# Results of Proficiency Test
# Free and Released
# Formaldehyde in textile
# November 2017


Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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# 1 INTRODUCTION

Since the 1990's, many countries have adopted environmental standards and requirements restricting the use of harmful chemicals in the production of textiles and clothing. Laws and regulations impose some of these standards and requirements. In addition to mandatory environmental standards and requirements for textiles, there are some Ecolabelling schemes imposing environmental requirements for textile products on a voluntary basis. Well known programs are for instance Milieukeur (the Netherlands), Öko-Tex Standard 100 (Germany), Thai Green Label (Thailand) and Bluesign® (Switzerland), which has created a Bluesign® system substances list (BSSL).

Since 2008, the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for Free Formaldehyde in textile, which was extended in 2013/2014 with a PT for Released Formaldehyde. During the annual proficiency testing program 2017/2018, it was decided to continue the proficiency test for the analysis of Free and Released Formaldehyde in textile.
In this interlaboratory study 187 laboratories in 38 different countries registered for participation. See appendix 3 for the number of participating laboratories per country.
In this report, the results of the 2017 Free and Released Formaldehyde in Textile 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 preparation and analyses of fit-for-use and homogeneity were subcontracted to an ISO17025 accredited laboratory. It was decided to send two different positive samples of approx. 5 gram each, resp. labelled #17635 and #17636. The participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for the statistical evaluation.

## 2.1 QUALITY SYSTEM

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, has implemented a quality system based on ISO/IEC 17043:2010. 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 March 2017 (iis-protocol, version 3.4). This protocol is electronically available through the iis website www.iisnl.com, from the FAQ page.

## 2.3 CONFIDENTIALITY STATEMENT

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

## 2.4 SAMPLES

Two batches, each positive on (Free) Formaldehyde were selected. From the first batch, a light blue coloured cotton, 200 subsamples of approx. 5 grams were prepared and labelled #17635. Each sample was packed in a polypropylene bag and wrapped in aluminium foil. The homogeneity of the subsamples was checked on 8 stratified randomly selected samples. See the following tables for the test results.

| | Free Formaldehyde in mg/kg |
|---|---|
| Sample #17635-1 | 62.7 |
| Sample #17635-2 | 62.5 |
| Sample #17635-3 | 62.5 |
| Sample #17635-4 | 62.9 |
| Sample #17635-5 | 63.4 |
| Sample #17635-6 | 65.9 |
| Sample #17635-7 | 61.7 |
| Sample #17635-8 | 62.6 |

Table 1: homogeneity test results of subsamples #17635

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

| | Free Formaldehyde in mg/kg |
|---|---|
| r(observed) | 3.5 |
| Reference | Horwitz |
| 0.3 x R (reference) | 4.5 |

Table 2: evaluation of the repeatability of subsamples #17635

From the second batch, a yellow coloured cotton, 200 subsamples of approx. 5 grams were prepared and labelled #17636. Each sample was packed in a polypropylene bag and wrapped in aluminium foil. The homogeneity of the subsamples was checked on 8 stratified randomly selected samples. See the following tables for the test results.

The calculated repeatability of the subsamples was in agreement with 0.3 times the corresponding reproducibility estimated using the Horwitz equation. Therefore, homogeneity of the subsamples #17635 was assumed.

| | Free Formaldehyde in mg/kg |
|---|---|
| Sample #17636-1 | 191 |
| Sample #17636-2 | 202 |
| Sample #17636-3 | 201 |
| Sample #17636-4 | 195 |
| Sample #17636-5 | 191 |
| Sample #17636-6 | 198 |
| Sample #17636-7 | 195 |
| Sample #17636-8 | 197 |

Table 3: homogeneity test results of subsamples #17636

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

| | Free Formaldehyde in mg/kg |
|---|---|
| r(observed) | 12 |
| Reference | Horwitz |
| 0.3 x R (reference) | 12 |

Table 4: evaluation of the repeatability of subsamples #17636

The calculated repeatability of the subsamples was in agreement with 0.3 times the corresponding reproducibility estimated using the Horwitz equation. Therefore, homogeneity of the subsamples #17636 was assumed.

To each of the participants, 1 sample labelled #17635 and 1 sample labelled #17636 was sent on October 11, 2017.

## 2.5 ANALYSES

The participants were requested to determine on both samples (#17635 and #17636) the Free Formaldehyde content and the Released Formaldehyde content with the analytical procedures that are routinely used in the laboratory. Also, some analytical details were requested to be reported of the determination of Released Formaldehyde.

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 results, but report as much significant figures as possible. It was also requested not to report ‘less than’ results, which are above the detection limit, because such test results cannot be used for meaningful statistical calculations.

To get comparable test results, a detailed report form and a letter of instructions are prepared. On the report form the reporting units are given as well as the reference test methods that will be used during the evaluation. The detailed report form and the letter of instructions are both made available on the data entry portal www.kpmd.com/sgs-iis-cts/. 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 results of the individual laboratories were gathered via the data entry portal www.kpmd.co.uk/sgs-iis-cts/. The reported test results are tabulated per determination in the appendix 1 of this report. The laboratories are represented by their code numbers.

Directly after the deadline, a reminder was sent to those laboratories that did not report 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. Additional or corrected test results are used for the data analysis and the original 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 organisation of this proficiency test was the one as described for proficiency testing in the report ‘iis Interlaboratory Studies, Protocol for the Organisation, Statistics and Evaluation’ of March 2017 (iis-protocol, version 3.4).

For the statistical evaluation, the *unrounded* (when available) figures were used instead of the rounded test results. Test results reported as ‘<...” or ‘>...” were not used in the statistical evaluation.

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

In accordance to ISO 5725 the original 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. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

For each assigned value, the uncertainty was determined in accordance with ISO13528. Subsequently the calculated uncertainty was evaluated against the respective

requirement based on the target reproducibility in accordance with ISO13528. When the uncertainty passed the evaluation, no remarks are made in the report. However, when the uncertainty failed the evaluation, it is mentioned in the report and it will have significant consequences for the evaluation of the test results.

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

### 3.2 GRAPHICS

In order to visualise the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported analysis results are plotted. The corresponding laboratory numbers are on the X-axis.

The straight horizontal line presents the consensus value (a trimmed mean). The four striped lines, parallel to the consensus value line, are the +3s, +2s, -2s and -3s target reproducibility limits of the selected standard. Outliers and other data, which were excluded from the calculations, are represented as a cross. Accepted data are represented as a triangle.

Furthermore, Kernel Density Graphs were made. The Kernel Density Graph is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms. Also, a normal Gauss curve was projected over the Kernel Density Graph for reference.

### 3.3 Z-SCORES

To evaluate the performance of the participating laboratories the z-scores were calculated. As it was decided to evaluate the performance of the participants in this proficiency test (PT) against the literature requirements, 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 target reproducibility (preferably taken from a standardized test method) by division with 2.8. In case no literature reproducibility was available, other target values were 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 should be done in order to evaluate whether the reported test results are fit-for-purpose.

The z-scores were calculated according to:

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

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

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 should be done in order to evaluate whether the reported test results are fit-for-use.

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

During the execution of this proficiency test, no problems were encountered with the delivery of the samples. Three laboratories did not report any test results and eight laboratories reported results after the final reporting date.
Finally, the 184 reporting laboratories sent in total 511 numerical test results. Observed were 15 outlying test results, which is 2.9% of the numerical test results. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

The method for determination of the Free Formaldehyde is specified in the Standards of the Ecolabelling Institutes.
It should be noticed that ISO14184-1 corresponds to the Japanese method specified in the Japanese Law 112 and is described in the Japanese Standard JIS L1096.

In ISO14184-1:11 and ISO14184-2:11 some information on precision data is given. In table B.1 of ISO14184-1 and table C.2 of ISO14184-2 precision values are mentioned, but they were obtained using slightly different methods for calibration or performance than the ISO14184 methods. Therefore, it was concluded that reliable reproducibility data cannot be estimated form the ISO14184 methods. Therefore, target reproducibilities estimated from the Horwitz equation were used for statistical evaluation.

All original data sets proved to have a normal Gaussian distribution.

### 4.1 EVALUATION PER SAMPLE AND PER TEST

In this paragraph, the test results are discussed per sample and per test.

**Sample #17635:**

Free Formaldehyde content: This determination may be problematic. Six statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the estimated reproducibility using the Horwitz equation.

Released Formaldehyde: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the estimated reproducibility using the Horwitz equation.

**Sample #17636:**

Free Formaldehyde content: This determination may be problematic. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the estimated reproducibility using the Horwitz equation.

Released Formaldehyde: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the estimated reproducibility using the Horwitz equation.

### 4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the calculated reproducibilities using the Horwitz equation and the reproducibilities as found for the group of participating laboratories. The target reproducibilities (Horwitz equation), are compared in the next table.

| Parameter | unit | n | average | 2.8 * sd | R (target) |
|---|---|---|---|---|---|
| Free Formaldehyde | mg/kg | 178 | 80.5 | 22.0 | 18.6 |
| Released Formaldehyde | mg/kg | 70 | 135.3 | 29.6 | 29.0 |

Table 5: reproducibilities of tests on sample #17635

| Parameter | unit | n | average | 2.8 * sd | R (target) |
|---|---|---|---|---|---|
| Free Formaldehyde | mg/kg | 179 | 133.3 | 32.4 | 28.6 |
| Released Formaldehyde | mg/kg | 69 | 170.9 | 33.4 | 35.3 |

Table 6: reproducibilities of tests on sample #17636

Without further statistical calculations, the group of participating laboratories do not have much difficulties with the analysis of Released Formaldehyde. However, the analysis of Free Formaldehyde gives more difficulties when the calculated target results are compared with the Horwitz equation. See also the discussions in paragraphs 4.4 and 6.

### 4.3 COMPARISON OF THE PROFICIENCY TEST OF NOVEMBER 2017 WITH PREVIOUS PTS

| | Nov 2017 | Nov 2016 | Nov 2015 | Oct 2014 | Oct 2013 | Oct 2012 |
|---|---|---|---|---|---|---|
| Number of reporting labs | 184 | 192 | 192 | 176 | 173 | 169 |
| Number of results reported | 511 | 452 | 415 | 193 | 378 | 338 |
| Number of statistical outliers | 15 | 26 | 14 | 8 | 13 | 12 |
| Percentage outliers | 2.9% | 5.8% | 3.4% | 4.1% | 3.4% | 3.6% |

Table 7: Comparison with previous PTs

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

The performance of the determinations of the proficiency test was compared expressed as relative standard deviation (RSD) of the PTs, see below table.

| | Nov 2017 | Nov 2016 | Nov 2015 | Oct 2014 | Oct 2013 | 2009 - 2012 |
|---|---|---|---|---|---|---|
| Free Formaldehyde | 9-10% | 8-9% | 9-10% | 8% | 10-13% | 7-15% |
| Released Formaldehyde | 7-8% | 9-10% | 17-22% | 10% | 9-10% | n.e. |

Table 8: Comparison of relative uncertainties over the years

The uncertainties, present in the results for the two samples with Free and Released Formaldehyde during the present PT, are fully in line with the uncertainties as observed in previous iis PTs. It is remarkable that the uncertainty of the released determination did improve, while more participants reported a test result than in previous PTs.

### 4.4 EVALUATION OF THE ANALYSIS DETAILS

The reported details of the analytical test methods that were used by the participants are listed in appendix 2. About 82% of the participating laboratories reported to be accredited for the determination of Free and Released Formaldehyde in textile.

For this PT only some analytical details of the determination: Released Formaldehyde were requested. A variety of analytical details was reported.
It appeared that no effect was observed on the reported test results for Released Formaldehyde in sample #17635 nor in sample #17636.

## 5 DISCUSSION

When the results of this interlaboratory study were compared to the Ecolabelling Standards and Requirements for Textiles in EU and with the similar Bluesign® BSSL (Table 9), it was noticed that not all participants would make identical decisions about the acceptability of the textiles for the determined parameters.

| Ecolabel | baby clothes | Öko-Tex 103 in direct skin contact | Öko-Tex 103 no direct skin contact |
|---|---|---|---|
| Bluesign® BSSL | next to skin use | occasional skin contact | no skin contact |
| Free Formaldehyde extractable (mg/kg) | <16 | 75 | 300 |
| Released Formaldehyde ($mg/m^3$) | 0.1 | 0.1 | 0.1 |

Table 9: Bluesign® BSSL and Ecolabelling Standards and Requirements for Textiles in EU

Extractable free formaldehyde:
For sample #17635, 37 of the 184 reporting laboratories would accept the sample for the category: “in direct skin contact” (<75 mg/kg).
Furthermore, all reporting laboratories, would reject the sample for the categories: “baby clothes” and “next to skin use” (<16 mg/kg), but would accept it for the category: “no kin contact” (<300 mg/kg).

For sample #17636, all the reporting laboratories would reject for the category: “in direct skin contact” (<75 mg/kg). All reporting laboratories would accept the sample for the category: “no direct skin contact” (<300 mg/kg).

Released Formaldehyde:
No conclusions can be drawn, as the limits mentioned in the Ecolabel Standard have a different unit compared with test method ISO14184-2:11 ($mg/m^3$ vs mg/kg).

For each of the samples #17635 and #17636, the average of the homogeneity test results is not in line with the average (consensus value) from the PT results. There is a feasible explanation for this.
Most important point to make, is that the goal of the homogeneity testing is different from the goal of the evaluation of the reported test results. To prove the homogeneity of the PT samples, a test method is selected with a high precision (smallest variation). The accuracy (trueness) of the selected test method is less relevant.
Then, the homogeneity testing is done by one single laboratory. The test results of this (ISO/IEC 17025 accredited) laboratory will have a bias (systematic deviation) by definition.
Also, each test result reported by one of the PT participants will have a bias. However, some will have a positive bias and others a negative bias. These different biases compensate each other in the PT average (consensus value). Therefore, the PT consensus value may deviate from the homogeneity test results. At the same time, the accuracy of the PT consensus value is more reliable than the accuracy of the results of the homogeneity test.

## 6 CONCLUSION

In this proficiency test, the Free Formaldehyde and the Released Formaldehyde content were determined. The variation observed for Free Formaldehyde and Released Formaldehyde in this interlaboratory study are in line with observations in the previous proficiency tests. A possible explanation for the variation could be the preparation or the conditioning of the sample and/or by the performance of the analysis by the laboratory. Each laboratory should evaluate its performance in this study and make decisions about necessary corrective actions. Therefore, participation on a regular basis in this scheme could be helpful to improve the performance and thus increase of the quality of the analytical results.

## APPENDIX 1

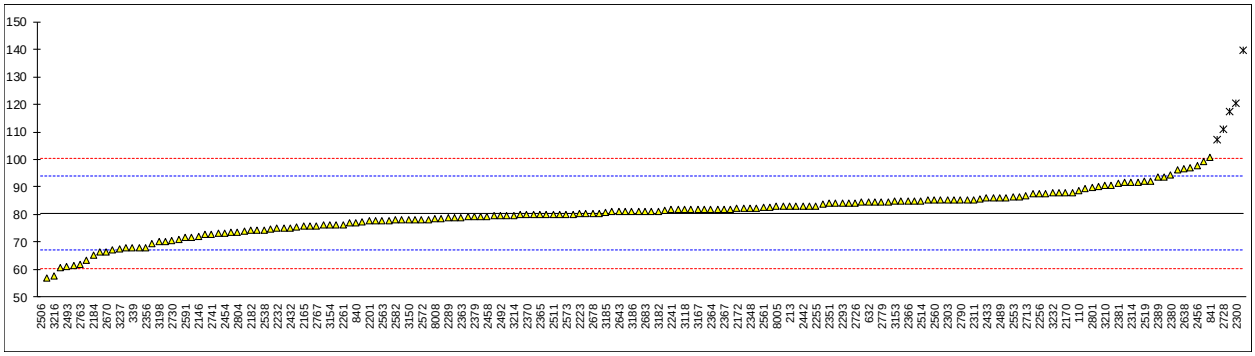
Determination of Free Formaldehyde content on sample #17635; results in mg/kg

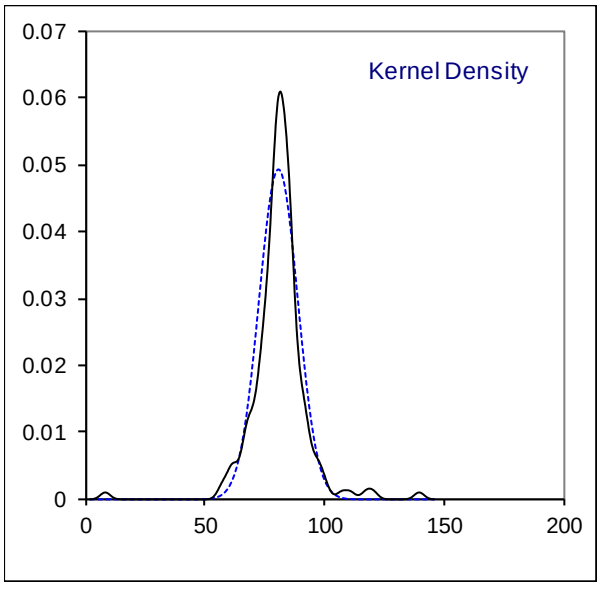
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 110 | ISO14184-1 | 88.812 | | 1.25 | 2380 | ISO14184-1 | 94.3 | | 2.08 |
| 213 | ISO14184-1 | 82.98 | | 0.38 | 2381 | ISO14184-1 | 91.20 | | 1.61 |
| 230 | ISO14184-1 | 61.57 | C | -2.84 | 2385 | ISO14184-1 | 56.8 | | -3.56 |
| 339 | ISO14184-1 | 68 | | -1.88 | 2389 | ISO14184-1 | 93.5 | | 1.96 |
| 348 | In house | 80.00 | | -0.07 | 2390 | ISO14184-1 | 87.70 | | 1.09 |
| 362 | ISO14184-1 | 75.9 | | -0.69 | 2425 | ISO14184-1 | 90.34 | | 1.48 |
| 523 | | ----- | | ----- | 2426 | ISO14184-1 | 85.8 | | 0.80 |
| 551 | ISO14184-1 | 96.40 | | 2.39 | 2429 | ISO14184-1 | 72.8 | | -1.15 |
| 623 | ISO14184-1 | 91.65 | | 1.68 | 2432 | ISO14184-1 | 75.196 | | -0.79 |
| 632 | ISO14184-1 | 84.5640 | | 0.61 | 2433 | ISO14184-1 | 85.97 | | 0.83 |
| 840 | ISO14184-1 | 77 | | -0.52 | 2442 | ISO14184-1 | 83.05 | | 0.39 |
| 841 | | 100.6 | | 3.02 | 2449 | ISO14184-1 | 82 | | 0.23 |
| 1213 | ISO14184-1 | 75.48 | | -0.75 | 2453 | ISO14184-1 | 73.9 | | -0.99 |
| 2115 | ISO14184-1 | 84.1 | | 0.54 | 2454 | ISO14184-1 | 73.2 | | -1.09 |
| 2120 | ISO14184-1 | 73.6 | | -1.03 | 2456 | ISO14184-1 | 97.8 | | 2.60 |
| 2129 | ISO14184-1 | 77.29 | | -0.48 | 2457 | ISO14184-1 | 139.60 | C,R(0.01) | 8.89 |
| 2132 | ISO14184-1 | 80 | | -0.07 | 2458 | ISO14184-1 | 79.37 | | -0.17 |
| 2137 | ISO14184-1 | 79.62 | | -0.13 | 2459 | ISO14184-1 | 91.666 | | 1.68 |
| 2146 | ISO14184-1 | 72.0 | | -1.27 | 2467 | ISO14184-1 | 74.37 | C | -0.92 |
| 2159 | In house | 76.34 | | -0.62 | 2468 | ISO14184-1 | 88.0 | | 1.13 |
| 2165 | ISO14184-1 | 75.9 | | -0.69 | 2474 | ISO14184-1 | 70.1 | | -1.56 |
| 2170 | ISO14184-1 | 88 | | 1.13 | 2475 | ISO14184-1 | 78.19 | | -0.34 |
| 2172 | ISO14184-1 | 82.3 | | 0.27 | 2476 | ISO14184-1 | 80.1 | | -0.06 |
| 2182 | ISO14184-1 | 74.3 | | -0.93 | 2483 | ISO14184-1 | 85 | | 0.68 |
| 2184 | ISO14184-1 | 65.4 | | -2.27 | 2489 | ISO14184-1 | 86.1 | | 0.85 |
| 2201 | ISO14184-1 | 77.80 | | -0.40 | 2492 | ISO14184-1 | 79.6 | | -0.13 |
| 2212 | JIS L1041-B | 74.9 | | -0.84 | 2493 | ISO14184-1 | 61 | | -2.93 |
| 2213 | ISO14184-1 | 92 | | 1.73 | 2504 | ISO14184-1 | 71.7197 | | -1.32 |
| 2221 | ISO14184-1 | 88.0 | | 1.13 | 2506 | ISO14184-1 | 8.09 | R(0.01) | -10.88 |
| 2223 | ISO14184-1 | 80.37 | | -0.02 | 2511 | ISO14184-1 | 80.00 | | -0.07 |
| 2226 | ISO14184-1 | 93.63 | | 1.98 | 2514 | ISO14184-1 | 85.00 | | 0.68 |
| 2232 | ISO14184-1 | 74.952 | | -0.83 | 2519 | ISO14184-1 | 91.9 | | 1.72 |
| 2236 | ISO14184-1 | 78.6046 | | -0.28 | 2532 | ISO14184-1 | 84.71 | | 0.64 |
| 2238 | ISO14184-1 | 78 | | -0.37 | 2538 | B82.02-1 | 74.38 | | -0.92 |
| 2241 | ISO14184-1 | 81.7 | | 0.18 | 2553 | ISO14184-1 | 86.51 | | 0.91 |
| 2247 | ISO14184-1 | 85.2 | | 0.71 | 2560 | ISO14184-1 | 85.1 | | 0.69 |
| 2255 | ISO14184-1 | 83.2 | | 0.41 | 2561 | ISO14184-1 | 82.60 | | 0.32 |
| 2256 | ISO14184-1 | 87.63 | | 1.08 | 2563 | ISO14184-1 | 77.9 | | -0.39 |
| 2261 | GB/T2912 | 76.4 | | -0.61 | 2566 | ISO14184-1 | 80.37 | | -0.02 |
| 2265 | ISO14184-1 | 117.3 | R(0.01) | 5.54 | 2567 | ISO14184-1 | 86.22 | | 0.86 |
| 2269 | ISO14184-1 | 89.52 | | 1.36 | 2572 | ISO14184-1 | 78.1 | | -0.36 |
| 2275 | ISO14184-1 | 76.8 | | -0.55 | 2573 | ISO14184-1 | 80.04 | | -0.07 |
| 2277 | ISO14184-1 | 83.1763 | | 0.41 | 2582 | ISO14184-1 | 77.95 | | -0.38 |
| 2284 | ISO14184-1 | 81.78 | | 0.20 | 2590 | ISO14184-1 | 73.02 | | -1.12 |
| 2289 | GB/T2912 | 79.0 | | -0.22 | 2591 | In house | 71.52 | | -1.35 |
| 2290 | ISO14184-1 | 82.04 | | 0.23 | 2605 | ISO14184-1 | 80.95 | | 0.07 |
| 2293 | ISO14184-1 | 84.090 | | 0.54 | 2609 | GB/T2912 | 77.9 | | -0.39 |
| 2294 | JIS L1041 | 83.78 | C | 0.50 | 2618 | ISO14184-1 | 79.06 | | -0.21 |
| 2295 | ISO14184-1 | 85 | | 0.68 | 2625 | ISO14184-1 | 66.47 | | -2.11 |
| 2300 | ISO14184-1 | 120.3 | C,R(0.01) | 5.99 | 2638 | ISO14184-1 | 96.62 | | 2.43 |
| 2301 | ISO14184-1 | 60.58 | | -2.99 | 2643 | ISO14184-1 | 80.97 | | 0.07 |
| 2303 | ISO14184-1 | 85.21 | | 0.71 | 2644 | ISO14184-1 | 99.3 | | 2.83 |
| 2310 | ISO14184-1 | 84.7 | | 0.63 | 2648 | GB/T2912 | 81.15 | | 0.10 |
| 2311 | ISO14184-1 | 85.43 | | 0.74 | 2670 | ISO14184-1 | 66.5 | | -2.10 |
| 2313 | ISO14184-1 | 84.50 | | 0.60 | 2674 | ISO14184-1 | 69.3 | | -1.68 |
| 2314 | ISO14184-1 | 91.66 | | 1.68 | 2678 | ISO14184-1 | 80.49 | | 0.00 |
| 2330 | ISO14184-1 | 79.57 | | -0.14 | 2683 | GB/T2912 | 81.2 | | 0.11 |
| 2347 | GB/T2912 | 107 | R(0.05) | 3.99 | 2713 | ISO14184-1 | 86.76 | C | 0.94 |
| 2348 | ISO14184-1 | 82.4 | | 0.29 | 2719 | ISO14184-1 | 81.2 | | 0.11 |
| 2350 | ISO14184-1 | 85.28 | | 0.72 | 2726 | ISO14184-1 | 84.3 | | 0.57 |
| 2351 | ISO14184-1 | 84 | | 0.53 | 2728 | ISO14184-1M | 110.80 | R(0.05) | 4.56 |
| 2352 | ISO14184-1 | 78.1 | | -0.36 | 2730 | ISO14184-1 | 70.74 | | -1.46 |
| 2356 | ISO14184-1 | 68.05 | | -1.87 | 2741 | ISO14184-1 | 73 | | -1.12 |
| 2358 | ISO14184-1 | 80.0 | | -0.07 | 2763 | ISO14184-1 | 62 | | -2.78 |
| 2360 | ISO14184-1 | 82.3 | | 0.27 | 2767 | ISO14184-1 | 76 | | -0.67 |
| 2363 | ISO14184-1 | 79 | | -0.22 | 2768 | ISO14184-1 | 86.03 | | 0.83 |
| 2364 | ISO14184-1 | 82 | | 0.23 | 2773 | | ----- | | ----- |
| 2365 | GB/T2912 | 80.0 | | -0.07 | 2779 | ISO14184-1 | 84.7 | | 0.63 |
| 2366 | ISO14184-1 | 85.0 | | 0.68 | 2782 | GB/T2912 | 63.3 | | -2.58 |
| 2367 | ISO14184-1 | 82.04 | | 0.23 | 2789 | ISO14184-1 | 76.04 | | -0.67 |
| 2369 | ISO14184-1 | 79.0 | | -0.22 | 2790 | ISO14184-1 | 85.35 | | 0.73 |
| 2370 | ISO14184-1 | 80.0 | | -0.07 | 2791 | ISO14184-1 | 84.07 | | 0.54 |
| 2374 | ISO14184-1 | 85.4 | | 0.74 | 2792 | ISO14184-1 | 77.86 | | -0.39 |
| 2375 | ISO14184-1 | 80.98 | | 0.08 | 2801 | ISO14184-1 | 89.9 | | 1.42 |
| 2378 | ISO14184-1 | 85.1 | | 0.69 | 2802 | ISO14184-1 | 82.4 | | 0.29 |
| 2379 | ISO14184-1 | 79.19 | | -0.19 | 2804 | JIS L1041 | 73.73 | | -1.01 |

| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 2805 | ISO14184-1 | 79.28 | | -0.18 | 3195 | ISO14184-1 | 67 | | -2.03 |
| 3110 | ST 2016 | 75.0 | | -0.82 | 3197 | ISO14184-1 | 81.4 | | 0.14 |
| 3116 | ISO14184-1 | 82.78 | | 0.35 | 3198 | ISO14184-1 | 70.04 | | -1.57 |
| 3118 | ISO14184-1 | 81.76 | | 0.19 | 3207 | JIS L1041 | 80.0 | | -0.07 |
| 3146 | ISO14184-1 | 71.0 | | -1.42 | 3209 | ISO14184-1 | 80.53 | | 0.01 |
| 3149 | ISO14184-1 | 82.9 | | 0.36 | 3210 | ISO14184-1 | 90.424 | | 1.50 |
| 3150 | ISO14184-1 | 78 | | -0.37 | 3214 | ISO14184-1 | 79.72 | | -0.11 |
| 3153 | ISO14184-1 | 84.92 | | 0.67 | 3216 | ISO14184-1 | 57.8 | | -3.41 |
| 3154 | ISO14184-1 | 76.059 | | -0.66 | 3220 | ISO14184-1 | 90.65 | | 1.53 |
| 3166 | | ----- | | ----- | 3225 | ISO14184-1 | 97 | | 2.48 |
| 3167 | ISO14184-1 | 81.9 | | 0.21 | 3228 | ISO14184-1 | 68.0 | | -1.88 |
| 3172 | ISO14184-1 | 67.9 | | -1.89 | 3232 | ISO14184-1 | 87.98 | | 1.13 |
| 3174 | ISO14184-1 | 87.47 | | 1.05 | 3237 | ISO14184-1 | 67.53 | | -1.95 |
| 3176 | ISO14184-1 | 86.60 | | 0.92 | 3243 | ISO14184-1 | 82 | | 0.23 |
| 3182 | ISO14184-1 | 81.30 | | 0.12 | 3248 | GB/T2912 | 83 | | 0.38 |
| 3185 | ISO14184-1 | 80.63 | | 0.02 | 8005 | JIS L1041-B | 82.85 | | 0.36 |
| 3186 | ISO14184-1 | 81.1 | | 0.09 | 8008 | ISO14184-1 | 78.5 | | -0.30 |
| 3190 | ISO14184-1 | 81.74 | | 0.19 | | | | | |

| | | |
|---|---|---|
| normality | OK | |
| n | 178 | |
| outliers | 6 | |
| mean (n) | 80.478 | |
| st.dev. (n) | 7.8570 | RSD% = 10% |
| R(calc.) | 22.000 | |
| st.dev.(Horwitz) | 6.6522 | |
| R(Horwitz) | 18.626 | |

Lab 230: first reported 107.3
Lab 2294: first reported 56.59
Lab 2300: first reported 128.52
Lab 2457: first reported 123.30
Lab 2467: first reported 136.56
Lab 2713: first reported 59.83



Determination of Released Formaldehyde content on sample #17635; results in mg/kg

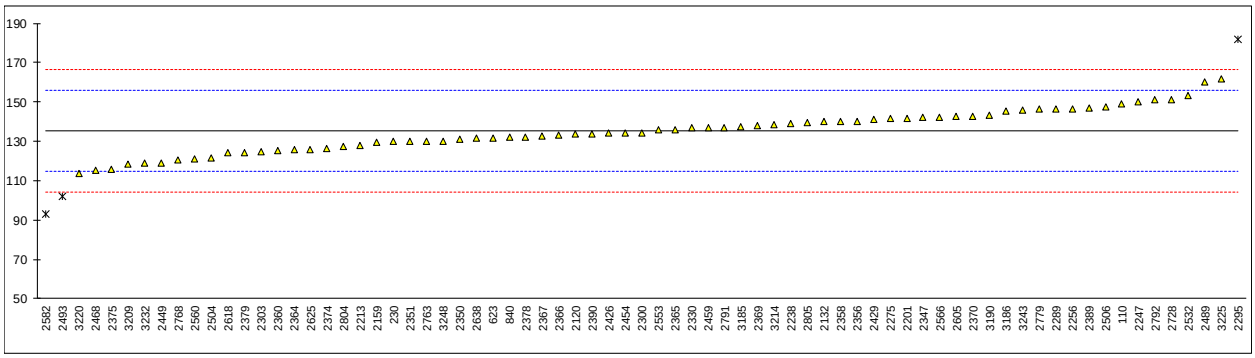
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 110 | ISO14184-2 | 149.188 | | 1.34 | 2380 | | ----- | | ----- |
| 213 | | ----- | | ----- | 2381 | | ----- | | ----- |
| 230 | ISO14184-2 | 129.81 | C | -0.54 | 2385 | | ----- | | ----- |
| 339 | | ----- | | ----- | 2389 | ISO14184-2 | 146.9 | | 1.12 |
| 348 | | ----- | | ----- | 2390 | ISO14184-2 | 133.80 | | -0.15 |
| 362 | | ----- | | ----- | 2425 | | ----- | | ----- |
| 523 | | ----- | | ----- | 2426 | ISO14184-2 | 134.2 | | -0.11 |
| 551 | | ----- | | ----- | 2429 | ISO14184-2 | 140.9 | | 0.54 |
| 623 | ISO14184-2 | 131.80 | | -0.34 | 2432 | | ----- | | ----- |
| 632 | | ----- | | ----- | 2433 | | ----- | | ----- |
| 840 | ISO14184-2 | 132 | | -0.32 | 2442 | | ----- | | ----- |
| 841 | | ----- | | ----- | 2449 | ISO14184-2 | 119 | | -1.58 |
| 1213 | | ----- | | ----- | 2453 | | ----- | | ----- |
| 2115 | | ----- | | ----- | 2454 | ISO14184-2 | 134.2 | | -0.11 |
| 2120 | ISO14184-2 | 133.8 | | -0.15 | 2456 | | ----- | | ----- |
| 2129 | | ----- | | ----- | 2457 | | ----- | | ----- |
| 2132 | ISO14184-2 | 140 | | 0.45 | 2458 | | ----- | | ----- |
| 2137 | | ----- | | ----- | 2459 | ISO14184-2 | 137.0 | | 0.16 |
| 2146 | | ----- | | ----- | 2467 | | ----- | | ----- |
| 2159 | In house | 129.57 | | -0.56 | 2468 | ISO14184-2 | 115.1 | | -1.96 |
| 2165 | | ----- | | ----- | 2474 | | ----- | | ----- |
| 2170 | | ----- | | ----- | 2475 | | ----- | | ----- |
| 2172 | | ----- | | ----- | 2476 | | ----- | | ----- |
| 2182 | | ----- | | ----- | 2483 | | ----- | | ----- |
| 2184 | | ----- | | ----- | 2489 | ISO14184-2 | 160.3 | | 2.41 |
| 2201 | ISO14184-2 | 141.42 | | 0.59 | 2492 | | ----- | | ----- |
| 2212 | | ----- | | ----- | 2493 | ISO14184-2 | 102 | | -3.22 |
| 2213 | ISO14184-2 | 128 | | -0.71 | 2504 | ISO14184-2 | 121.6079 | | -1.33 |
| 2221 | | ----- | | ----- | 2506 | ISO14184-2 | 147.7 | | 1.19 |
| 2223 | | ----- | | ----- | 2511 | | ----- | | ----- |
| 2226 | | ----- | | ----- | 2514 | | ----- | | ----- |
| 2232 | | ----- | | ----- | 2519 | | ----- | | ----- |
| 2236 | | ----- | | ----- | 2532 | ISO14184-2 | 153.4 | | 1.74 |
| 2238 | ISO14184-2 | 139 | | 0.35 | 2538 | | ----- | | ----- |
| 2241 | | ----- | | ----- | 2553 | ISO14184-2 | 135.97 | | 0.06 |
| 2247 | ISO14184-2 | 150.2 | | 1.44 | 2560 | ISO14184-2 | 121.0 | | -1.39 |
| 2255 | | ----- | | ----- | 2561 | | ----- | | ----- |
| 2256 | ISO14184-2 | 146.62 | | 1.09 | 2563 | | ----- | | ----- |
| 2261 | | ----- | | ----- | 2566 | ISO14184-2 | 142.366 | | 0.68 |
| 2265 | | ----- | | ----- | 2567 | | ----- | | ----- |
| 2269 | | ----- | | ----- | 2572 | | ----- | | ----- |
| 2275 | ISO14184-2 | 141.4 | | 0.58 | 2573 | | ----- | | ----- |
| 2277 | | ----- | | ----- | 2582 | ISO14184-2 | 92.99 | R(0.05) | -4.09 |
| 2284 | | ----- | | ----- | 2590 | | ----- | | ----- |
| 2289 | GB/T2912 | 146.4 | | 1.07 | 2591 | | ----- | | ----- |
| 2290 | | ----- | | ----- | 2605 | ISO14184-2 | 142.65 | | 0.71 |
| 2293 | | ----- | | ----- | 2609 | | ----- | | ----- |
| 2294 | | ----- | | ----- | 2618 | ISO14184-2 | 124.32 | | -1.07 |
| 2295 | ISO14184-2 | 182 | R(0.05) | 4.51 | 2625 | AATCC112 | 126.05 | | -0.90 |
| 2300 | ISO14184-2 | 134.35 | | -0.10 | 2638 | ISO14184-2 | 131.65 | | -0.36 |
| 2301 | | ----- | | ----- | 2643 | | ----- | | ----- |
| 2303 | ISO14184-2 | 124.62 | | -1.04 | 2644 | | ----- | | ----- |
| 2310 | | ----- | | ----- | 2648 | | ----- | | ----- |
| 2311 | | ----- | | ----- | 2670 | | ----- | | ----- |
| 2313 | | ----- | | ----- | 2674 | | ----- | | ----- |
| 2314 | | ----- | | ----- | 2678 | | ----- | | ----- |
| 2330 | ISO14184-2 | 136.71 | | 0.13 | 2683 | | ----- | | ----- |
| 2347 | ISO14184-2 | 142 | | 0.64 | 2713 | | ----- | | ----- |
| 2348 | | ----- | | ----- | 2719 | | ----- | | ----- |
| 2350 | AATCC112 | 131.20 | | -0.40 | 2726 | | ----- | | ----- |
| 2351 | ISO14184-2 | 130 | | -0.52 | 2728 | ISO14184-2M | 151.10 | | 1.52 |
| 2352 | | ----- | | ----- | 2730 | | ----- | | ----- |
| 2356 | ISO14184-2 | 140.1 | | 0.46 | 2741 | | ----- | | ----- |
| 2358 | ISO14184-2 | 140.0 | | 0.45 | 2763 | ISO14184-2 | 130 | | -0.52 |
| 2360 | ISO14184-2 | 125.1 | | -0.99 | 2767 | | ----- | | ----- |
| 2363 | | ----- | | ----- | 2768 | ISO14184-2 | 120.29 | | -1.46 |
| 2364 | ISO14184-2 | 126 | | -0.90 | 2773 | | ----- | | ----- |
| 2365 | GB/T2912 | 136.1 | | 0.07 | 2779 | ISO14184-2 | 146.3 | | 1.06 |
| 2366 | ISO14184-2 | 133.3 | | -0.20 | 2782 | | ----- | | ----- |
| 2367 | ISO14184-2 | 132.52 | | -0.27 | 2789 | | ----- | | ----- |
| 2369 | ISO14184-2 | 138.2 | | 0.28 | 2790 | | ----- | | ----- |
| 2370 | ISO14184-2 | 142.7 | | 0.71 | 2791 | ISO14184-2 | 137.03 | | 0.16 |
| 2374 | ISO14184-2 | 126.1 | | -0.89 | 2792 | ISO14184-2 | 150.92 | | 1.51 |
| 2375 | ISO14184-2 | 115.9 | | -1.88 | 2801 | | ----- | | ----- |
| 2378 | ISO14184-2 | 132.1 | | -0.31 | 2802 | | ----- | | ----- |
| 2379 | ISO14184-2 | 124.48 | | -1.05 | 2804 | AATCC112 | 127.64 | | -0.75 |

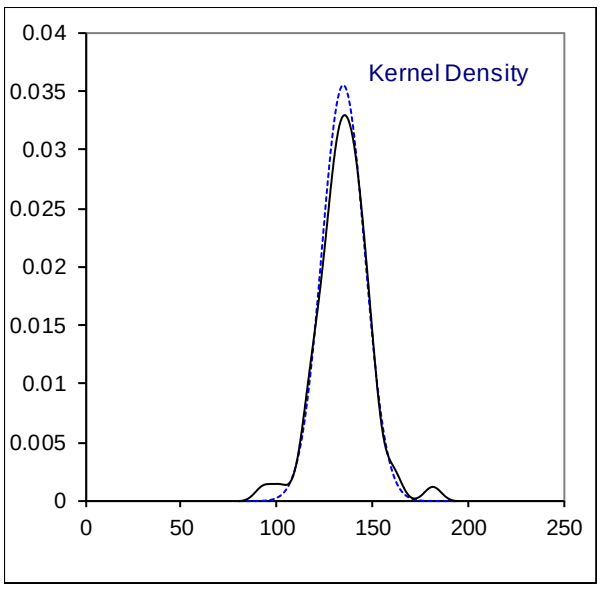
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 2805 | ISO14184-2 | 139.45 | | 0.40 | 3195 | | ----- | | ----- |
| 3110 | | ----- | | ----- | 3197 | | ----- | | ----- |
| 3116 | | ----- | | ----- | 3198 | | ----- | | ----- |
| 3118 | | ----- | | ----- | 3207 | | ----- | | ----- |
| 3146 | | ----- | | ----- | 3209 | ISO14184-2 | 118.52 | | -1.63 |
| 3149 | | ----- | | ----- | 3210 | | ----- | | ----- |
| 3150 | | ----- | | ----- | 3214 | ISO14184-2 | 138.42 | | 0.30 |
| 3153 | | ----- | | ----- | 3216 | | ----- | | ----- |
| 3154 | | ----- | | ----- | 3220 | ISO14184-2 | 113.45 | | -2.12 |
| 3166 | | ----- | | ----- | 3225 | ISO14184-2 | 162 | | 2.58 |
| 3167 | | ----- | | ----- | 3228 | | ----- | | ----- |
| 3172 | | ----- | | ----- | 3232 | ISO14184-2 | 118.70 | | -1.61 |
| 3174 | | ----- | | ----- | 3237 | | ----- | | ----- |
| 3176 | | ----- | | ----- | 3243 | ISO14184-2 | 146 | | 1.03 |
| 3182 | | ----- | | ----- | 3248 | ISO14184-2 | 130 | | -0.52 |
| 3185 | ISO14184-2 | 137.27 | | 0.19 | 8005 | | ----- | | ----- |
| 3186 | ISO14184-2 | 145.1 | | 0.94 | 8008 | | ----- | | ----- |
| 3190 | ISO14184-2 | 143.47 | | 0.78 | | | | | |

| | |
|---|---|
| normality | OK |
| n | 70 |
| outliers | 3 |
| mean (n) | 135.349 |
| st.dev. (n) | 10.5687 |
| R(calc.) | 29.592 |
| st.dev.(Horwitz) | 10.3457 |
| R(Horwitz) | 28.968 |

RSD% = 8%

Lab 230: first reported 202.2



Determination of Free Formaldehyde content on sample #17636; results in mg/kg

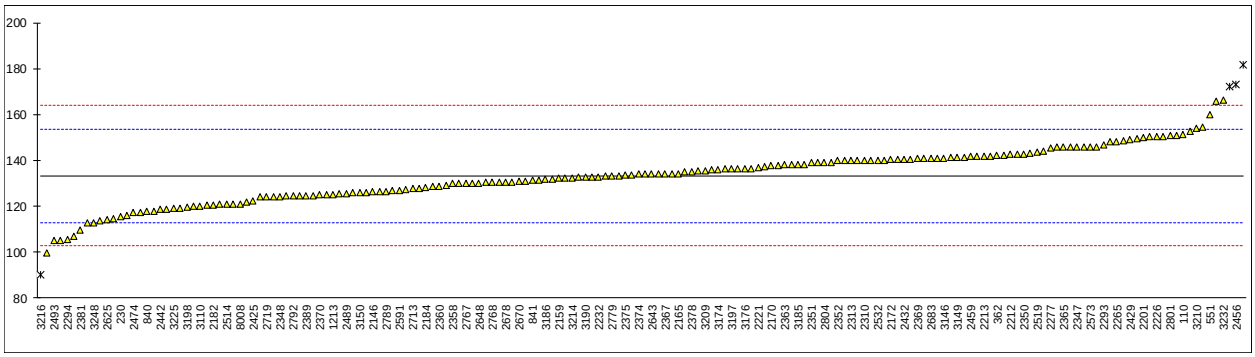
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 110 | ISO14184-1 | 151.102 | | 1.75 | 2380 | ISO14184-1 | 126.1 | C | -0.70 |
| 213 | ISO14184-1 | 127.23 | | -0.59 | 2381 | ISO14184-1 | 109.43 | | -2.34 |
| 230 | ISO14184-1 | 115.32 | C | -1.76 | 2385 | ISO14184-1 | 113.9 | | -1.90 |
| 339 | ISO14184-1 | 130 | | -0.32 | 2389 | ISO14184-1 | 124.7 | C | -0.84 |
| 348 | In house | 150.23 | | 1.66 | 2390 | ISO14184-1 | 130.16 | | -0.30 |
| 362 | ISO14184-1 | 142.3 | | 0.88 | 2425 | ISO14184-1 | 122.15 | | -1.09 |
| 523 | | ----- | | ----- | 2426 | ISO14184-1 | 99.85 | | -3.27 |
| 551 | ISO14184-1 | 160.15 | | 2.63 | 2429 | ISO14184-1 | 148.9 | | 1.53 |
| 623 | ISO14184-1 | 150.55 | | 1.69 | 2432 | ISO14184-1 | 140.580 | | 0.72 |
| 632 | ISO14184-1 | 126.5681 | | -0.66 | 2433 | ISO14184-1 | 137.92 | | 0.46 |
| 840 | ISO14184-1 | 118 | | -1.50 | 2442 | ISO14184-1 | 118.74 | | -1.42 |
| 841 | | 131.2 | | -0.20 | 2449 | ISO14184-1 | 138 | C | 0.46 |
| 1213 | ISO14184-1 | 125.27 | | -0.78 | 2453 | ISO14184-1 | 124.4 | | -0.87 |
| 2115 | ISO14184-1 | 105.2 | | -2.75 | 2454 | ISO14184-1 | 126.7 | | -0.64 |
| 2120 | ISO14184-1 | 134.2 | | 0.09 | 2456 | ISO14184-1 | 173.0 | R(0.05) | 3.89 |
| 2129 | ISO14184-1 | 121.86 | | -1.12 | 2457 | ISO14184-1 | 137.12 | | 0.38 |
| 2132 | ISO14184-1 | 120 | | -1.30 | 2458 | ISO14184-1 | 132.88 | | -0.04 |
| 2137 | ISO14184-1 | 148.27 | | 1.47 | 2459 | ISO14184-1 | 141.666 | | 0.82 |
| 2146 | ISO14184-1 | 126.4 | | -0.67 | 2467 | ISO14184-1 | 136.56 | C | 0.32 |
| 2159 | In house | 132.25 | | -0.10 | 2468 | ISO14184-1 | 131.5 | | -0.17 |
| 2165 | ISO14184-1 | 134.2 | | 0.09 | 2474 | ISO14184-1 | 117.2 | | -1.57 |
| 2170 | ISO14184-1 | 137.66 | | 0.43 | 2475 | ISO14184-1 | 123.99 | | -0.91 |
| 2172 | ISO14184-1 | 140.4 | | 0.70 | 2476 | ISO14184-1 | 132.3 | | -0.10 |
| 2182 | Japan ST2016 | 120.7 | | -1.23 | 2483 | ISO14184-1 | 140 | | 0.66 |
| 2184 | ISO14184-1 | 128.4 | | -0.48 | 2489 | ISO14184-1 | 125.7 | | -0.74 |
| 2201 | ISO14184-1 | 149.95 | | 1.63 | 2492 | ISO14184-1 | 113.0 | | -1.99 |
| 2212 | JIS L1041-B | 142.5 | | 0.90 | 2493 | ISO14184-1 | 105 | | -2.77 |
| 2213 | ISO14184-1 | 142 | | 0.85 | 2504 | ISO14184-1 | 139.2466 | | 0.59 |
| 2221 | ISO14184-1 | 136.8 | | 0.35 | 2506 | ISO14184-1 | 145.9 | | 1.24 |
| 2223 | ISO14184-1 | 165.59 | | 3.17 | 2511 | ISO14184-1 | 144.1 | | 1.06 |
| 2226 | ISO14184-1 | 150.42 | | 1.68 | 2514 | ISO14184-1 | 120.97 | | -1.20 |
| 2232 | ISO14184-1 | 132.891 | | -0.04 | 2519 | ISO14184-1 | 143.6 | | 1.01 |
| 2236 | ISO14184-1 | 141.3587 | | 0.79 | 2532 | ISO14184-1 | 140.0 | | 0.66 |
| 2238 | ISO14184-1 | 142 | | 0.85 | 2538 | B82.02-1 | 130.38 | | -0.28 |
| 2241 | ISO14184-1 | 139.0 | | 0.56 | 2553 | ISO14184-1 | 140.01 | | 0.66 |
| 2247 | | ----- | | ----- | 2560 | ISO14184-1 | 135.75 | | 0.24 |
| 2255 | ISO14184-1 | 131.4 | | -0.18 | 2561 | ISO14184-1 | 140.80 | | 0.74 |
| 2256 | ISO14184-1 | 146.03 | | 1.25 | 2563 | ISO14184-1 | 125.8 | | -0.73 |
| 2261 | GB/T2912 | 140.6 | | 0.72 | 2566 | ISO14184-1 | 136.174 | | 0.28 |
| 2265 | ISO14184-1 | 148.3 | | 1.47 | 2567 | ISO14184-1 | 135.45 | | 0.21 |
| 2269 | ISO14184-1 | 146.09 | | 1.26 | 2572 | ISO14184-1 | 130.32 | | -0.29 |
| 2275 | ISO14184-1 | 130.7 | | -0.25 | 2573 | ISO14184-1 | 146.08 | | 1.25 |
| 2277 | ISO14184-1 | 145.2675 | | 1.17 | 2582 | ISO14184-1 | 120.62 | | -1.24 |
| 2284 | ISO14184-1 | 140.42 | | 0.70 | 2590 | ISO14184-1 | 124.11 | | -0.90 |
| 2289 | GB/T2912 | 133.3 | | 0.00 | 2591 | In house | 126.92 | | -0.62 |
| 2290 | ISO14184-1 | 133.72 | | 0.04 | 2605 | ISO14184-1 | 142.6 | | 0.91 |
| 2293 | ISO14184-1 | 146.59 | | 1.30 | 2609 | GB/T2912 | 145.7 | | 1.22 |
| 2294 | JIS L1041 | 105.55 | | -2.72 | 2618 | ISO14184-1 | 124.7 | | -0.84 |
| 2295 | ISO14184-1 | 172 | R(0.05) | 3.79 | 2625 | ISO14184-1 | 114.03 | C | -1.88 |
| 2300 | ISO14184-1 | 149.4 | | 1.58 | 2638 | ISO14184-1 | 152.86 | | 1.92 |
| 2301 | ISO14184-1 | 107.11 | | -2.56 | 2643 | ISO14184-1 | 134.06 | | 0.08 |
| 2303 | ISO14184-1 | 181.58 | R(0.05) | 4.73 | 2644 | ISO14184-1 | 127.9 | | -0.53 |
| 2310 | ISO14184-1 | 140.0 | | 0.66 | 2648 | GB/T2912 | 130.25 | | -0.30 |
| 2311 | ISO14184-1 | 142.4 | | 0.89 | 2670 | ISO14184-1 | 130.8 | | -0.24 |
| 2313 | ISO14184-1 | 139.9 | | 0.65 | 2674 | ISO14184-1 | 132.03 | | -0.12 |
| 2314 | ISO14184-1 | 141.56 | | 0.81 | 2678 | ISO14184-1 | 130.47 | | -0.27 |
| 2330 | ISO14184-1 | 119.22 | | -1.38 | 2683 | GB/T2912 | 140.8 | | 0.74 |
| 2347 | GB/T2912 | 146 | | 1.25 | 2713 | ISO14184-1 | 127.74 | C | -0.54 |
| 2348 | ISO14184-1 | 124.2 | | -0.89 | 2719 | ISO14184-1 | 124.0 | | -0.91 |
| 2350 | ISO14184-1 | 142.75 | | 0.93 | 2726 | ISO14184-1 | 129 | | -0.42 |
| 2351 | ISO14184-1 | 139 | | 0.56 | 2728 | ISO14184-1M | 148.8 | | 1.52 |
| 2352 | ISO14184-1 | 139.8 | | 0.64 | 2730 | ISO14184-1 | 133.95 | | 0.07 |
| 2356 | ISO14184-1 | 130.95 | | -0.23 | 2741 | ISO14184-1 | 124.5 | | -0.86 |
| 2358 | ISO14184-1 | 130.0 | | -0.32 | 2763 | ISO14184-1 | 125 | | -0.81 |
| 2360 | ISO14184-1 | 128.8 | | -0.44 | 2767 | ISO14184-1 | 130 | | -0.32 |
| 2363 | ISO14184-1 | 138 | | 0.46 | 2768 | ISO14184-1 | 130.33 | | -0.29 |
| 2364 | ISO14184-1 | 133 | | -0.03 | 2773 | | ----- | | ----- |
| 2365 | GB/T2912 | 145.8 | | 1.23 | 2779 | ISO14184-1 | 133.2 | | -0.01 |
| 2366 | ISO14184-1 | 141.9 | | 0.84 | 2782 | GB/T2912 | 116.0 | | -1.69 |
| 2367 | ISO14184-1 | 134.15 | | 0.09 | 2789 | ISO14184-1 | 126.57 | | -0.66 |
| 2369 | ISO14184-1 | 140.8 | | 0.74 | 2790 | ISO14184-1 | 120.83 | | -1.22 |
| 2370 | ISO14184-1 | 124.9 | | -0.82 | 2791 | ISO14184-1 | 143.04 | | 0.96 |
| 2374 | ISO14184-1 | 133.9 | | 0.06 | 2792 | ISO14184-1 | 124.46 | | -0.86 |
| 2375 | ISO14184-1 | 133.6 | | 0.03 | 2801 | ISO14184-1 | 150.7 | | 1.71 |
| 2378 | ISO14184-1 | 135.2 | | 0.19 | 2802 | ISO14184-1 | 132.7 | | -0.06 |
| 2379 | ISO14184-1 | 118.83 | | -1.41 | 2804 | JIS L1041 | 139.05 | | 0.57 |

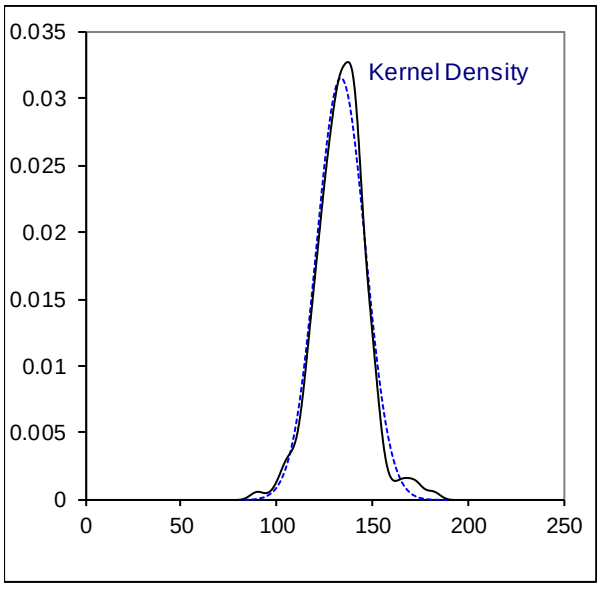
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 2805 | ISO14184-1 | 139.94 | | 0.65 | 3195 | ISO14184-1 | 121 | | -1.20 |
| 3110 | ST2016 | 120.0 | | -1.30 | 3197 | ISO14184-1 | 136.3 | | 0.30 |
| 3116 | ISO14184-1 | 140.87 | | 0.74 | 3198 | ISO14184-1 | 119.71 | | -1.33 |
| 3118 | ISO14184-1 | 118.00 | | -1.50 | 3207 | JIS L1041 | 117.4 | | -1.55 |
| 3146 | ISO14184-1 | 140.9 | | 0.75 | 3209 | ISO14184-1 | 135.52 | | 0.22 |
| 3149 | ISO14184-1 | 141.5 | | 0.81 | 3210 | ISO14184-1 | 154.13 | | 2.04 |
| 3150 | ISO14184-1 | 126 | | -0.71 | 3214 | ISO14184-1 | 132.49 | | -0.08 |
| 3153 | ISO14184-1 | 134.86 | | 0.16 | 3216 | ISO14184-1 | 90.0 | R(0.05) | -4.24 |
| 3154 | ISO14184-1 | 125.546 | | -0.76 | 3220 | ISO14184-1 | 154.64 | | 2.09 |
| 3166 | | ----- | | ----- | 3225 | ISO14184-1 | 119 | | -1.40 |
| 3167 | ISO14184-1 | 136.4 | | 0.31 | 3228 | ISO14184-1 | 128.5 | | -0.47 |
| 3172 | ISO14184-1 | 138.2 | | 0.48 | 3232 | ISO14184-1 | 166.30 | | 3.23 |
| 3174 | ISO14184-1 | 135.91 | | 0.26 | 3237 | ISO14184-1 | 114.82 | | -1.81 |
| 3176 | ISO14184-1 | 136.50 | | 0.32 | 3243 | ISO14184-1 | 151 | | 1.74 |
| 3182 | ISO14184-1 | 134.10 | | 0.08 | 3248 | GB/T2912 | 113 | | -1.99 |
| 3185 | ISO14184-1 | 138.04 | | 0.47 | 8005 | JIS L1041-B | 139.81 | | 0.64 |
| 3186 | ISO14184-1 | 131.7 | | -0.15 | 8008 | ISO14184-1 | 121.0 | | -1.20 |
| 3190 | ISO14184-1 | 132.77 | | -0.05 | | | | | |

| | |
|---|---|
| normality | OK |
| n | 179 |
| outliers | 4 |
| mean (n) | 133.272 |
| st.dev. (n) | 11.5704 |
| R(calc.) | 32.397 |
| st.dev.(Horwitz) | 10.2106 |
| R(Horwitz) | 28.590 |

RSD% = 9%

Lab 230: first reported 199.8
Lab 2380: first reported 98.2
Lab 2389: first reported 91.7
Lab 2449: first reported 88
Lab 2467: first reported 74.37
Lab 2625: first reported 89.37
Lab 2713: first reported 93.81



Determination of Released Formaldehyde content on sample #17636; results in mg/kg

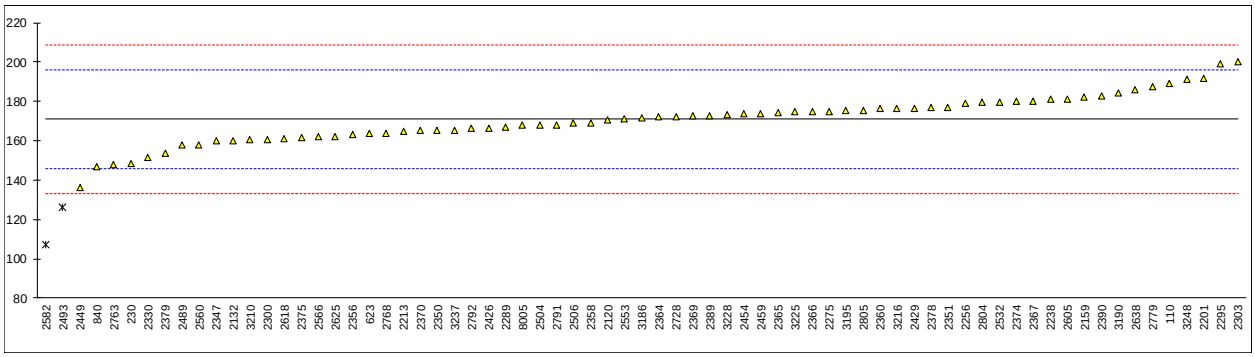
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 110 | ISO14184-2 | 189.274 | | 1.45 | 2380 | | ----- | | ----- |
| 213 | | ----- | | ----- | 2381 | | ----- | | ----- |
| 230 | ISO14184-2 | 148.15 | C | -1.81 | 2385 | | ----- | | ----- |
| 339 | | ----- | | ----- | 2389 | ISO14184-2 | 172.7 | | 0.14 |
| 348 | | ----- | | ----- | 2390 | ISO14184-2 | 182.91 | | 0.95 |
| 362 | | ----- | | ----- | 2425 | | ----- | | ----- |
| 523 | | ----- | | ----- | 2426 | ISO14184-2 | 166.35 | | -0.36 |
| 551 | | ----- | | ----- | 2429 | ISO14184-2 | 176.6 | | 0.45 |
| 623 | ISO14184-2 | 163.65 | | -0.58 | 2432 | | ----- | | ----- |
| 632 | | ----- | | ----- | 2433 | | ----- | | ----- |
| 840 | ISO14184-2 | 147 | | -1.90 | 2442 | | ----- | | ----- |
| 841 | | ----- | | ----- | 2449 | ISO14184-2 | 136 | | -2.77 |
| 1213 | | ----- | | ----- | 2453 | | ----- | | ----- |
| 2115 | | ----- | | ----- | 2454 | ISO14184-2 | 173.8 | | 0.23 |
| 2120 | ISO14184-2 | 170.5 | | -0.03 | 2456 | | ----- | | ----- |
| 2129 | | ----- | | ----- | 2457 | | ----- | | ----- |
| 2132 | ISO14184-2 | 160 | | -0.87 | 2458 | | ----- | | ----- |
| 2137 | | ----- | | ----- | 2459 | ISO14184-2 | 174 | | 0.24 |
| 2146 | | ----- | | ----- | 2467 | | ----- | | ----- |
| 2159 | In house | 182.04 | | 0.88 | 2468 | | ----- | W | ----- |
| 2165 | | ----- | | ----- | 2474 | | ----- | | ----- |
| 2170 | | ----- | | ----- | 2475 | | ----- | | ----- |
| 2172 | | ----- | | ----- | 2476 | | ----- | | ----- |
| 2182 | | ----- | | ----- | 2483 | | ----- | | ----- |
| 2184 | | ----- | | ----- | 2489 | ISO14184-2 | 157.9 | | -1.03 |
| 2201 | ISO14184-2 | 191.87 | | 1.66 | 2492 | | ----- | | ----- |
| 2212 | | ----- | | ----- | 2493 | ISO14184-2 | 126 | R(0.05) | -3.56 |
| 2213 | ISO14184-2 | 165 | | -0.47 | 2504 | ISO14184-2 | 168.0530 | | -0.23 |
| 2221 | | ----- | | ----- | 2506 | ISO14184-2 | 168.98 | | -0.15 |
| 2223 | | ----- | | ----- | 2511 | | ----- | | ----- |
| 2226 | | ----- | | ----- | 2514 | | ----- | | ----- |
| 2232 | | ----- | | ----- | 2519 | | ----- | | ----- |
| 2236 | | ----- | | ----- | 2532 | ISO14184-2 | 179.4 | | 0.67 |
| 2238 | ISO14184-2 | 181 | | 0.80 | 2538 | | ----- | | ----- |
| 2241 | | ----- | | ----- | 2553 | ISO14184-2 | 170.96 | | 0.00 |
| 2247 | | ----- | | ----- | 2560 | ISO14184-2 | 158.16 | | -1.01 |
| 2255 | | ----- | | ----- | 2561 | | ----- | | ----- |
| 2256 | ISO14184-2 | 179.11 | | 0.65 | 2563 | | ----- | | ----- |
| 2261 | | ----- | | ----- | 2566 | ISO14184-2 | 162.31 | | -0.68 |
| 2265 | | ----- | | ----- | 2567 | | ----- | | ----- |
| 2269 | | ----- | | ----- | 2572 | | ----- | | ----- |
| 2275 | ISO14184-2 | 174.8 | | 0.31 | 2573 | | ----- | | ----- |
| 2277 | | ----- | | ----- | 2582 | ISO14184-2 | 107.28 | R(0.01) | -5.05 |
| 2284 | | ----- | | ----- | 2590 | | ----- | | ----- |
| 2289 | GB/T2912 | 166.8 | | -0.33 | 2591 | | ----- | | ----- |
| 2290 | | ----- | | ----- | 2605 | ISO14184-2 | 181.3 | | 0.82 |
| 2293 | | ----- | | ----- | 2609 | | ----- | | ----- |
| 2294 | | ----- | | ----- | 2618 | ISO14184-2 | 161.2 | | -0.77 |
| 2295 | ISO14184-2 | 199 | | 2.23 | 2625 | AATCC112 | 162.37 | | -0.68 |
| 2300 | ISO14184-2 | 160.7 | | -0.81 | 2638 | ISO14184-2 | 186.07 | | 1.20 |
| 2301 | | ----- | | ----- | 2643 | | ----- | | ----- |
| 2303 | ISO14184-2 | 200.29 | | 2.33 | 2644 | | ----- | | ----- |
| 2310 | | ----- | | ----- | 2648 | | ----- | | ----- |
| 2311 | | ----- | | ----- | 2670 | | ----- | | ----- |
| 2313 | | ----- | | ----- | 2674 | | ----- | | ----- |
| 2314 | | ----- | | ----- | 2678 | | ----- | | ----- |
| 2330 | ISO14184-2 | 151.45 | | -1.54 | 2683 | | ----- | | ----- |
| 2347 | ISO14184-2 | 160 | | -0.87 | 2713 | | ----- | | ----- |
| 2348 | | ----- | | ----- | 2719 | | ----- | | ----- |
| 2350 | AATCC112 | 165.16 | | -0.46 | 2726 | | ----- | | ----- |
| 2351 | ISO14184-2 | 177 | | 0.48 | 2728 | ISO14184-2M | 172.2 | | 0.10 |
| 2352 | | ----- | | ----- | 2730 | | ----- | | ----- |
| 2356 | ISO14184-2 | 163.35 | | -0.60 | 2741 | | ----- | | ----- |
| 2358 | ISO14184-2 | 169.0 | | -0.15 | 2763 | ISO14184-2 | 148 | | -1.82 |
| 2360 | ISO14184-2 | 176.3 | | 0.43 | 2767 | | ----- | | ----- |
| 2363 | | ----- | | ----- | 2768 | ISO14184-2 | 163.90 | | -0.56 |
| 2364 | ISO14184-2 | 172 | | 0.09 | 2773 | | ----- | | ----- |
| 2365 | GB/T2912 | 174.5 | | 0.28 | 2779 | ISO14184-2 | 187.4 | | 1.31 |
| 2366 | ISO14184-2 | 174.8 | | 0.31 | 2782 | | ----- | | ----- |
| 2367 | ISO14184-2 | 180.34 | | 0.75 | 2789 | | ----- | | ----- |
| 2369 | ISO14184-2 | 172.6 | | 0.13 | 2790 | | ----- | | ----- |
| 2370 | ISO14184-2 | 165.1 | | -0.46 | 2791 | ISO14184-2 | 168.09 | | -0.22 |
| 2374 | ISO14184-2 | 180.2 | | 0.74 | 2792 | ISO14184-2 | 166.26 | | -0.37 |
| 2375 | ISO14184-2 | 161.4 | | -0.75 | 2801 | | ----- | | ----- |
| 2378 | ISO14184-2 | 177.0 | | 0.48 | 2802 | | ----- | | ----- |
| 2379 | ISO14184-2 | 153.92 | | -1.35 | 2804 | AATCC112 | 179.33 | | 0.67 |

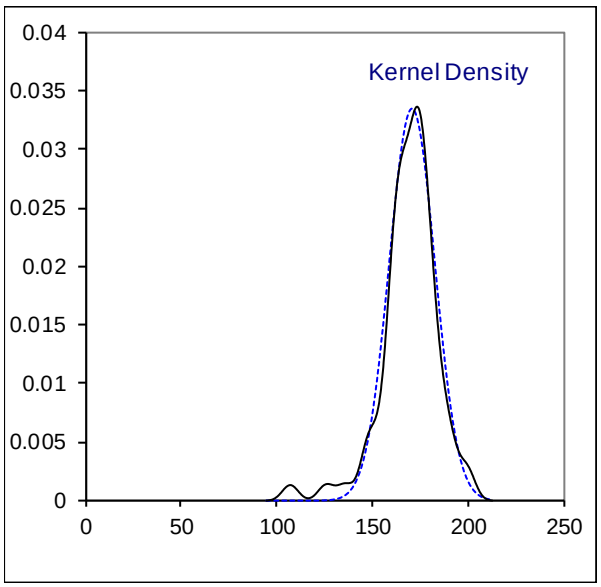
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 2805 | ISO14184-2 | 175.48 | | 0.36 | 3195 | | ----- | | ----- |
| 3110 | | ----- | | ----- | 3197 | | ----- | | ----- |
| 3116 | | ----- | | ----- | 3198 | | ----- | | ----- |
| 3118 | | ----- | | ----- | 3207 | | ----- | | ----- |
| 3146 | | ----- | | ----- | 3209 | ISO14184-2 | 160.53 | | -0.82 |
| 3149 | | ----- | | ----- | 3210 | | ----- | | ----- |
| 3150 | | ----- | | ----- | 3214 | ISO14184-2 | 176.44 | | 0.44 |
| 3153 | | ----- | | ----- | 3216 | | ----- | | ----- |
| 3154 | | ----- | | ----- | 3220 | ISO14184-2 | 174.74 | | 0.30 |
| 3166 | | ----- | | ----- | 3225 | ISO14184-2 | 173 | | 0.16 |
| 3167 | | ----- | | ----- | 3228 | | ----- | | ----- |
| 3172 | | ----- | | ----- | 3232 | ISO14184-2 | 165.33 | | -0.44 |
| 3174 | | ----- | | ----- | 3237 | | ----- | | ----- |
| 3176 | | ----- | | ----- | 3243 | ISO14184-2 | 191 | | 1.59 |
| 3182 | | ----- | | ----- | 3248 | ISO14184-2 | 168 | | -0.23 |
| 3185 | ISO14184-2 | 171.74 | | 0.06 | 8005 | | ----- | | ----- |
| 3186 | ISO14184-2 | 184.6 | | 1.08 | 8008 | | ----- | | ----- |
| 3190 | ISO14184-2 | 175.25 | | 0.34 | | | | | |

| | |
|---|---|
| normality | OK |
| n | 69 |
| outliers | 2 |
| mean (n) | 170.923 |
| st.dev. (n) | 11.9297 |
| R(calc.) | 33.403 |
| st.dev.(Horwitz) | 12.6139 |
| R(Horwitz) | 35.319 |

RSD% = 7%

Lab 230: first reported 250.3
Lab 2468: test result withdrawn, reported 112.1



## APPENDIX 2

| labno | ISO/IEC17025 accredited? | Acetylacetone preparation time to test | Released Formald.: Intake of sample in grams | Released Formald.: volume of water in mls | Released Formald.: temp. and time for colour to develop |
|---|---|---|---|---|---|
| 110 | Yes | 33 days | 1g | 50ml | 49c 20 hrs |
| 213 | Yes | | | | |
| 230 | Yes | Fresh | | | |
| 339 | No | three months ago | | | |
| 348 | Yes | Between 12h and 4days | | | 30 min / 40ºC |
| 362 | Yes | 24 h | | | |
| 523 | --- | | | | |
| 551 | Yes | 21 days | | | |
| 623 | Yes | 1 day | 1 g | 50 | 40 C for 30 minutes |
| 632 | Yes | 24 hours approx | | | |
| 840 | Yes | 12 hours | 1 gram | 50 ml | 40°C, 30 minutes |
| 841 | --- | | | | |
| 1213 | Yes | 07 day | | | |
| 2115 | Yes | immediately | | | |
| 2120 | No | 12 hours | 0,5 g | 50 ml | 40 + 2 ºC ; 30 + 5 min. |
| 2129 | Yes | | | | |
| 2132 | Yes | One Day | 1 gram | around 1L | 40°C 30minutes |
| 2137 | Yes | 24 hours | | | |
| 2146 | Yes | 1 month and 1 week | | | |
| 2159 | Yes | 24 hour | 1 gr | 50 ml | 50 °C, 20 hour |
| 2165 | Yes | 24 hours | | | |
| 2170 | Yes | 18 hours | | | |
| 2172 | Yes | 24 hours | / | / | / |
| 2182 | Yes | | | | |
| 2184 | Yes | 1 day | | | |
| 2201 | Yes | 24 hours | 1g | 50mL | 40°C 30min |
| 2212 | Yes | Used after 24 hours of prep | | | |
| 2213 | Yes | | | | |
| 2221 | Yes | about 3 days (72 hours) | | | |
| 2223 | Yes | same day | | | |
| 2226 | Yes | one week | 2.5 g | 100 ml | 40 C for 60 min |
| 2232 | Yes | WEEKLY | | | |
| 2236 | Yes | 1 Month | | | |
| 2238 | Yes | 12h | 1g | 50ml | 49 °C for 20h |
| 2241 | Yes | 12h | | | |
| 2247 | Yes | 24 hrs | | 50 ml | 40.0 |
| 2255 | Yes | 12 hours | NA | NA | NA |
| 2256 | Yes | 7 days | 1 gram | 50mL | 40 °C for 30 mins |
| 2261 | Yes | Twenty-four hours. | | | |
| 2265 | Yes | | | | |
| 2269 | Yes | 12 hours before use | | | |
| 2275 | Yes | 12 hours. | 1.0000g. | 50ml. | 40 °C and 30 minutes. |
| 2277 | Yes | 24 hours | | | |
| 2284 | Yes | More than 12 hours | | | |
| 2289 | Yes | 2days | 1.00g | 50ml | 40 °C 30minutes |
| 2290 | --- | | | | |
| 2293 | Yes | 9 days | | | |
| 2294 | No | 24 hours | | | |
| 2295 | Yes | 4 days | 1 gram | 50ml | 50C, 20 hours |
| 2300 | Yes | Before 24 hours | 1 gram | 50 ml | 40°C 30 min: 30min at room temperature |
| 2301 | --- | | | | |

| labno | ISO/IEC17025 accredited? | Acetylacetone preparation time to test | Released Formald.: Intake of sample in grams | Released Formald.: volume of water in mls | Released Formald.: temp. and time for colour to develop |
|---|---|---|---|---|---|
| 2303 | No | 24 hours | 1g | 50ml | 40°C for 30 mins, room temp 30 mins. |
| 2310 | Yes | 2 days | | | |
| 2311 | Yes | 3days | | | |
| 2313 | Yes | one day before | | | |
| 2314 | Yes | 12 hours before use. | | | |
| 2330 | Yes | more than 12 hours | 0.5 g | 25 ml | 40 °C and 30 min |
| 2347 | Yes | 12 hours | 1g | 50ml | 49°C, 20h |
| 2348 | --- | | | | |
| 2350 | Yes | 12 hours | 0.5 g | 50 mL | 65 °C, 4 hours |
| 2351 | Yes | About 9 days | weigh 1g | 50ml | At 40 °C for 30 mins |
| 2352 | Yes | 12h | 1g | 100ml | 40°C 30min |
| 2356 | Yes | One day | 1g | 50mL | 49°C for 20hours |
| 2358 | Yes | 1 week before use | 1g | 50 ml | 40 °C and 30 min |
| 2360 | Yes | >12h | 1.0071g / 1.0047g | 50ml | 49°C 20h |
| 2363 | Yes | more than 12hr | 1g | 100ml | 40°C ,30min |
| 2364 | Yes | 12H | 1.0009g | 50ml | 40°C 30 minutes |
| 2365 | Yes | 16 hours | 0.5g | 50mL | 40°C,30min |
| 2366 | Yes | 24 hours | 1g | 50ml | 40°C 30min |
| 2367 | Yes | 12 hours | 1gram | 50ml | 40°C 30 min |
| 2369 | --- | | | | |
| 2370 | Yes | 12hr | 1.0g | 100mL | 1)40°C 2) 30 min |
| 2374 | Yes | 12h | 1.0g | 50ml | 40°C 30min |
| 2375 | Yes | 12 hours | 1 gramme | 50ml | 50 C and 20 hours |
| 2378 | --- | | | | |
| 2379 | No | 12 hr | 20 hr | 50 ml | 40 °C 30 min |
| 2380 | Yes | 12 Hours | | | |
| 2381 | Yes | 2 days ago | | | |
| 2385 | Yes | 48 hours before use | | | |
| 2389 | --- | | | | |
| 2390 | Yes | 24 hrs | 1 g | 50 ml | 40 C for 30 min |
| 2425 | Yes | One week | | | |
| 2426 | Yes | 1 day before | | | |
| 2429 | Yes | one week | 1g | 50ml | 49°C, 30min |
| 2432 | No | 12h | | | |
| 2433 | Yes | 12 hours | | | |
| 2442 | Yes | 1 day | | | 40 °C & 60 min |
| 2449 | Yes | | | | |
| 2453 | Yes | 15 days | 1.5g | | |
| 2454 | Yes | 12 h before use | 1 g | 50 ml | 49°C, 20h (oven); 40°C, 30 min |
| 2456 | Yes | 3 days | | | |
| 2457 | Yes | 2 weeks | | | |
| 2458 | Yes | 3 weeks | | | |
| 2459 | Yes | 1 week | 5 ml of extract | 50 ml | 40°C for 30 minutes |
| 2467 | No | 48 h | 1g | | |
| 2468 | Yes | 1 week | 1g | 50 ml | 40 °C / 30 mins |
| 2474 | Yes | 24 hours before use | | | |
| 2475 | Yes | min 18H | | | |
| 2476 | Yes | 2 DAYS | | | |
| 2483 | Yes | | | | |
| 2489 | Yes | 5 days before use | 1 g | 50 ml | 40°C ± 2°C, 30 Mins |
| 2492 | Yes | More than 12 hours | | | |
| 2493 | --- | | | | |

| labno | ISO/IEC17025 accredited? | Acetylacetone preparation time to test | Released Formald.: Intake of sample in grams | Released Formald.: volume of water in mls | Released Formald.: temp. and time for colour to develop |
|---|---|---|---|---|---|
| 2504 | Yes | 3 days | 1 g | 50 mL | 40.1 C , 30 mins |
| 2506 | Yes | within 1 week | 1.0007 g | 50 ml | 40.2°C : 30 min |
| 2511 | Yes | 12 H | | | |
| 2514 | Yes | 15 Hours | | | |
| 2519 | No | prepared on the test day | | | |
| 2532 | Yes | 1 day before | 0.5gm | 25 ml | 49±1°C for 20 h (oven) 40 °C for 30 mints. |
| 2538 | Yes | 1 hour before | | | |
| 2553 | Yes | 12hours | 1.0g | 50ml | 49°C for 20hrs |
| 2560 | Yes | 24 hours | 1.001 gm | 50 ml | 40 °C, 30 min |
| 2561 | Yes | 4 weeks | | | |
| 2563 | Yes | | | | |
| 2566 | Yes | After 12 hrs | 1gm | 50 ml | 40 C for 30 min |
| 2567 | Yes | 1 day | between 0.5 - 1.0085 g | | |
| 2572 | --- | | | | |
| 2573 | Yes | 24 hours. | | | |
| 2582 | Yes | 2 days | 1.00 g | 50 ml | 40 °C, 30min |
| 2590 | Yes | Immediately before use | | | |
| 2591 | Yes | 2 days | | | |
| 2605 | Yes | 12h | 1g | 50ml | 40°C 30min |
| 2609 | Yes | 2 days | | | |
| 2618 | Yes | 24 Hours | 1 gram | 50 ml | 40°C 30 minutes |
| 2625 | Yes | | | | |
| 2638 | No | one week before | 0.8-0.9 gm | 50 ml | 40 C, 30 min |
| 2643 | Yes | 12 ~ 24 hours | | | |
| 2644 | Yes | 1 HOUR | | | |
| 2648 | --- | | | | |
| 2670 | Yes | 24 hours | | | |
| 2674 | Yes | about 36 hours | | | |
| 2678 | Yes | 1 week | | | |
| 2683 | --- | | | | |
| 2713 | No | | 50 hours | | |
| 2719 | Yes | 24 hours | | | |
| 2726 | Yes | before two days | | | |
| 2728 | Yes | 24 hours | 1 gram | 50 | 49 |
| 2730 | No | 9 days | | | |
| 2741 | Yes | 12h | / | / | 40 C, 30 min |
| 2763 | Yes | 12 Hours | 1.0019 g | 50 ml | 40 C, 30 min |
| 2767 | No | 1 | | | |
| 2768 | Yes | 24 hours | 0.5 g | 50 mL | |
| 2773 | --- | | | | |
| 2779 | Yes | Two Day | 1 gm | 50ml | 49°C for 20 h (oven) 40 °C for 30 mints. |
| 2782 | Yes | 24h | 1g | 100ml | 40℃ 1h |
| 2789 | No | 5 days | | | |
| 2790 | Yes | 13 hours | | | |
| 2791 | Yes | 17 hours | 1.0012 g | 50 ml | 40°C for 30 minutes |
| 2792 | No | 1 day before use. | 1 gram. | 50 mL. | 40°C for 30 minutes |
| 2801 | Yes | 24 hour before | 1g | 100 ml | at 40°C and 30 minutes |
| 2802 | No | A day ago | | | |
| 2804 | Yes | 12 Hours Before Use | 1 gram | 50 ml | 58°C and 6 Minutes |
| 2805 | Yes | 1 day | 1.00g | 50ml | 40 °C, 30 minutes |
| 3110 | --- | | | | |
| 3116 | Yes | 1 day before | | | |

| labno | ISO/IEC17025 accredited? | Acetylacetone preparation time to test | Released Formald.: Intake of sample in grams | Released Formald.: volume of water in mls | Released Formald.: temp. and time for colour to develop |
|---|---|---|---|---|---|
| 3118 | Yes | 24 hours | | | |
| 3146 | Yes | | | | |
| 3149 | Yes | 1 day | | | |
| 3150 | Yes | 24 h | | | |
| 3153 | Yes | 12 hours before use | NA | NA | NA |
| 3154 | Yes | 8 days | 0,5 g | 50 | 40 °C for 60 min |
| 3166 | --- | | | | |
| 3167 | Yes | 24h | 1g | 100ml | 40 |
| 3172 | Yes | | | | 40°C-30min |
| 3174 | Yes | 24 hrs | - | - | - |
| 3176 | Yes | 12 hrs | - | - | - |
| 3182 | Yes | 48hrs | 1g | 50ml | 40°C-30min |
| 3185 | Yes | 12hours | 1g | 50ml | 40°C-30min |
| 3186 | Yes | 1 day before | 1 gm | 50 ml | 40°C and 30mins |
| 3190 | Yes | 1 week | 1.00g | 50ml | 40°C-30min |
| 3195 | Yes | 24 h | | | |
| 3197 | Yes | At least 12 hours | | | |
| 3198 | Yes | 24 hours before start. | | | |
| 3207 | Yes | No more than 1 week. | 1 gram. | Distilled water 100 ml | 40 °C 60 min. |
| 3209 | Yes | 24 hours | 1.0056g | 50 mL | 40°C-30min |
| 3210 | --- | | | | |
| 3214 | Yes | > 12hrs | 1 g | 50 mL | 40°C , 30 mins |
| 3216 | --- | | | | |
| 3220 | Yes | 1 day before | 5 ml | 50 ml | 40 degree C / 30 min |
| 3225 | Yes | 12 hours before | 1 gram | 50 ml | 40oC, 30mins |
| 3228 | Yes | more than 12hours | | | |
| 3232 | Yes | 12 hours | 1 gram | 50 ml | 49 °C and 20 hours |
| 3237 | Yes | Before two day | | | |
| 3243 | Yes | - | 1g | 50 ml | - |
| 3248 | Yes | at least 12 hours | 1g | 50 mL | 40°C-30min |
| 8005 | Yes | Freshly prepared | | | |
| 8008 | --- | | | | |

## APPENDIX 3

### Number of participants per country

9 labs in BANGLADESH
1 lab in BRAZIL
1 lab in BULGARIA
2 labs in CAMBODIA, Kingdom of
1 lab in CROATIA
1 lab in CZECH REPUBLIC
1 lab in EGYPT
1 lab in FINLAND
4 labs in FRANCE
11 labs in GERMANY
1 lab in GUATEMALA
15 labs in HONG KONG
1 lab in HUNGARY
16 labs in INDIA
6 labs in INDONESIA
5 labs in ITALY
5 labs in KOREA
2 labs in MAURITIUS
4 labs in MEXICO
1 lab in MOROCCO
42 labs in P.R. of CHINA
7 labs in PAKISTAN
1 lab in PERU
2 labs in PHILIPPINES
2 labs in PORTUGAL
1 lab in ROMANIA
2 labs in SINGAPORE
1 lab in SLOVENIA
4 labs in SPAIN
2 labs in SRI LANKA
1 lab in SWITZERLAND
3 labs in TAIWAN R.O.C.
5 labs in THAILAND
2 labs in TUNISIA
9 labs in TURKEY
4 labs in U.S.A.
3 labs in UNITED KINGDOM
8 labs in VIETNAM

## APPENDIX 4

**Abbreviations**:

C = final 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
n.a. = not applicable
n.d. = not detected
n.e. = not evaluated
W = test result withdrawn on request of participant
ex = test result excluded from the statistical evaluation

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