
Safety of toys —

**Part 3:
Migration of certain elements**

Sécurité des jouets —

Partie 3: Migration de certains éléments



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 181, *Safety of toys*.

This third edition cancels and replaces the second edition (ISO 8124-3:2010), which has been technically revised. It also incorporates the Amendments ISO 8124-3:2010/Amd.1:2014 and ISO 8124-3:2010/Amd.2:2018. The main changes to the previous edition are as follows:

- two detailed dewaxing methods have been introduced to replace the original one;
- an ICP-OES method for determination of the elements is given in [Annex C](#) as informative content.

A list of all parts in the ISO 8124 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The requirements of this document are based on the bioavailability of certain elements resulting from the use of toys, which should not, as an objective, exceed the following levels per day:

- 0,2 µg for antimony;
- 0,1 µg for arsenic;
- 25,0 µg for barium;
- 0,6 µg for cadmium;
- 0,3 µg for chromium;
- 0,7 µg for lead;
- 0,5 µg for mercury;
- 5,0 µg for selenium.

For the interpretation of these values, it has been necessary to identify an upper limit for the ingestion of toy material. Very limited data have been available for identifying this upper limit. As a working hypothesis, a summed average daily intake of the various toy materials has been gauged at the currently accepted value of 8 mg/d, in the knowledge that in certain individual cases these values might be exceeded.

By combining the daily intake with the bioavailability values listed above, limits have been obtained for various toxic elements in micrograms per gram of toy material (milligrams per kilogram) and are detailed in [Table 1](#). The values obtained have been adjusted to minimize children's exposure to toxic elements in toys and to ensure analytical feasibility, taking into account limits achievable under current manufacturing conditions (see [Annex D](#)).

Safety of toys —

Part 3: Migration of certain elements

WARNING — Persons applying this document should be familiar with laboratory practice for chemical analysis. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices.

IMPORTANT — It is essential that the laboratory ensures that personnel have the competence to perform laboratory activities for which they are responsible.

1 Scope

1.1 This document specifies maximum acceptable levels and methods of sampling, extraction and determination for the migration of the elements antimony, arsenic, barium, cadmium, chromium, lead, mercury and selenium from toy materials and from parts of toys.

1.2 Maximum acceptable levels are specified for the migration of the elements listed in [1.1](#) from the following toy materials:

- coatings of paints, varnishes, lacquers, printing inks, polymers and similar coatings (see [9.1](#));
- polymeric and similar material, including laminates, whether textile-reinforced or not, but excluding other textiles and non-woven textiles (see [9.2](#));
- paper and paperboard (see [9.3](#));
- natural, artificial or synthetic textiles (see [9.4](#));
- glass/ceramic/metallic materials, excepting lead solder when used for electrical connections (see [9.5](#));
- other materials, whether mass-coloured or not (e.g. wood, fibreboard, hardboard, bone and leather) (see [9.6](#));
- materials intended to leave a trace (e.g. the graphite materials in pencils and liquid ink in pens) (see [9.7](#));
- pliable modelling materials, including modelling clays and gels (see [9.8](#));
- paints to be used as such in the toy, including finger paints, varnishes, lacquers, glazing powders and similar material in solid or liquid form (see [9.9](#)).

1.3 The requirements in this document apply to the following toys and toy components of toys and toy materials (see [D.2.1](#)):

- all intended food and oral contact toys, cosmetic toys and writing instruments categorized as toys, irrespective of any age grading or recommended age labelling;
- all toys intended for or suitable for children under 72 months of age;
- accessible coatings, irrespective of any age grading or recommended age labelling;

- accessible liquids, pastes and gels (e.g. liquid paints, modelling compounds), irrespective of any age grading or recommended age labelling.

1.4 Packaging materials are not included, unless they are intended to be kept, for example boxes and containers, or unless they form part of the toy or have intended play value (see [D.2.2](#)).

NOTE No requirements are given for toys and parts of toys which, due to their accessibility, function, mass, size or other characteristics, are obviously unlikely to be sucked, licked or swallowed, bearing in mind the normal and foreseeable behaviour of children (e.g. the coating on the crossbeam of a swing set, the tyres of a toy bicycle).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 8124-1:2018, *Safety of toys — Part 1: Safety aspects related to mechanical and physical properties*

ISO 8124-6:2018, *Safety of toys — Part 6: Certain phthalate esters in toys and children's products*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

base material

material upon which *coatings* ([3.2](#)) may be formed or deposited

3.2

coating

layers of material formed or deposited on the *base material* ([3.1](#)) of a toy, including paints, varnishes, lacquers, inks, polymers or other substances of a similar nature, whether they contain metallic particles or not, no matter how they have been applied to the toy, and which can be removed by *scraping* ([3.7](#)) with a sharp blade

3.3

method detection limit

MDL

three times the standard deviation of the result obtained in the method blank by the laboratory carrying out the analysis

3.4

mass-coloured material

material which has absorbed colouring matter without formation of a *coating* ([3.2](#))

EXAMPLE Wood, fibreboard, hardboard, leather, bone and other porous substances.