

Australian/New Zealand Standard™

Safety of toys

Part 7: Requirements and test methods for finger paints (ISO 8124-7:2015, MOD)



AS/NZS 8124.7:2017

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee CS-018, Safety of Children's Toys. It was approved on behalf of the Council of Standards Australia on 18 October 2017 and by the New Zealand Standards Approval Board on 4 October 2017.

This Standard was published on 17 November 2017.

The following are represented on Committee CS-018:

Australian Chamber of Commerce and Industry
Australian Competition and Consumer Commission
Australian Toy Association
CHOICE
Consumer Affairs Victoria
Consumers Federation of Australia
Kidsafe
Ministry of Business Innovation and Employment, New Zealand
National Acoustic Laboratories
National Retail Association
New Zealand Toy Distributors Association
NSW Fair Trading
Office of Fair Trading, Qld
Safekids New Zealand
The Children's Hospital at Westmead

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Web Shop at www.saiglobal.com or Standards New Zealand web site at www.standards.govt.nz and looking up the relevant Standard in the on-line catalogue.

For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of Standards Australia or the New Zealand Standards Executive at the address shown on the back cover.

This Standard was issued in draft form for comment as DR AS/NZS 8124.7:2016.

Australian/New Zealand Standard™

Safety of toys

Part 7: Requirements and test methods for finger paints (ISO 8124-7:2015, MOD)

Originated in Australia as AS 8124.7—2003.
Jointly revised and designated as AS/NZS 8124.7:2017.

COPYRIGHT

© Standards Australia Limited

© The Crown in right of New Zealand, administered by the New Zealand Standards Executive

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Australia) or the Copyright Act 1994 (New Zealand).

Jointly published by SAI Global Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001 and by Standards New Zealand, PO Box 1473, Wellington 6140.

ISBN 978 1 76035 943 0

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CS-018, Safety of Childrens Toys, to supersede AS 8124.7—2003, *Safety of toys, Part 7: Finger paints—Requirements and test methods*.

The objective of this Standard is to provide requirements which are intended to reduce the risks to children when finger paints are used as intended or in a foreseeable way, bearing in mind the behaviour of children.

AS/NZS 8124 consists of the following parts under the general title, *Safety of toys*:

- Part 1: Safety aspects related to mechanical and physical properties (ISO 8124-1:2014, MOD)
- Part 2: Flammability (ISO 8124-2:2014, MOD)
- Part 3: Migration of certain elements (ISO 8124-3:2010, MOD)
- Part 6: Swings, slides and similar activity toys for indoor and outdoor family domestic use (ISO 8124-4:2014, MOD)
- Part 7: Requirements and test methods for finger paints (ISO 8124-7:2015, MOD)
- Part 9: Organic chemical compounds—Requirements
- Part 10: Organic chemical compounds—Sample preparation and extraction
- Part 11: Organic chemical compounds—Methods of analysis
- Part 12: Determination of total concentration of certain elements in toys (ISO 8124-5:2015, MOD)

SA/SNZ ISO TR 8124 consists of the following part under the same general title, *Safety of toys*:

- Part 8: Age determination guidelines

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

- Part 4: Experimental sets for chemistry and related activities
- Part 5: Chemical toys (sets) other than experimental sets

This Standard is an adoption with national modifications, and has been reproduced from ISO 8124-7:2015, *Safety of toys, Part 7: Requirements and test methods for finger paints*, and has been varied as indicated to take account of Australian and New Zealand conditions. The modifications are specified in the normative Appendix ZZ following the source text.

As this Standard is reproduced from an International Standard, the following applies:

- (a) In the source text ‘this part of ISO 8124’ should read ‘this Australian/New Zealand Standard’.
- (b) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to the Australian/New Zealand Standard, as follows:

<i>Reference to International Standard</i>	<i>Australian/New Zealand Standard</i>
ISO	AS/NZS
8124 Safety of toys	8124 Safety of toys
8124-3 Part 3: Migration of certain elements	8124.3 Part 3: Migration of certain elements (ISO 8124-3:2010, MOD)

Other normative references listed in Clause 2 have not been adopted as Australian or Australian/New Zealand Standards.

There are regulated requirements for toys in Australia and New Zealand. Users of this Standard are reminded that such regulations may refer to specific versions of the Standard and may also make variations to the requirements stated in the referenced version. Conformance with this Standard can therefore not be relied on to ensure compliance with the legal requirements for the sale of toys. Suppliers of toys should comply with all regulated requirements for toys as well as the requirements in this Standard.

Regulations for consumer products can be found at—

- (a) *Australia* www.productsafety.gov.au; or
- (b) *New Zealand* <http://www.comcom.govt.nz/fair-trading/product-safety-standards/>.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the annex or appendix to which they apply. A ‘normative’ annex or appendix is an integral part of a Standard, whereas an ‘informative’ annex or appendix is only for information and guidance.

CONTENTS

1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Requirements	2
4.1	General	2
4.2	Colourants	2
4.3	Preservatives	3
4.4	Migration of certain elements	3
4.5	Limits for impurities	3
4.5.1	Limits for primary aromatic amines	3
4.5.2	Limits for other impurities	4
4.6	Taste and smell	5
4.7	pH value	5
4.8	Binding agents, extenders, humectants and surfactants	5
4.9	N-Nitrosamines	5
4.10	Container	5
	Annex A (informative) Rationale	6
	Annex B (informative) Non exhaustive list of colourants that are commonly used in finger paints and need to be in compliance with both the general and specific purity requirements	9
	Annex C (normative) Method for the detection of certain azo colourants and determination of free primary aromatic amines	13
	Annex D (normative) List of preservatives allowed for use in finger paints and maximum allowed concentrations	28
	Annex E (normative) Method for the determination of hexachlorobenzene, polychlorinated biphenyls and benzo[α]pyrene	32
	Annex F (informative) Ingredients used in the manufacture of finger paints	49
	Annex G (informative) Labelling guidelines and manufacturer's markings	51
	Bibliography	53

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 of 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

This part of ISO 8124 contains requirements which are intended to reduce the risks to children when finger paints are used as intended or in a foreseeable way, bearing in mind the behaviour of children. In particular it is recognized that finger paints present different risks when compared to other toys because of their intended use which requires application to the hands and fingers of young children. It cannot be ruled out that some of the paint material will be ingested or flicked into the eye or that prolonged contact with the skin will occur. Therefore, in order to address the particular risks associated with finger paints, this part of ISO 8124 contains requirements relating to the ingredients that may be used in the manufacture of finger paints and limitations on certain impurities that may be found in these ingredients. It also sets out certain requirements on the packaging and labelling of finger paints.

Chemical Abstract Service Registry Numbers (CAS) or Colour Index Numbers given in the Tables are provided for information purposes only.

[Annex A](#) provides rationale for the requirements.

AUSTRALIAN/NEW ZEALAND STANDARD

Safety of toys

Part 7:

Requirements and test methods for finger paints (ISO 8124-7:2015, MOD)

1 Scope

This part of ISO 8124 specifies requirements for the substances and materials used in finger paints. It is applicable to finger paints only.

It is not applicable to paints intended to be applied to the face or body e.g. face paints.

Additional requirements are specified for markings, labelling and containers.

2 Normative references

The following referenced documents are indispensable for the application 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 787-9, *General methods of test for pigments and extenders — Part 9: Determination of pH value of an aqueous suspension*

ISO 8124-3:2010, *Safety of toys — Part 3: Migration of certain elements*

3 Terms and definitions

For the purposes of this document the following definitions apply.

3.1**finger paint**

aqueous semi-solid or liquid, coloured mixture specially designed for children to apply directly to suitable surfaces with the fingers and hands

Note 1 to entry: Finger paint supplied in powder form is mixed with water according to the manufacturer's instructions before being considered in relation to this part of ISO 8124.

3.2**colourant**

pigment or dyestuff

Note 1 to entry: For definitions of pigment and dyestuff see [A.2](#).

3.3**extender**

material in granular or powder form, insoluble in the medium and used to modify or influence certain physical properties

Note 1 to entry: [SOURCE: ISO 4618:2014, definition 2.102, modified — Note 1 to entry deleted]

3.4**humectant**

substance that delays the drying process

3.5**binding agent**

water-soluble or miscible, non-volatile component that binds the paint to the surface to which it has been applied

3.6**preservative**

substance that prevents the growth of undesirable micro-organisms

3.7**surfactant**

surface active substance that reduces the surface tension of the solution

Note 1 to entry: It can be used to make components miscible.

3.8**embittering agent**

substance that gives the product a bitter taste

4 Requirements

4.1 General

Finger paints supplied in powder form shall be assessed against this part of ISO 8124 when mixed with water in accordance with the manufacturer's instructions.

When assessed according to the rules set out in the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS), a finger paint shall not be classified with any of the following health hazards:

- acute toxicity (hazard class 3.1);
- skin corrosion/irritation (hazard class 3.2);
- serious eye damage/eye irritation (hazard class 3.3);
- respiratory or skin sensitization (hazard class 3.4);
- germ cell mutagenicity (hazard class 3.5);
- carcinogenicity (hazard class 3.6);
- reproductive toxicity – adverse effects on sexual function and fertility or on development (hazard class 3.7);
- specific target organ toxicity — single exposure effects other than narcotic effects (hazard class 3.8);
- specific target organ toxicity — repeated exposure (hazard class 3.9);
- aspiration hazard (hazard class 3.10).

4.2 Colourants

See [A.2](#).

4.2.1 Colourants used in finger paint shall not have any of the health hazard classifications set out in [4.1](#) (hazard class 3.1 to 3.10).

NOTE [Annex B](#) provides a list of commonly used colorants that have been found to meet the requirements of [4.2](#), providing they meet the purity requirements specified. These fall into one or more of the following categories: Colourants permitted for use in food and/or cosmetics and other pigments which meet the general requirements of [4.1](#).

4.2.2 Finger paints shall not contain azo colourants that by cleavage of one or more azo groups can produce the primary aromatic amines listed in [Tables 1](#) and [2](#) when tested in accordance with the test method specified in [Annex C](#).

4.3 Preservatives

See [A.3](#).

Finger paints shall be preserved using only the preservatives listed in [Annex D](#). The maximum concentrations of preservatives shall not exceed the limits in column 4 of [Table D.1](#) in [Annex D](#).

Methods for the determination of certain preservatives are set out in the EU Cosmetics Legislation, (see Bibliography) and should be used when evaluating the maximum concentrations specified in the column “maximum allowed concentration” of [Table D.1](#). Alternative methods that provide an equivalent detection limit may also be used.

4.4 Migration of certain elements

See [A.4](#).

The concentration of elements shall not exceed the maximum limit values for finger paint specified in ISO 8124-3:2010, Table 1.

4.5 Limits for impurities

See [A.5](#).

4.5.1 Limits for primary aromatic amines

4.5.1.1 The primary aromatic amines listed in [Table 1](#) shall not be detectable when tested in accordance with the test method in [Annex C](#).

Table 1 — Primary aromatic amines

Primary aromatic amines	CAS Number
Benzidine	92-87-5
2-Naphthylamine	91-59-8
4-Chloro-2-methylaniline (4-Chloro- <i>o</i> -toluidine)	95-69-2
4-Aminobiphenyl	92-67-1

4.5.1.2 Finger paint shall not contain carcinogenic primary aromatic amines (see [Table 2](#) for a non-exhaustive list of relevant substances) in a total amount exceeding 20 mg/kg, with no individual primary aromatic amine exceeding 10 mg/kg, when tested in accordance with [Annex C](#). The limitation does not apply to aromatic aminocarboxylic acids or aminosulfonic acids.

Table 2 — Other primary aromatic amines (non-exhaustive list)

Primary aromatic amine	CAS Number
<i>o</i> -Aminoazotoluene (4- <i>o</i> -Tolyazo- <i>o</i> -toluidine)	97-56-3
^a For certain pigments limit values for 3,3'-Dichlorobenzidine are given Annex B, Table B.1 .	

Table 2 (continued)

Primary aromatic amine	CAS Number
2-Amino-4-nitrotoluene (5-Nitro- <i>o</i> -toluidine)	99-55-8
4-Chloroaniline	106-47-8
2,4-Diaminoanisole	615-05-4
4,4'-Diaminodiphenylmethane (4,4'-Methylenedianiline)	101-77-9
3,3'-Dichlorobenzidine ^a	91-94-1
3,3'-Dimethoxybenzidine	119-90-4
3,3'-Dimethylbenzidine	119-93-7
3,3'-Dimethyl-4,4'-diaminodiphenylmethane (4,4'-Methylenedi- <i>o</i> -toluidine)	838-88-0
<i>p</i> -Cresidine (6-Methoxy- <i>m</i> -toluidine)	120-71-8
2, 2' - D i c h l o r o - 4, 4' - m e t h y l e n e d i a n i l i n e (4,4'-Methylene-bis-2-chloroaniline)	101-14-4
4,4'-Oxydianiline	101-80-4
4,4'-Thiodianiline	139-65-1
<i>o</i> -Toluidine	95-53-4
2,4-Xylidine	95-68-1
2,6-Xylidine	87-62-7
4-Amino-3-fluorophenol	399-95-1
6-Amino-2-ethoxynaphthalene	not available
2-Methoxyaniline (<i>o</i> -Anisidine)	90-04-0
4-Aminoazobenzene	60-09-3
4-Methyl- <i>m</i> -phenylenediamine (Toluene-2,4-diamine)	95-80-7
2,4,5-Trimethylaniline	137-17-7
Aniline	62-53-3
^a For certain pigments limit values for 3,3'-Dichlorobenzidine are given Annex B, Table B.1 .	

4.5.2 Limits for other impurities

See [A.5](#).

Finger paints shall not contain the impurities specified in [Table 3](#), column 1 above the limits specified in column 2 when colourants specified in column 3 are used, when tested in accordance with [Annex E](#).

Table 3 — Impurities in finger paints

Values in milligrams per kilogram of finger paint

Impurity	Limit	Finger paints of concern
Polychlorinated biphenyls	< 2	Finger paints containing chlorinated colourants or colourants manufactured in chlorinated solvents
Hexachlorobenzene (CAS No. 118-74-1)	< 5	Finger paints containing chlorinated colourants or colourants manufactured in chlorinated solvents
Benzo (α) pyrene (CAS No. 50-32-8)	< 0,05	Only for finger paints containing carbon black

4.6 Taste and smell

See [A.7](#).

Finger paints shall not be sweetened, flavoured or fragranced.

An embittering agent in accordance with [Table 4](#) shall be added in order to discourage and minimize the ingestion of paint.

Table 4 — Embittering agents

Embittering agent	CAS Number
Naringin	CAS 10236-47-2
Denatonium benzoate	CAS 3734-33-6

The bitterness should be detectable by taste when the finger paint is diluted with water in a ratio of 1:100. The following levels have been found suitable: naringin 1 %; denatonium benzoate 0,0004 % (4 mg/kg). The relative bitterness of these substances is approximately 1:3 000 (naringin : denatonium benzoate).

The embittering agent and its concentration should be such that it provides a bitter taste during the expected lifetime of the finger paint.

4.7 pH value

See [A.8](#).

The pH value of the finger paint shall be between 4,0 and 10,0 when tested in accordance with ISO 787-9.

4.8 Binding agents, extenders, humectants and surfactants

Finger paints shall only use binding agents, extenders, humectants and surfactants which are not classified with any of the health hazards set out in [4.1](#) (hazards class 3.1 to 3.10).

NOTE See [Annex F](#) for a list of compounds known to be commonly used in finger paints.

4.9 N-Nitrosamines

See [A.9](#).

Finger paints shall not contain more than 0,02 mg/kg of N-nitrosodiethanolamine (NDELA), CAS No.:1116-54-7.

NOTE One suitable and validated test method is detailed in EN 71-12:2013, 7.2.1 and Clause 8. Other test methods may be used provided they are validated for finger paints.

4.10 Container

See [A.10](#).

Containers used for finger paints shall not have a design that is likely to be mistaken by children with containers of foodstuffs or drinks.

Manufacturers should take into consideration the material(s), shape, volume, colours, labelling, other packaging and the means of access to the contents, when assessing similarity with containers of foodstuff or drinks.

Annex A (informative)

Rationale

A.1 Finger paints

In addition to water, *finger paints* essentially consist of colourants, binders, preservatives and embittering agents and may additionally contain extenders, humectants and surfactants. *Finger paints* may be coloured by using colouring substances or mixtures containing colouring and other ingredients which are incorporated into a finger paint to impart colour to the finger paint.

A.2 Colourants

See [4.2](#).

[Annex B](#) contains a list of colourants which are suitable for finger paints subject to them meeting certain purity requirements. It includes colourants specific to finger paints, food colourants and cosmetic colourants.

More detailed requirements on aromatic amines are included in order to exclude risks which may derive from impurities in colourants.

Dyes are intensely coloured or fluorescent organic substances only, which impart colour to a substrate by selective absorption of light. They are soluble and/or go through an application process which, at least temporarily, destroys any crystal structure by absorption, solution, and mechanical retention, or by ionic or covalent chemical bonds.

Pigments are coloured, black, white or fluorescent particulate organic or inorganic solids which usually are insoluble in, and essentially physically and chemically unaffected by, the vehicle or substrate in which they are incorporated. They alter appearance by selective absorption and/or by scattering of light. Pigments are usually dispersed in vehicles or substrates for application, as for instance in the manufacture of inks, paints, plastics or other polymeric materials. Pigments retain a crystal or particulate structure throughout the coloration process.

A.3 Preservatives

See [4.3](#).

The use of appropriate preservatives in water-based systems like finger paints is necessary in order to provide protection against the growth of bacteria, fungi and yeasts and maintain a hygienic compound.

Preservatives allowed for use in finger paints are listed in [Annex D](#). The following properties were taken into consideration when drafting this list: high efficacy with respect to micro-organisms accompanied by suitable toxicological performance (e.g. low human toxicity, low volatility, low odour), suitable technical performance (e.g. solubility in water-based systems, stability against other ingredients, stability against chemical or physical influences) and suitable environmental performance [e.g. low adsorbable organic halogens (AOX), low persistence]. The list includes, for example, preservatives that are allowed for cosmetic use or for food use.

A.4 Elements

See [4.4](#).

The limit values and test methods for the migration of certain elements in finger paints are specified in ISO 8124-3, Table 1, row 3.

A.5 Limits for primary aromatic amines

See [4.5.1.1](#) and [4.5.1.2](#).

[Table 1](#) lists the four primary aromatic amines which shall not be determinable in finger paints at the limit of quantification (LOQ) using the method described in [Annex C](#) using GC-MS as the detection technique. [Table 2](#) lists 24 primary aromatic amines which were taken from Table 2 of EN 71-7:2014 entitled "Other carcinogenic primary aromatic amines (non-exhaustive list)". Therefore, the listing of primary aromatic amines in [Table 2](#) of this part of ISO 8124 has been described as a non-exhaustive list and does not preclude other primary aromatic amines from being analysed. The information provided in Chromatography ([C.6.5](#)) and Precision ([C.8](#)) includes the four primary aromatic amines listed in [Table 1](#), and 18 primary aromatic amines from [Table 2](#). The inclusion of 18 rather than all 23 primary aromatic amines in [Table 2](#) reflects the difficulty in obtaining the suitable commercial standards at the time of writing this part of ISO 8124. The information in [C.5](#) and [C.8](#) should provide the competent analyst with indicative information in the determination of other primary aromatic amines where/when calibration standards are available. The limitation for primary aromatic amines does not apply to aromatic aminocarboxylic acids or aminosulfonic acids because they are considered to be harmless.

A.6 Limit for benzo(α)pyrene

See [4.5.2](#).

Benzo(α)pyrene in finger paints is limited to the currently technically achievable analytical limit of quantitation (LOQ) of 0,02 mg/kg.

A.7 Taste and smell

See [4.6](#).

The addition of sweeteners, flavourings and fragrances to a finger paint may be determined by an assessment of the individual ingredients in the formulation of the finger paint.

The requirement to add an embittering agent to finger paints is intended to minimize potential oral ingestion by young children who may deliberately or accidentally put some of the finger paint in their mouth.

It should be noted that products with added embittering agents show remarkable bitterness, which may remain for a while after putting it into the mouth.

Experience has shown that the bitterness in finger paint will last for the product's lifetime, if one of the two embittering agents in [Table 4](#) is used in diluted finger paint as given in the Note in [4.6](#).

A.8 pH value

See [4.7](#).

The use of calcium carbonate may raise the pH value as a result of more dissociation by dilution with water in accordance with ISO 787-9 up to pH 10.

Some types of formulations containing calcium carbonate show pH values higher than 10 because the dilution of the finger paint is made with distilled water. This may also be found for small amounts of calcium carbonate in finger paint. Such a high increase as an analytical artefact does not happen when tap water is used to dilute the finger paint.

A.9 N-Nitrosamines

See [4.9](#).

To avoid the possible formation of N-nitrosamines avoid using formulations that combine diethanolamine and triethanolamine (which is known to be often contaminated with diethanolamine or which can be decomposed to diethanolamine) with possible sources of nitrite that may be present in certain preservatives (e.g. bronopol) and other raw materials.

Work undertaken during the development of EN 71-12:2013, showed that the only N-nitrosamine of relevance for finger paints is N-nitrosodiethanolamine (NDELA), CAS No.:1116-54-7. Consequently this part of ISO 8124 sets a limitation on NDELA only. EN 71-12:2013 mentions other N-nitrosamines because this aligns with the EU toy safety directive but other N-nitrosamines are not known to occur in finger paints.

EN 71-12:2013 contains a validated test method for the determinations of NDELA in finger paints but other test methods may be used provided they are validated for determination of NDELA in a typical finger paint matrix.

A.10 Containers

See [4.10](#).

This requirement is intended to minimize the potential for a child to mistake finger paint for a foodstuff or a drink. The requirement is one of a series of precautionary measures (e.g. embittering agents, no flavour, no sweetening, no fragrance, warning to parents to supervise) intended to discourage the ingestion of finger paints by typical users (e.g. two years and above).

A.11 Labelling guidelines

See [Annex G](#).

Young children have a propensity for exploring objects orally. The warning phrase recognizes the fact that children under three years of age may be tempted to taste or eat the finger paint and this is something that the supervisor would be expected to discourage or prevent. Even though finger paints that are in conformity with this part of ISO 8124 may be considered to present a minimal risk, ingestion of repeated amounts of finger paint is not recommended.

Annex B (informative)

Non exhaustive list of colourants that are commonly used in finger paints and need to be in compliance with both the general and specific purity requirements

[Table B.1](#) lists organic colourants commonly used in finger paints.

Table B.1 — Organic colourants which are commonly used in finger paints

No.	Colour	CI Generic Name ^a	CI Constitution Number	CAS Number	Limitations, requirements and information
1	Yellow	Pigment Yellow 1	11680	2512-29-0	See ^b . Check purity criteria for amine limits and that excess coupling component ^d is less than 1 000 ppm (parts per million).
2		Pigment Yellow 3	11710	6486-23-3	See ^b . Check purity criteria for amine limits and that excess coupling component ^d is less than 1 000 ppm.
3		Pigment Yellow 12	21090	6358-85-6	3,3'-Dichlorobenzidine ≤ 5 mg/kg; see C.1 detection limit of the method.
4		Pigment Yellow 13	21100	5102-83-0	3,3'-Dichlorobenzidine ≤ 5 mg/kg; see C.1 detection limit of the method.
5		Pigment Yellow 14	21095	5468-75-7	3,3'-Dichlorobenzidine ≤ 5 mg/kg; see C.1 detection limit of the method.
6		Pigment Yellow 17	21105	4531-49-1	3,3'-Dichlorobenzidine ≤ 5 mg/kg; see C.1 detection limit of the method.
7		Pigment Yellow 74	11741	6358-31-2	Check purity criteria for amine limits and that excess coupling component ^d is less than 1 000 ppm.
8		Pigment Yellow 138	56300	30125-47-4	
9		Pigment Yellow 139	56298	36888-99-0	
10		Pigment Yellow 151	13980	31837-42-0	
11	Yellow	Pigment Yellow 154	11781	68134-22-5	Check purity criteria for amine limits and that excess coupling component ^d is less than 1 000 ppm.
12		Pigment Yellow 155	200310	68516-73-4	
13		Pigment Yellow 185	56290	76199-85-4	
14		Natural Yellow 3	75300	458-37-7	Food grade, for example see current European legislation (2008/128/EC), E 100
15		Natural Yellow 6	75100	8 9 3 8 2 - 8 8 - 7 27876-94-4	

^a The Colour Index is published by The Society of Dyers and Colourists, PO Box 244, Perkin House 82 Grattan Road, Bradford, West Yorkshire BD1 2JB, United Kingdom, www.colour-index.org. Colourants are classified using both their CI generic name and their constitution number. These relate only to the “essential colourant” as defined by the Colour Index.

^b This substance is restricted in Regulation (EC) No 1223/2009^[8] as follows: “Not to be used in eye products” or “Not to be used in products applied on mucous membranes”, as applicable.

^c This substance is restricted in Regulation (EC) No 1223/2009^[8] as follows: “Rinse-off products”.

^d Azo colourants are typically formed by a reaction sequence of diazotization of a primary aromatic amine which is referred to as the diazo component, followed by reaction (known as “coupling”) with a compound having active methylene groups referred to as a coupling component.

Table B.1 (continued)

No.	Colour	CI Generic Name ^a	CI Constitution Number	CAS Number	Limitations, requirements and information
16		Natural Yellow 26	75130	7235-40-8	Food grade, for example see current European Directive (2008/128/EC), E 160 a
17		Natural Yellow 27	75135	79-75-4 3763-55-1	Food grade, for example see current European Directive (2008/128/EC), E 161 d
18	Orange	Pigment Orange 13	21110	3520-72-7	Check purity criteria for amine limits and coupling component ^d limits Combinations with Pigment Black 7 shall be checked for release of 3,3'-dichlorobenzene 3,3'-dichlorobenzidine ≤ 5 mg/kg: see C.1 Detection limit of the method
19	Orange	Pigment Orange 34	21115	15793-73-4	Check purity criteria for amine limits and coupling component ^d limits Combinations with Pigment Black 7 shall be checked for release of 3,3'-dichlorobenzene 3,3'-dichlorobenzidine ≤ 5 mg/kg: see C.1 Detection limit of the method
20		Pigment Orange 43	71105	4424-06-0	See b.
21		Pigment Orange 71	561200	86432-50-8	
22		Pigment Orange 73	56117	84632-59-7	
23		Natural Orange 4	75120	8015-67-6	Food grade, for example see current European Directive (2008/128/EC), E 160 b
24	Red	Pigment Red 48:2	15865:2	7023-61-2	
25		Pigment Red 48:3	15865:3	15782-05-5	
26		Pigment Red 57:2	15850:2	17852-98-1	
27		Pigment Red 57:1	15850:1	5281-04-9	
28		Pigment Red 63:1	15880:1	6417-83-0	
29		Pigment Red 68	15525	5850-80-6	
30		Pigment Red 83	58000:1	104074-25-1	
31		Pigment Red 122	73915	980-26-7	See c.
32		Pigment Red 181	73360	2379-74-0	
33		Pigment Red 214	200660	82643-43-4	
34		Pigment Red 242	20067	52238-92-3	
35		Pigment Red 254	56110	84632-65-5	
36		Pigment Red 255	561050	54660-00-3	
37		Pigment Red 264	561300	88949-33-1	
38		Pigment Red 272	561150	350249-32-0	

^a The Colour Index is published by The Society of Dyers and Colourists, PO Box 244, Perkin House 82 Grattan Road, Bradford, West Yorkshire BD1 2JB, United Kingdom, www.colour-index.org. Colourants are classified using both their CI generic name and their constitution number. These relate only to the "essential colourant" as defined by the Colour Index.

^b This substance is restricted in Regulation (EC) No 1223/2009^[8] as follows: "Not to be used in eye products" or "Not to be used in products applied on mucous membranes", as applicable.

^c This substance is restricted in Regulation (EC) No 1223/2009^[8] as follows: "Rinse-off products".

^d Azo colourants are typically formed by a reaction sequence of diazotization of a primary aromatic amine which is referred to as the diazo component, followed by reaction (known as "coupling") with a compound having active methylene groups referred to as a coupling component.

Table B.1 (continued)

No.	Colour	CI Generic Name ^a	CI Constitution Number	CAS Number	Limitations, requirements and information
39	Red	Natural Red 4	75470	1 3 9 0 – 6 5 – 4 1260–17–9	Food grade, for example see current European Directive (2008/128/EC), E 120
40	Violet	Pigment Violet 19	73900	1047–16–1	See c.
41		Pigment Violet 23	51319	2 1 5 2 4 7 – 9 5 – 3 6358–30–1	See c.
42	Blue	Pigment Blue 15	74160	1 4 7 – 1 4 – 8 , 1 2 2 3 9 – 8 7 – 1 2 7 6 1 4 – 7 1 – 7 6 8 9 8 7 – 6 3 – 3 16040–69–0	Check purity criteria for PCB, PCDD/DF and HCB limits. For example, limits as specified in existing chemical regulations in EU (see regulation. (EC) No. 1907/2006 “REACH”, Annex XVII) Pigment Blue 15:2 and 15:4 are surface treated. Before using surface treated substances, manufacturers should contact their suppliers regarding composition and hazards.
43		Pigment Blue 16	74100	574–93–6	See c.
44		Pigment Blue 60	69800	81–77–6	
45	Green	Pigment Green 7	74260	1328–53–6	See b.
46		Pigment Green 36	74265	14302–13–7	
47		Natural Green 3	75810	8 0 4 9 – 8 4 – 1 11006–34–1	Food grade, for example see current European Directive (2008/128/EC), E 140 and E 141

^a The Colour Index is published by The Society of Dyers and Colourists, PO Box 244, Perkin House 82 Grattan Road, Bradford, West Yorkshire BD1 2JB, United Kingdom, www.colour-index.org. Colourants are classified using both their CI generic name and their constitution number. These relate only to the “essential colourant” as defined by the Colour Index.

^b This substance is restricted in Regulation (EC) No 1223/2009^[8] as follows: “Not to be used in eye products” or “Not to be used in products applied on mucous membranes”, as applicable.

^c This substance is restricted in Regulation (EC) No 1223/2009^[8] as follows: “Rinse-off products”.

^d Azo colourants are typically formed by a reaction sequence of diazotization of a primary aromatic amine which is referred to as the diazo component, followed by reaction (known as “coupling”) with a compound having active methylene groups referred to as a coupling component.

[Table B.2](#) lists non-organic colourants commonly used in finger paints.

Table B.2 — Non-organic colourants which are commonly used in finger paints

No.	Colour	CI Generic Name ^a	CI Constitution Number	CAS Number	Limitations, requirements and information
48	Yellow	Pigment Yellow 42	77492	51274–00–1	Iron oxide yellow Food grade, for example see current European Directive (2008/128/EC), E 172
49	Red	Pigment Red 101	77491	1309–37–1	Food grade, for example see current European Directive (2008/128/EC), E 172
50	Blue	Pigment Blue 29	77007	1317–97–1 57455–37–5	Ultramarine

^a The Colour Index is published by The Society of Dyers and Colourists, PO Box 244, Perkin House 82 Grattan Road, Bradford, West Yorkshire BD1 2JB, United Kingdom, www.colour-index.org. Colourant are classified using both their CI Generic name and their constitution number. These relate only to the “essential colourant” as defined by the Colour Index.

Table B.2 (continued)

No.	Colour	CI Generic Name ^a	CI Constitution Number	CAS Number	Limitations, requirements and information
51	White	Pigment White 4	77947	1314-13-2	Zinc Oxide
52		Pigment White 6	77891	13463-67-7	Food grade, for example see current European Directive (2008/128/EC), E 171
53		Pigment White 18	77220	2 0 7 - 4 3 9 - 9 208-915-9	Chalk Food grade, for example see current European Directive (2008/128/EC), E 170 Mixture Calcium carbonate, Magnesium carbonate
54		Pigment White 19	77004 77005	8047-76-5	Aluminium silicate, hydrated
55		Silver	77820	7440-22-4	Food grade, for example see current European Directive (2008/128/EC), E 174
56		Pigment White 21	77120	7727-43-7	Blancfixe
57		Pigment White 25	77231	91315-45-6	Gypsum
58		Aluminium, zinc, magnesium and calcium stearates	-	Various	
59	Black	Pigment Black 6	77266	1333-86-4	Carbon black food contact quality
60		Pigment Black 7	77266	1333-86-4	Carbon black food contact quality
61		Pigment Black 11	77499	12227-89-3	Food grade, for example see current European Directive (2008/128/EC), E 172
62	Brown	Pigment Metal 3	77480	7440-57-5	Gold Food grade, for example see current European Directive (2008/128/EC), E 175
63	Orange	Ferrous oxide	77489	Various	Food grade, for example see current European Directive (2008/128/EC), E 172 (Mix)

^a The Colour Index is published by The Society of Dyers and Colourists, PO Box 244, Perkin House 82 Grattan Road, Bradford, West Yorkshire BD1 2JB, United Kingdom, www.colour-index.org. Colourant are classified using both their CI Generic name and their constitution number. These relate only to the “essential colourant” as defined by the Colour Index.

Annex C (normative)

Method for the detection of certain azo colourants and determination of free primary aromatic amines

C.1 General

For the detection of certain azo *colourants*, the sample is treated with sodium dithionite in a citrate buffer (pH 6) at 70 °C in a sealed vessel. Upon reductive cleavage, the resultant amines are extracted with *tert*-Butyl methyl ether (MTBE) by means of a “kieselguhr” type SPE column. The ether extract is carefully concentrated with a rotary evaporator or an equivalent sample concentrator and the residue is dissolved in acetonitrile or other suitable solvent, depending upon the detection/determination procedure to be used.

The detection/determination of amines resulting either from the reductive cleavage method or already present in the sample as free primary aromatic amines is performed by high performance liquid chromatography with a diode-array detector (HPLC/DAD) or by capillary gas chromatography with mass-selective detector (GC-MS).

The amines shall be identified by at least one of the chromatographic separation techniques described in this annex. Unless an unequivocal identification is achieved (e.g. by using GC-MS and comparing retention times with known standards), confirmation of positive results shall be achieved by a suitable alternative separation technique (to avoid possible misinterpretation from, for example, isomers of the amines to be identified).

NOTE 1 Some amines may be thermally unstable and cannot be determined by gas chromatography.

The quantification of the amines is performed by HPLC/DAD or GC-MS.

NOTE 2 Some of the amines are cleaved under the reductive conditions in [C.6.2](#) according to [Table C.1](#):

Table C.1 — Amine compounds and cleavage products

Amine compound	Cleavage products
<i>o</i> -Aminoazotoluene	<i>o</i> -Toluidine, 2-Methyl- <i>p</i> -phenylenediamine
2-Amino-4-nitrotoluene	4-Methyl- <i>m</i> -phenylenediamine
4-Aminoazobenzene	<i>p</i> -Phenylenediamine, Aniline

4-Aminoazobenzene is reductively cleaved to *p*-phenylenediamine and aniline; *o*-aminoazotoluene is reductively cleaved to 2-methyl-*p*-phenylenediamine and *o*-toluidine; and 5-nitro-*o*-toluidine is reduced to 4-methyl-*m*-phenylenediamine.

A prohibited azo colourant is deemed to be present in the finger paint if, on reductive cleavage, one or more of the amines listed in [Tables 1](#) and [2](#) is present in a concentration exceeding 30 mg/kg.

Each primary aromatic amines listed in [Table 1](#) is deemed to be determinable at levels exceeding 5 mg/kg.

C.2 Reagents

Reagent-grade chemicals are to be used, if nothing else is specified.

C.2.1 Methanol.