
Safety of toys —

Part 5:

**Determination of total concentration
of certain elements in toys**

Sécurité des jouets —

*Partie 5: Détermination de la concentration totale de certains
éléments dans les jouets*



This document is a preview generated by EMS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2015, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Principle	2
5 Reagents and apparatus	3
5.1 Reagents.....	3
5.2 Apparatus.....	3
5.2.1 Microwave digestion system.....	3
5.2.2 High pressure microwave digestion vessel.....	3
6 Selection and composition of test portions	4
6.1 Selection of test portions.....	4
6.2 Compositing of test portions.....	5
7 Preparation of test portions	5
7.1 Coatings of paint, varnish, lacquer, printing ink, polymer and similar coatings.....	5
7.2 Polymeric and similar materials, including laminates, whether textile-reinforced or not, but excluding other textiles.....	5
7.3 Paper, paperboard and cardboard.....	5
7.4 Natural or synthetic textiles.....	6
7.5 Other materials, whether mass-coloured or not.....	6
7.6 Materials intended to leave a trace.....	6
7.7 Pliable modelling materials, including modelling clays, and gels.....	6
7.8 Paints, including finger paints, varnishes, lacquers, and similar materials, in solid or liquid form.....	6
7.8.1 Materials in solid form.....	6
7.8.2 Materials in liquid form.....	6
7.9 Metallic materials whether or not partly coated.....	7
8 Digestion of test portions and instrumental analysis	7
8.1 Microwave digestion.....	7
8.1.1 If the instrumental analysis technique is ICP-MS.....	7
8.1.2 If the instrumental analysis technique is ICP-AES.....	8
8.1.3 Microwave digestion conditions.....	8
8.1.4 Cooling and dilution.....	8
8.2 Hot plate and hot block digestion of test portion.....	8
8.2.1 If the instrumental analysis technique is ICP-AES.....	8
8.2.2 If the instrumental analysis technique is ICP-MS.....	9
9 Detection limits of the instrumental method	9
10 Expression of results	10
11 Test report	10
Annex A (informative) Background and rationale	11
Bibliography	15

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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword — Supplementary information](#).

The committee responsible for this document is ISO/TC 181, *Safety of toys*.

ISO 8124 consists of the following parts, under the general title *Safety of toys*:

- *Part 1: Safety aspects related to mechanical and physical properties*
- *Part 2: Flammability*
- *Part 3: Migration of certain elements*
- *Part 4: Swings, slides and similar activity toys for indoor and outdoor family domestic use*
- *Part 5: Determination of total concentration of certain elements in toys*
- *Part 6: Certain phthalate esters in toys and children's products*
- *Part 7: Requirements and test methods for finger paints*
- *Part 8: Age determination guidelines*

Introduction

See [A.1](#) (use and applicability).

This part of ISO 8124 defines a method for the determination of the total concentration of certain elements in toy materials and can be used to decide whether there is a need to undertake migration testing in accordance with the method specified in ISO 8124-3, *Migration of certain elements* or other equivalent standards, e.g. EN 71-3:1994/AC:2002 or ASTM F963-11. A material can be considered to conform to the requirements of ISO 8124-3:2010 if the total concentration results are below the soluble limits as prescribed in ISO 8124-3:2010, Table 1. If the soluble limits in ISO 8124-3:2010, Table 1 are exceeded, migration testing in accordance with ISO 8124-3:2010 will be required to determine compliance with ISO 8124-3:2010.

In addition, decisions can be also taken, within the scope of this part of ISO 8124, on the compliance of the material with any regulatory requirements that impose restrictions on the total concentration of certain elements.

Where legal conformity requires migration testing, this part of ISO 8124 can only be used to non-quantitatively confirm compliance with regulatory limits.

Users of this part of ISO 8124 are reminded that it has been developed only for the eight elements listed in [Table 1](#). The use of this method for other elements must be validated by the user.

Safety of toys —

Part 5:

Determination of total concentration of certain elements in toys

1 Scope

1.1 This part of ISO 8124 specifies methods of sampling and digestion prior to analysis of the total concentration of the elements antimony, arsenic, barium, cadmium, chromium, lead, mercury, and selenium from toy materials and from parts of toys.

NOTE Other elements can be determined by this method provided adequate analytical performance is demonstrated. Manufacturers are encouraged to apply the test methods of this part of ISO 8124 and the limits from ISO 8124-3 to raw materials used in the manufacture of toys to give increased certainty of conformity to the requirements of ISO 8124-3.

1.2 Digestion methods for the elements mentioned in [1.1](#) are specified for the following types of toy materials:

- coatings of paints, varnishes, lacquers, printing inks, polymers, and similar coatings;
- polymeric and similar materials, including laminates, whether textile-reinforced or not, but excluding other textiles;
- paper, paperboard, and cardboard;
- natural or synthetic textiles;
- metallic materials whether coated or not;
- other materials, whether mass-coloured or not (e.g. wood, fibreboard, hardboard, bone, and leather);
- materials intended to leave a trace (e.g. the graphite materials in pencils and liquid ink in pens);
- pliable modelling materials, including modelling clays and gels;
- paints to be used as such in the toy, including finger paints, varnishes, lacquers, and similar materials in solid or liquid form;
- packaging materials that form part of the toy or have intended play value (see [A.2.1](#), packaging).

NOTE Digestion methods for glass, ceramic, and other siliceous materials or fluorinated polymers or fluorinated polymer coatings are not described, and these types of materials are outside the scope of this part of ISO 8124 (see [A.1](#), use and applicability).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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