	0.565

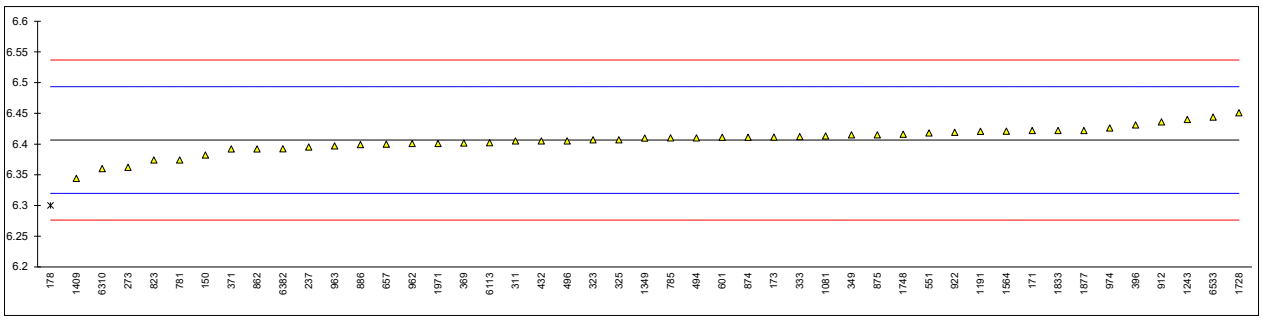

42.5
42.3
42.1
41.9
41.7
41.5
41.3
41.1
40.9
40.7
178 150 551 371 614 325 369 823 781 674 1748 875 173 171 323 237 432 1833 1191 333 922 862 962 974 1971 6113 6310 1243 349 273 886 1877 311 496 1409 1081 785 779 1349 1728 6382 963 657 396 912 1564 6516 6533

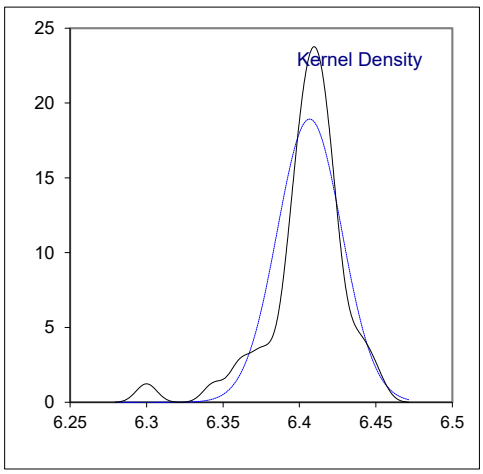

Kernel Density
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
39
40
41
42
43

Determination of Kinematic Viscosity at 100 °C on sample #23070; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
150	D445	6.382		-0.57	
171	D445	6.422		0.35	
173	D445	6.4113		0.11	
178	D445	6.30	C,R(0.01)	-2.45	first reported 12.37
179		-----		-----	
237	D445	6.395		-0.27	
273	D445	6.362		-1.03	
309		-----		-----	
311	D445	6.405		-0.04	
323	D445	6.407		0.01	
325	D445	6.407		0.01	
329		-----		-----	
333	D445	6.412		0.12	
349	D445	6.415		0.19	
369	D445	6.4016		-0.12	
371	D445	6.392		-0.34	
396	D445	6.431		0.56	
432	D445	6.405		-0.04	
480		-----		-----	
489		-----		-----	
494	D445	6.410		0.08	
496	D445	6.4050		-0.04	
551	D445	6.418	C	0.26	first reported 6.53
601	D445	6.411		0.10	
603		-----		-----	
614		-----		-----	
657	D445	6.400		-0.15	
779		-----		-----	
781	D445	6.374		-0.75	
785	D445	6.410		0.08	
823	ISO3104	6.374		-0.75	
862	D445	6.392		-0.34	
874	D445	6.411		0.10	
875	D445	6.415		0.19	
886	D445	6.399		-0.18	
901		-----		-----	
912	D445	6.436		0.68	
922	D445	6.419		0.28	
962	D445	6.401	C	-0.13	first reported 6.501
963	D445	6.397		-0.22	
974	D445	6.426		0.45	
982		-----		-----	
1081	D445	6.413		0.15	
1191	ISO3104	6.4208		0.33	
1243	D7279 corrected to D445	6.44		0.77	
1320		-----		-----	
1349	D445	6.409673		0.07	
1389		-----		-----	
1409	D445	6.344		-1.44	
1429		-----		-----	
1564	D445	6.421		0.33	
1728	ISO3104	6.451		1.02	
1748	D7042	6.416		0.22	Stabinger Kinematic viscosity
1833	ISO3104	6.422		0.35	
1877	D445	6.422		0.35	
1971	D445	6.401		-0.13	
6111		-----		-----	
6113	D445	6.402		-0.11	
6310	D7279 corrected to D445	6.36		-1.07	
6382	DIN51562-1,2	6.3922		-0.33	
6442		-----		-----	
6516		-----		-----	
6533	D445	6.444		0.86	

normality	suspect
n	46
outliers	1
mean (n)	6.407
st.dev. (n)	0.0211
R(calc.)	0.059
st.dev.(D445:21e2)	0.0435
R(D445:21e2)	0.122

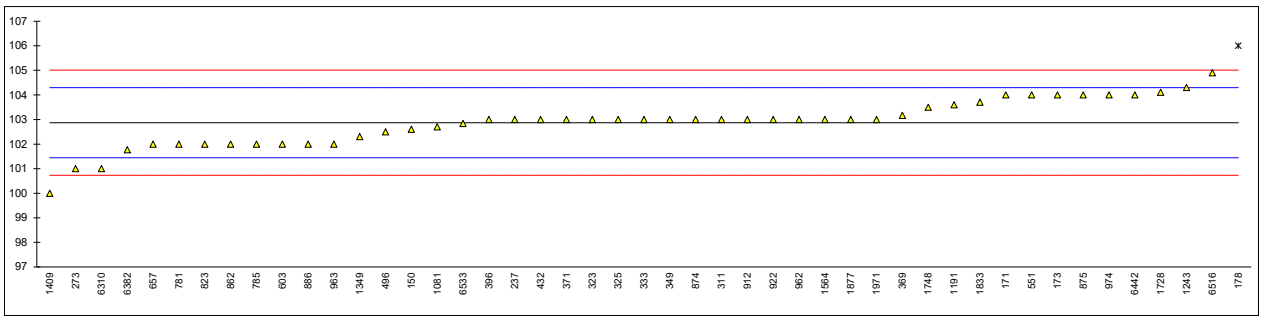

6.6
6.55
6.5
6.45
6.4
6.35
6.3
6.25
6.2
178
1409
6310
273
823
781
150
371
862
6382
237
963
886
657
962
1971
369
6113
311
432
496
323
325
1349
785
494
601
874
173
333
1081
349
875
1748
551
922
1191
1564
171
1833
1877
974
396
912
1243
6533
1728

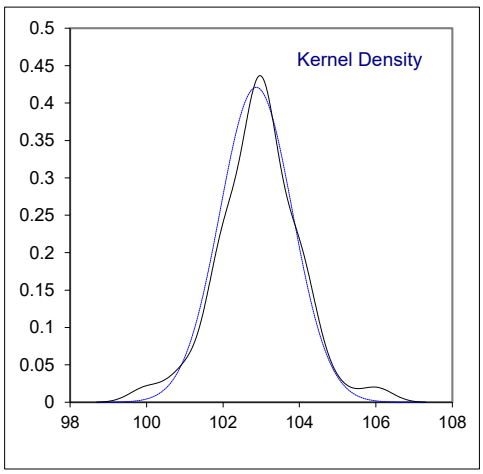

Kernel Density
25
20
15
10
5
0
6.25
6.3
6.35
6.4
6.45
6.5

Determination of Viscosity Index on sample #23070

lab	method	value	mark	z(targ)	remarks
150	D2270	102.6	C	-0.38	first reported 105
171	D2270	104		1.58	
173	D2270	104	E	1.58	calculation difference, iis calculated 103
178	D2270	106	ex,C	4.38	test result excluded as statistical outlier in KV 40 and 100 °C / fr. 96
179		-----		-----	
237	D2270	103		0.18	
273	D2270	101	C	-2.62	first reported 111
309		-----		-----	
311	D2270	103		0.18	
323	D2270	103		0.18	
325	D2270	103		0.18	
329		-----		-----	
333	D2270	103		0.18	
349	D2270	103		0.18	
369	D2270	103.17		0.42	
371	D2270	103		0.18	
396	D2270	103		0.18	
432	D2270	103.0		0.18	
480		-----		-----	
489		-----		-----	
494		-----		-----	
496	ISO2909	102.5		-0.52	
551	D2270	104	C	1.58	first reported 109
601		-----		-----	
603	D2270	102		-1.22	
614		-----		-----	
657	D2270	102		-1.22	
779		-----		-----	
781	D2270	102		-1.22	
785	D2270	102	E	-1.22	calculation difference, iis calculated 103
823	D2270	102		-1.22	
862	D2270	102		-1.22	
874	D2270	103		0.18	
875	D2270	104		1.58	
886	D2270	102		-1.22	
901		-----		-----	
912	D2270	103		0.18	
922	D2270	103	E	0.18	calculation difference, iis calculated 104
962	D2270	103	C	0.18	first reported 106.99
963	D2270	102		-1.22	
974	D2270	104		1.58	
982		-----		-----	
1081	D2270	102.7		-0.24	
1191	D2270	103.6		1.02	
1243	ISO2909	104.3		2.00	
1320		-----		-----	
1349	D2270	102.3		-0.80	
1389		-----		-----	
1409	D2270	100		-4.02	
1429		-----		-----	
1564	D2270	103	E	0.18	calculation difference, iis calculated 102
1728	D2270	104.11		1.74	
1748	D2270	103.5		0.88	
1833	ISO2909	103.7		1.16	
1877	D2270	103		0.18	
1971	D2270	103		0.18	
6111		-----		-----	
6113		-----		-----	
6310	D2270	101		-2.62	
6382	ISO2909	101.77		-1.54	
6442	D2270	104		1.58	
6516	D2270	104.9		2.84	
6533	D2270	102.841		-0.04	

normality	OK
n	46
outliers	0 +1ex
mean (n)	102.87
st.dev. (n)	0.948
R(calc.)	2.65
st.dev.(D2270:10R16)	0.714
R(D2270:10R16)	2

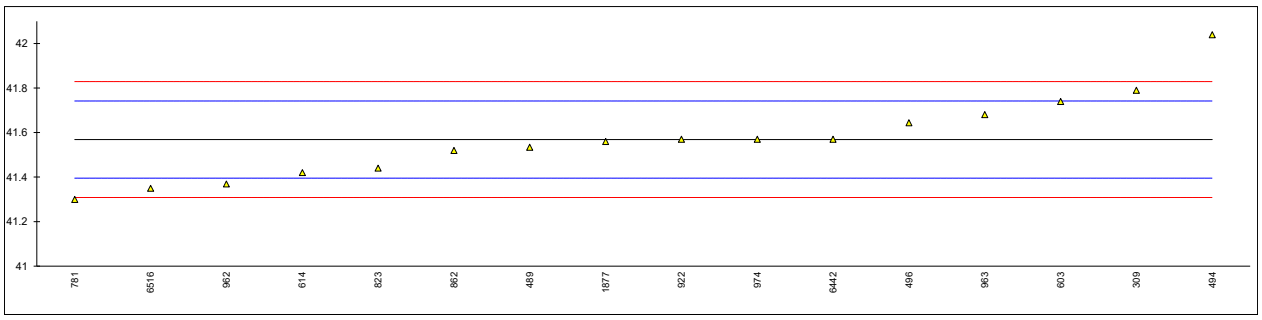

107
106
105
104
103
102
101
100
99
98
97
1409 273 6310 6382 657 781 823 862 785 603 886 963 1349 496 150 1081 6533 396 237 432 371 323 325 333 349 874 311 912 922 962 1564 1877 1971 369 1748 1191 1833 171 551 173 875 974 6442 1728 1243 6516 178

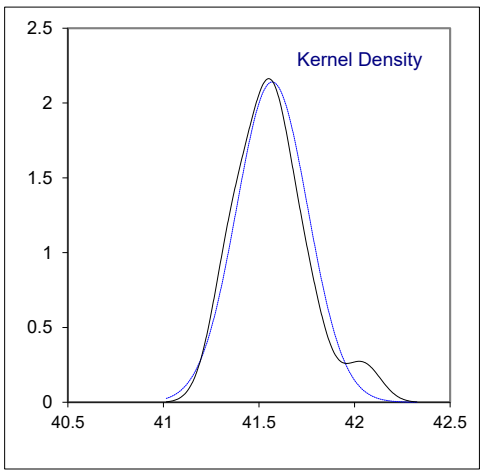

Kernel Density
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
98 100 102 104 106 108

Determination of Kinematic Viscosity Stabinger at 40 °C on sample #23070; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
173		-----		-----	
178		-----		-----	
179		-----		-----	
237		-----		-----	
273		-----		-----	
309	D7042	41.79		2.55	
311		-----		-----	
323		-----		-----	
325		-----		-----	
329		-----		-----	
333		-----		-----	
349		-----		-----	
369		-----		-----	
371		-----		-----	
396		-----		-----	
432		-----		-----	
480		-----		-----	
489	DIN51659-2	41.534		-0.40	
494	D7042	42.04		5.44	
496	D7042	41.644		0.87	
551		-----		-----	
601		-----		-----	
603	D7042	41.74		1.98	
614	D7042	41.42		-1.71	
657		-----		-----	
779		-----		-----	
781	D7042	41.30		-3.10	
785		-----		-----	
823	D7042	41.44		-1.48	
862	D7042	41.52		-0.56	
874		-----		-----	
875		-----		-----	
886		-----		-----	
901		-----		-----	
912		-----		-----	
922	D7042	41.57		0.02	
962	D7042	41.369		-2.30	
963	D7042	41.681		1.30	
974	D7042	41.57		0.02	
982		-----		-----	
1081		-----		-----	
1191		-----		-----	
1243		-----		-----	
1320		-----		-----	
1349		-----		-----	
1389		-----		-----	
1409		-----		-----	
1429		-----		-----	
1564		-----		-----	
1728		-----		-----	
1748		-----		-----	
1833		-----		-----	
1877	D7042	41.56		-0.10	
1971		-----		-----	
6111		-----		-----	
6113		-----		-----	
6310		-----		-----	
6382		-----		-----	
6442	D7042	41.57		0.02	
6516	D7042	41.35		-2.52	
6533		-----		-----	

normality	suspect
n	16
outliers	0
mean (n)	41.569
st.dev. (n)	0.1864
R(calc.)	0.522
st.dev.(D7042:21a)	0.0867
R(D7042:21a)	0.243

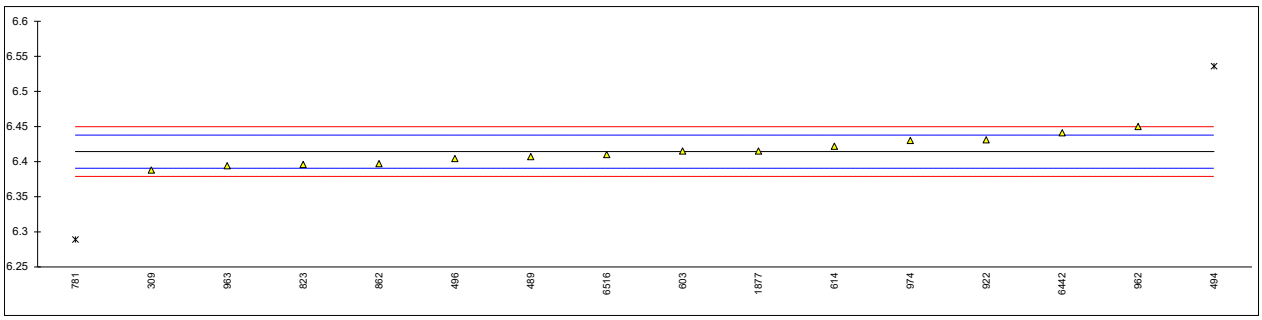

42
41.8
41.6
41.4
41.2
41
781
6516
962
614
823
862
489
1877
922
974
6442
496
963
603
309
494

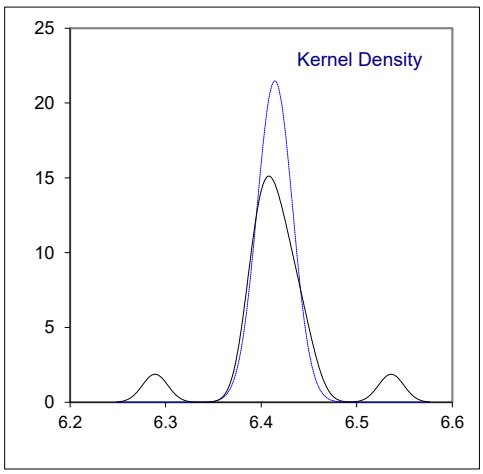

Kernel Density
2.5
2
1.5
1
0.5
0
40.5
41
41.5
42
42.5

Determination of Kinematic Viscosity Stabinger at 100 °C on sample #23070; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
173		-----		-----	
178		-----		-----	
179		-----		-----	
237		-----		-----	
273		-----		-----	
309	D7042	6.3879		-2.24	
311		-----		-----	
323		-----		-----	
325		-----		-----	
329		-----		-----	
333		-----		-----	
349		-----		-----	
369		-----		-----	
371		-----		-----	
396		-----		-----	
432		-----		-----	
480		-----		-----	
489	DIN51659-2	6.4069		-0.63	
494	D7042	6.536	G(0.01)	10.33	
496	D7042	6.4044		-0.84	
551		-----		-----	
601		-----		-----	
603	D7042	6.415		0.06	
614	D7042	6.422		0.65	
657		-----		-----	
779		-----		-----	
781	D7042	6.289	G(0.05)	-10.64	
785		-----		-----	
823	D7042	6.396		-1.55	
862	D7042	6.397		-1.47	
874		-----		-----	
875		-----		-----	
886		-----		-----	
901		-----		-----	
912		-----		-----	
922	D7042	6.431		1.42	
962	D7042	6.450		3.03	
963	D7042	6.394		-1.72	
974	D7042	6.430		1.33	
982		-----		-----	
1081		-----		-----	
1191		-----		-----	
1243		-----		-----	
1320		-----		-----	
1349		-----		-----	
1389		-----		-----	
1409		-----		-----	
1429		-----		-----	
1564		-----		-----	
1728		-----		-----	
1748		-----		-----	
1833		-----		-----	
1877	D7042	6.415		0.06	
1971		-----		-----	
6111		-----		-----	
6113		-----		-----	
6310		-----		-----	
6382		-----		-----	
6442	D7042	6.441		2.27	
6516	D7042	6.41		-0.37	
6533		-----		-----	

normality	OK
n	14
outliers	2
mean (n)	6.414
st.dev. (n)	0.0186
R(calc.)	0.052
st.dev.(D7042:21a)	0.0118
R(D7042:21a)	0.033

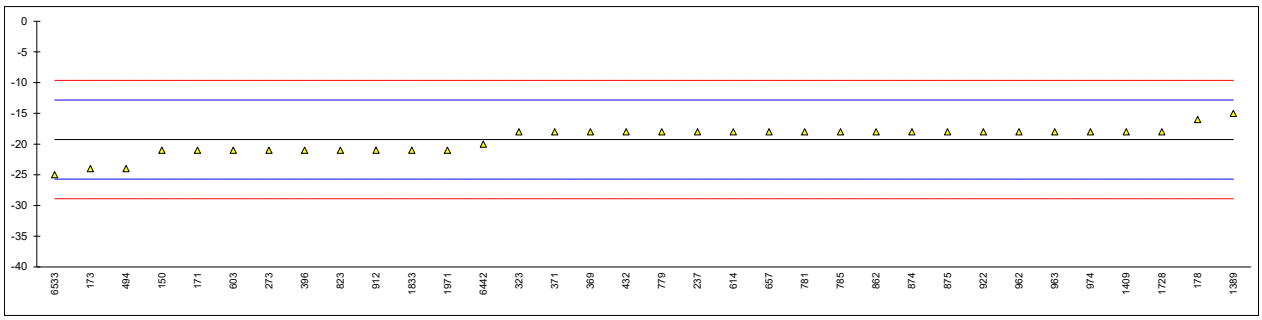

6.6
6.55
6.5
6.45
6.4
6.35
6.3
6.25
781
309
963
823
862
496
489
6516
603
1877
614
974
922
6442
962
494

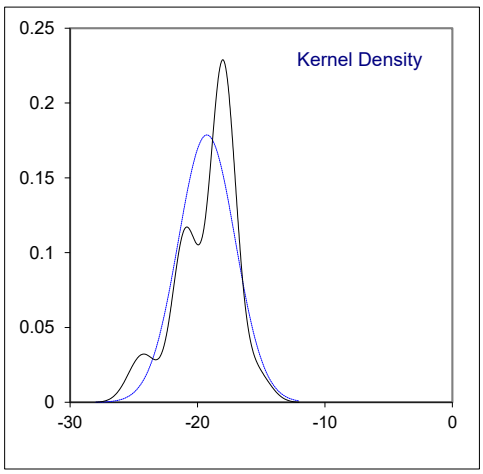

Kernel Density
25
20
15
10
5
0
6.2
6.3
6.4
6.5
6.6

Determination of Pour Point Manual on sample #23070; results in °C

lab	method	value	mark	z(targ)	remarks
150	D97	-21		-0.54	
171	D97	-21		-0.54	
173	D97	-24		-1.47	
178	D97	-16	C	1.02	first reported -33
179		-----		-----	
237	D97	-18		0.39	
273	D97	-21		-0.54	
309		-----		-----	
311		-----		-----	
323	D97	-18		0.39	
325		-----		-----	
329		-----		-----	
333		-----		-----	
349		-----		-----	
369	D97	-18		0.39	
371	D97	-18		0.39	
396	D97	-21		-0.54	
432	D97	-18		0.39	
480		-----		-----	
489		-----		-----	
494	D97	-24		-1.47	
496		-----		-----	
551		-----		-----	
601		-----		-----	
603	D97	-21		-0.54	
614	D97	-18		0.39	
657	D97	-18		0.39	
779	D97	-18		0.39	
781	D97	-18		0.39	
785	D97	-18		0.39	
823	D97	-21		-0.54	
862	D97	-18		0.39	
874	D97	-18		0.39	
875	D97	-18		0.39	
886		-----		-----	
901		-----		-----	
912	D97	-21		-0.54	
922	D97	-18		0.39	
962	D97	-18		0.39	
963	D97	-18		0.39	
974	D97	-18		0.39	
982		-----		-----	
1081		-----		-----	
1191		-----		-----	
1243		-----		-----	
1320		-----		-----	
1349		-----		-----	
1389	D97	-15.0		1.33	
1409	D97	-18		0.39	
1429		-----		-----	
1564		-----		-----	
1728	D97	-18		0.39	
1748		-----		-----	
1833	D97	-21		-0.54	
1877		-----		-----	
1971	D97	-21		-0.54	
6111		-----		-----	
6113		-----		-----	
6310		-----		-----	
6382		-----		-----	
6442	D97	-20		-0.23	
6516		-----		-----	
6533	D97	-25		-1.78	

normality	OK
n	34
outliers	0
mean (n)	-19.26
st.dev. (n)	2.233
R(calc.)	6.25
st.dev.(D97:17bR22)	3.214
R(D97:17bR22)	9

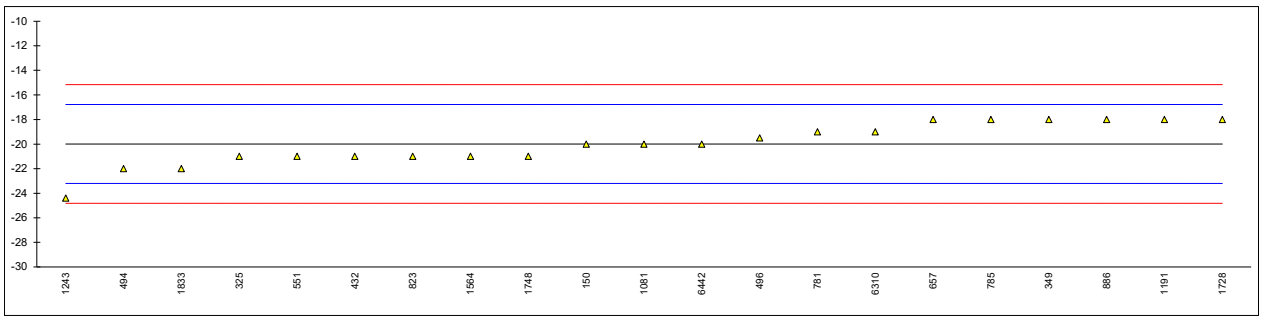

0
-5
-10
-15
-20
-25
-30
-35
-40
6533
173
494
150
171
603
273
396
823
912
1833
1971
6442
323
371
369
432
779
237
614
657
781
785
862
874
875
922
962
963
974
1409
1728
178
1389

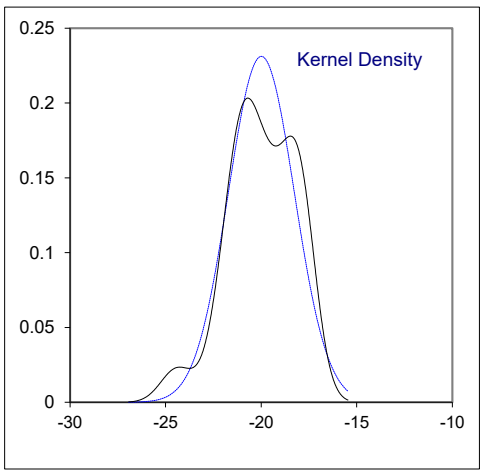

Kernel Density
0.25
0.2
0.15
0.1
0.05
0
-30
-20
-10
0

Determination of Pour Point Automated 1 °C interval on sample #23070; results in °C

lab	method	value	mark	z(targ)	remarks
150	D5950	-20		0.00	
171		-----		-----	
173		-----		-----	
178		-----		-----	
179		-----		-----	
237		-----		-----	
273		-----		-----	
309		-----		-----	
311		-----		-----	
323		-----		-----	
325	D5950	-21		-0.63	
329		-----		-----	
333		-----		-----	
349	D5950	-18		1.24	
369		-----		-----	
371		-----		-----	
396		-----		-----	
432	D5950	-21		-0.63	
480		-----		-----	
489		-----		-----	
494	D5950	-22		-1.25	
496	D5950	-19.5		0.31	
551	D5950	-21		-0.63	
601		-----		-----	
603		-----		-----	
614		-----		-----	
657	D5950	-18		1.24	
779		-----		-----	
781	D5950	-19		0.62	
785	D6749	-18		1.24	
823	D5950	-21		-0.63	
862		-----		-----	
874		-----		-----	
875		-----		-----	
886	D5950	-18		1.24	
901		-----		-----	
912		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
982		-----		-----	
1081	In house	-20		0.00	
1191	D5950	-18		1.24	
1243	D7346	-24.4		-2.74	
1320		-----		-----	
1349		-----		-----	
1389		-----		-----	
1409		-----		-----	
1429		-----		-----	
1564	D5949	-21		-0.63	
1728	D5950	-18		1.24	
1748	D7346	-21		-0.63	
1833	D5950	-22		-1.25	
1877		-----		-----	
1971		-----		-----	
6111		-----		-----	
6113		-----		-----	
6310	D5950	-19		0.62	
6382		-----		-----	
6442		-20		0.00	
6516		-----		-----	
6533		-----		-----	

normality	OK
n	21
outliers	0
mean (n)	-20.00
st.dev. (n)	1.726
R(calc.)	4.83
st.dev.(D5950:14R20)	1.607
R(D5950:14R20)	4.5


-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
1243
494
1833
325
551
432
823
1564
1748
150
1081
6442
496
781
6310
657
785
349
886
1191
1728


Kernel Density
0.25
0.2
0.15
0.1
0.05
0
-30
-25
-20
-15
-10

Determination of Rust Prevention acc. to ASTM D665, proc. B, synthetic seawater on sample #23070

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
173		-----		-----	
178		-----		-----	
179		-----		-----	
237		-----		-----	
273		-----		-----	
309	D665	FAIL		-----	
311		-----		-----	
323		-----		-----	
325	D665	severe		-----	
329		-----		-----	
333		-----		-----	
349		-----		-----	
369		-----		-----	
371		-----		-----	
396		-----		-----	
432		-----		-----	
480		-----		-----	
489		-----		-----	
494		-----		-----	
496	D665	Severe Rusting		-----	
551		-----		-----	
601		-----		-----	
603		-----		-----	
614		-----		-----	
657		-----		-----	
779		-----		-----	
781	D665	Fail/Severe		-----	
785		-----		-----	
823		-----		-----	
862		-----		-----	
874		-----		-----	
875		-----		-----	
886		-----		-----	
901	D665	Not Pass		-----	
912		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
982		-----		-----	
1081		-----		-----	
1191		-----		-----	
1243		-----		-----	
1320	D665	Severe		-----	
1349		-----		-----	
1389		-----		-----	
1409	D665	Sévére		-----	
1429		-----		-----	
1564	D665	No pasa		-----	
1728		-----		-----	
1748		-----		-----	
1833		-----		-----	
1877		-----		-----	
1971		-----		-----	
6111		-----		-----	
6113		-----		-----	
6310		-----		-----	
6382		-----		-----	
6442	D665	Not Pass		-----	
6516		-----		-----	
6533		-----		-----	
	n	9			
	mean (n)	Fail/Not Pass			

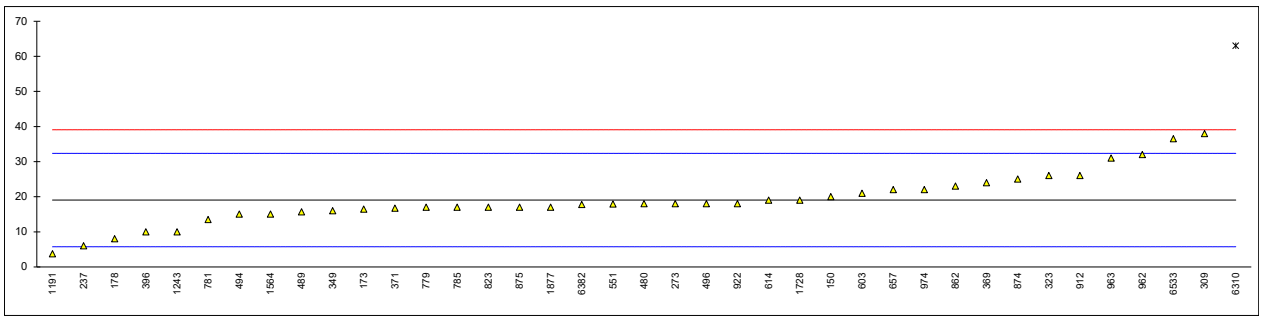
Determination of Sulfur on sample #23070; results in mg/kg

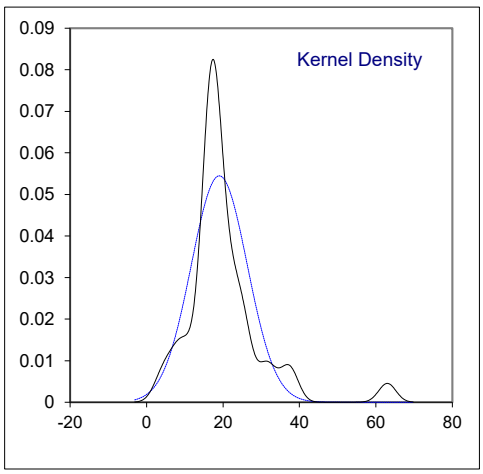
lab	method	value	mark	z(targ)	remarks
150	D2622	<20		-----	
171	D2622	<3.0		-----	
173		-----		-----	
178		-----		-----	
179		-----		-----	
237	D4294	<17		-----	
273	D5453	<1		-----	
309	D4294	<300		-----	
311		-----		-----	
323	D5453	1.0		-----	
325	D2622	2		-----	
329		-----		-----	
333		-----		-----	
349	D2622	1		-----	
369	D4294	<10		-----	
371	D5453	1.1		-----	
396		-----		-----	
432		-----		-----	
480		-----		-----	
489		-----		-----	
494	D5453	1.3		-----	
496		-----		-----	
551	D4294	5.1		-----	
601		-----		-----	
603		-----		-----	
614		-----		-----	
657	D5453	1		-----	
779	D4294	L17		-----	
781	D4294	<17		-----	
785	D2622	1.0		-----	
823	D5453	<1.0		-----	
862	D2622	<3		-----	
874	D2622	1.6		-----	
875	D2622	< 3		-----	
886		-----		-----	
901		-----		-----	
912	D4294	<17		-----	
922	D4294	<17		-----	
962	D4294	<20		-----	
963		-----		-----	
974	D4294	<17		-----	
982		-----		-----	
1081	D2622	0.8		-----	
1191		-----		-----	
1243	ISO8754	2		-----	
1320		-----		-----	
1349	D7039	0.70		-----	
1389		-----		-----	
1409		-----		-----	
1429		-----		-----	
1564	D4294	40		-----	possibly a false positive test result?
1728	D2622	1		-----	
1748		-----		-----	
1833	D5453	<3		-----	
1877		-----		-----	
1971		-----		-----	
6111		-----		-----	
6113		-----		-----	
6310	D7751	<1		-----	
6382	ISO8754	0		-----	
6442		-----		-----	
6516	D4294	10		-----	
6533		-----		-----	
	n	29			
	mean (n)	<17			application range D4294:21: 17 mg/kg – 4.6 %M/M application range D2622:21: 3 mg/kg – 4.6 %M/M

Determination of Water on sample #23070; results in mg/kg

lab	method	value	mark	z(targ)	remarks
150	D6304-A:20	20		0.15	
171	D6304-A:20	<20		-----	
173	D6304-A:20	16.47		-0.38	
178	D6304-B:20	8		-1.65	
179		-----		-----	
237	D6304-C:16e1	6		-1.95	
273	D6304-A:16e1	18		-0.15	
309	D6304-A:20	38		2.84	
311		-----		-----	
323	D6304-A:16e1	26		1.05	
325	D6304-C:20	<100		-----	
329		-----		-----	
333		-----		-----	
349	D6304-A:20	16		-0.45	
369	ISO12937	24		0.75	
371	D6304-C:20	16.7		-0.35	
396	D6304-A:20	10		-1.35	
432		-----		-----	
480	D6304-A:20	18		-0.15	
489	DIN51777	15.65		-0.51	
494	D6304-C:20	15		-0.60	
496	D6304-B:20	18		-0.15	
551	D6304-A:16e1	17.9		-0.17	
601		-----		-----	
603	D6304-A:20	21		0.30	
614	D6304-B:20	19		0.00	
657	D6304-A:20	22		0.45	
779	D6304-A:20	17		-0.30	
781	D6304-A:20	13.5		-0.83	
785	D6304-A:20	17		-0.30	
823	D6304-A:20	17		-0.30	
862	D6304-A	23		0.60	
874	D6304-A:20	25		0.90	
875	ISO12937	17		-0.30	
886		-----		-----	
901		-----		-----	
912	D6304	26		1.05	
922	D6304-A:20	18		-0.15	
962	D6304-A:20	32		1.94	
963	D6304-A:16e1	31		1.80	
974	D6304-A:20	22		0.45	
982		-----		-----	
1081		-----		-----	
1191	D6304-C:20	3.7		-2.30	
1243	ISO12937	10		-1.35	
1320		-----		-----	
1349		-----		-----	
1389		-----		-----	
1409	D6304-B:20	< 30		-----	
1429		-----		-----	
1564	D6304-B:20	15		-0.60	
1728	D6304-A:20	19		0.00	
1748		-----		-----	
1833		-----		-----	
1877	D6304-C:20	17		-0.30	
1971		-----		-----	
6111		-----		-----	
6113		-----		-----	
6310	D6304-C:16e1	63	C,R(0.01)	6.59	first reported 87
6382	EN60814	17.75		-0.19	
6442		-----		-----	
6516		-----		-----	
6533	ISO12937	36.49	C	2.62	first reported 56.95

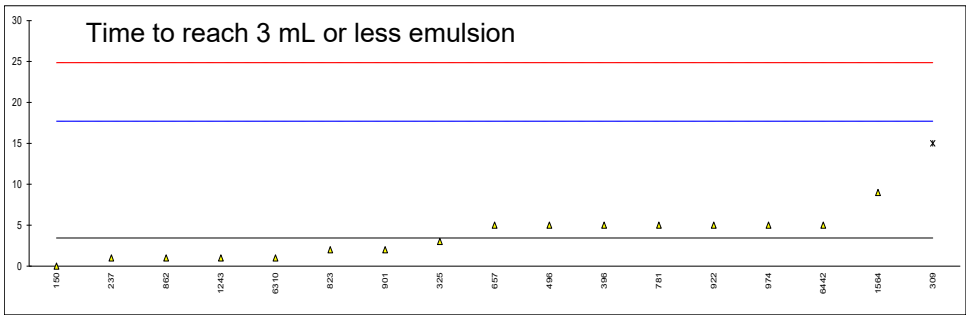
normality	suspect		
n	38		
outliers	1		
mean (n)	19.03		
st.dev. (n)	7.324		
R(calc.)	20.51		
st.dev.(D6304-A:20)	6.668		
R(D6304-A:20)	18.67		range 20 – 25000 mg/kg
Compare:			
R(D6304-B:20)	79.57		range 30 – 2100 mg/kg
R(D6304-C:20)	11.74		range 20 – 360 mg/kg

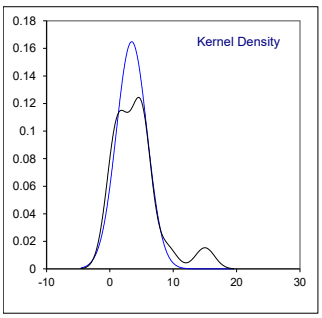

70
60
50
40
30
20
10
0
1191
237
178
396
1243
781
494
1564
489
349
173
371
779
785
823
875
1877
6382
551
480
273
496
922
614
1728
150
603
657
974
862
369
874
323
912
963
962
6533
309
6310

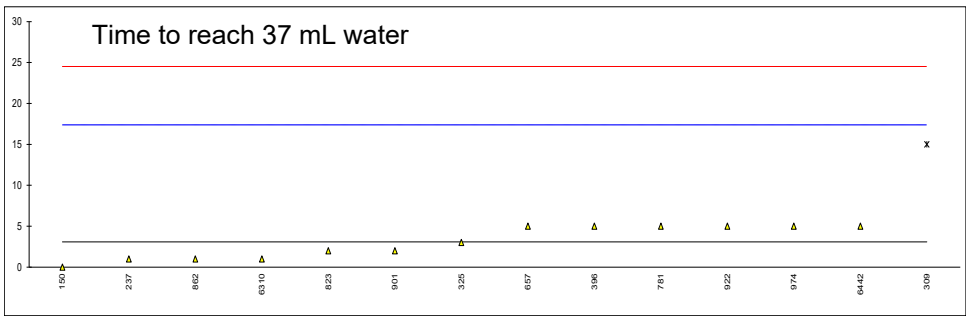

Kernel Density
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-20
0
20
40
60
80

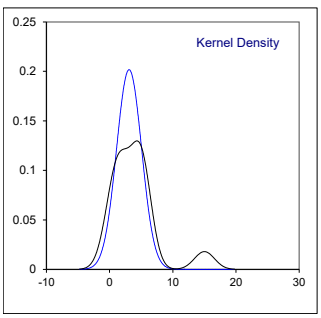
Determination of Water Separability at 54 °C, distilled water on sample #23070; results in minutes

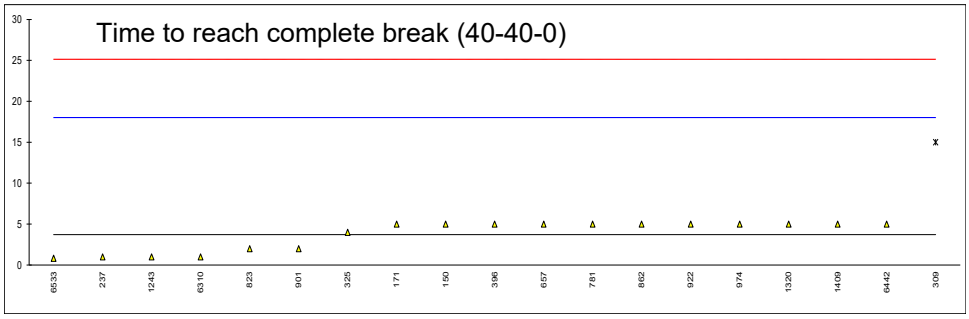
lab	method	3 mL or less emulsion	z(targ)	37 mL of water	z(targ)	complete break (40-40-0)	z(targ)	test aborted	time test aborted (min)
150	D1401	0	-0.48	0	-0.43	5	0.18	No	-----
171		-----	-----	-----	-----	5	0.18	No	-----
173		-----	-----	-----	-----	-----	-----	-----	-----
178		-----	-----	-----	-----	-----	-----	-----	-----
179		-----	-----	-----	-----	-----	-----	-----	-----
237		1	-0.34	1	-0.29	1	-0.38	No	-----
273		-----	-----	-----	-----	-----	-----	-----	-----
309	D1401	15 G1	1.62	15 G1	1.67	15 G1	1.58	Yes	15
311		-----	-----	-----	-----	-----	-----	-----	-----
323		-----	-----	-----	-----	-----	-----	-----	-----
325	D1401	3	-0.06	3	-0.01	4	0.04	No	4
329		-----	-----	-----	-----	-----	-----	-----	-----
333		-----	-----	-----	-----	-----	-----	-----	-----
349		-----	-----	-----	-----	-----	-----	-----	-----
369		-----	-----	-----	-----	-----	-----	-----	-----
371		-----	-----	-----	-----	-----	-----	-----	-----
396	D1401	5	0.22	5	0.27	5	0.18	No	-----
432		-----	-----	-----	-----	-----	-----	-----	-----
480		-----	-----	-----	-----	-----	-----	-----	-----
489		-----	-----	-----	-----	-----	-----	-----	-----
494		-----	-----	-----	-----	-----	-----	-----	-----
496	D1401	5	0.22	-----	-----	-----	-----	No	30
551		-----	-----	-----	-----	-----	-----	-----	-----
601		-----	-----	-----	-----	-----	-----	-----	-----
603		-----	-----	-----	-----	-----	-----	-----	-----
614	D1401	<1	-----	<1	-----	<1	-----	No	-----
657	D1401	5	0.22	5	0.27	5	0.18	No	-----
779		-----	-----	-----	-----	-----	-----	-----	-----
781	D1401	5	0.22	5	0.27	5	0.18	No	-----
785		-----	-----	-----	-----	-----	-----	-----	-----
823	D1401	2	-0.20	2	-0.15	2	-0.24	No	5
862	D1401	1	-0.34	1	-0.29	5	0.18	Yes	5
874		-----	-----	-----	-----	-----	-----	-----	-----
875		-----	-----	-----	-----	-----	-----	-----	-----
886		-----	-----	-----	-----	-----	-----	-----	-----
901	D1401	2	-0.20	2	-0.15	2	-0.24	Yes	30
912		-----	-----	-----	-----	-----	-----	-----	-----
922	D1401	5	0.22	5	0.27	5	0.18	No	-----
962		-----	-----	-----	-----	-----	-----	-----	-----
963		-----	-----	-----	-----	-----	-----	-----	-----
974	D1401	5	0.22	5	0.27	5	0.18	No	-----
982		-----	-----	-----	-----	-----	-----	-----	-----
1081		-----	-----	-----	-----	-----	-----	-----	-----
1191		-----	-----	-----	-----	-----	-----	-----	-----
1243	ISO6614	1	-0.34	<1	-----	1	-0.38	No	-----
1320		-----	-----	-----	-----	5	0.18	-----	-----
1349		-----	-----	-----	-----	-----	-----	-----	-----
1389		-----	-----	-----	-----	-----	-----	-----	-----
1409		-----	-----	-----	-----	5	0.18	No	-----
1429		-----	-----	-----	-----	-----	-----	-----	-----
1564		9	0.78	-----	-----	-----	-----	-----	-----
1728		-----	-----	-----	-----	-----	-----	-----	-----
1748		-----	-----	-----	-----	-----	-----	-----	-----
1833		-----	-----	-----	-----	-----	-----	-----	-----
1877		-----	-----	-----	-----	-----	-----	-----	-----
1971		-----	-----	-----	-----	-----	-----	-----	-----
6111		-----	-----	-----	-----	-----	-----	-----	-----
6113		-----	-----	-----	-----	-----	-----	-----	-----
6310	D1401	1	-0.34	1	-0.29	1	-0.38	No	-----
6382		-----	-----	-----	-----	-----	-----	-----	-----
6442		5	0.22	5	0.27	5	0.18	-----	-----
6516		-----	-----	-----	-----	-----	-----	-----	-----
6533		-----	-----	-----	-----	0.83	-0.40	No	-----
	normality	OK		OK		OK			
	n	16		13		18			
	outliers	1		1		1			
	mean (n)	3.44		3.08		3.71			
	st.dev. (n)	2.421		1.977		1.792			
	R(calc.)	6.78		5.54		5.02			
	st.dev.(D1401:21)	7.143		7.143		7.143			
	R(D1401:21)	20		20		20			

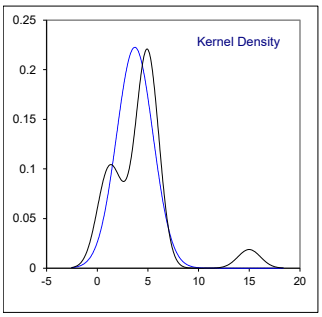

Time to reach 3 mL or less emulsion
150
237
862
1243
6310
823
901
325
657
496
396
781
922
974
6442
1564
309


Kernel Density


Time to reach 37 mL water
150
237
862
6310
823
901
325
657
396
781
922
974
6442
309


Kernel Density


Time to reach complete break (40-40-0)
6533
237
1243
6310
823
901
325
171
150
396
657
781
862
922
974
1320
1409
6442
309


Kernel Density

Determination of Water Separability at 54 °C, distilled water sample #23070; results in mL

lab	method	oil phase	mark	water phase	mark	emulsion phase	mark
150	D1401	40		39		0	
171	D1401	40		40		0	
173		-----		-----		-----	
178		-----		-----		-----	
179		-----		-----		-----	
237	D1401	40.0		40.0		0	
273		-----		-----		-----	
309	D1401	41		39		0	
311		-----		-----		-----	
323		-----		-----		-----	
325	D1401	40		40		0	
329		-----		-----		-----	
333		-----		-----		-----	
349		-----		-----		-----	
369		-----		-----		-----	
371		-----		-----		-----	
396		-----		-----		-----	
432		-----		-----		-----	
480		-----		-----		-----	
489		-----		-----		-----	
494		-----		-----		-----	
496	D1401	40		39		1	
551		-----		-----		-----	
601		-----		-----		-----	
603		-----		-----		-----	
614	D1401	40		40		0	
657	D1401	40		40		0	
779		-----		-----		-----	
781	D1401	40		40		0	
785		-----		-----		-----	
823	D1401	40		40		0	
862	D1401	40		40		0	
874		-----		-----		-----	
875		-----		-----		-----	
886		-----		-----		-----	
901	D1401	40		40		0	C
912		-----		-----		-----	
922	D1401	40		40		0	
962		-----		-----		-----	
963		-----		-----		-----	
974	D1401	40		40		0	
982		-----		-----		-----	
1081		-----		-----		5	
1191		-----		-----		-----	
1243		-----		-----		-----	
1320	ISO6614	40		40		0	
1349		-----		-----		-----	
1389		-----		-----		-----	
1409		-----		-----		-----	
1429		-----		-----		-----	
1564		-----		-----		-----	
1728		-----		-----		-----	
1748		-----		-----		-----	
1833		-----		-----		-----	
1877		-----		-----		-----	
1971		-----		-----		-----	
6111		-----		-----		-----	
6113		-----		-----		-----	
6310		-----		-----		-----	
6382		-----		-----		-----	
6442		-----		-----		-----	
6516		-----		-----		-----	
6533		-----		-----		-----	

Lab 901 first reported 40 for emulsion phase

APPENDIX 2

Number of participants per country

1 lab in	AUSTRALIA
1 lab in	AUSTRIA
6 labs in	BELGIUM
1 lab in	BRAZIL
1 lab in	CHINA, People's Republic
1 lab in	ESTONIA
1 lab in	FINLAND
1 lab in	FRANCE
5 labs in	GERMANY
1 lab in	INDIA
1 lab in	IRAN, Islamic Republic of
1 lab in	ITALY
1 lab in	JORDAN
1 lab in	KOREA, Republic of
1 lab in	KUWAIT
2 labs in	LATVIA
2 labs in	MALAYSIA
3 labs in	NETHERLANDS
1 lab in	NIGERIA
1 lab in	PAKISTAN
2 labs in	POLAND
1 lab in	PORTUGAL
1 lab in	ROMANIA
5 labs in	RUSSIAN FEDERATION
2 labs in	SAUDI ARABIA
1 lab in	SINGAPORE
1 lab in	SLOVAKIA
1 lab in	SOUTH AFRICA
4 labs in	SPAIN
1 lab in	TAIWAN
3 labs in	TURKEY
1 lab in	UNITED ARAB EMIRATES
2 labs in	UNITED KINGDOM
5 labs in	UNITED STATES OF AMERICA

APPENDIX 3

Abbreviations

C	= final test result after checking of first reported suspect test result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01),G1	= 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	= calculation difference between reported test result and result calculated by iis
W	= test result withdrawn on request of participant
ex	= test result excluded from statistical evaluation
n.a.	= not applicable
n.e.	= not evaluated
n.d.	= not detected
fr.	= first reported
f+?	= possibly a false positive test result?
f-?	= possibly a false negative test result?
SDS	= Safety Data Sheet

Literature

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