



APLAC T098 Proficiency Testing Programme  
Determination of Migration of Heavy Metals in Toys Coating



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**1. Objective**

Barium, Cadmium, Chromium and Lead are toxic metals which can have harmful effects on the behavior and development of children even at very low levels of exposure. There are many similar toys regulatory such as ISO 8124-3:2010, EN71-3:2013, GB 6675-2014, ASTM F963-11 with respect to heavy metal migration in children's toys in different countries and areas. This program is intent to understand the general level in determining Migration of heavy metals in toys coating, and to find out and identify the diversity among laboratories. It can also help the specific laboratories to make improvement, and try to establish a kind of equivalence.

**2. Organization and Responsibilities**

This program was organized by China National Accreditation Service for Conformity Assessment (CNAS), with Toys and Juvenile Products Testing Lab of Inspection and Quarantine Technology Center (IQTC) as the collaborator, under the auspices of Asia Pacific Laboratory Accreditation Cooperation (APLAC).

During this proficiency testing program, CNAS would be responsible for proposing this program for approval by the APLAC Proficiency Testing Committee, inviting participants, circulating the draft report and final report to participants and acting as a contact point among APLAC, participating accreditation bodies / participants and IQTC. IQTC will be responsible for the preparing, packaging, dispatching samples, handling participants' queries, receiving the test results, receiving samples and make confirmation evaluation of the samples, statistical analysis, issuing interim and final report.

**3. Points of contacts**

The contact details are given below:

Coordinator of organising accreditation body CNAS:

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Coordinator of the proficiency testing provider in IQTC:

Name: Liu Chonghua

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Guangzhou, China

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#### **4. Selection of Participants**

APLAC members as well as other non-APLAC members will be invited to participate in the program. Invitations will be sent to all APLAC members and other accreditation bodies. Participating accreditation bodies will be asked to nominate laboratories to participate and indicate the accreditation status of the nominated laboratories for the test. Each accreditation body of APLAC members is invited to nominate up to a maximum of 4 laboratories from your economy to participate in this program. Each of others is invited to nominate up to a maximum of 2 laboratories to participate. Note that preference will be given to laboratories that are accredited for the proposed tests.

#### **5. Description of PTIs**

Toy painting powder weights approx. 2 grams and is packed in a brown bottle, which will be delivered by IQTC.

#### **6. Properties Measured for Comparison and Requirement**

The following properties / quantities will be measured and compared in this proficiency testing. Tests are asked to perform twice, and according to the method stipulated in the Standard ISO 8124-3:2010 (or equivalent method, eg. European Standard EN71 Part 3:2013.)

- 1) Migration content of the elements Barium(Ba)
- 2) Migration content of the elements Cadmium(Cd),
- 3) Migration content of the elements Chromium(Cr)
- 4) Migration content of the elements Lead(Pb)

Uncertainty and Method Detection Limit is required to be calculated and

reported by the participating laboratories. The uncertainty of each measured quantity shall be expressed in expanded uncertainty with a confidence interval of 95 % or a coverage factor k=2.

#### **7. Homogeneity & Stability Study**

10 samples will be selected randomly from the prepared bottles of samples and analyzed in duplicate for determining the sample in homogeneity in accordance with the recommendation stipulated in ISO 13528:2005. Three samples will be taken randomly and be analyzed in duplicate for monitoring the stability of analytes between sample dispatch and after submission of results.

#### **8. Assigned Value**

Assigned value will be given by consensus value from all the participants. It is the robust average value of the participants' results which was calculated using Algorithm A in ISO13528: 2005 Annex C.

#### **9. Evaluation of the Performance**

The proficiency testing program use robust statistical technology to process test results and evaluate results in accordance with the requirements of ISO 13528: 2005. Statistical methods for use in proficiency testing by interlaboratory comparisons, according to ISO13528: 2005 Appendix C algorithm A to compute the robust standard deviation.

The ability of the laboratory in accordance with the following formula to calculate the Z-score to be evaluated:

$$Z = \frac{x - X}{\sigma}$$

Where

x — the participant laboratory's result

X — the assigned value, that is, the robust average  $x^*$  of the results calculated using Algorithm A in ISO13528: 2005 Annex C;

$\sigma$  — the standard deviation for proficiency assessment , that is, the robust standard deviation  $s^*$  of the results calculated using Algorithm A in ISO13528: 2005 Annex C.

The usual interpretation of z-scores is as follows:

(a)  $|z| \leq 2.0$  Satisfactory

(b)	$2.0 <  z  < 3.0$	Warning Signal
(c)	$ z  \geq 3.0$	Action Signal

## 10. Reporting to the Participants

After the artefacts returning back to IQTC, interim reports will be prepared and distributed. With the approval of APLAC, final report will be distributed.

## 11. Confidentially

The concerned parties (APLAC, CNAS and IQTC) strive to maintain strict confidentiality with respect to composition of the proficiency test sample distributed and the performance of all participating laboratories. To preserve the confidentiality, participants receive reports giving all results for assessment but without identifying individual laboratories. The code number assigned to a participant in the proficiency testing programme is only made known to the contact person/authorized person of the participating laboratory and/or the respective accreditation body.

The proficiency testing programme is conducted in the belief that participants will perform the analysis and report results with scientific rigour. Collusion and falsification of results are clearly against the spirit of the proficiency testing programme.

## 12. Program Schedule

Event	Deadline	Responsible
Invitation of participants	Mar 2015	CNAS
Nomination of participants	April 2015	ABs
Dispatch of PTIs	May 2015	IQTC
Submission of results	Jun 2015	Participants
Statistical analysis of results	Sep 2015	CNAS/IQTC
Interim report	Oct 2015	CNAS/IQTC
Draft final report	Dec 2015	CNAS/IQTC

## 13. Reference

- [1] ISO/IEC 17043:2010, Conformity assessment - General requirements for proficiency testing.
- [2] APLAC PT002-2003, Testing interlaboratory comparisons.
- [3] ISO 13528:2005, Statistical methods for use in proficiency testing by interlaboratory comparisons.

[4] ISO 8124-3:2010, Safety of toys – Part 3: Migration of certain elements.