Results of Proficiency Test
Phthalates in Leather
March 2021

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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1 INTRODUCTION

Phthalates is a restricted substance in a lot of applications. In the EU Phthalates are restricted in polymers by Regulation EC 1907/2006 Annex XVII with a limit of 0.1% M/M. Furthermore, some Ecolabel organizations have restrictions for the use of Phthalates in consumer items like Textile and Leather. The Oekotex® for Leather label has a limit for Phthalates of 0.05% M/M and the Bluesign® has a limit of 50 mg/kg.

Since 2017 the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for the determination of Phthalates in Leather every year. During the annual proficiency testing program of 2020/2021 it was decided to continue the proficiency test for the analysis of Phthalates in Leather.

In this interlaboratory study 50 laboratories in 23 countries registered for participation. See appendix 4 for the number of participants per country. In this report the results of this 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 analyzes for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC17025 accredited laboratory. It was decided to send two different leather samples of 3 grams each labelled #21515 and #21516. The samples were positive on some Phthalates. The participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 QUALITY SYSTEM

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, has implemented a quality system based on ISO/IEC17043:2010. 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 a 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 black grinded leather was selected which was made positive for Di-(2-ethylhexyl) phthalate (DEHP) and Di-iso-nonyl phthalate (DINP) by iis. After homogenization the batch was divided over 80 subsamples in small bags of approximately 3 grams each and labelled #21515.
The homogeneity of the subsamples was checked by determination of DEHP and DINP in accordance with test method ISO/TS16181 on 7 stratified randomly selected subsamples.

	DEHP in %M/M	DINP in %M/M
Sample #21515-1	0.0963	0.0833
Sample #21515-2	0.1041	0.0931
Sample #21515-3	0.1021	0.0925
Sample #21515-4	0.0911	0.0835
Sample #21515-5	0.0945	0.0916
Sample #21515-6	0.0989	0.0889
Sample #21515-7	0.0970	0.0855

Table 1: homogeneity test results of the subsamples #21515

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

	DEHP in %M/M	DINP in %M/M
r (observed)	0.0124	0.0119
reference method	iis memo 1701*)	iis memo 1701*)
0.3 x R (reference method)	0.0131	0.0119

Table 2: evaluation of repeatabilities of the subsamples #21515

*) see literature 15

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

A second batch of a red grinded leather was selected which was made positive for Benzyl butyl phthalate (BBP) and Dibutyl phthalate (DBP) by iis. After homogenization the batch was divided over 80 subsamples in small bags of approximately 3 grams each and labelled #21516.
The homogeneity of the subsamples was checked by determination of BBP and DBP in accordance with test method ISO/TS16181 on 8 stratified randomly selected subsamples.

	BBP in %M/M	DBP in %M/M
Sample #21516-1	0.1553	0.1751
Sample #21516-2	0.1542	0.1765
Sample #21516-3	0.1530	0.1765
Sample #21516-4	0.1660	0.1818
Sample #21516-5	0.1506	0.1562
Sample #21516-6	0.1480	0.1629
Sample #21516-7	0.1558	0.1753
Sample #21516-8	0.1498	0.1649

Table 3: homogeneity test results of the subsamples #21516

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

	BBP in %M/M	DBP in %M/M
r (observed)	0.0155	0.0245
reference method	iis memo 1701*)	iis memo 1701*)
0.3 x R (reference method)	0.0207	0.0230

Table 4: evaluation of repeatabilities of the subsamples #21516

*) see literature 15

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

To each of the participating laboratories one sample labelled #21515 and one sample labelled #21516 was sent on January 27, 2021.

2.5 ANALYZES

The participants were requested to determine on both samples #21515 and #21516, sixteen individual Phthalates (see appendices 1 and 2) and eventually other Phthalates when identified. It was also requested to report if the laboratory was accredited for the requested components and some method details were asked.
Furthermore, to ensure the homogeneity it was requested to not use less than 0.5 gram per determination. And not to dry or age the sample, nor determine volatile matter.

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

To get comparable test results, a detailed report form and a letter of instructions are prepared. On the report form the reporting units are given as well as the reference test methods that will be used during the evaluation. The detailed report form and the letter of instructions are both made available on the data entry portal www.kpmd.co.uk/sgs-iis-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 participants were gathered via the data entry portal www.kpmd.co.uk/sgs-iis-cts/. The reported test results are tabulated per sample and determination in appendices 1 and 2 of this report. The laboratories are presented by the 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 the data analysis and the original results are placed under 'Remarks' in the result tables in appendices 1 or 2. 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 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 (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, 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 by division with 2.8. In case no literature reproducibility was available, other target values are used, like 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 should be done in order to evaluate whether the reported test results are fit-for-purpose.

The z-scores were calculated according to:

$z_{(target)}$ = (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

During the execution of this proficiency test some problems occurred with the dispatch of the samples due to the COVID-19 pandemic. Therefore, the reporting time on the data entry portal was extended with another week. Four participants did not report any test results and three other participants reported the test results after the extended final reporting date. Not all laboratories were able to report all components requested.
Finally, 46 laboratories reported 256 numerical test results. Observed were 12 outlying test results, which is 4.7%. In proficiency studies outlier percentages of 3% - 7.5% are quite normal.

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

4.1 EVALUATION PER SAMPLE AND PER COMPONENT

In this section the reported test results are discussed per sample and per component. 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 reported test results in appendix 1. The abbreviations, used in these tables, are explained in appendix 5.

For many years iis organizes PTs on Phthalates in Polymers. In 2017 it was decided for the Phthalates in polymers PT to use the iis PT data to estimate a more realistic target

reproducibility (see iis memo 1701, lit. 15). The target reproducibility was estimated as the relative standard deviation (16%) of the mean multiplied by 2.8.
Test method ISO/TS16181 provides a variety of precision data and therefore it was decided to continue to use the estimated iis target reproducibility from the polymers PT also for the Leather PT. It is observed that the previous iis Leather PT data is in line with the estimated target reproducibility from PTs on Phthalates in Polymers, see table 8 for the observed relative standard deviations over the years.
Please note that the target reproducibility from iis memo 1701 has also been used for the textile PT on Phthalates.

Sample #21515

DEHP: The determination may be problematic at the level of 0.08 %M/M. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the reproducibility derived from iis memo 1701.

DBP: The determination may be problematic at the level of 0.01 %M/M. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the reproducibility derived from iis memo 1701.

DIDP: The determination may be problematic at the level of 0.02 %M/M. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the reproducibility derived from iis memo 1701.

DINP: The determination may be problematic at the level of 0.08 %M/M. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the reproducibility derived from iis memo 1701.

For all other Phthalates the group of participants agreed on a concentration close to or below than 0.005 %M/M. Therefore, these Phthalates were not further evaluated. The reported test results are given in appendix 2.

Sample #21516

BBP: The determination was not problematic at the level of 0.16 %M/M. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the reproducibility derived from the iis memo 1701.

DBP: The determination was not problematic at the level of 0.12 %M/M. One statistical outlier was observed and one other test result was excluded. The calculated reproducibility after rejection of the suspect data is in agreement with the reproducibility derived from the iis memo 1701.

For all other Phthalates the group of participants agreed on a concentration close to or below than 0.005 %M/M. Therefore, these Phthalates were not further evaluated. The reported test results are given in appendix 2.

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 test method are presented in the next table.

Component	unit	n	average	2.8 * sd	R(target)
DEHP	%M/M	44	0.082	0.043	0.037
DBP	%M/M	38	0.010	0.006	0.004
DIDP	%M/M	32	0.019	0.020	0.008
DINP	%M/M	41	0.084	0.043	0.038

Table 5: reproducibilities of tests for sample #21515

Component	unit	n	average	2.8 * sd	R(target)
BBP	%M/M	44	0.157	0.076	0.070
DBP	%M/M	44	0.116	0.054	0.052

Table 6: reproducibilities of tests for sample #21516

Without further statistical calculations, it can be concluded that the total group of participating laboratories may have difficulties with the analysis of Phthalates in leather, see also the discussion in paragraphs 4.1 and 5.

4.3 COMPARISON OF THE PROFICIENCY TEST OF MARCH 2021 WITH PREVIOUS PTS

	March 2021	May 2020	May 2019	April 2018	April 2017
Number of reporting laboratories	46	42	54	66	41
Number of test results	256	180	224	123	127
Number of statistical outliers	12	5	10	2	9
Percentage of statistical outliers	4.7%	2.8%	4.5%	1.6%	7.1%

Table 7: comparison with previous proficiency tests

The performance of the determinations of the proficiency test was compared, expressed as relative standard deviation (RSD) of the PTs over the years and to the target method, see below table.

Component	March 2021	May 2020	May 2019	April 2018	April 2017	iis memo 1701
BBP	17%	22%	n.e.	16%	13%	16%
DEHP	19%	25%	n.e.	n.e.	n.e.	16%
DBP	17-21%	n.e.	n.e.	n.e.	18%	16%
DIDP	38%	n.e.	21%	n.e.	n.e.	16%
DINP	18%	n.e.	29%	n.e.	n.e.	16%
DCHP	n.e.	16%	n.e.	21%	n.e.	16%
DEP	n.e.	23-27%	n.e.	n.e.	n.e.	16%
DMP	n.e.	n.e.	33-46%	n.e.	n.e.	16%
DNHP	n.e.	n.e.	14%	n.e.	n.e.	16%
DIBP	n.e.	n.e.	n.e.	n.e.	16%	16%

Table 8: development of uncertainties over the years

The uncertainty (RSD) of the PT is in line with previous PTS and except for DIDP in line with the target method, see also the discussion in paragraph 5.

4.4 EVALUATION OF THE ANALYTICAL DETAILS

For this PT some analytical details were requested. The answers are given in appendix 3. Based on the answers given by the participants the following can be summarized:
- About 90% of the reporting participants mentioned that they are accredited for the determination of Phthalates in Leather.
- About 58% of the reporting participants used a test portion between 0.5 and 1 grams. About 30% used less sample material and about 12% used a sample intake of 2 – 3 grams.
- About 88% of the reporting participants used an extraction time of 60 minutes.
- About 90% of the reporting participants used an extraction temperature of 50°C or 60°C.
- About 38% of the reporting laboratories used Hexane/Acetone as solvent mixture to release the Phthalates. Another part of the group used THF/Hexane (38%), THF (12%) or other mixtures such as THF/Acetonitrile or Toluene as solvent (8%).

Looking at the analytical details, it may be remarkable that several participants used a sample intake of less than 0.5 grams. This deviates with the instruction “Please note, to ensure the homogeneity, do not use less than 0.5 gram per determination” in the accompanied letter of instructions. Method ISO/TS16181:11 describes a sample intake of 2 grams. Test method CPSC-CH-C1001-09.3 mentions an intake of only 0.05 gram. However, this test method describes also that 10 mL of THF can be added for every 0.1 gram of extra sample intake.

Looking at the statistical evaluation of the components of both samples, the group is almost within the target reproducibility for these components. Therefore, the use of different solvent mixtures to release the Phthalates does not have a significant effect on the reproducibility nor on the released Phthalates.

5 DISCUSSION

During the PT an email was received about the quantification of DIDP in relation to the quantification of DINP. DINP can be quantified by two calibration standards, both CAS numbers are mentioned on the report form of the PT. The standard containing DINP of CAS number 28553-12-0 contains also DIDP. The confusion caused by this standard may have contributed to the larger observed reproducibility in this PT for DIDP. Therefore, iis advise to discuss this subject with the analytical working group on the analysis of DINP and DIDP.

In this proficiency test for the determination of Phthalates in Leather, it was noticed that the majority of the participants were able to detect the Phthalates present in sample #21515 and sample #21516.

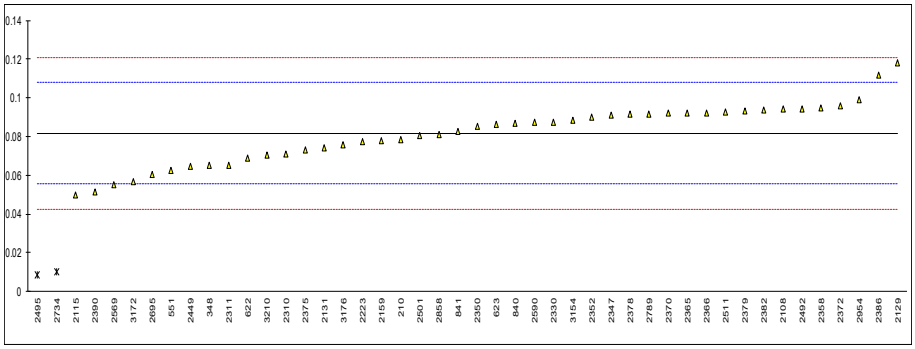
6 CONCLUSION

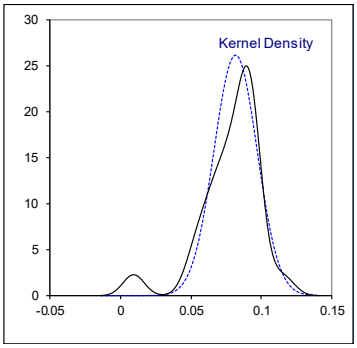
Although it can be concluded that most of the participants have no problem with the determination on Phthalates in Leather in this PT, each participating laboratory will have to evaluate its performance in this study and decide about any corrective actions if necessary. Therefore, participation on a 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 DEHP - Di-(2-ethylhexyl) phthalate on sample #21515; results in %M/M

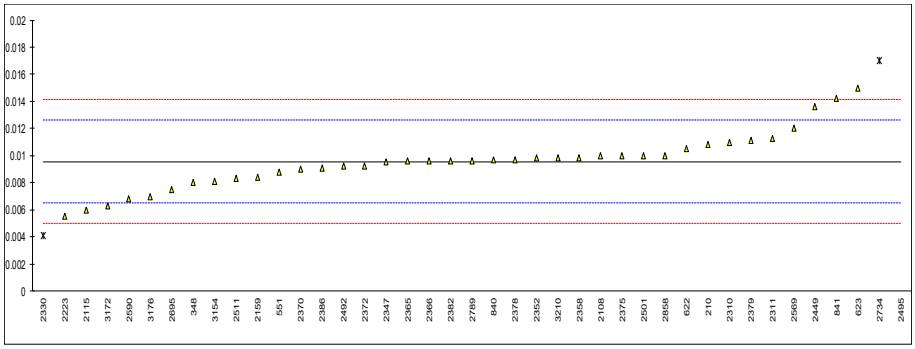
lab	method	value	mark	z(targ)	remarks
210	CPSC-CH-C1001-09.4	0.078281		-0.26	
348	CPSC-CH-C1001-09.4	0.06492		-1.28	
551	In house	0.06237		-1.47	
622	ISO/TS 16181	0.0689		-0.97	
623	ISO14389	0.0865		0.37	
840	In house	0.0869		0.40	
841	In house	0.08248		0.07	
2108	ISO14389	0.094		0.95	
2115	ISO14389	0.05		-2.42	
2129	ISO14389	0.118		2.78	
2131	In house	0.074		-0.58	
2159	ISO/TS 16181	0.0778		-0.29	
2223	In house	0.07743		-0.32	
2310	ISO/TS 16181	0.071		-0.81	
2311	ISO14389	0.0652		-1.26	
2330	ISO/TS 16181	0.0875		0.45	
2347	ISO/TS 16181	0.0910		0.72	
2350	CPSC-CH-C1001-09.4	0.0853		0.28	
2352	ISO/TS 16181	0.0901		0.65	
2358	ISO/TS 16181	0.09487		1.01	
2365	ISO/TS 16181	0.0922		0.81	
2366	ISO14389	0.0923		0.82	
2370	CNS15138-1	0.0920		0.79	
2372	ISO14389	0.09597	C	1.10	first reported: 959.7 %M/M
2375	ISO/TS 16181	0.073		-0.66	
2378	ISO/TS 16181	0.0915		0.76	
2379	ISO/TS 16181	0.0930		0.87	
2382	ISO14389	0.0936		0.92	
2386	ISO/TS 16181	0.1119		2.32	
2390	ISO14389	0.0513		-2.32	
2449	ISO/TS 16181	0.0648		-1.29	
2455		-----		-----	
2492	In house	0.0943		0.97	
2495	ISO14389	0.0085	R(0.01)	-5.60	
2501	ISO/TS 16181	0.0806		-0.08	
2511	ISO/TS 16181	0.0927		0.85	
2569	ISO/TS 16181	0.055		-2.04	
2582		-----		-----	
2590	ISO/TS 16181	0.0874		0.44	
2695	ISO/TS 16181	0.06026		-1.64	
2734	ISO/TS 16181	0.010	R(0.01)	-5.48	
2789	CPSC-CH-C1001-09.4	0.0915		0.76	
2806		-----		-----	
2858	ISO14389	0.081		-0.05	
2945		-----		-----	
2954	In house	0.099		1.33	
3154	ISO16181-1 Draft	0.0884		0.52	
3172	ISO8124-6	0.05665	C	-1.91	first reported: <0.005
3176	ISO/TS 16181	0.076	C	-0.43	first reported: 762.66 %M/M
3210	In house	0.0707		-0.84	
	normality	OK			
	n	44			
	outliers	2			
	mean (n)	0.08163			
	st.dev. (n)	0.015261	RSD = 19%		
	R(calc.)	0.04273			
	st.dev.(iis memo 1701)	0.013060			
	R(iis memo 1701)	0.03657			

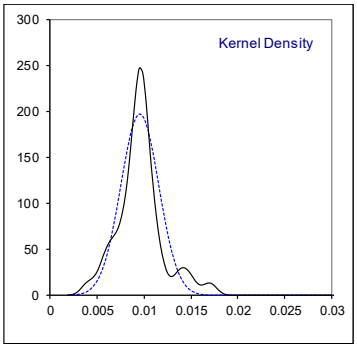




Determination of DBP - Dibutyl phthalate on sample #21515; results in %M/M

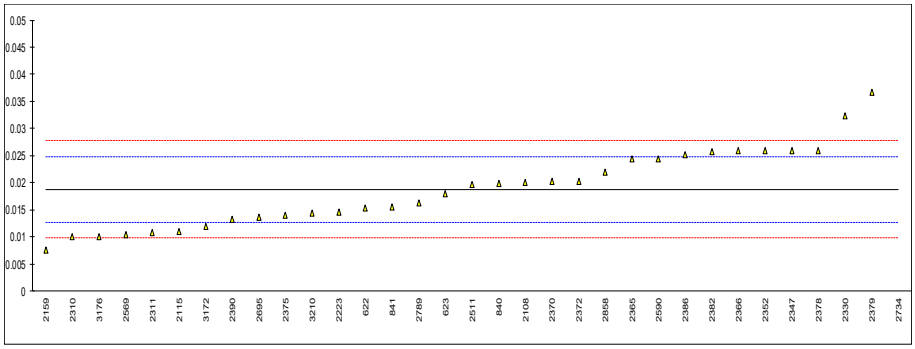
lab	method	value	mark	z(targ)	remarks
210	CPSC-CH-C1001-09.4	0.010823		0.82	
348	CPSC-CH-C1001-09.4	0.00804		-1.00	
551	In house	0.00877		-0.52	
622	ISO/TS 16181	0.0105		0.61	
623	ISO14389	0.0150		3.55	
840	In house	0.0097		0.09	
841	In house	0.0142		3.03	
2108	ISO14389	0.01		0.28	
2115	ISO14389	0.006		-2.33	
2129		-----		-----	
2131	In house	not detected		-----	
2159	ISO/TS 16181	0.0084		-0.76	
2223	In house	0.00555		-2.62	
2310	ISO/TS 16181	0.011		0.94	
2311	ISO14389	0.0113		1.13	
2330	ISO/TS 16181	0.0041	R(0.01)	-3.57	
2347	ISO/TS 16181	0.0095		-0.04	
2350		-----		-----	
2352	ISO/TS 16181	0.0098		0.15	
2358	ISO/TS 16181	0.009857		0.19	
2365	ISO/TS 16181	0.0096		0.02	
2366	ISO14389	0.0096		0.02	
2370	CNS15138-1	0.00900		-0.37	
2372	ISO14389	0.009223	C	-0.23	first reported: 92.23 %M/M
2375	ISO/TS 16181	0.010		0.28	
2378	ISO/TS 16181	0.0097		0.09	
2379	ISO/TS 16181	0.0111		1.00	
2382	ISO14389	0.0096		0.02	
2386	ISO/TS 16181	0.0091		-0.31	
2390		-----		-----	
2449	ISO/TS 16181	0.0136		2.63	
2455		-----		-----	
2492	In house	0.0092		-0.24	
2495	ISO14389	0.0924	R(0.01)	54.11	
2501	ISO/TS 16181	0.0100		0.28	
2511	ISO/TS 16181	0.0083		-0.83	
2569	ISO/TS 16181	0.012		1.59	
2582		-----		-----	
2590	ISO/TS 16181	0.00681		-1.80	
2695	ISO/TS 16181	0.00753		-1.33	
2734	ISO/TS 16181	0.017	R(0.01)	4.85	
2789	CPSC-CH-C1001-09.4	0.0096		0.02	
2806		-----		-----	
2858	ISO14389	0.010		0.28	
2945		-----		-----	
2954	In house	not detected		-----	
3154	ISO16181-1 Draft	0.00809		-0.97	
3172	ISO8124-6	0.0063		-2.13	
3176	ISO/TS 16181	0.007	C	-1.68	first reported: 67.2 %M/M
3210	In house	0.0098		0.15	
	normality	suspect			
	n	38			
	outliers	3			
	mean (n)	0.00957			
	st.dev. (n)	0.002019	RSD = 21%		
	R(calc.)	0.00565			
	st.dev.(iis memo 1701)	0.001531			
	R(iis memo 1701)	0.00429			

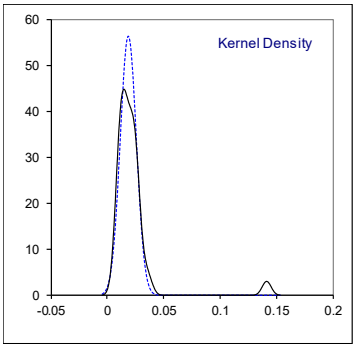




Determination of DIDP - Di-iso-decyl phthalate on sample #21515; results in %M/M

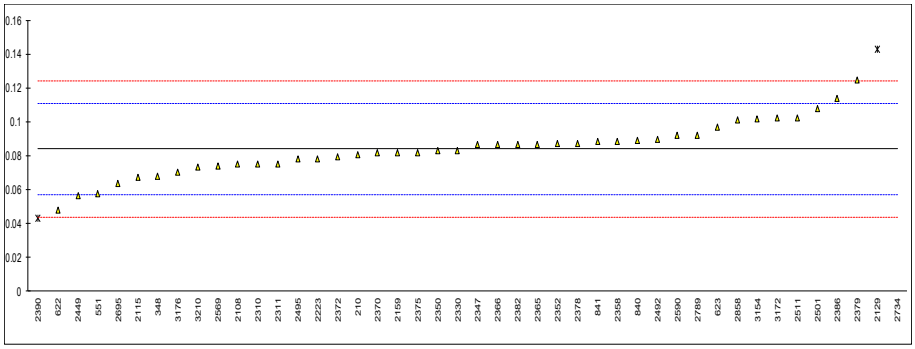
lab	method	value	mark	z(targ)	remarks
210		-----		-----	
348		-----		-----	
551		-----		-----	
622	ISO/TS 16181	0.0153		-1.16	
623	ISO14389	0.0180		-0.26	
840	In house	0.0198		0.34	
841	In house	0.01553		-1.08	
2108	ISO14389	0.02		0.40	
2115	ISO14389	0.011		-2.59	
2129		-----		-----	
2131	In house	not detected		-----	
2159	ISO/TS 16181	0.0076		-3.72	
2223	In house	0.0145	C	-1.43	first reported: <0.01
2310	ISO/TS 16181	0.01		-2.92	
2311	ISO14389	0.0108		-2.66	
2330	ISO/TS 16181	0.0323		4.49	
2347	ISO/TS 16181	0.0260		2.40	
2350		-----		-----	
2352	ISO/TS 16181	0.0260		2.40	
2358	ISO/TS 16181	n.d.		-----	
2365	ISO/TS 16181	0.0244		1.87	
2366	ISO14389	0.0259		2.37	
2370	CNS15138-1	0.0202		0.47	
2372	ISO14389	0.02033	C	0.51	first reported: 203.3 %M/M
2375	ISO/TS 16181	0.014		-1.59	
2378	ISO/TS 16181	0.0260		2.40	
2379	ISO/TS 16181	0.0367		5.96	
2382	ISO14389	0.0257		2.30	
2386	ISO/TS 16181	0.0252		2.13	
2390	ISO14389	0.0133		-1.83	
2449		-----		-----	
2455		-----		-----	
2492	In house	not detected		-----	
2495	ISO14389	<0.001		<-5.92	possibly a false negative test result?
2501		-----		-----	
2511	ISO/TS 16181	0.0197		0.30	
2569	ISO/TS 16181	0.0104		-2.79	
2582		-----		-----	
2590	ISO/TS 16181	0.0244		1.87	
2695	ISO/TS 16181	0.01370		-1.69	
2734	ISO/TS 16181	0.141	R(0.01)	40.65	
2789	CPSC-CH-C1001-09.4	0.0162		-0.86	
2806		-----		-----	
2858	ISO14389	0.022		1.07	
2945		-----		-----	
2954	In house	not applicable		-----	
3154		-----		-----	
3172	ISO8124-6	0.0119		-2.29	
3176	ISO/TS 16181	0.010	C	-2.92	first reported: 99.6 %M/M
3210	In house	0.0144		-1.46	
	normality	OK			
	n	32			
	outliers	1			
	mean (n)	0.01879			
	st.dev. (n)	0.007068	RSD = 38%		
	R(calc.)	0.01979			
	st.dev.(iis memo 1701)	0.003006			
	R(iis memo 1701)	0.00842			

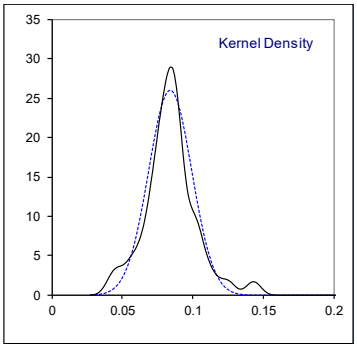




Determination of DINP - Di-iso-nonyl phthalate on sample #21515; results in %M/M

lab	method	value	mark	z(targ)	remarks
210	CPSC-CH-C1001-09.4	0.080528		-0.25	
348	CPSC-CH-C1001-09.4	0.06788		-1.20	
551	In house	0.05748		-1.97	
622	ISO/TS 16181	0.0476		-2.71	
623	ISO14389	0.0970		0.97	
840	In house	0.0892		0.39	
841	In house	0.0884		0.33	
2108	ISO14389	0.075		-0.67	
2115	ISO14389	0.067		-1.26	
2129	ISO14389	0.143	R(0.05)	4.40	
2131	In house	not detected		-----	
2159	ISO/TS 16181	0.0819		-0.15	
2223	In house	0.07834		-0.42	
2310	ISO/TS 16181	0.075		-0.67	
2311	ISO14389	0.0752		-0.65	
2330	ISO/TS 16181	0.0829		-0.08	
2347	ISO/TS 16181	0.0863		0.18	
2350	CPSC-CH-C1001-09.4	0.0827		-0.09	
2352	ISO/TS 16181	0.0872		0.24	
2358	ISO/TS 16181	0.08858		0.34	
2365	ISO/TS 16181	0.0868		0.21	
2366	ISO14389	0.0867		0.20	
2370	CNS15138-1	0.0817		-0.17	
2372	ISO14389	0.07953	C	-0.33	first reported: 795.3 %M/M
2375	ISO/TS 16181	0.082		-0.14	
2378	ISO/TS 16181	0.0873		0.25	
2379	ISO/TS 16181	0.1248		3.04	
2382	ISO14389	0.0867		0.20	
2386	ISO/TS 16181	0.1140		2.24	
2390	ISO14389	0.0429	R(0.05)	-3.06	
2449	ISO/TS 16181	0.0562		-2.07	
2455		-----		-----	
2492	In house	0.0898		0.44	
2495	ISO14389	0.0782		-0.43	
2501	ISO/TS 16181	0.1080		1.79	
2511	ISO/TS 16181	0.1025		1.38	
2569	ISO/TS 16181	0.074		-0.74	
2582		-----		-----	
2590	ISO/TS 16181	0.0917		0.58	
2695	ISO/TS 16181	0.06349		-1.52	
2734	ISO/TS 16181	0.493	R(0.01)	30.45	
2789	CPSC-CH-C1001-09.4	0.0918		0.58	
2806		-----		-----	
2858	ISO14389	0.101		1.27	
2945		-----		-----	
2954	In house	not applicable		-----	
3154	ISO16181-1 Draft	0.1016		1.31	
3172	ISO8124-6	0.1024		1.37	
3176	ISO/TS 16181	0.07	C	-1.04	first reported: 696 %M/M
3210	In house	0.0734		-0.79	
	normality	OK			
	n	41			
	outliers	3			
	mean (n)	0.08395			
	st.dev. (n)	0.015323	RSD = 18%		
	R(calc.)	0.04290			
	st.dev.(iis memo 1701)	0.013432			
	R(iis memo 1701)	0.03761			

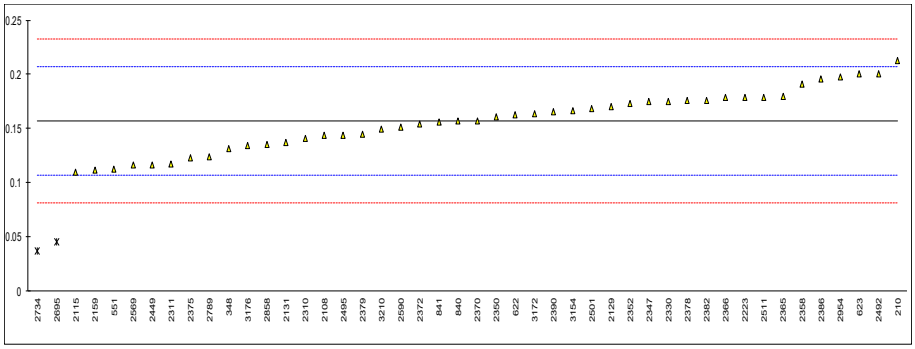


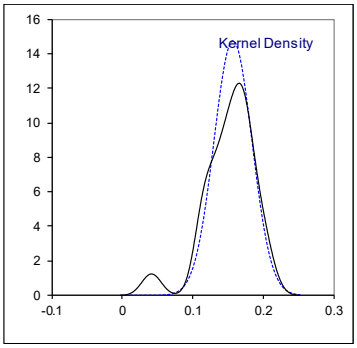


Determination of BBP – Benzyl butyl phthalate on sample #21516; results in %M/M

lab	method	value	mark	z(targ)	remarks
210	CPSC-CH-C1001-09.4	0.212562		2.21	
348	CPSC-CH-C1001-09.4	0.13121		-1.03	
551	In house	0.11296		-1.75	
622	ISO/TS 16181	0.1626		0.22	
623	ISO14389	0.200	C	1.71	first reported: 0.2570
840	In house	0.1569		-0.01	
841	In house	0.1557		-0.05	
2108	ISO14389	0.144		-0.52	
2115	ISO14389	0.11		-1.87	
2129	ISO14389	0.170		0.52	
2131		0.137		-0.80	
2159	ISO/TS 16181	0.1116		-1.81	
2223	In house	0.1790		0.87	
2310	ISO/TS 16181	0.1406		-0.65	
2311	ISO14389	0.1177		-1.57	
2330	ISO/TS 16181	0.1751		0.72	
2347	GB/T32440	0.1750		0.71	
2350	CPSC-CH-C1001-09.4	0.1603		0.13	
2352	ISO/TS 16181	0.1733		0.65	
2358	ISO/TS 16181	0.1906		1.34	
2365	ISO/TS 16181	0.1794		0.89	
2366	ISO14389	0.1783		0.85	
2370	CNS15138-1	0.1570		0.00	
2372	ISO14389	0.15379	C	-0.13	first reported: 1537.9 %M/M
2375	ISO/TS 16181	0.123		-1.35	
2378	ISO/TS 16181	0.1755		0.73	
2379	ISO/TS 16181	0.1447		-0.49	
2382	ISO14389	0.1760		0.75	
2386	ISO/TS 16181	0.1955		1.53	
2390	ISO14389	0.165	C	0.32	first reported: 0.0779
2449	ISO/TS 16181	0.1167		-1.61	
2455		-----		-----	
2492	In house	0.2003		1.72	
2495	ISO14389	0.1440		-0.52	
2501	ISO/TS 16181	0.1681		0.44	
2511	ISO/TS 16181	0.179		0.87	
2569		0.1165		-1.61	
2582		-----		-----	
2590	ISO/TS 16181	0.1510		-0.24	
2695	ISO/TS 16181	0.04547	R(0.01)	-4.44	
2734	ISO/TS 16181	0.037	R(0.01)	-4.78	
2789	CPSC-CH-C1001-09.4	0.1237		-1.33	
2806		-----		-----	
2858	ISO14389	0.135		-0.88	
2945		-----		-----	
2954	In house	0.198		1.63	
3154	ISO16181-1 Draft	0.1661	C	0.36	first reported as DEHP
3172	ISO8124-6	0.1638		0.27	
3176	ISO14389	0.134	C	-0.92	first reported: 1335.18 %M/M
3210	In house	0.1492		-0.31	

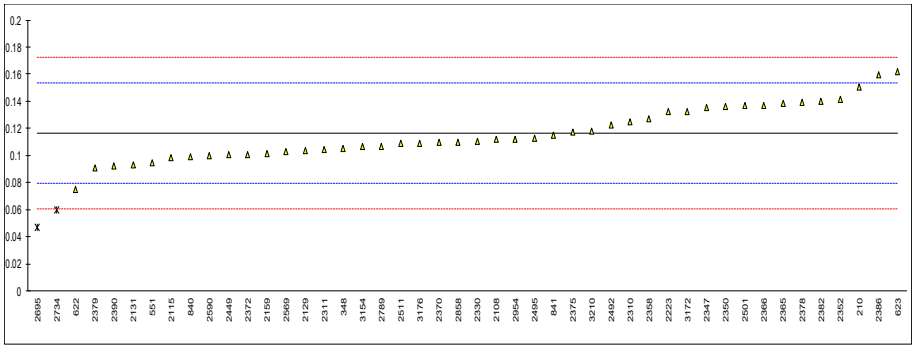
normality	OK	
n	44	
outliers	2	
mean (n)	0.15704	
st.dev. (n)	0.027024	RSD = 17%
R(calc.)	0.07567	
st.dev.(iis memo 1701)	0.025126	
R(iis memo 1701)	0.07035	

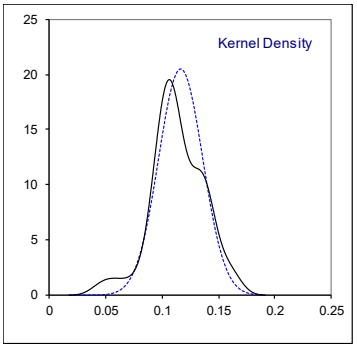




Determination of DBP - Dibutyl phthalate on sample #21516; results in %M/M

lab	method	value	mark	z(targ)	remarks
210	CPSC-CH-C1001-09.4	0.150206		1.81	
348	CPSC-CH-C1001-09.4	0.10486		-0.62	
551	In house	0.09479		-1.16	
622	ISO/TS 16181	0.0750		-2.23	
623	ISO14389	0.162	C	2.44	first reported: 0.1865
840	In house	0.0995		-0.91	
841	In house	0.11488		-0.09	
2108	ISO14389	0.112		-0.24	
2115	ISO14389	0.098		-0.99	
2129	ISO14389	0.104		-0.67	
2131		0.093		-1.26	
2159	ISO/TS 16181	0.1011		-0.82	
2223	In house	0.1324		0.85	
2310	ISO/TS 16181	0.125		0.46	
2311	ISO14389	0.1046		-0.64	
2330	ISO/TS 16181	0.1102		-0.34	
2347	GB/T32440	0.1352		1.00	
2350	CPSC-CH-C1001-09.4	0.1364		1.07	
2352	ISO/TS 16181	0.1411		1.32	
2358	ISO/TS 16181	0.1269		0.56	
2365	ISO/TS 16181	0.1381		1.16	
2366	ISO14389	0.1368		1.09	
2370	CNS15138-1	0.1100		-0.35	
2372	ISO14389	0.10093	C	-0.83	first reported: 1009.3 %M/M
2375	ISO/TS 16181	0.117		0.03	
2378	ISO/TS 16181	0.1395		1.24	
2379	ISO/TS 16181	0.0909		-1.37	
2382	ISO14389	0.1396		1.24	
2386	ISO/TS 16181	0.1598		2.33	
2390	ISO14389	0.092	C	-1.31	first reported: 0.0605
2449	ISO/TS 16181	0.1004		-0.86	
2455		-----		-----	
2492	In house	0.1226		0.33	
2495	ISO14389	0.1126		-0.21	
2501	ISO/TS 16181	0.1366		1.08	
2511	ISO/TS 16181	0.1088		-0.41	
2569		0.1032		-0.71	
2582		-----		-----	
2590	ISO/TS 16181	0.0997		-0.90	
2695	ISO/TS 16181	0.04695	R(0.05)	-3.73	
2734	ISO/TS 16181	0.060	ex	-3.03	test result excluded, five out of six test results were outliers
2789	CPSC-CH-C1001-09.4	0.1069		-0.51	
2806		-----		-----	
2858	ISO14389	0.110		-0.35	
2945		-----		-----	
2954	In house	0.112		-0.24	
3154	ISO16181-1 Draft	0.1068		-0.52	
3172	ISO8124-6	0.1327		0.87	
3176	ISO14389	0.109	C	-0.40	first reported: 1084.68 %M/M
3210	In house	0.1177		0.07	
	normality	OK			
	n	44			
	outliers	1 (+1ex)			
	mean (n)	0.11647			
	st.dev. (n)	0.019446	RSD = 17%		
	R(calc.)	0.05445			
	st.dev.(iis memo 1701)	0.018636			
	R(iis memo 1701)	0.05218			





APPENDIX 2

Summary of other Phthalates in sample #21515: results in %M/M

BBP = Benzylbutylphthalate
DNOP = Di-n-Octylphthalate
DCHP = Dicyclohexylphthalate
DEP = Diethylphthalate
DMP = Dimethylphthalate
DNHP = Di-n Hexylphthalate
DIBP = Diisobutylphthalate

Lab	BBP	DNOP	DCHP	DEP	DMP	DNHP	DIBP
210	-----	-----	-----	-----	-----	-----	-----
348	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
551	-----	-----	-----	-----	-----	-----	-----
622	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0006
623	not detected	not detected	not detected	not detected	not detected	not detected	not detected
840	not detected	not detected	not detected	not detected	not detected	not detected	not detected
841	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
2108	-----	-----	-----	-----	-----	-----	-----
2115	-----	-----	-----	-----	-----	-----	0.0011
2129	-----	-----	-----	-----	-----	-----	-----
2131	not detected	not detected	not detected	not detected	not detected	not detected	not detected
2159	<0,0050	<0,0050	<0,0050	<0,0050	<0,0050	<0,0050	<RL
2223	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
2310	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
2311	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
2330	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2347	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
2350	-----	-----	-----	-----	-----	-----	-----
2352	-----	-----	-----	-----	-----	-----	-----
2358	n.d.	n.d.	N/A	N/A	N/A	N/A	n.d.
2365	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
2366	<0.004	<0.004	not determ.	<0.004	<0.004	<0.004	<0.004
2370	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
2372	not detected	not detected	not detected	not detected	not detected	not detected	not detected
2375	-----	-----	-----	-----	-----	-----	-----
2378	-----	-----	-----	-----	-----	-----	-----
2379	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2382	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
2386	<0,005	<0,005	<0,005	<0,005	<0,005	<0,005	<0,005
2390	-----	-----	-----	-----	-----	-----	-----
2449	-----	-----	-----	-----	-----	-----	-----
2455	-----	-----	-----	-----	-----	-----	-----
2492	not detected	not detected	-----	-----	-----	-----	not detected
2495	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
2501	-----	-----	-----	-----	-----	-----	-----
2511	-----	-----	-----	-----	-----	-----	-----
2569	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
2582	-----	-----	-----	-----	-----	-----	-----
2590	-----	-----	-----	-----	-----	-----	-----
2695	not detected	not detected	not detected	not detected	not detected	not detected	not detected
2734	not detected	not detected	not detected	not detected	not detected	not detected	not detected
2789	-----	-----	-----	-----	-----	-----	-----
2806	-----	-----	-----	-----	-----	-----	-----
2858	n.d	n.d	n.d	n.d	n.d	n.d	n.d
2945	-----	-----	-----	-----	-----	-----	-----
2954	not detected	not detected	not applicable	not detected	not detected	not applicable	not applicable
3154	-----	-----	-----	-----	-----	-----	-----
3172	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
3176	-----	-----	-----	-----	-----	-----	-----
3210	not detected		not detected	not detected	not detected	not detected	not detected

Summary of other Phthalates in sample #21515: results in %M/M - continued

DPHP = Di(2-propylheptyl)phthalate
DNPP = Di-n-Pentylphthalate
DUP = Diundecylphthalate
DPrP = Di-n-Propylphthalate
DMEP = Di(methoxyethyl)phthalate
Other = Other Phthalates

Lab	DPHP	DNPP	DUP	DPrP	DMEP	Other
210	-----	-----	-----	-----	-----	-----
348	-----	<0.005	-----	-----	<0.005	-----
551	-----	-----	-----	-----	-----	-----
622	-----	0.0000	-----	-----	0.0000	-----
623	not detected	not detected	not detected	not detected	not detected	not detected
840	not detected	not detected	not detected	not detected	not detected	-----
841	<0.003	<0.003	<0.003	<0.003	<0.003	-----
2108	-----	-----	-----	-----	-----	-----
2115	-----	-----	-----	-----	-----	-----
2129	-----	-----	-----	-----	-----	-----
2131	not analysed	not detected	not detected	not detected	not detected	not detected
2159	<0,0050	<RL	<RL	<RL	<RL	Not applicable
2223	<0.001	<0.001	-----	<0.001	<0.001	-----
2310	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
2311	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
2330	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2347	<0.010	<0.003	<0.003	<0.003	<0.003	-----
2350	-----	-----	-----	-----	-----	-----
2352	-----	-----	-----	-----	-----	-----
2358	N/A	N/A	N/A	N/A	N/A	N/A
2365	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
2366	<0.004	<0.004	<0.004	<0.004	<0.004	not determined
2370	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
2372	not detected	not detected	not detected	not detected	not detected	not detected
2375	-----	-----	-----	-----	-----	-----
2378	-----	-----	-----	-----	-----	-----
2379	Not detected	Not detected	Not detected	Not detected	Not detected	Not tested
2382	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
2386	<0,005	<0,005	<0,005	<0,005	<0,005	<0,005
2390	-----	-----	-----	-----	-----	-----
2449	-----	-----	-----	-----	-----	0.1346
2455	-----	-----	-----	-----	-----	-----
2492	-----	-----	-----	-----	-----	-----
2495	-----	<0.001	-----	<0.001	<0.001	-----
2501	-----	-----	-----	-----	-----	-----
2511	-----	-----	-----	-----	-----	-----
2569	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	0.1514
2582	-----	-----	-----	-----	-----	-----
2590	-----	-----	-----	-----	-----	-----
2695	not detected	not detected	not analyzed	not detected	not detected	not detected
2734	not detected	not detected	not detected	not detected	not detected	not detected
2789	-----	-----	-----	-----	-----	-----
2806	-----	-----	-----	-----	-----	-----
2858	n.d	n.d	n.d	n.d	n.d	n.d
2945	-----	-----	-----	-----	-----	-----
2954	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable
3154	-----	-----	-----	-----	-----	-----
3172	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-----
3176	-----	-----	-----	-----	-----	-----
3210	-----	not detected	not detected	not detected	not detected	-----

Summary of other Phthalates in sample #21516: results in %M/M

DEHP = Bis-2-ethylhexylphthalate
DIDP = Diisodecylphthalate
DINP = Diisononylphthalate
DNOP = Di-n-Octylphthalate
DCHP = Dicyclohexylphthalate
DEP = Diethylphthalate
DMP = Dimethylphthalate
DNHP = Di-n-Hexylphthalate

Lab	DEHP	DIDP	DINP	DNOP	DCHP	DEP	DMP	DNHP
210	-----	-----	-----	-----	-----	-----	-----	-----
348	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
551	-----	-----	-----	-----	-----	-----	-----	-----
622	0.0004	0.0000	0.0025	0.0000	0.0000	0.000	0.0000	0.0000
623	not detected	not detected	not detected	not detected	not detected	not detected	not detected	not detected
840	not detected	not detected	not detected	not detected	not detected	not detected	not detected	not detected
841	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
2108	-----	-----	-----	-----	-----	-----	-----	-----
2115	-----	-----	-----	-----	-----	-----	-----	-----
2129	-----	-----	-----	-----	-----	-----	-----	-----
2131	not detected	not detected	not detected	not detected	not detected	not detected	not detected	not detected
2159	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL
2223	<0.001	<0.01	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001
2310	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
2311	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
2330	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2347	<0.003	<0.010	<0.010	<0.003	<0.003	<0.003	<0.003	<0.003
2350	-----	-----	-----	-----	-----	-----	-----	-----
2352	-----	-----	-----	-----	-----	-----	-----	-----
2358	n.d.	n.d.	n.d.	n.d.	N/A	N/A	N/A	N/A
2365	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
2366	<0.004	<0.004	<0.004	<0.004	not determ.	<0.004	<0.004	<0.004
2370	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
2372	not detected	not detected	not detected	not detected	not detected	not detected	not detected	not detected
2375	-----	-----	-----	-----	-----	-----	-----	-----
2378	-----	-----	-----	-----	-----	-----	-----	-----
2379	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2382	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
2386	<0,005	<0,005	<0,005	<0,005	<0,005	<0,005	<0,005	<0,005
2390	-----	-----	-----	-----	-----	-----	-----	-----
2449	-----	-----	-----	-----	-----	-----	-----	-----
2455	-----	-----	-----	-----	-----	-----	-----	-----
2492	not detected	not detected	not detected	not detected	-----	-----	-----	-----
2495	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
2501	-----	-----	-----	-----	-----	-----	-----	-----
2511	-----	-----	-----	-----	-----	-----	-----	-----
2569	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
2582	-----	-----	-----	-----	-----	-----	-----	-----
2590	-----	-----	-----	-----	-----	-----	-----	-----
2695	not detected	not detected	not detected	not detected	not detected	not detected	not detected	0.02100
2734	not detected	not detected	not detected	not detected	not detected	not detected	not detected	not detected
2789	-----	-----	-----	-----	-----	-----	-----	-----
2806	-----	-----	-----	-----	-----	-----	-----	-----
2858	n.d	n.d	n.d	n.d	n.d	n.d	n.d	n.d
2945	-----	-----	-----	-----	-----	-----	-----	-----
2954	not detected	not applicable	not applicable	not detected	not applicable	not detected	not detected	not applicable
3154	-----	-----	-----	-----	-----	-----	-----	-----
3172	<0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
3176	-----	-----	-----	-----	-----	-----	-----	-----
3210	not detected	not detected	not detected	not detected	not detected	not detected	not detected	not detected

Summary of other Phthalates in sample #21516: results in %M/M - continued

DIBP = Diisobutylphthalate
DPHP = Di(2-propylheptyl)phthalate
DNPP = Di-n-Pentylphthalate
DUP = Diundecylphthalate
DPrP = Di-n-Propylphthalate
DMEP = Di(2-methoxyethyl)phthalate
Other = Other Phthalates

Lab	DIBP	DPHP	DNPP	DUP	DPrP	DMEP	Other
210	-----	-----	-----	-----	-----	-----	-----
348	<0.005	-----	<0.005	-----	-----	<0.005	-----
551	-----	-----	-----	-----	-----	-----	-----
622	0.0001	-----	0.0000	-----	-----	0.0000	-----
623	not detected	not detected	not detected	not detected	not detected	not detected	0.0045
840	not detected	not detected	not detected	not detected	not detected	not detected	-----
841	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	-----
2108	-----	-----	-----	-----	-----	-----	-----
2115	-----	-----	-----	-----	-----	-----	-----
2129	-----	-----	-----	-----	-----	-----	-----
2131	not detected	not analysed	not detected	not detected	not detected	not detected	not detected
2159	<RL	<RL	<RL	<RL	<RL	<RL	Not applicable
2223	<0.001	<0.001	<0.001	-----	<0.001	<0.001	-----
2310	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
2311	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
2330	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2347	<0.003	<0.010	<0.003	<0.003	<0.003	<0.003	-----
2350	-----	-----	-----	-----	-----	-----	-----
2352	-----	-----	-----	-----	-----	-----	-----
2358	n.d.	N/A	N/A	N/A	N/A	N/A	N/A
2365	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
2366	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	not determined
2370	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
2372	not detected	not detected	not detected	not detected	not detected	not detected	not detected
2375	-----	-----	-----	-----	-----	-----	-----
2378	-----	-----	-----	-----	-----	-----	-----
2379	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not tested
2382	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
2386	<0,005	<0,005	<0,005	<0,005	<0,005	<0,005	<0,005
2390	-----	-----	-----	-----	-----	-----	-----
2449	-----	-----	-----	-----	-----	-----	-----
2455	-----	-----	-----	-----	-----	-----	-----
2492	not detected	-----	-----	-----	-----	-----	-----
2495	<0.001	-----	<0.001	-----	<0.001	<0.001	-----
2501	-----	-----	-----	-----	-----	-----	-----
2511	-----	-----	-----	-----	-----	-----	-----
2569	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	0.2197
2582	-----	-----	-----	-----	-----	-----	-----
2590	-----	-----	-----	-----	-----	-----	-----
2695	not detected	not detected	not detected	not analyzed	not detected	not detected	not detected
2734	not detected	not detected	not detected	not detected	not detected	not detected	not detected
2789	-----	-----	-----	-----	-----	-----	-----
2806	-----	-----	-----	-----	-----	-----	-----
2858	n.d	n.d	n.d	n.d	n.d	n.d	n.d
2945	-----	-----	-----	-----	-----	-----	-----
2954	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable
3154	-----	-----	-----	-----	-----	-----	-----
3172	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-----
3176	-----	-----	-----	-----	-----	-----	-----
3210	not detected	-----	not detected	not detected	not detected	not detected	-----

APPENDIX 3 Analytical details

lab	ISO/IEC17025 accredited	Sample intake (in grams)	Solvent (mixture) used to release the analytes	Extraction time (in minutes)	Extraction temp. (in °C)
210	Yes	---	---	---	---
348	Yes	0.5	THF	180	60±5
551	---	---	---	---	---
622	Yes	1	n-hexane:acetone (80:20)	60	50
623	Yes	0.1	THF Hexane	60	60
840	Yes	0.5	THF-HEXANE	60	60
841	Yes	0.5	Tetrahydrofuran/ n-hexane	60	60
2108	Yes	0,5	THF/Hexane	1h	60
2115	Yes	0.3	THF	60	60
2129	Yes	0,5	THF	1h	60
2131	Yes	0.5	THF:Hexane 1:2	1h	60
2159	Yes	1,0	Hexane/Acetone	1 hour	50
2223	Yes	0.3	first THF, later addition of i-octane	1 hour	60
2310	Yes	0.5	Acetone and Hexane	60	50
2311	Yes	0.3	THF and Hexane	60	60
2330	No	0.50	n-Hexane:Acetane 80:20	60	50
2347	---	1	25mL	60	50
2350	Yes	0.5	THF + ACN	2 h	60
2352	Yes	1.0	25mL	60	50
2358	Yes	2	n-hexane / acetone	60	30
2365	Yes	1.0	Acetone: N-hexane=1:1	60	50
2366	Yes	0.3	THF:n-hexane(1:2)	60	60
2370	Yes	0.5	THF：Hexane = 10：20 mL	30	room temperature
2372	No	0.5	THF	60	60
2375	Yes	0.1	Hexane : Acetone (4:1)	60	50
2378	Yes	2	40 ml of n-hexane/acetone	60	50
2379	No	0.5	Hexane : Acetone 80 : 20	60	50
2382	No	0.1	Tetrahydrofuran and Hexane	60	60
2386	Yes	0,5	n-Hexane/Acetone (80:20)	60	50
2390	Yes	0.1	Tetra hydro furan (THF) and n-hexane	60	60
2449	---	---	---	---	---
2455	---	---	---	---	---
2492	Yes	0.3	THF:n-Hex (1:2)	60	60
2495	Yes	0.15	THF/Hexane	60	60
2501	Yes	2	hexane acetone	60	50
2511	---	---	---	---	---
2569	Yes	1	Hexane : Acetone	1 hr	50
2582	---	---	---	---	---
2590	Yes	1.25	thf:hex	60	60
2695	Yes	3	HEXANE:ACETONE (80:20)	60	50
2734	Yes	3	n-hexane 80% / acetone 20%	60	50
2789	Yes	0.05	Acetonitrile / Tetrahidrofuran	30	Ambient
2806	---	---	---	---	---
2858	Yes	0.5	THF+n-Hexane	60	60
2945	---	---	---	---	---
2954	Yes	0,1	THF/hexane	120	40
3154	Yes	---	---	---	---
3172	---	---	---	---	---
3176	Yes	0,5	N-Hexane / Acetone	60	50
3210	Yes	1	Toluene	60	60

APPENDIX 4

Number of participants per country

1 lab in BANGLADESH
1 lab in BRAZIL
1 lab in CAMBODIA
1 lab in FRANCE
4 labs in GERMANY
2 labs in HONG KONG
3 labs in INDIA
2 labs in INDONESIA
7 labs in ITALY
1 lab in MOROCCO
7 labs in P.R. of CHINA
2 labs in PAKISTAN
1 lab in SERBIA
1 lab in SOUTH KOREA
2 labs in SPAIN
1 lab in SRI LANKA
2 labs in SWITZERLAND
2 labs in TAIWAN
1 lab in THAILAND
1 lab in TUNISIA
3 labs in TURKEY
1 lab in U.S.A.
3 labs in VIETNAM

APPENDIX 5

Abbreviations

C	= final test result after checking of first reported suspect test result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01)	= outlier in Grubbs' outlier test
G(0.05)	= straggler in Grubbs' outlier test
DG(0.01)	= outlier in Double Grubbs' outlier test
DG(0.05)	= straggler in Double Grubbs' outlier test
R(0.01)	= outlier in Rosner's outlier test
R(0.05)	= straggler in Rosner's outlier test
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

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