Results of Proficiency Test
Migration of elements EN71-3
Category 3
April 2021

Organized by: Institute for Interlaboratory Studies
Spijkenisse, The Netherlands

Author: ing. R.J. Starink
Correctors: ing. G.A. Oosterlaken-Buijs & ing. C.M. Nijssen-Wester
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1 INTRODUCTION

Toy safety is the practice of ensuring that toys, especially those made for children, are safe, usually through the application of set safety standards. In many countries, toys must be able to pass safety tests in order to be sold. Many regions model their safety standards on the EU's EN71 standard, either directly, or through adoption of the ISO8124-3 standard which in itself is modelled on EN71. In Europe, toys must meet the criteria set by the EC Toy Safety Directive (Council Directive 88/378/EEC). This directive has been superseded by Council Directive 2009/48/EC, which applies to toy imports into the EU since 20 July 2011. There is an exception for the chemical requirements under part III of Annex II of this directive. These chemical requirements became into force on 20 July 2013.
The test methods EN71-3:19 and ISO8124-3:20 both describe the determination of Migration of Elements (metals that are considered hazardous) when a toy gets into contact with an acid solution (0.07 n HCl, simulating a gastric acid solution).

Since 2010 the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for Migration of Elements EN71-3 every year. During the annual proficiency testing program 2020/2021, it was decided to continue the proficiency test for the analysis of the Migration of Elements. This year it was decided to publish the proficiency test results for each category separately.
In the interlaboratory study Migration of Elements EN71-3 for category 3 samples 90 laboratories in 28 different countries registered for participation. See appendix 4 for the number of participants per country. In this report the results of the proficiency test of category 3 samples 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 three different samples: one sample of 2 grams textile labelled #21575, one sample of 0.5 grams dried paint labelled #21576 and one sample of 0.5 grams dried paint labelled #21577.
The participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 ACCREDITATION

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

2.2 PROTOCOL

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organization, 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

For the first batch it was decided to use a blue jeans textile, which was made positive on Organic Tin with Dibutyl Tin (DBT) for the iis proficiency test Organic Tin in Textile.
After cutting and homogenization the textile batch was randomly divided over 141 small bags. Each bag contained 2 grams and was labelled #21575.
The homogeneity of the subsamples was checked with the determination of DBT by ISO16179 on 8 stratified randomly selected subsamples.

	Dibutyl Tin in mg/kg
sample #21575-1	4.19
sample #21575-2	4.77
sample #21575-3	4.37
sample #21575-4	4.04
sample #21575-5	3.79
sample #21575-6	4.20
sample #21575-7	4.28
sample #21575-8	4.51

Table 1: homogeneity test results of subsamples #21575

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

	Dibutyl Tin in mg/kg
r (observed)	0.83
reference test method	ISO/TS16179:12
0.3 x R (reference test method)	0.82

Table 2: evaluation of the repeatability of subsamples #21575

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

For the second batch a white colored dried paint was prepared by iis. The elements Chromium (III), Mercury and Selenium were added to the paint as salts. After thorough mixing 130 small bags were filled with 0.5 grams each and labelled #21576.
The homogeneity of the subsamples was checked with the determination of the elements Chromium (III), Mercury and Selenium content by EN71-3 on 8 stratified randomly selected subsamples.

	Chromium (III) in mg/kg	Mercury in mg/kg	Selenium in mg/kg
sample #21576-1	690.6	42.150	479.8
sample #21576-2	700.3	39.250	477.3
sample #21576-3	690.1	42.740	476.4
sample #21576-4	691.6	41.120	476.6
sample #21576-5	695.7	40.540	475.5
sample #21576-6	666.4	37.460	457.3
sample #21576-7	705.4	39.830	484.6
sample #21576-8	693.1	37.770	487.6

Table 3: homogeneity test results of subsamples #21576

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

	Chromium (III) in mg/kg	Mercury in mg/kg	Selenium in mg/kg
r (observed)	32.2	5.35	25.2
reference test method	EN71-3:19	EN71-3:19	EN71-3:19
0.3 x R (reference test method)	87.1	6.74	60.1

Table 4: evaluation of the repeatabilities of subsamples #21576

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

For the third batch a brown colored dried paint was prepared by iis. The element Lead was added to the paint as a salt. After thorough mixing 153 small bags were filled with 0.5 grams each and labelled #21577.
The batch was used in a previous proficiency test on Total Lead in dried paint (as sample #1001 in iis10V01X). Therefore, homogeneity of the subsamples was assumed.

To each of the participants an appropriate set of PT samples was sent on March 24, 2021.

2.5 ANALYZES

The participants were requested to determine the migration of nineteen elements applying the analysis procedure that is routinely used in the laboratory. It was requested to report if the laboratory was accredited for the requested components that were determined and to report some analytical details.

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

To get comparable 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 samples receipt on this data entry portal. The letter of instructions can also be downloaded from the iis website www.iisnl.com.

3 RESULTS

During five weeks after sample dispatch, the test results of the individual laboratories were gathered via the data entry portal www.kpmd.co.uk/sgs-iis-cts/. The reported test results are tabulated per determination in appendix 1 and 2 of this report. The laboratories are presented by their code numbers.

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

3.1 STATISTICS

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

First, the normality of the distribution of the various data sets per determination was checked by means of the Lilliefors-test, a variant of the Kolmogorov-Smirnov test and by the

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

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

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

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

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

3.2 GRAPHICS

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

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

3.3 Z-SCORES

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

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

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

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

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

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

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

4 EVALUATION

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. One laboratory did not report any test results. Eleven other participants reported the test results after the reporting deadline. Not all laboratories were able to report all elements requested.
Finally, the 89 reporting laboratories submitted 723 numerical test results. Observed were 52 outlying test results, which is 7.2%. 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 ELEMENT

In this section the reported test results are discussed per sample and per element. 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 in appendix 1 together with the original data. The abbreviations used in these tables are explained in appendix 5.

EN71-3 method is considered to be the official test method for the determination of Elements migrated from different matrices. In April 2019 the CEN committee published a new version of EN71-3. In this 2019 test method of EN71-3 new precision data are given in table 4 and in table C.1. Table 4 contains precision data from an interlaboratory study. The committee was not able to obtain precision data for all elements for each category via an interlaboratory study. In order to compensate for missing data for certain element and category combinations estimations for the reproducibility have been considered by the committee based on table 4 and input from experts. These precision data are given in table C.1 of EN71-3:19 and are used to evaluate the performance of the group of participants in this PT.

#21575

Organic Tin: The sample was made positive on Organic Tin by adding Dibutyl Tin (DBT). Regretfully, none of the participants found this sample positive.

The majority of the participants agreed on a concentration near or below the limit of detection for all other reported elements mentioned in paragraph 2.5. Therefore, no z-scores were calculated for these elements. The reported results can be found in appendix 2.

#21576

Aluminum: This determination was problematic for a number of laboratories. Six statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the target reproducibility based on EN71-3:19.

Chromium (III): This determination was problematic for a number of laboratories. Seven statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the target reproducibility based on EN71-3:19.

Manganese: This determination was problematic for a number of laboratories. Eight statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in full agreement with the target reproducibility based on EN71-3:19.

Mercury: This determination was problematic. Five statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the target reproducibility based on EN71-3:19.

Selenium: This determination was problematic for a number of laboratories. Ten statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in full agreement with the target reproducibility based on EN71-3:19.

Strontium: This determination was problematic for a number of laboratories. Eight statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the target reproducibility based on EN71-3:19.

The majority of the participants agreed on a concentration near or below the limit of detection for all other reported elements mentioned in paragraph 2.5. Therefore, no z-scores were calculated for these elements. The reported results can be found in appendix 2.

#21577

Aluminum: This determination was very problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is very large in comparison with the target reproducibility based on EN71-3:19. Therefore, no z-scores were calculated.

Barium: This determination was problematic for a number of laboratories. Five statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the target reproducibility based on EN71-3:19.

Chromium (III): This determination may be problematic. The consensus value was near or below the detection limit. Therefore, no z-scores were calculated.

Chromium (VI): This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in good agreement with the target reproducibility based on EN71-3:19.

Lead: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the target reproducibility based on EN71-3:19.

The majority of the participants agreed on a concentration near or below the limit of detection for all other reported elements mentioned in paragraph 2.5. Therefore, no z-scores were calculated for these elements. The reported results can be found in appendix 2.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibilities as declared by the reference test method and the reproducibilities as found for the group of participating laboratories. The number of significant test results, the average, the calculated reproducibilities (2.8 * standard deviation) and the target reproducibilities, derived from the official test method EN71-3:2019 are presented in the next table.

Element	unit	n	average	2.8 * sd	R(lit)
Organic Tin as Sn	mg/kg	25	<12	n.e.	n.e.

Table 5: reproducibility on sample #21575

Element	unit	n	average	2.8 * sd	R(lit)
Aluminum as Al	mg/kg	71	1233	380	518
Chromium (III) as Cr	mg/kg	59	288	103	121
Manganese as Mn	mg/kg	62	26.0	11.9	10.9
Mercury as Hg	mg/kg	59	10.0	8.6	5.6
Selenium as Se	mg/kg	77	404	175	170
Strontium as Sr	mg/kg	75	337	118	142

Table 6: reproducibilities on sample #21576

Element	unit	n	average	2.8 * sd	R(lit)
Aluminum as Al	mg/kg	46	16.5	16.1	(6.9)
Barium as Ba	mg/kg	60	11.2	4.6	9.4
Chromium (III) as Cr	mg/kg	39	3.9	2.9	(1.6)
Chromium (VI) as Cr6+	mg/kg	36	1.3	1.2	1.8
Lead as Pb	mg/kg	84	17.6	9.4	14.8

Table 7: reproducibilities on sample #21577

The calculated reproducibility between brackets is much higher than the reference test method

Without further statistical calculations, it can be concluded that the group of participating laboratories has no difficulties with the determination of the migration of the evaluated elements in dried paint in accordance with EN71-3:19. The determination of migration of elements in the textile sample #21575 has been further discussed in paragraph 4.1 and 5.

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

The uncertainties determined in this PT are compared with the relative standard deviations as found in previous years and with the target requirements in the next tables.

Element	April 2021	April 2020	April 2019	April 2018	2016 – 2017	EN71-3:19 table C.1
Aluminum	11-35%	12-13%	13-33%	46-54%	16-63%	15%
Antimony	--	--	--	--	28%	30%
Arsenic	--	--	--	--	20%	20%
Barium	15%	--	--	13%	--	30%
Boron	--	--	--	--	--	15%
Cadmium	--	9-15%	--	20%	13%	15%
Chromium *)	--				17-25%	n.a.
Chromium (III)	13-27%	--	--	--	--	15%
Chromium (VI)	35%	--	--	--	--	50%
Cobalt	--	--	20%	--	20%	15%

Element	April 2021	April 2020	April 2019	April 2018	2016 – 2017	EN71-3:19 table C.1
Copper	--	11%	--	18%	--	15%
Lead	19%	23%	--	--	22%	30%
Manganese	16%	32%	13-22%	21-23%	24-29%	15%
Mercury	31%	--	25%	--	--	20%
Nickel	--	--	15%	--	--	20%
Selenium	16%	--	14%	--	--	15%
Strontium	12%	16-23%	13-15%	18-20%	13-25%	15%
Tin	--	--	--	--	--	30%
Organic Tin	n.e.	--	--	--	--	50%
Zinc	--	--	14%	--	--	15%

Table 8: development of uncertainties over the years for category 3 materials (e.g. textile, dried paint)

*) Chromium total

The performance of the group is in general equal to or better in comparison to the performance in previous years.

4.4 EVALUATION OF ANALYTICAL DETAILS

A vast majority of the registered participants mentioned that they are ISO/IEC17025 accredited for category 3 determination of Migration of Elements EN71-3.

Furthermore, the participants were asked to provide several analytical details which are listed in appendix 3. Based on the answers given by the participants the following can be summarized:
In EN71-3:19 it is emphasized that maintaining the pH between 1.1 and 1.3 is very important for the migration of the elements. All reporting participants have used a solution with a pH between 1.1 and 1.3 (with or without adjustment of HCl solution) to measure the metals.
All reporting participants mentioned to have used for sample intake at least 100 mg or more.
For the migration, (almost) all reporting participants mentioned to have used a volume ratio of 5 mL of HCl solution per 100 mg sample intake.

5 DISCUSSION

In this PT it appeared that version of EN71-3:19 has been followed well by most of the participants.
For the first time we had selected a sample (#21575) which contains Organic Tin. This sample was made positive on Organic Tin with Dibutyl Tin for the proficiency test Organic Tin in Textile (extraction with Methanol/Ethanol mixture). Regretfully, the amount of Organic Tin did not migrate when using EN71-3 as a test method.
For the dried paint samples (#21576 and #21577, category 3) the influence (e.g. adjusting the pH and a minimum amount of intake) is visible when following the test method correctly.
The relative standard deviation of the group for the measured metals is in line compared to the relative standard deviation mentioned in EN71-3:19.

In this PT the average of the homogeneity test results for a number of elements is not in line with the average (consensus value) from the PT results. There are several reasons for this. First, the goal of the homogeneity testing is different from the goal of the evaluation of the reported PT results. In order to prove the homogeneity of the PT samples, a test method is selected with a high precision (smallest variation). The accuracy (trueness) of the test method is less relevant.
Secondly, the homogeneity testing is done by one laboratory only. The test results of this ISO/IEC17025 accredited laboratory will have a bias (systematic deviation) depending on the test method used. The desire to detect small variations between the PT samples leads to the use of a sensitive test method with high precision, which may be a test method with significant bias.
Also, each test result reported by the laboratories that participate in the PT 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 average of the homogeneity test. At the same time the accuracy of the PT consensus value is more reliable than the accuracy of the average of the homogeneity test.

6 CONCLUSION

Each participating laboratory should 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 migration of Organic Tin as Sn on textile sample #21575; results in mg/kg

lab	method	Value	mark	z(targ)	remarks
210		-----		-----	
310		-----		-----	
551		-----		-----	
623	EN71-3	not detected		-----	
840	EN71-3	0.31		-----	
841	EN71-3	0.295		-----	
1213		-----		-----	
2102	In house	Not detected		-----	
2118		-----		-----	
2120		-----		-----	
2129		-----		-----	
2132	EN71-3	<7.2		-----	
2135		-----		-----	
2137		-----		-----	
2156		-----		-----	
2165	EN71-3	not detected		-----	
2182	EN71-3	not detected		-----	
2184	EN71-3	not detected		-----	
2201	EN71-3	<3.0		-----	
2228		-----		-----	
2230	EN71-3	<2		-----	
2232	EN71-3	<0.02		-----	
2236		-----		-----	
2238	EN71-3	<3		-----	
2241	EN71-3	not detected		-----	
2247	EN71-3	Not detected			
2250		-----		-----	
2256	EN71-3	ND		-----	
2265	EN71-3	not detected		-----	
2272		-----		-----	
2284	EN71-3	<4		-----	
2289	EN71-3	<3.0		-----	
2290		-----		-----	
2293		-----		-----	
2294	EN71-3	In Full		-----	
2301	EN71-3	<2		-----	
2352		-----		-----	
2357		-----		-----	
2363	EN71-3	<0.5		-----	
2365	EN71-3	＜12		-----	
2366	EN71-3	<12		-----	
2372		-----		-----	
2375		-----		-----	
2379	EN71-3	Not detected		-----	
2382	EN71-3	＜0.50		-----	
2384		-----		-----	
2385	EN71-3	0.237		-----	
2390	EN71-3	n.d		-----	
2406		-----		-----	
2410		-----		-----	
2429	EN71-3	ND		-----	
2431		-----		-----	
2442	EN71-3	Not detected		-----	
2475		-----		-----	
2489	EN71-3	ND		-----	
2495		-----		-----	
2500	EN71-3	ND		-----	
2503		-----		-----	
2582	EN71-3	not detected		-----	
2590		-----		-----	
2643	EN71-3	not detected		-----	
2650		-----		-----	
2651	EN71-3	not detected		-----	
2654		-----		-----	
2674		-----		-----	
2703	EN71-3	Not required		-----	
2743		-----		-----	
2805	EN71-3	< 0.1		-----	
2817		-----		-----	
2864		-----		-----	
2867	EN71-3	not detected		-----	
2917		-----		-----	
2953		-----		-----	
2965	EN71-3	not detected		-----	

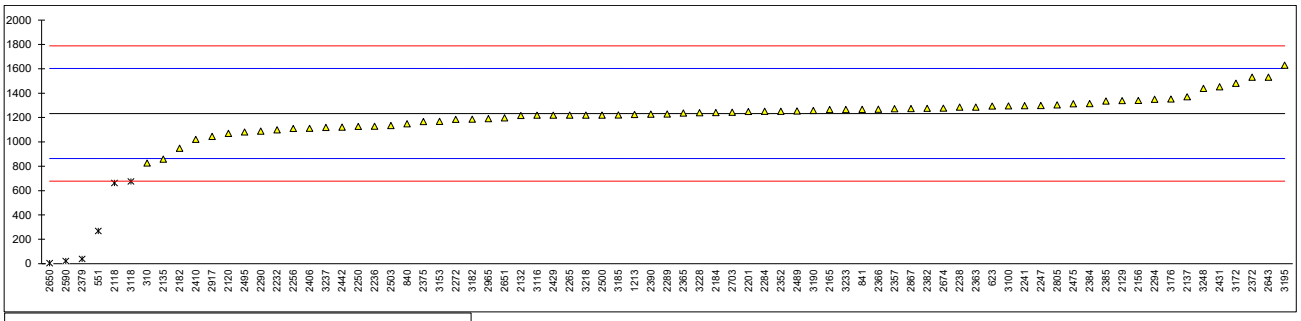
lab	method	Value	mark	z(targ)	remarks
3100	EN71-3	＜2.0		-----	
3116	EN71-3	LT0.225		-----	
3118		-----		-----	
3153	EN71-3	<2		-----	
3172	EN71-3	< 2		-----	
3176		-----		-----	
3182		-----		-----	
3185	EN71-3	<5		-----	
3190	EN71-3	<2		-----	
3195		-----		-----	
3218	EN71-3	<3.0		-----	
3228		-----		-----	
3233	EN71-3	< 2.5		-----	
3237		-----		-----	
3248	EN71-3	<3		-----	
8005		-----		-----	
	n	25			
	mean (n)	<12			

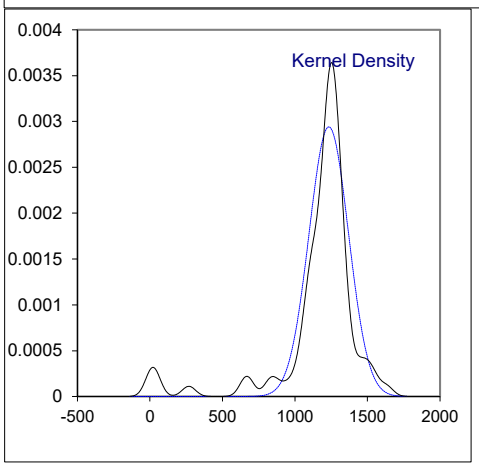
Determination of migration of Aluminum as Al on dried paint sample #21576; results in mg/kg

lab	method	value	mark	z(targ)	remarks
210		-----		-----	
310	EN71-3	825.25	C	-2.20	First reported 1116
551	EN71-3	268.727	R(0.01)	-5.21	
623	EN71-3	1293.96		0.33	
840	EN71-3	1147.78		-0.46	
841	EN71-3	1267.1		0.18	
1213	EN71-3	1224.30		-0.05	
2102	In house	Not detected		-----	
2118	EN71-3	661.86	R(0.01)	-3.09	
2120	EN71-3	1070		-0.88	
2129	EN71-3	1338		0.57	
2132	EN71-3	1216.35		-0.09	
2135	EN71-3	858.5		-2.02	
2137	EN71-3	1370		0.74	
2156	EN71-3	1339		0.57	
2165	EN71-3	1265.4		0.18	
2182	EN71-3	948.215		-1.54	
2184	EN71-3	1240.2		0.04	
2201	EN71-3	1249.00		0.09	
2228	EN71-3	not detected		-----	
2230	EN71-3	<2		<-6.66	Possibly a false negative test result?
2232	EN71-3	1098.62		-0.73	
2236	EN71-3	1128		-0.57	
2238	EN71-3	1284.69		0.28	
2241	EN71-3	1296.667		0.34	
2247	EN71-3	1298.20		0.35	
2250	EN71-3	1126		-0.58	
2256	EN71-3	1109.45		-0.67	
2265	EN71-3	1220		-0.07	
2272		1184.12		-0.26	
2284	EN71-3	1250.723		0.10	
2289	EN71-3	1228.2		-0.03	
2290	EN71-3	1088.1		-0.78	
2293		-----		-----	
2294	EN71-3	1349.21		0.63	
2301		-----		-----	
2352	EN71-3	1251.32		0.10	
2357	EN71-3	1272.2		0.21	
2363	EN71-3	1285.0		0.28	
2365	EN71-3	1236.45		0.02	
2366	EN71-3	1267.8		0.19	
2372	EN71-3	1530		1.61	
2375	EN71-3	1167		-0.36	
2379	EN71-3	37.95	C,R(0.01)	-6.46	First reported 25.9
2382	EN71-3	1275.6		0.23	
2384	EN71-3	1314.264		0.44	
2385	EN71-3	1334		0.55	
2390	EN71-3	1226.89		-0.03	
2406	EN71-3	1111.036		-0.66	
2410	EN71-3	1020		-1.15	
2429	EN71-3	1218.3		-0.08	
2431	EN71-3	1451.97		1.18	
2442	EN71-3	1120.20		-0.61	
2475	EN71-3	1313		0.43	
2489	EN71-3	1253.9		0.11	
2495	EN71-3	1081.10		-0.82	
2500	EN71-3	1220.124		-0.07	
2503	EN71-3	1134		-0.54	
2582	EN71-3	not detected		-----	
2590	EN71-3	21.96	C,R(0.01)	-6.55	First reported 17.5
2643	EN71-3	1530.0		1.61	
2650	EN71-3	3.76	R(0.01)	-6.65	
2651	EN71-3	1197.2		-0.19	
2654		-----		-----	
2674	EN71-3	1276.51		0.24	
2703	EN71-3	1242.21		0.05	
2743		-----		-----	
2805	EN71-3	1303.47		0.38	
2817		-----		-----	
2864		-----		-----	
2867	EN71-3	1273.3		0.22	
2917	EN71-3	1044		-1.02	
2953		-----		-----	
2965	EN71-3	1190.5		-0.23	
3100	EN71-3	1294.40		0.33	

lab	method	value	mark	z(targ)	remarks
3116	EN71-3	1218.17		-0.08	
3118	EN71-3	674	C,R(0.01)	-3.02	First reported 557.16
3153	EN71-3	1168.18		-0.35	
3172	EN71-3	1481		1.34	
3176	EN71-3	1351.26		0.64	
3182	EN71-3	1185.493		-0.26	
3185	EN71-3	1221.2		-0.06	
3190	EN71-3	1257		0.13	
3195	EN71-3	1630		2.15	
3218	EN71-3	1220.00		-0.07	
3228	EN71-3	1239.3		0.03	
3233	EN71-3	1266.16		0.18	
3237	EN71-3	1118.21		-0.62	
3248	EN71-3	1438.4		1.11	
8005		-----		-----	

	normality	suspect
	n	71
	outliers	6
	mean (n)	1233.030
	st.dev. (n)	135.6353 RSD = 11%
	R(calc.)	379.779
	st.dev.(EN71-3:19)	184.9545
	R(EN71-3:19)	517.873





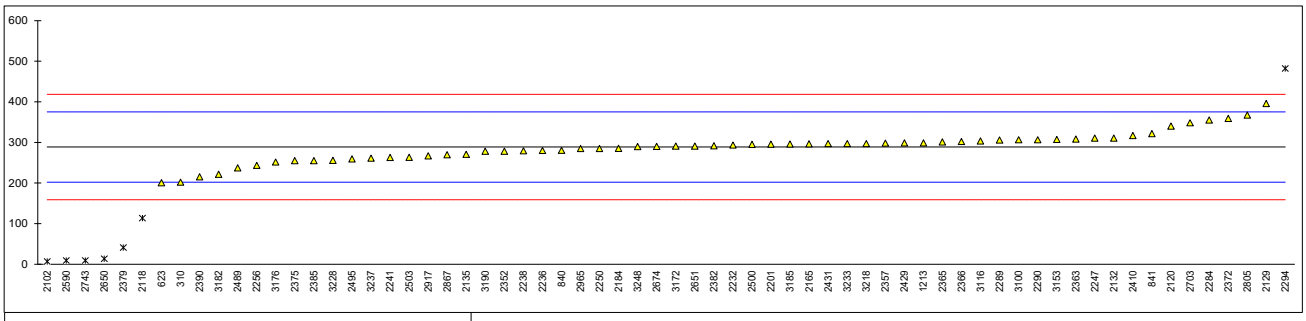
Determination of migration of Chromium (III) on dried paint sample #21576; results in mg/kg

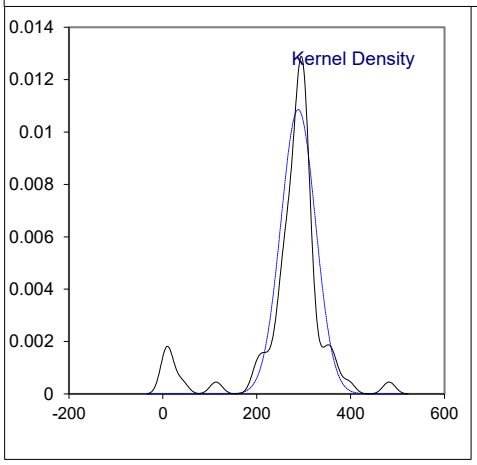
lab	method	value	mark	z(targ)	remarks
210		-----		-----	
310	EN71-3	201.78	C	-2.00	First reported 44.16
551	EN71-3	Not detected		-----	
623	EN71-3	200.68		-2.03	
840	EN71-3	280.43		-0.19	
841	EN71-3	321.7		0.77	
1213	EN71-3	298.95		0.24	
2102	In house	6.624	R(0.01)	-6.51	
2118	EN71-3	113.57	R(0.01)	-4.04	
2120	EN71-3	340		1.19	
2129	EN71-3	395.6		2.48	
2132	EN71-3	310.53		0.51	
2135	EN71-3	270.5		-0.42	
2137		-----		-----	
2156		-----		-----	
2165	EN71-3	296.2		0.18	
2182	EN71-3	-----		-----	
2184	EN71-3	285.3		-0.07	
2201	EN71-3	295.60		0.16	
2228		-----		-----	
2230		-----		-----	
2232	EN71-3	293.36		0.11	
2236	EN71-3	279.8		-0.20	
2238	EN71-3	279.07		-0.22	
2241	EN71-3	262.767		-0.59	
2247	EN71-3	310.28		0.50	
2250	EN71-3	285.125		-0.08	
2256	EN71-3	243.28		-1.04	
2265		-----		-----	
2272		-----		-----	
2284	EN71-3	355.179		1.54	
2289	EN71-3	305.7		0.40	
2290	EN71-3	306.4		0.41	
2293		-----		-----	
2294	EN71-3	481.94	R(0.01)	4.47	
2301		-----		-----	
2352	EN71-3	278.21		-0.24	
2357	EN71-3	297.9		0.22	
2363	EN71-3	308.2		0.46	
2365	EN71-3	301.00		0.29	
2366	EN71-3	302		0.31	
2372	EN71-3	359		1.63	
2375	EN71-3	255		-0.77	
2379	EN71-3	40.80	C,R(0.01)	-5.72	First reported 33.15
2382	EN71-3	291.7		0.07	
2384		-----		-----	
2385	EN71-3	255		-0.77	
2390	EN71-3	214.89		-1.70	
2406		-----		-----	
2410	EN71-3	317		0.66	
2429	EN71-3	298.8		0.24	
2431	EN71-3	296.90		0.19	
2442		-----		-----	
2475		-----		-----	
2489	EN71-3	237		-1.19	
2495	EN71-3	259.15		-0.68	
2500	EN71-3	295.142		0.15	
2503	EN71-3	263.4		-0.58	
2582	EN71-3	not detected		-----	
2590	EN71-3	9.00	C,R(0.01)	-6.46	First reported 10.5
2643		-----		-----	
2650	EN71-3	13.43	R(0.01)	-6.36	
2651	EN71-3	290.9		0.06	
2654		-----		-----	
2674	EN71-3	290.23		0.04	
2703	EN71-3	348.10		1.38	
2743	EN71-3	9.0073	R(0.01)	-6.46	
2805	EN71-3	367.29		1.82	
2817		-----		-----	
2864		-----		-----	
2867	EN71-3	269.4		-0.44	
2917	EN71-3	266.87		-0.50	
2953		-----		-----	
2965	EN71-3	284.5		-0.09	

lab	method	value	mark	z(targ)	remarks
3100	EN71-3	306.270		0.41	
3116	EN71-3	303.39		0.34	
3118		-----		-----	
3153	EN71-3	307.17		0.43	
3172	EN71-3	290.7		0.05	
3176	EN71-3	251.56	C	-0.85	First reported 245.92
3182	EN71-3	221.382		-1.55	
3185	EN71-3	295.9		0.17	
3190	EN71-3	278		-----	
3195		-----		-----	
3218	EN71-3	297.00		0.20	
3228	EN71-3	255.6		-0.76	
3233	EN71-3	296.90		0.19	
3237	EN71-3	261.09		-0.63	
3248	EN71-3	289.8		0.03	
8005		-----		-----	

	normality	suspect
	n	59
	outliers	7
	mean (n)	288.484
	st.dev. (n)	36.7345
	R(calc.)	102.857
	st.dev.(EN71-3:19)	43.2726
	R(EN71-3:19)	121.163

RSD = 13%





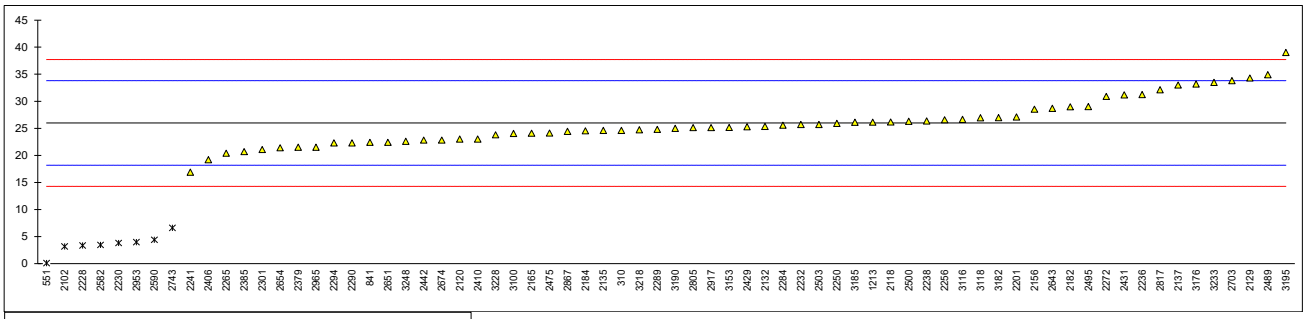
Determination of migration of Manganese as Mn on dried paint sample #21576; results in mg/kg

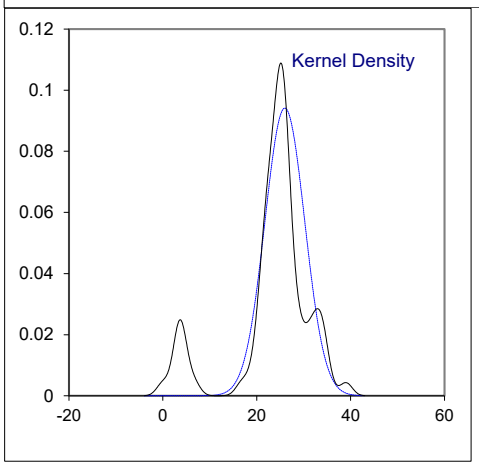
lab	method	value	mark	z(targ)	Remarks
210		-----		-----	
310	EN71-3	24.61	C	-0.36	First reported 12.03
551	EN71-3	0.1061	R(0.01)	-6.64	
623	EN71-3	not detected		-----	
840	EN71-3	not detected		-----	
841	EN71-3	22.4		-0.92	
1213	EN71-3	26.14		0.04	
2102	In house	3.175	R(0.01)	-5.85	
2118	EN71-3	26.17		0.04	
2120	EN71-3	23		-0.77	
2129	EN71-3	34.3		2.13	
2132	EN71-3	25.36		-0.16	
2135	EN71-3	24.6		-0.36	
2137	EN71-3	33		1.80	
2156	EN71-3	28.54		0.65	
2165	EN71-3	24.1		-0.49	
2182	EN71-3	28.963		0.76	
2184	EN71-3	24.53		-0.38	
2201	EN71-3	27.10		0.28	
2228	EN71-3	3.35	R(0.01)	-5.81	
2230	EN71-3	3.80	R(0.01)	-5.69	
2232	EN71-3	25.7	C	-0.08	First reported 10.7
2236	EN71-3	31.23		1.34	
2238	EN71-3	26.35		0.09	
2241	EN71-3	16.900		-2.33	
2247	EN71-3	not detected		-----	
2250	EN71-3	25.931		-0.02	
2256	EN71-3	26.56		0.14	
2265	EN71-3	20.4		-1.43	
2272		30.90		1.26	
2284	EN71-3	25.576		-0.11	
2289	EN71-3	24.8		-0.31	
2290	EN71-3	22.3		-0.95	
2293		-----		-----	
2294	EN71-3	22.30		-0.95	
2301	EN71-3	21.07		-1.26	
2352		-----		-----	
2357	EN71-3	<50		-----	
2363	EN71-3	<50		-----	
2365	EN71-3	＜50		-----	
2366	EN71-3	<50		-----	
2372	EN71-3	<50		-----	
2375	EN71-3	<50		-----	
2379	EN71-3	21.50		-1.15	
2382	EN71-3	＜50.0		-----	
2384	EN71-3	not detected		-----	
2385	EN71-3	20.7		-1.36	
2390	EN71-3	n.d		-----	
2406	EN71-3	19.189		-1.75	
2410	EN71-3	23		-0.77	
2429	EN71-3	25.3		-0.18	
2431	EN71-3	31.17		1.33	
2442	EN71-3	22.82	C	-0.81	First reported 5.88
2475	EN71-3	24.11		-0.48	
2489	EN71-3	34.9		2.28	
2495	EN71-3	29.03		0.78	
2500	EN71-3	26.311		0.08	
2503	EN71-3	25.71		-0.07	
2582	EN71-3	3.44	R(0.01)	-5.78	
2590	EN71-3	4.39	C,R(0.01)	-5.54	First reported 5.4
2643	EN71-3	28.70	C	0.69	First reported 38.5
2650		-----		-----	
2651	EN71-3	22.4		-0.92	
2654		21.40	C	-1.18	First reported 3.21
2674	EN71-3	22.83		-0.81	
2703	EN71-3	33.81		2.00	
2743	EN71-3	6.6120	R(0.01)	-4.97	
2805	EN71-3	25.12		-0.22	
2817		32.1339		1.57	
2864		-----		-----	
2867	EN71-3	24.42		-0.40	
2917	EN71-3	25.13		-0.22	
2953	EN71-3	3.97	C,R(0.01)	-5.65	First reported 3.84
2965	EN71-3	21.5		-1.15	

lab	method	value	mark	z(targ)	Remarks
3100	EN71-3	24.04		-0.50	
3116	EN71-3	26.65		0.17	
3118	EN71-3	26.96		0.25	
3153	EN71-3	25.17		-0.21	
3172	EN71-3	< 50		-----	
3176	EN71-3	33.19		1.85	
3182	EN71-3	26.985		0.25	
3185	EN71-3	26.1		0.03	
3190	EN71-3	25		-0.26	
3195	EN71-3	39.0		3.34	
3218	EN71-3	24.73		-0.32	
3228	EN71-3	23.8		-0.56	
3233	EN71-3	33.48		1.92	
3237		-----		-----	
3248	EN71-3	22.6		-0.87	
8005		-----		-----	

normality	OK
n	62
outliers	8
mean (n)	25.9955
st.dev. (n)	4.23850
R(calc.)	11.8678
st.dev.(EN71-3:19)	3.89932
R(EN71-3:19)	10.9181

RSD = 16%



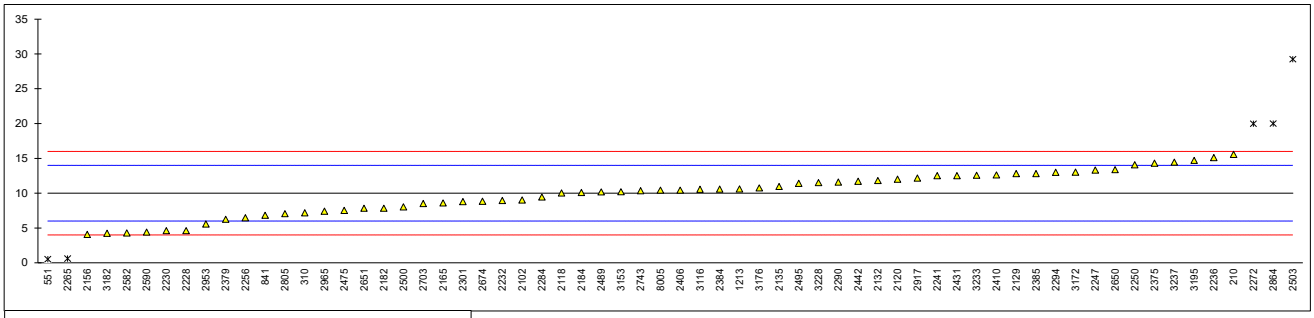


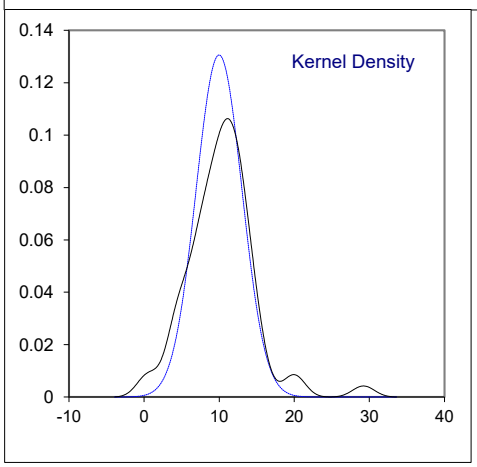
Determination of migration of Mercury as Hg on dried paint sample #21576; results in mg/kg

lab	method	value	mark	z(targ)	remarks
210	In house	15.57		2.79	
310	EN71-3	7.17	C	-1.41	First reported 18.85
551	EN71-3	0.4992	R(0.01)	-4.75	
623	EN71-3	not detected		-----	
840	EN71-3	not detected		-----	
841	EN71-3	6.8		-1.60	
1213	EN71-3	10.60		0.30	
2102	In house	9.016		-0.49	
2118	EN71-3	10.02		0.01	
2120	EN71-3	12		1.00	
2129	EN71-3	12.796		1.40	
2132	EN71-3	11.81		0.91	
2135	EN71-3	10.963		0.48	
2137		-----		-----	
2156	EN71-3	4.050		-2.97	
2165	EN71-3	8.58		-0.71	
2182	EN71-3	7.823		-1.09	
2184	EN71-3	10.08		0.04	
2201	EN71-3	<10		-----	
2228	EN71-3	4.61		-2.69	
2230	EN71-3	4.60		-2.70	
2232	EN71-3	8.942		-0.53	
2236	EN71-3	15.11		2.56	
2238	EN71-3	<10		-----	
2241	EN71-3	12.500		1.25	
2247	EN71-3	13.30		1.65	
2250	EN71-3	14.063		2.03	
2256	EN71-3	6.46		-1.77	
2265	EN71-3	0.59	R(0.01)	-4.70	
2272		19.97	R(0.01)	4.99	
2284	EN71-3	9.439		-0.28	
2289	EN71-3	<10		-----	
2290	EN71-3	11.6		0.80	
2293		-----		-----	
2294	EN71-3	12.99		1.50	
2301	EN71-3	8.78		-0.61	
2352		-----		-----	
2357	EN71-3	<10		-----	
2363	EN71-3	<10		-----	
2365	EN71-3	＜10		-----	
2366	EN71-3	<10		-----	
2372	EN71-3	<10		-----	
2375	EN71-3	14.3		2.15	
2379	EN71-3	6.23		-1.88	
2382	EN71-3	＜10.0		-----	
2384	EN71-3	10.572		0.29	
2385	EN71-3	12.8		1.40	
2390	EN71-3	n.d		-----	
2406	EN71-3	10.436		0.22	
2410	EN71-3	12.6		1.30	
2429	EN71-3	ND		-----	
2431	EN71-3	12.51		1.26	
2442	EN71-3	11.70		0.85	
2475	EN71-3	7.5		-1.25	
2489	EN71-3	10.18		0.09	
2495	EN71-3	11.40		0.70	
2500	EN71-3	8.014		-0.99	
2503	EN71-3	29.23	R(0.01)	9.62	
2582	EN71-3	4.26		-2.87	
2590	EN71-3	4.4		-2.80	
2643	EN71-3	not detected		-----	
2650	EN71-3	13.36		1.68	
2651	EN71-3	7.82		-1.09	
2654		not detected	C	-----	First reported 1.63
2674	EN71-3	8.81		-0.59	
2703	EN71-3	8.5	C	-0.75	First reported 21.65
2743	EN71-3	10.3362		0.17	
2805	EN71-3	7.04		-1.48	
2817		-----		-----	
2864	EN71-3	20	C,R(0.01)	5.00	First reported 27.65
2867	EN71-3	not detected		-----	
2917	EN71-3	12.16		1.08	
2953	EN71-3	5.56		-2.22	
2965	EN71-3	7.4		-1.30	

lab	method	value	mark	z(targ)	remarks
3100	EN71-3	＜10		-----	
3116	EN71-3	10.55		0.28	
3118	EN71-3	<5		-----	
3153	EN71-3	10.19		0.10	
3172	EN71-3	13.0		1.50	
3176	EN71-3	10.75		0.38	
3182	EN71-3	4.222		-2.89	
3185	EN71-3	<10		-----	
3190		-----		-----	
3195	EN71-3	14.7		2.35	
3218	EN71-3	<10		-----	
3228	EN71-3	11.5		0.75	
3233	EN71-3	12.57		1.29	
3237	EN71-3	14.45		2.23	
3248	EN71-3	<10		-----	
8005	ASTM F963	10.43		0.22	

normality	OK	
n	59	
outliers	5	
mean (n)	9.9987	
st.dev. (n)	3.05456	RSD = 31%
R(calc.)	8.5528	
st.dev.(EN71-3:19)	1.99974	
R(EN71-3:19)	5.5993	

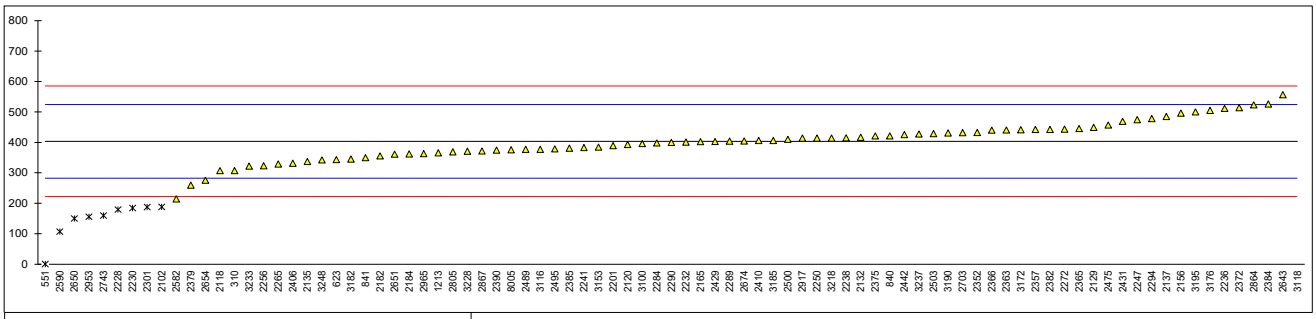


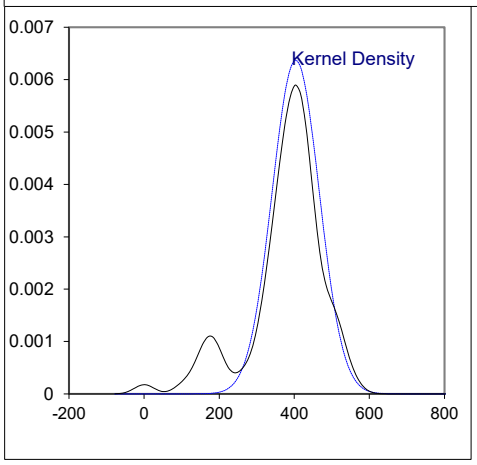


Determination of migration of Selenium as Se on dried paint sample #21576; results in mg/kg

lab	method	value	mark	z(targ)	remarks
210		-----		-----	
310	EN71-3	307.59	C	-1.59	First reported 711.28
551	EN71-3	0.1873	R(0.01)	-6.66	
623	EN71-3	343.15		-1.00	
840	EN71-3	421.28		0.29	
841	EN71-3	349.5		-0.89	
1213	EN71-3	365.47		-0.63	
2102	In house	188.277	C,R(0.01)	-3.56	First reported 180.277
2118	EN71-3	307.19		-1.59	
2120	EN71-3	393		-0.18	
2129	EN71-3	449.21		0.75	
2132	EN71-3	416.98		0.22	
2135	EN71-3	336.75		-1.11	
2137	EN71-3	485		1.34	
2156	EN71-3	496.3		1.53	
2165	EN71-3	402.4		-0.02	
2182	EN71-3	355.581		-0.79	
2184	EN71-3	362.0		-0.69	
2201	EN71-3	389.03		-0.24	
2228	EN71-3	179.36	R(0.01)	-3.70	
2230	EN71-3	184	R(0.01)	-3.63	
2232	EN71-3	401	C	-0.04	First reported 200.44
2236	EN71-3	511.4		1.78	
2238	EN71-3	414.98		0.19	
2241	EN71-3	383.041		-0.34	
2247	EN71-3	474.50		1.17	
2250	EN71-3	414.0		0.17	
2256	EN71-3	322.92		-1.33	
2265	EN71-3	329		-1.23	
2272		443.20		0.65	
2284	EN71-3	397.970		-0.09	
2289	EN71-3	404.2		0.01	
2290	EN71-3	399.7		-0.07	
2293		-----		-----	
2294	EN71-3	478.27		1.23	
2301	EN71-3	187.71	C,R(0.01)	-3.57	First reported 197.71
2352	EN71-3	432.13		0.47	
2357	EN71-3	442.5		0.64	
2363	EN71-3	440.5		0.61	
2365	EN71-3	445.267		0.69	
2366	EN71-3	439.9		0.60	
2372	EN71-3	514		1.82	
2375	EN71-3	421		0.29	
2379	EN71-3	259.50	C	-2.38	First reported 238.25
2382	EN71-3	442.6		0.64	
2384	EN71-3	525.844		2.02	
2385	EN71-3	381		-0.37	
2390	EN71-3	374.81		-0.48	
2406	EN71-3	331.623		-1.19	
2410	EN71-3	406		0.04	
2429	EN71-3	402.7		-0.02	
2431	EN71-3	468.77		1.07	
2442	EN71-3	425.57		0.36	
2475	EN71-3	456.8		0.88	
2489	EN71-3	377.29		-0.44	
2495	EN71-3	378.60		-0.41	
2500	EN71-3	410.214		0.11	
2503	EN71-3	428.9		0.42	
2582	EN71-3	213.94		-3.13	
2590	EN71-3	106.78	C,R(0.01)	-4.90	First reported 88.4
2643	EN71-3	556.67		2.53	
2650	EN71-3	149.60	R(0.01)	-4.20	
2651	EN71-3	361.0		-0.70	
2654		275.8	C	-2.11	First reported 166.2
2674	EN71-3	404.75		0.02	
2703	EN71-3	431.74		0.46	
2743	EN71-3	159.4675	R(0.01)	-4.03	
2805	EN71-3	368.69		-0.58	
2817		-----		-----	
2864	EN71-3	523.28		1.98	
2867	EN71-3	371.8		-0.53	
2917	EN71-3	413.91		0.17	
2953	EN71-3	155.49	C,R(0.01)	-4.10	First reported 173.11
2965	EN71-3	363.0		-0.67	

lab	method	value	mark	z(targ)	remarks
3100	EN71-3	396.06		-0.13	
3116	EN71-3	377.32		-0.44	
3118	EN71-3	3344	C,R(0.01)	48.56	First reported 1516.11
3153	EN71-3	384.13		-0.32	
3172	EN71-3	441.5		0.62	
3176	EN71-3	504.94		1.67	
3182	EN71-3	345.368		-0.96	
3185	EN71-3	406.0		0.04	
3190	EN71-3	431		0.45	
3195	EN71-3	500		1.59	
3218	EN71-3	414.00		0.17	
3228	EN71-3	370.6		-0.55	
3233	EN71-3	321.90		-1.35	
3237	EN71-3	427.57		0.39	
3248	EN71-3	342.5		-1.01	
8005	ASTM F963	375.80		-0.46	
	normality	OK			
	n	77			
	outliers	10			
	mean (n)	403.681			
	st.dev. (n)	62.6369	RSD = 16%		
	R(calc.)	175.383			
	st.dev.(EN71-3:19)	60.5521			
	R(EN71-3:19)	169.546			



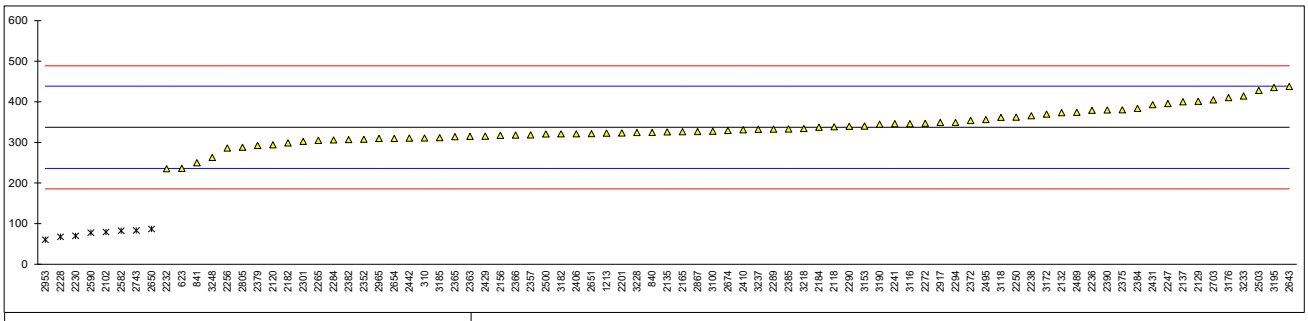


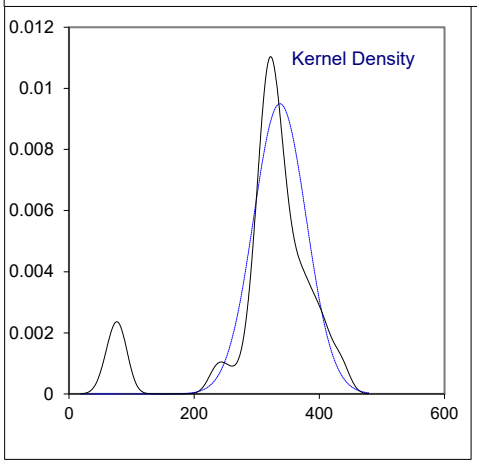
Determination of migration of Strontium as Sr on dried paint sample #21576; results in mg/kg

lab	method	value	mark	z(targ)	remarks
210		-----		-----	
310	EN71-3	310.83	C	-0.52	First reported 527.63
551	EN71-3	Not detected		-----	
623	EN71-3	236.23		-2.00	
840	EN71-3	324.52		-0.25	
841	EN71-3	249.8		-1.73	
1213	EN71-3	322.83		-0.28	
2102	In house	78.923	R(0.01)	-5.11	
2118	EN71-3	338.29		0.02	
2120	EN71-3	294		-0.85	
2129	EN71-3	401		1.26	
2132	EN71-3	373.20		0.71	
2135	EN71-3	325.475		-0.23	
2137	EN71-3	399.85		1.24	
2156	EN71-3	317.2		-0.40	
2165	EN71-3	326.5		-0.21	
2182	EN71-3	298.637		-0.76	
2184	EN71-3	337.1		0.00	
2201	EN71-3	323.26		-0.28	
2228	EN71-3	67.36	R(0.01)	-5.33	
2230	EN71-3	69.6	R(0.01)	-5.29	
2232	EN71-3	234.89		-2.02	
2236	EN71-3	378.8		0.82	
2238	EN71-3	365.57		0.56	
2241	EN71-3	345.825		0.17	
2247	EN71-3	395.70		1.16	
2250	EN71-3	362.15		0.49	
2256	EN71-3	285.95		-1.01	
2265	EN71-3	305		-0.64	
2272		346.87		0.19	
2284	EN71-3	306.013		-0.62	
2289	EN71-3	332.4		-0.09	
2290	EN71-3	339.5		0.05	
2293		-----		-----	
2294	EN71-3	349.11		0.24	
2301	EN71-3	302.31		-0.69	
2352	EN71-3	307.42		-0.59	
2357	EN71-3	318.4		-0.37	
2363	EN71-3	314.7		-0.44	
2365	EN71-3	314.00		-0.46	
2366	EN71-3	318		-0.38	
2372	EN71-3	354		0.33	
2375	EN71-3	380		0.85	
2379	EN71-3	292.20		-0.89	
2382	EN71-3	306.8		-0.60	
2384	EN71-3	383.649		0.92	
2385	EN71-3	333		-0.08	
2390	EN71-3	379.81		0.84	
2406	EN71-3	320.901		-0.32	
2410	EN71-3	331		-0.12	
2429	EN71-3	315.1		-0.44	
2431	EN71-3	392.64		1.10	
2442	EN71-3	310.47		-0.53	
2475	EN71-3	<500		-----	
2489	EN71-3	373.76		0.72	
2495	EN71-3	356.20		0.38	
2500	EN71-3	320.412		-0.33	
2503	EN71-3	427.9		1.79	
2582	EN71-3	82.20	R(0.01)	-5.04	
2590	EN71-3	77.38	C,R(0.01)	-5.14	First reported 69.5
2643	EN71-3	437.75		1.99	
2650	EN71-3	86.50	R(0.01)	-4.96	
2651	EN71-3	321.3		-0.31	
2654		309.8	C	-0.54	First reported 62.23
2674	EN71-3	329.21		-0.16	
2703	EN71-3	404.77		1.34	
2743	EN71-3	83.0422	R(0.01)	-5.02	
2805	EN71-3	288.04		-0.97	
2817		-----	W	-----	Test result withdrawn, reported 999.1004
2864		-----		-----	
2867	EN71-3	326.6		-0.21	
2917	EN71-3	349.05		0.23	
2953	EN71-3	60.10	C,R(0.01)	-5.48	First reported 68.17
2965	EN71-3	309.5		-0.55	

lab	method	value	mark	z(targ)	remarks
3100	EN71-3	327.37		-0.19	
3116	EN71-3	345.98		0.17	
3118	EN71-3	361.61		0.48	
3153	EN71-3	340.20		0.06	
3172	EN71-3	369.6		0.64	
3176	EN71-3	410.26		1.44	
3182	EN71-3	320.821		-0.32	
3185	EN71-3	311.6		-0.51	
3190	EN71-3	345		0.15	
3195	EN71-3	435		1.93	
3218	EN71-3	334.00		-0.06	
3228	EN71-3	324.3		-0.26	
3233	EN71-3	414.19		1.52	
3237	EN71-3	332.18		-0.10	
3248	EN71-3	262.9		-1.47	
8005		-----		-----	

normality	OK	
n	75	
outliers	8	
mean (n)	337.203	
st.dev. (n)	42.0211	RSD = 12%
R(calc.)	117.659	
st.dev.(EN71-3:19)	50.5804	
R(EN71-3:19)	141.625	



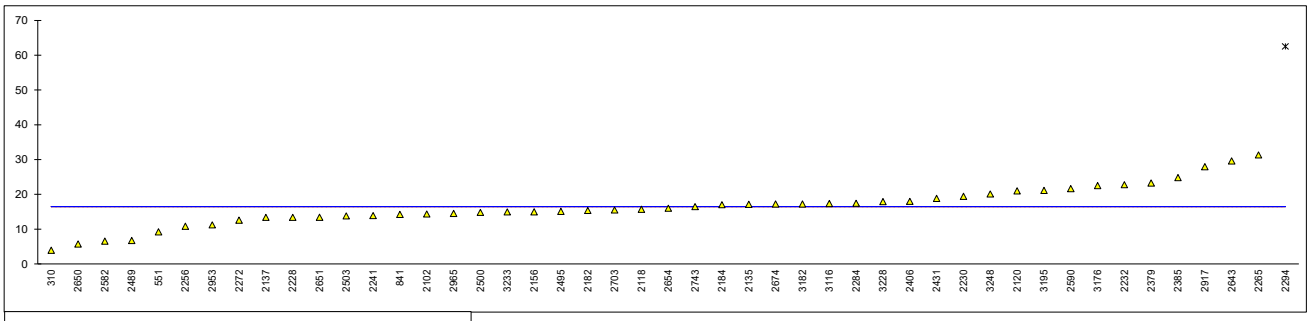


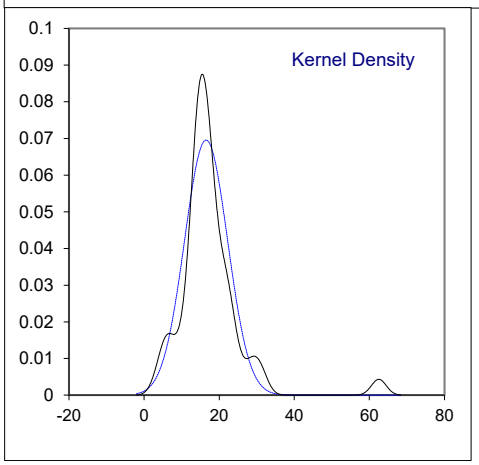
Determination of migration of Aluminum as Al on dried paint sample #21577; results in mg/kg

lab	method	value	mark	z(targ)	remarks
210		-----		-----	
310	EN71-3	3.91		-----	
551	EN71-3	9.218		-----	
623	EN71-3	not detected		-----	
840	EN71-3	not detected		-----	
841	EN71-3	14.2		-----	
1213	EN71-3	ND		-----	
2102	In house	14.337		-----	
2118	EN71-3	15.71		-----	
2120	EN71-3	21		-----	
2129		-----		-----	
2132	EN71-3	<50		-----	
2135	EN71-3	17.13		-----	
2137	EN71-3	13.35		-----	
2156	EN71-3	14.96		-----	
2165	EN71-3	Not detected		-----	
2182	EN71-3	15.352		-----	
2184	EN71-3	17.0		-----	
2201	EN71-3	<100		-----	
2228	EN71-3	13.37		-----	
2230	EN71-3	19.4		-----	
2232	EN71-3	22.77		-----	
2236	EN71-3	<50.0		-----	
2238	EN71-3	<300		-----	
2241	EN71-3	13.874		-----	
2247	EN71-3	Not detected		-----	
2250	EN71-3	<10		-----	
2256	EN71-3	10.82		-----	
2265	EN71-3	31.3		-----	
2272		12.57		-----	
2284	EN71-3	17.415		-----	
2289	EN71-3	<300		-----	
2290	EN71-3	<300		-----	
2293		-----		-----	
2294	EN71-3	62.50	R(0.01)	-----	
2301		-----		-----	
2352		-----		-----	
2357	EN71-3	<50		-----	
2363	EN71-3	<50		-----	
2365	EN71-3	＜50		-----	
2366	EN71-3	<50		-----	
2372	EN71-3	<50		-----	
2375	EN71-3	<50		-----	
2379	EN71-3	23.21		-----	
2382	EN71-3	＜50.0		-----	
2384	EN71-3	not detected		-----	
2385	EN71-3	24.8		-----	
2390	EN71-3	n.d		-----	
2406	EN71-3	17.965		-----	
2410		-----		-----	
2429	EN71-3	ND		-----	
2431	EN71-3	18.81		-----	
2442	EN71-3	Not detected		-----	
2475	EN71-3	<500		-----	
2489	EN71-3	6.72		-----	
2495	EN71-3	15.10		-----	
2500	EN71-3	14.821		-----	
2503	EN71-3	13.77		-----	
2582	EN71-3	6.56		-----	
2590	EN71-3	21.6		-----	
2643	EN71-3	29.55		-----	
2650	EN71-3	5.71		-----	
2651	EN71-3	13.4		-----	
2654		15.99		-----	
2674	EN71-3	17.22		-----	
2703	EN71-3	15.46		-----	
2743	EN71-3	16.4387		-----	
2805		< 10		-----	
2817		-----		-----	
2864		-----		-----	
2867	EN71-3	not detected		-----	
2917	EN71-3	27.94		-----	
2953	EN71-3	11.21		-----	
2965	EN71-3	14.5		-----	

lab	method	value	mark	z(targ)	remarks
3100	EN71-3	＜300		-----	
3116	EN71-3	17.35		-----	
3118	EN71-3	<5		-----	
3153	EN71-3	<300		-----	
3172	EN71-3	< 50		-----	
3176	EN71-3	22.51		-----	
3182	EN71-3	17.223		-----	
3185	EN71-3	<300		-----	
3190	EN71-3	<300		-----	
3195	EN71-3	21.1		-----	
3218	EN71-3	<300		-----	
3228	EN71-3	17.9		-----	
3233	EN71-3	14.93		-----	
3237		-----		-----	
3248	EN71-3	20.1		-----	
8005		-----		-----	

normality	OK	
n	46	
outliers	1	
mean (n)	16.5125	
st.dev. (n)	5.73428	RSD = 35%
R(calc.)	16.0560	
st.dev.(EN71-3:19)	(2.47687)	
R(EN71-3:19)	(6.9352)	





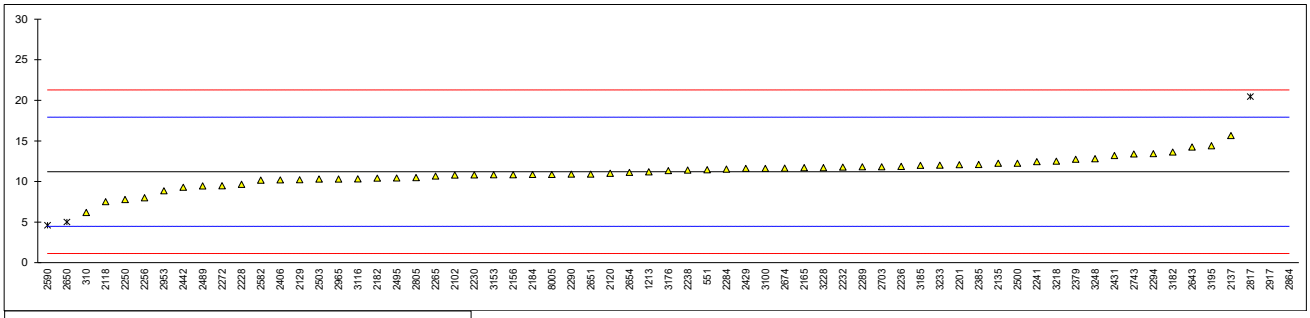
Determination of migration of Barium as Ba on dried paint sample #21577; results in mg/kg

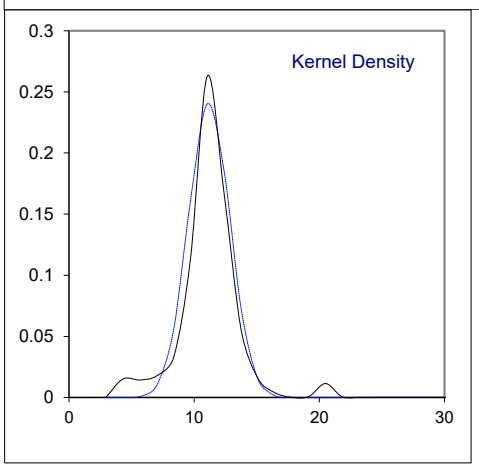
lab	method	value	mark	z(targ)	remarks
210		-----		-----	
310	EN71-3	6.18		-1.49	
551	EN71-3	11.4396		0.07	
623	EN71-3	not detected		-----	
840	EN71-3	not detected		-----	
841	EN71-3	<10		-----	
1213	EN71-3	11.18		0.00	
2102	In house	10.789		-0.12	
2118	EN71-3	7.50		-1.10	
2120	EN71-3	11		-0.06	
2129	EN71-3	10.212		-0.29	
2132	EN71-3	<25		-----	
2135	EN71-3	12.233		0.31	
2137	EN71-3	15.65		1.33	
2156	EN71-3	10.83		-0.11	
2165	EN71-3	11.7		0.15	
2182	EN71-3	10.411		-0.23	
2184	EN71-3	10.86		-0.10	
2201	EN71-3	12.05		0.25	
2228	EN71-3	9.65		-0.46	
2230	EN71-3	10.8		-0.12	
2232	EN71-3	11.77		0.17	
2236	EN71-3	11.86		0.20	
2238	EN71-3	11.41		0.06	
2241	EN71-3	12.432		0.37	
2247	EN71-3	Not detected		-----	
2250	EN71-3	7.773		-1.02	
2256	EN71-3	8.00		-0.95	
2265	EN71-3	10.66		-0.16	
2272		9.46		-0.52	
2284	EN71-3	11.52		0.10	
2289	EN71-3	11.8		0.18	
2290	EN71-3	10.9		-0.09	
2293		-----		-----	
2294	EN71-3	13.42		0.66	
2301		-----		-----	
2352		-----		-----	
2357	EN71-3	<50		-----	
2363	EN71-3	<50		-----	
2365	EN71-3	＜50		-----	
2366	EN71-3	<50		-----	
2372	EN71-3	<50		-----	
2375	EN71-3	<50		-----	
2379	EN71-3	12.72		0.45	
2382	EN71-3	＜50.0		-----	
2384	EN71-3	not detected		-----	
2385	EN71-3	12.1		0.27	
2390	EN71-3	n.d		-----	
2406	EN71-3	10.185		-0.30	
2410		-----		-----	
2429	EN71-3	11.6		0.12	
2431	EN71-3	13.2		0.60	
2442	EN71-3	9.29		-0.57	
2475	EN71-3	<500		-----	
2489	EN71-3	9.45		-0.52	
2495	EN71-3	10.43		-0.23	
2500	EN71-3	12.241		0.31	
2503	EN71-3	10.3		-0.27	
2582	EN71-3	10.16		-0.31	
2590	EN71-3	4.6	R(0.05)	-1.96	
2643	EN71-3	14.24		0.91	
2650	EN71-3	5.00	R(0.05)	-1.84	
2651	EN71-3	10.9		-0.09	
2654		11.11		-0.03	
2674	EN71-3	11.64		0.13	
2703	EN71-3	11.80		0.18	
2743	EN71-3	13.3769		0.65	
2805		10.47		-0.22	
2817	In house	20.4602	R(0.01)	2.76	
2864	EN71-3	345	C,R(0.01)	99.38	First reported 575.11
2867	EN71-3	not detected		-----	
2917	EN71-3	79.74	R(0.01)	20.41	
2953	EN71-3	8.84		-0.70	
2965	EN71-3	10.3		-0.27	

lab	method	value	mark	z(targ)	remarks
3100	EN71-3	11.61		0.12	
3116	EN71-3	10.31		-0.26	
3118	EN71-3	<5		-----	
3153	EN71-3	10.82		-0.11	
3172	EN71-3	< 50		-----	
3176	EN71-3	11.33		0.04	
3182	EN71-3	13.608		0.72	
3185	EN71-3	11.98		0.23	
3190	EN71-3	<10		-----	
3195	EN71-3	14.4		0.95	
3218	EN71-3	12.50		0.39	
3228	EN71-3	11.7		0.15	
3233	EN71-3	12.01		0.24	
3237		-----		-----	
3248	EN71-3	12.8		0.48	
8005	ASTM F963	10.86		-0.10	

	normality	suspect
	n	60
	outliers	5
	mean (n)	11.1962
	st.dev. (n)	1.65546
	R(calc.)	4.6353
	st.dev.(EN71-3:19)	3.35885
	R(EN71-3:19)	9.4048

RSD = 15%



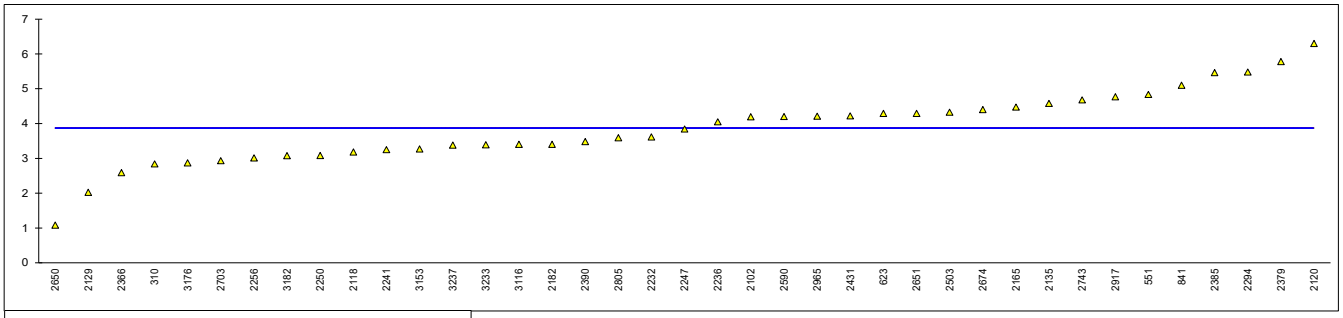


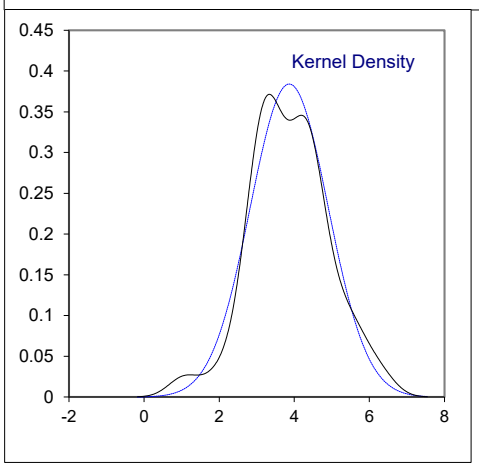
Determination of migration of Chromium (III) on dried paint sample #21577; results in mg/kg

lab	method	value	mark	z(targ)	remarks
210		-----		-----	
310	EN71-3	2.84		-----	
551	EN71-3	4.8373		-----	
623	EN71-3	4.29		-----	
840	EN71-3	not detected		-----	
841	EN71-3	5.1		-----	
1213	EN71-3	ND		-----	
2102	In house	4.194		-----	
2118	EN71-3	3.18		-----	
2120	EN71-3	6.3		-----	
2129	EN71-3	2.023		-----	
2132	EN71-3	<10		-----	
2135	EN71-3	4.577		-----	
2137		-----		-----	
2156		-----		-----	
2165	EN71-3	4.47		-----	
2182	EN71-3	3.403		-----	
2184	EN71-3	<10		-----	
2201	EN71-3	<10		-----	
2228		-----		-----	
2230	EN71-3	<2		-----	
2232	EN71-3	3.612		-----	
2236	EN71-3	4.048		-----	
2238	EN71-3	<10		-----	
2241	EN71-3	3.248		-----	
2247	EN71-3	3.84		-----	
2250	EN71-3	3.081		-----	
2256	EN71-3	3.01		-----	
2265		-----		-----	
2272		-----		-----	
2284	EN71-3	<5		-----	
2289	EN71-3	<10		-----	
2290	EN71-3	<10		-----	
2293		-----		-----	
2294	EN71-3	5.48		-----	
2301		-----		-----	
2352		-----		-----	
2357	EN71-3	<5		-----	
2363	EN71-3	<5		-----	
2365	EN71-3	＜5		-----	
2366	EN71-3	2.588		-----	
2372	EN71-3	<5		-----	
2375	EN71-3	<5		-----	
2379	EN71-3	5.78		-----	
2382	EN71-3	＜5.0		-----	
2384		-----		-----	
2385	EN71-3	5.46		-----	
2390	EN71-3	3.48		-----	
2406		-----		-----	
2410		-----		-----	
2429	EN71-3	ND		-----	
2431	EN71-3	4.22		-----	
2442		-----		-----	
2475		-----		-----	
2489	EN71-3	ND		-----	
2495	EN71-3	<5		-----	
2500	EN71-3	ND		-----	
2503	EN71-3	4.322		-----	
2582	EN71-3	not detected		-----	
2590	EN71-3	4.2		-----	
2643		-----		-----	
2650	EN71-3	1.08		-----	
2651	EN71-3	4.29		-----	
2654		-----		-----	
2674	EN71-3	4.40		-----	
2703	EN71-3	2.93		-----	
2743	EN71-3	4.6798		-----	
2805		3.59		-----	
2817		-----		-----	
2864		-----		-----	
2867	EN71-3	not detected		-----	
2917	EN71-3	4.77		-----	
2953		-----		-----	
2965	EN71-3	4.21		-----	

lab	method	value	mark	z(targ)	remarks
3100	EN71-3	＜10		-----	
3116	EN71-3	3.40		-----	
3118		-----		-----	
3153	EN71-3	3.27		-----	
3172	EN71-3	< 0.1		-----	
3176	EN71-3	2.87		-----	
3182	EN71-3	3.074		-----	
3185	EN71-3	<5		-----	
3190	EN71-3	<5		-----	
3195		-----		-----	
3218	EN71-3	<5		-----	
3228		-----		-----	
3233	EN71-3	3.39		-----	
3237	EN71-3	3.381	C	-----	First reported 3.696
3248	EN71-3	<10		-----	
8005		-----		-----	

normality	OK	
n	39	
outliers	0	
mean (n)	3.8697	
st.dev. (n)	1.03844	RSD = 27%
R(calc.)	2.9076	
st.dev.(EN71-3:19)	(0.58045)	
R(EN71-3:19)	(1.6253)	



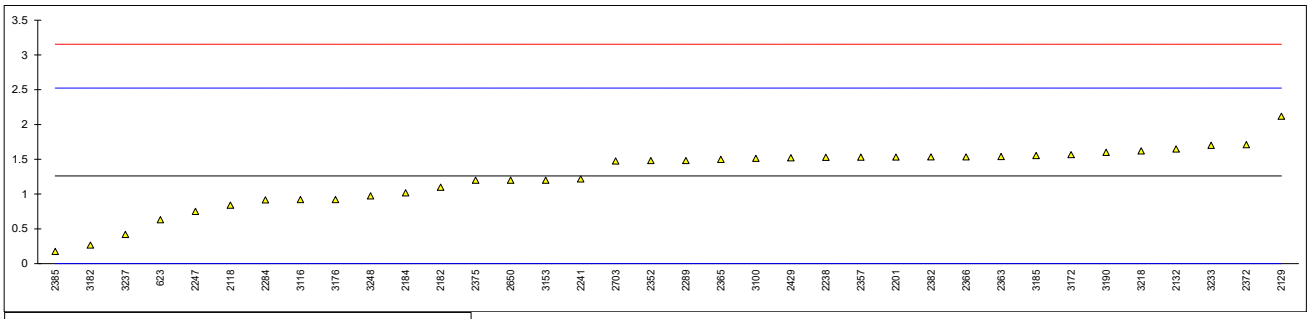


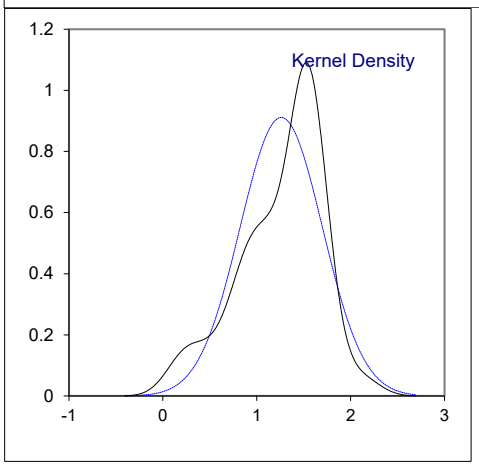
Determination of migration of Chromium (VI) on dried paint sample #21577; results in mg/kg

lab	method	value	mark	z(targ)	remarks
210		-----		-----	
310	EN71-3	<0,02		-----	
551		-----		-----	
623	EN71-3	0.63		-1.00	
840	EN71-3	not detected		-----	
841	EN71-3	<0.02		-----	
1213		-----		-----	
2102	In house	Not detected		-----	
2118	EN71-3	0.84		-0.67	
2120		-----		-----	
2129	EN71-3	2.117		1.36	
2132	EN71-3	1.6475		0.61	
2135		-----		-----	
2137		-----		-----	
2156		-----		-----	
2165	EN71-3	Not detected		-----	
2182	EN71-3	1.098		-0.26	
2184	EN71-3	1.018		-0.39	
2201	EN71-3	1.531		0.43	
2228		-----		-----	
2230	EN71-3	<2		-----	
2232		-----		-----	
2236		-----		-----	
2238	EN71-3	1.527		0.42	
2241	EN71-3	1.217		-0.07	
2247	EN71-3	0.75	C	-0.81	First reported 0.0874
2250	EN71-3	<0,02		-----	
2256	EN71-3	ND		-----	
2265		-----		-----	
2272		-----		-----	
2284	EN71-3	0.916		-0.55	
2289	EN71-3	1.48		0.35	
2290		-----		-----	
2293		-----		-----	
2294	EN71-3	In Full		-----	
2301		-----		-----	
2352	EN71-3	1.48		0.35	
2357	EN71-3	1.53		0.43	
2363	EN71-3	1.54		0.44	
2365	EN71-3	1.4975		0.37	
2366	EN71-3	1.534		0.43	
2372	EN71-3	1.71		0.71	
2375	EN71-3	1.2		-0.10	
2379	EN71-3	Not detected		-----	
2382	EN71-3	1.5330		0.43	
2384		-----		-----	
2385	EN71-3	0.175		-1.72	
2390	EN71-3	n.d		-----	
2406		-----		-----	
2410		-----		-----	
2429	EN71-3	1.52		0.41	
2431		-----		-----	
2442		-----		-----	
2475		-----		-----	
2489		-----		-----	
2495		-----		-----	
2500	EN71-3	ND		-----	
2503		-----		-----	
2582	EN71-3	not detected		-----	
2590		-----		-----	
2643		-----		-----	
2650	EN71-3	1.20		-0.10	
2651	EN71-3	not detected		-----	
2654		-----		-----	
2674		-----		-----	
2703	EN71-3	1.474		0.34	
2743		-----		-----	
2805		-----		-----	
2817		-----		-----	
2864		-----		-----	
2867		-----		-----	
2917		-----		-----	
2953		-----		-----	
2965	EN71-3	not detected		-----	

lab	method	value	mark	z(targ)	remarks
3100	EN71-3	1.512		0.40	
3116	EN71-3	0.92		-0.54	
3118		-----		-----	
3153	EN71-3	1.20		-0.10	
3172	EN71-3	1.565	C	0.48	First reported 3.99
3176	EN71-3	0.92		-0.54	
3182	EN71-3	0.267		-1.58	
3185	EN71-3	1.552		0.46	
3190	EN71-3	1.60		0.54	
3195		-----		-----	
3218	EN71-3	1.62		0.57	
3228		-----		-----	
3233	EN71-3	1.70		0.70	
3237	EN71-3	0.419	C	-1.34	First reported 0.104
3248	EN71-3	0.973		-0.46	
8005		-----		-----	

normality	OK	
n	36	
outliers	0	
mean (n)	1.2615	
st.dev. (n)	0.43796	RSD = 35%
R(calc.)	1.2263	
st.dev.(EN71-3:19)	0.63074	
R(EN71-3:19)	1.7661	



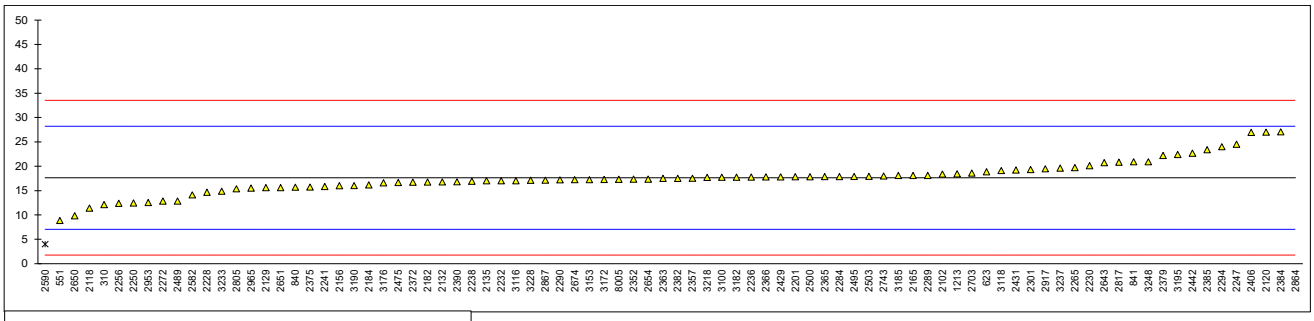


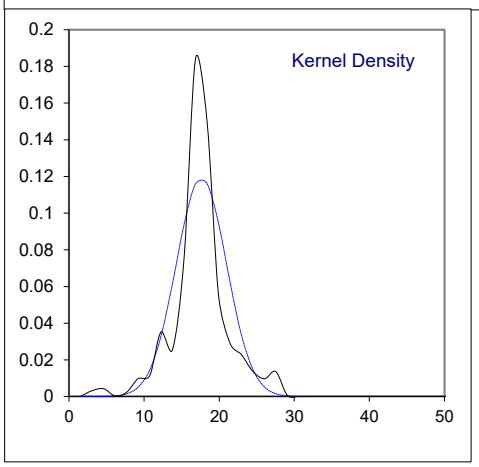
Determination of migration of Lead as Pb on dried paint sample #21577; results in mg/kg

lab	method	value	mark	z(targ)	remarks
210		-----		-----	
310	EN71-3	12.11		-1.05	
551	EN71-3	8.8435		-1.66	
623	EN71-3	18.86		0.23	
840	EN71-3	15.67		-0.37	
841	EN71-3	20.9		0.61	
1213	EN71-3	18.43		0.15	
2102	In house	18.382		0.14	
2118	EN71-3	11.38		-1.18	
2120	EN71-3	27		1.77	
2129	EN71-3	15.6		-0.39	
2132	EN71-3	16.77		-0.17	
2135	EN71-3	17.00		-0.12	
2137		-----		-----	
2156	EN71-3	15.995		-0.31	
2165	EN71-3	18.1		0.09	
2182	EN71-3	16.75		-0.17	
2184	EN71-3	16.15		-0.28	
2201	EN71-3	17.82		0.03	
2228	EN71-3	14.66		-0.56	
2230	EN71-3	20.1		0.46	
2232	EN71-3	17.01		-0.12	
2236	EN71-3	17.76		0.02	
2238	EN71-3	16.93		-0.14	
2241	EN71-3	15.823		-0.34	
2247	EN71-3	24.50		1.29	
2250	EN71-3	12.461		-0.98	
2256	EN71-3	12.38		-0.99	
2265	EN71-3	19.7		0.39	
2272		12.84		-0.91	
2284	EN71-3	17.866		0.04	
2289	EN71-3	18.1		0.09	
2290	EN71-3	17.2		-0.08	
2293		-----		-----	
2294	EN71-3	24		1.20	
2301	EN71-3	19.3		0.31	
2352	EN71-3	17.33		-0.06	
2357	EN71-3	17.52		-0.02	
2363	EN71-3	17.5		-0.03	
2365	EN71-3	17.8459		0.04	
2366	EN71-3	17.8		0.03	
2372	EN71-3	16.7		-0.18	
2375	EN71-3	15.7		-0.37	
2379	EN71-3	22.22		0.86	
2382	EN71-3	17.5		-0.03	
2384	EN71-3	27.053		1.78	
2385	EN71-3	23.4		1.09	
2390	EN71-3	16.81		-0.16	
2406	EN71-3	26.939		1.76	
2410		-----		-----	
2429	EN71-3	17.8		0.03	
2431	EN71-3	19.21		0.30	
2442	EN71-3	22.67		0.95	
2475	EN71-3	16.65		-0.19	
2489	EN71-3	12.84		-0.91	
2495	EN71-3	17.90		0.05	
2500	EN71-3	17.827		0.03	
2503	EN71-3	17.92		0.05	
2582	EN71-3	14.10		-0.67	
2590	EN71-3	4.0	R(0.01)	-2.58	
2643	EN71-3	20.73		0.58	
2650	EN71-3	9.82		-1.48	
2651	EN71-3	15.6		-0.39	
2654		17.33		-0.06	
2674	EN71-3	17.21		-0.08	
2703	EN71-3	18.59		0.18	
2743	EN71-3	17.9847		0.06	
2805		15.34		-0.44	
2817	In house	20.8104		0.60	
2864	EN71-3	388.82	C,R(0.01)	70.11	First reported 648.04
2867	EN71-3	17.13		-0.10	
2917	EN71-3	19.46		0.34	
2953	EN71-3	12.54		-0.96	
2965	EN71-3	15.5		-0.41	
3100	EN71-3	17.73		0.02	

lab	method	value	mark	z(targ)	remarks
3116	EN71-3	17.02		-0.12	
3118	EN71-3	19.10		0.27	
3153	EN71-3	17.21		-0.08	
3172	EN71-3	17.29		-0.07	
3176	EN71-3	16.60		-0.20	
3182	EN71-3	17.745		0.02	
3185	EN71-3	18.09		0.08	
3190	EN71-3	16		-0.31	
3195	EN71-3	22.4		0.90	
3218	EN71-3	17.70		0.01	
3228	EN71-3	17.1		-0.10	
3233	EN71-3	14.88		-0.52	
3237	EN71-3	19.61		0.37	
3248	EN71-3	20.9		0.61	
8005	ASTM F963	17.30		-0.07	

	normality	suspect	
	n	84	
	outliers	2	
	mean (n)	17.6470	
	st.dev. (n)	3.35068	RSD = 19%
	R(calc.)	9.3819	
	st.dev.(EN71-3:19)	5.29409	
	R(EN71-3:19)	14.8235	





APPENDIX 2

Determination of migration of other positive Elements on textile sample #21575; results in mg/kg

lab	Other reported Elements (all >5 mg/kg, except Cr(VI) >0.05 mg/kg)
2489	Zinc = 24.93
2582	Copper = 7.15
2590	Aluminum = 20.4
2743	Boron = 11.0068
2817	Manganese = 5.4418; Strontium = 9.4858
2864	Antimony = 12
2917	Aluminum = 7.50 ; Barium = 44.59 ; Boron = 88.10 ; Zinc = 35.28

Determination of migration of other positive Elements on dried paint sample #21576; results in mg/kg

lab	Other reported Elements (all >5 mg/kg, except Cr(VI) >0.05 mg/kg)
310	Barium = 225.20; Boron = 84.79; Zinc = 167.55
2129	Boron = 29.11
2156	Barium = 5.212
2184	Barium = 5.12
2236	Antimony = 7.367
2256	Chromium (VI) = 0.47
2272	Barium = 5.60
2294	Nickel = 5.71 ; Tin = 210.32 ; Zinc = 7.57
2406	Barium = 5.335
2431	Barium = 6.16
2489	Zinc = 10.98
2503	Barium = 5.044
2703	Barium = 6.64
2917	Barium = 75.76 ; Boron = 65.98 ; Zinc = 59.92
3116	Barium = 5.75
3176	Barium = 5.84 ; Boron = 12.93
3195	Barium = 5.91
8005	Barium = 5.373

Determination of migration of other Elements on dried paint sample #21577; results in mg/kg

lab	Other reported Elements (all >5 mg/kg, except Cr(VI) >0.05 mg/kg)
2129	Boron = 21.85
2294	Zinc = 162.38
2489	Selenium = 16.15 ; Zinc = 10.29
2743	Boron = 7.0711
2917	Boron = 70.61 ; Zinc = 63.5
3176	Zinc = 7.11
3182	Zinc = 5.862

APPENDIX 3
Analytical details for samples #21575, #21576 and #21577

lab	ISO/IEC17025 accredited	Sample intake in mg	Amount of 0.07 mol/L HCl solution used in mL	pH after 1 minute shaking	Was the pH adjusted after 1 minute of shaking	pH after adjustment
210	Yes				---	
310	Yes	#21575:0,251 #21576:0,258 #21577:0,271	#21575:12,5 ml #21576:12,9 ml #21577:13,6 ml	Yes	#21575: 1,3 #21576: 1,2 #21577: 1,3	---
551	No	1g for 21575 and 0.25g for 21576 and 21577.	50 mL for 21575 and 12.5 for 21576 and 21577.	1.2	No	
623	Yes	0.3	15	21575 - 1.17 21576 - 1.18 21577 - 1.15	No	
840	Yes	0.2	10		No	
841	Yes	0.1 grams	5 ml	ApH of the solution after shaking >1.3	Yes	< 1.3
1213	No	0.2	10	1.3	Yes	1.3
2102	Yes	0.1	5	1.2	No	N/A
2118	Yes	0.5 g used from #21575 0.1200 g used from #21576-#21577	25ml used for #21575 6ml used for #21576-#21577	#21575 pH 1.28 #21576 pH 6 #21577 pH 1.25	Yes	#21576 pH 1.25
2120	Yes	0,5 g for #21575 and 0,1 g for #21576 and #21577	25 ml for #21575 and 5 ml for #21576 and #21577	1,1 for all samples	No	
2129	Yes				No	
2132	Yes	0.1 gram	5 mL	#21575: 1.28 #21576: 5.47 #21577: 1.25	Yes	#21576: 1.25
2135	Yes	0,2	10	5,51	Yes	1,20
2137	Yes	0.2	0.613 mL / 100 mL	1.22	Yes	1.2
2156	Yes	0.1g	5ml	#21575 - pH 1.20 #21576 - pH 5.47 #21577 - pH 1.21	Yes	#21576 - pH 1.17
2165	Yes	0.1 g, nearest to 0.0001g	5.0 mL	1.2	No	1.2
2182	Yes	0.1g	5mL	21575: 1.26 21576: 5.70 21577: 1.24	Yes	For 21576 only: 1.29
2184	Yes	0.1g	5ml	#21575: 1.18 #21576: 5.32 #21577: 1.15	Yes	#21576: 1.19
2201	Yes	#21575: 0.2002 g #21576: 0.2003 g #21577: 0.2001 g	#21575: 10 mL #21576: 10 mL #21577: 10 mL	#21575: pH :1.20 #21576: pH :6.52 #21577: pH :1.42	Yes	#21575: pH :1.20 #21576: pH :1.17 #21577: pH :1.20
2228	---					
2230	Yes	#21575 =0.1008g #21576 =0.1069g #21577 =0.1026g	5ml	pH<1.3	No	We did not adjusted the pH.
2232	Yes				---	
2236	Yes	21575 - 0.3040 21576 - 0.3049 21577 - 0.3023	15.0 for all	21575 - 1.20 21576 - 5.79 21577 - 1.19	Yes	21576 - 1.26
2238	Yes	0.2g	10mL	#21575: 1.15, #21576: 5.83, #21577: 1.16	#21575: No, #21576: Yes, #2177: No	#21576: 1.13
2241	Yes	#21575:0.1440g #21576:0.1602g #21577:0.1050g	#21575:7mL #21576:8mL #21577:5mL	#21575:1.158 #21576:5.781 #21577:1.207	Yes	no adjustment on #21575 and #21577. #21576: 1.076
2247	Yes	0.1012	5.0	1.23	Yes	1.12
2250	Yes				No	
2256	Yes	#2157:113.0mg #21576 101.7mg #2177:104.6mg	#21575:5.69ml #21576: 5.09ml #21577:5.23ml	#21575:1.330 #21576:5.960 #21577:1.410	Yes	#21575:1.177 #21576:1.184 #21577:1.142
2265	No	0,5 for textile and 0,25 for dried paint	25 for textile and 12,5 for dried paint	1,2 - 1,3	No	
2272	---				---	

lab	ISO/IEC17025 accredited	Sample intake in mg	Amount of 0.07 mol/L HCl solution used in mL	pH after 1 minute shaking	Was the pH adjusted after 1 minute of shaking	pH after adjustment
2284	Yes	0.2g	10ml	#21575 pH:1.22; #21576 pH:6.60; #21577 pH:1.23	Yes	#21576 pH:1.11;
2289	Yes	0.1g	5.0mL	#21575:pH=1.24 #21576:pH=6.30 #21577:pH=1.19	Yes	#21575:pH=1.21 #21576:pH=1.20 #21577:pH=1.19
2290	Yes				---	
2293	---				---	
2294	Yes	21575: 0,3616 g 21576: 0,2506 g 21577: 0,2502 g	21575: 18 mL 21576: 12,5 mL 21577: 12,5 mL	21575: 1.80 21576: 5.38 21577: 1.38	Yes	21575: 1.19 21576: 1.10 21577: 1.15
2301	Yes	#21575 : 0.2040 g #21576 : 0.2054 g #21577 : 0.2046 g	10 mL	#21575 : 1.42 #21576 : 1.3 #21577 : 1.3	Yes	#21577 : 1.37
2352	Yes	0.2g/0.1g	10mL/5mL	1.19	Yes	1.10
2357	Yes				---	
2363	Yes	#21575 is 0.1200g #21576 is 0.1402g #21577 is 0.1399g	#21575 is 6ml #21576 is 7ml #21577 is 7ml	#21575 pH = 1.27 #21576 pH = 1.18 #21577 pH = 1.25	Yes	#21575 pH = 1.24 #21576 pH = 1.12 #21577 pH = 1.22
2365	Yes	#21575:0.3g #21576& #21577:0.1g	#21575:15.0mL #21576& #21577:5.0mL	#21575:1.21 #21576:6.48 #21577:1.21	Yes	#21576:1.16
2366	Yes	0.2g	10ml		---	
2372	---	0.17g	8.5ml	115	No	No
2375	Yes	-	-	-	---	-
2379	Yes	#21575 : 0.5007 g #21576 : 0.5000 g #21577 : 0.4688 g	#21575 : 25.0 mL #21576 : 25.0 mL #21577 : 23.4 mL	#21575 : 1.23 #21576 : 1.22 #21577 : 1.23	No	-
2382	Yes	#21575 : 0.1929 #21576 : 0.1474 #21577 : 0.1984	#21575 : 10ml #21576 : 7ml #21577 : 10ml	#21575 : 1.23 +6mol/L HCL 0ul #21576 : 1.18 +6mol/L HCL 400ul #21577 : 1.25 +6mol/L HCL 0ul	Yes	#21575 : 1.22 #21576 : 1.24 #21577 : 1.27
2384	Yes	#21575 :0.2g #21576 :0.16g #21577 :0.16g	#21575 :10mL #21576 :8mL #21577 :8mL	#21575 :1.3pH #21576 :5.0pH #21577 :1.3pH	Yes	#21575 :1.10pH #21576 :1.20pH #21577 :1.11pH
2385	Yes	0.58/0.49/0.46	29.0/24.5/23.0	1.28/5.54/1.32	Yes	pH not adjusted/1.15/1.15
2390	Yes	#21575= 0.5086 #21576= 0.2001 #21577= 0.2011	#21575= 25.4ml #21576= 10ml #21577= 10ml	1.2	No	
2406	Yes	0.1 g	5 mL	#21575: 1.30 #21576: 1.30 #21577: 1.29	Yes	#21575: Not adjust #21576: 1.10 #21577: Not adjust
2410	Yes	0.1 g	5 mL	5.64	No	1.20
2429	Yes	0.2	10	1.51	Yes	1.17
2431	Yes	0.1	5	1.2	Yes	1.2
2442	Yes	0.500	25	1.5	Yes	1.20
2475	Yes	#21575:0.178g #21576:0.102g #21577:0.103g	#21575:8.9 #21576:5.1 #21577:5.1	#21575:1.18 #21576:5.07 #21577:1.25	Yes	only for #21576:1.11
2489	Yes	0.1g / 0.099g / 0.099g	10 ml	1.23 / 5.35 / 1.43	Yes	1.23 / 1.26 / 1.26
2495	Yes	0.2	10mL	#21575 pH=1.2 #21576 pH=5.6 #21577 pH=1.2	Yes	#21576 pH=1.2
2500	Yes	0.1009	5	NO	Yes	NO
2503	Yes	0,1137 / 0,1140 / 0,1137	5,7 / ? / 5,9	1,2 / 7,75 / 1,12	Yes	1,12 / 1,14 / 1,11
2582	Yes	0.1000 g	5 mL	1.18	Yes	1.2
2590	Yes	0.1	5	1.25	No	
2643	Yes	about 0.2 g	10 mL	1.2	No	
2650	Yes	1,1g	100mL	1,17 / 1,19 / 1,15	No	N.A.
2651	Yes	0.20	10	#21575:1.23 #21576:6.43 #21577:1.23	Yes	#21576:1.23
2654	Yes	0.39	19.50		No	

lab	ISO/IEC17025 accredited	Sample intake in mg	Amount of 0.07 mol/L HCl solution used in mL	pH after 1 minute shaking	Was the pH adjusted after 1 minute of shaking	pH after adjustment
2674	Yes	About 0.15 g	About 7.5 mL	The pH of #21576 is >1.2	Yes	About 1.2
2703	Yes	#21575 0.5136g #21576 0.5103g #21577 0.4605g	25ml	≤ pH 1.3 for #21575 & #21577 pH 1.15 for #21576	Yes	≤ pH 1.3
2743	Yes	0.2 g	10 mL	1.2	No	
2805	No	0.1g	5ml	#21575: pH = 1.24 #21576: pH = 6.50 #21577: pH = 1.25	Yes	#21576: pH = 1.15
2817	Yes	#21575: 0.2003 g #21576: 0.2001 g #21577: 0.1999 g	#21575: 10 ml #21576: 10 ml #21577: 10 ml	#21575: 1.3 #21576: 6.66 #21577: 1.3	Yes	#21576: 1.17
2864	Yes	0.1g	5ml	pH 2.00	Yes	pH 1.20
2867	Yes	0.2g	10	21575 1.27, 21576 ＞2, 21577 1.21	Yes	21576 1.23
2917	Yes				Yes	
2953	No	0.25	10	1.24	No	
2965	Yes	0.20	10	#21575 pH=1.21 #21576 pH=6.52 e #21577 pH=1.20	Yes	#21576 pH=1.20
3100	Yes	0.1g	5mL	#21575:1.26 #21576:5.25 #21577:1.21	Yes	#21576:1.26
3116	Yes	0.5g for #21575 0.25g for #21576 and #21577	25mL for #21575 12.5mL for #21576 and #21577	Between 1.1 and 1.2	No	Not applicable
3118	Yes	#21575 = 0.2 gram #21576 = 0.1 gram #21577 = 0.1 gram	#21575 = 10 mL #21576 = 5 mL #21577 = 5 mL	#21575: pH = 1.76 #21576: pH = 6.07 #21577: pH = 2.79	Yes	#21575: pH = 1.17 #21576: pH = 1.12 #21577: pH = 1.11
3153	Yes	0.1g	5.0mL	5.96	Yes	1.19
3172	Yes	0.2	10		Yes	
3176	Yes	0,1	100	1,25	No	
3182	Yes	0.2035 g	10.2 mL	1.27	Yes	1.19
3185	Yes	#21575:0.2g #21576:0.12g #21577:0.12g	#21575:10ml #21576:6ml #21577:6ml	#21575:1.18 #21576:5.70 #21577:1.18	Yes	#21575:1.18 #21576:1.19 #21577:1.18
3190	Yes	0.1000g	5.0 ml	1.16	Yes	1.16
3195	No	0.50 #21575 0.20 #21576 0.20 #21577	25 #21575 10 #21576 10 #21577	1.1 #21575 5.4 #21576 1.1 #21577	Yes	1.2 #21575 1.1 #21576 1.1 #21577
3218	Yes	0.2g	10mL	#21575:PH=1.23 #21576:PH=6.14 #21577:PH=1.21	Yes	#21575:PH=1.23 #21576:PH=1.20 #21577:PH=1.21
3228	Yes	0.2g	10ml	> 1.2	Yes	about 1.2
3233	Yes	21575 : 0.1128 21576 : 0.1102 21577 : 0.1036	21575 : 5.6 21576 : 5.5 21577 : 5.2	21575 : 1.25 21576 : 1.12 21577 : 1.23	No	21575 : 1.25 21576 : 1.14 21577 : 1.23
3237	Yes	0,1	5,5 mL	-	No	1,17
3248	Yes	0.2000	10	21575: 1.33 21576: 5.13 21577: 1.21	Yes	21575: 1.27 21576: 1.11
8005	Yes	0.5g for #21575 0.25g for #21576 and #21577	25mL for #21575 12.5mL for #21576 and #21577	Between 1.1 and 1.2	No	Not applicable

APPENDIX 4

Number of participants per country

1 lab in	BANGLADESH
1 lab in	BELGIUM
1 lab in	BRAZIL
2 labs in	FRANCE
6 labs in	GERMANY
1 lab in	GUATEMALA
9 labs in	HONG KONG
2 labs in	INDIA
3 labs in	INDONESIA
5 labs in	ITALY
2 labs in	MALAYSIA
3 labs in	MEXICO
2 labs in	MOROCCO
24 labs in	P.R. of CHINA
1 lab in	PAKISTAN
1 lab in	PORTUGAL
1 lab in	SINGAPORE
1 lab in	SLOVENIA
3 labs in	SOUTH KOREA
1 lab in	SPAIN
1 lab in	SRI LANKA
3 labs in	TAIWAN
2 labs in	THAILAND
2 labs in	THE NETHERLANDS
3 labs in	TURKEY
2 labs in	U.S.A.
1 lab in	UNITED KINGDOM
6 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

Literature

1 iis Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, June 2018
2 ISO5725:86
3 ISO5725 parts 1-6:94
4 ISO13528:05
5 M. Thompson and R. Wood, J. AOAC Int, 76, 926, (1993)
6 W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)
7 P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)
8 J.N. Miller, Analyst, 118, 455, (1993)
9 Analytical Methods Committee, Technical Brief, No 4, January 2001
10 P.J. Lowthian and M. Thompson, The Royal Society of Chemistry, Analyst, 127, 1359-1364, (2002)
11 W. Horwitz and R. Albert, J. AOAC Int, 79, 3, 589-621, (1996)
12 Bernard Rosner, Percentage Points for a Generalized ESD Many-Outlier Procedure, Technometrics, 25(2), 165-172, (1983)
13 Update on the Global Status of Legal Limits on Lead in Paint September 2018, Publication developed by the UN Environment in partnership with WHO and US EPA, the Chair of the Lead Paint Alliance.
14 Council Directive 88/378/EEC
15 Council Directive 2009/48/EC