भारतीय मानक
Indian Standard

IS 9873 (Part 2) : 2017
ISO 8124-2 : 2014

http://www.china-gauges.com/

खिलौनों की सुरक्षा

भाग 2 ज्वलनशीलता

(तीसरा पुनरीक्षण)

Safety of Toys

Part 2 Flammability

(Third Revision)

ICS 97.200.50

© BIS 2017

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली-110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.gov.in www.standardsbis.in

August 2017 **Price Group 8**

http://www.china-gauges.com/

NATIONAL FOREWORD

This Indian Standard (Part 2) (Third Revision) which is identical with ISO 8124-2 : 2014 'Safety of toys — Part 2: Flammability' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on recommendation of the Plastics Sectional Committee and approval of the Petroleum, Coal and Related Products Division Council.

This standard was first published in 1981 and revised in 1990. Second revision of this standard was carried out in 2012 which was identical with ISO 8124-2 : 2007. The third revision of this standard has been undertaken to align it with the latest version of ISO 8124-2.

The significant technical changes between this standard and its previous version are listed in Annex B (informative) of this standard.

This standard has various parts under general title 'Safety of toys'. Other parts in this series are:

Part 1 Safety aspects related to mechanical and physical properties
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 Determination of certain phthalate esters in toys and children's products
Part 7 Requirements and test methods for finger paints
Part 9 Certain phthalates esters in toys and children's products

Further, the Committee has decided to formulate the following new part of this standard which is under preparation:

Part 8 Age determination guidelines

This Standard also makes a reference to the BIS Certification Marking of the product. Details of which are given in National Annex A.

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.
b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted in their respective places, are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 2431 : 2011 Paints and varnishes — Determination of flow time by use of flow cups	IS 3944 : 1982 Method for determination of flow time by use of flow cups (*first revision*)	Technically Equivalent with ISO 2431 : 1972
ISO 6941 : 2003 Textile fabrics — Burning behaviour — Measurement of flame spread properties of vertically oriented specimens	IS 15590 : 2005 Textile fabrics — Burning behaviour — Measurement of flame spread properties of vertically oriented specimens	Identical

(*Continued on third cover*)

भारतीय मानक
Indian Standard

IS 9873 (Part 2) : 2017
ISO 8124-2 : 2014

http://www.china-gauges.com/

खिलौनों की सुरक्षा

भाग 2 ज्वलनशीलता

(तीसरा पुनरीक्षण)

Safety of Toys

Part 2 Flammability

(Third Revision)

ICS 97.200.50

© BIS 2017

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली-110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.gov.in www.standardsbis.in

September 2017 **Price Group 8**

http://www.china-gauges.com/

NATIONAL FOREWORD

This Indian Standard (Part 2) (Third Revision) which is identical with ISO 8124-2 : 2014 'Safety of toys — Part 2: Flammability' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on recommendation of the Plastics Sectional Committee and approval of the Petroleum, Coal and Related Products Division Council.

This standard was first published in 1981 and revised in 1990. Second revision of this standard was carried out in 2012 which was identical with ISO 8124-2 : 2007.

The Committee decided to revise this standard to align it with the latest version of ISO 8124-2.

The significant technical changes between this Standard and its previous version are listed in Annex B (informative) of the standard.

Other parts in this series are :

Part 1 Safety aspects related to mechanical and physical properties
Part 3 Migration of certain elements
Part 6 Determination of certain phthalate esters in toys and children's products
Part 9 Certain phthalate esters in toys and children's products
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 7 Requirements and test methods for finger paints

Further, the Committee has decided to formulate following new parts of IS 9873 which are under preparation:

Part 8 Age determination guidelines

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are however not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.
b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted in their places, are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 2431 : 2011 Paints and varnishes — Determination of flow time by use of flow cups	IS 3944 : 1982 Method for determination of flow time by use of flow cups (*first revision*)	Technically Equivalent
ISO 6941 : 2003 Textile fabrics — Burning behaviour — Measurement of flame spread properties of vertically oriented specimens	IS 15590 : 2005 Textile fabrics — Burning behaviour — Measurement of flame spread properties of vertically oriented specimens	Identical
ISO 8124-1 : 2014 Safety of toys — Part 1: Safety aspects related to mechanical and physical properties	IS 9873 (Part 1) : 2016 Safety of toys: Part 1 Safety aspects related to mechanical and physical properties (*third revision*)	do

(*Continued on third cover*)

Indian Standard

SAFETY OF TOYS

PART 2 FLAMMABILITY

(Third Revision)

http://www.china-gauges.com/

1 Scope

This part of ISO 8124 specifies the categories of flammable materials that are prohibited in all toys, and requirements concerning *flammability* of certain toys when they are subjected to a minor source of ignition.

The test methods described in Clause 5 are used for the purposes of determining the *flammability* of toys under the particular test conditions specified. The test results thus obtained cannot be considered as providing an overall indication of the potential fire hazard of toys or materials when subjected to other sources of ignition.

This part of ISO 8124 includes general requirements relating to all toys and specific requirements and test methods relating to the following toys, which are considered as being those presenting the greatest hazard:

— toys intended to be worn on the head: beards, moustaches, wigs, etc. made from *hair*, pile or *material that behaves in a similar manner to hair*; masks; hoods, headdresses, etc.; flowing elements of toys to be worn on the head, but excluding paper novelty hats of the type usually supplied in party crackers (see A.4);

— toy disguise costumes and toys intended to be worn by a child in play (see A.5);

— toys intended to be entered by a child (see A.6);

— *soft-filled toys* (see A.7).

NOTE 1 Additional requirements for *flammability* of electric toys are specified in IEC 62115.

NOTE 2 There are very few accident data concerning the hazards associated with the *flammability* of toys.

NOTE 3 See A.2.

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 2431:2011, *Paints and varnishes — Determination of flow time by use of flow cups*

ISO 6941:2003, *Textile fabrics — Burning behaviour — Measurement of flame spread properties of vertically oriented specimens*

ISO 8124-1:2012, *Safety of toys — Part 1: Safety aspects related to mechanical and physical properties*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply. Terms defined in this clause appear in italics throughout this part of ISO 8124.

3.1
chemical toy
toy intended for the direct handling of chemical substances and mixtures and which is used in a manner appropriate to a given age group and under the supervision of an adult

3.2
extremely flammable liquid
liquid having a flash point < 23 °C and initial boiling point ≤ 35 °C

3.3
flaming debris
material that becomes detached from the sample during the test procedure and continues to flame as it falls

3.4
flammability
ability of a material or a product to burn with a flame under specified test conditions

http://www.china-gauges.com/

3.5
flammable gas
gas or gas mixture having a flammable range with air at 20 °C and a standard pressure of 101,3 kPa

3.6
flammable liquid
liquid having a flash point ≥ 23 °C and ≤ 60 °C

3.7
hair
slender flexible fibres intended to represent human or animal hair

3.8
highly flammable liquid
liquid having a flash point < 23 °C and initial boiling point > 35 °C

3.9
material that behaves in a similar manner to hair
material having the ability to flow like hair, to hang closely to the head and continue to move on its own after the head is rotated then stopped

3.10
molten drips
falling droplets of molten material

3.11
moulded head mask
mask that is moulded to the contours of the head or face

3.12
soft-filled toys
toy, clothed or unclothed, with soft body surfaces and filled with soft materials or a combination of soft and non-soft materials (e.g. pellets), allowing compression of the main part readily with the hand

Note 1 to entry: A soft-filled toy can only be filled with a combination of soft and non-soft material if the main part of the toy can still be readily compressed with the hand.

Note 2 to entry: This definition is intended to be consistent with that in ISO 8124-1.

3.13
surface flash
rapid spread of flame over the surface of a material without ignition of its base structure at the same time

4 Requirements

4.1 General

See A.3.

The following materials shall not be present in toys:

— celluloid (cellulose nitrate), except when used in varnish, paint, glue or in balls of the type used for table tennis or similar games;

— materials with the same behaviour in fire as celluloid;

Specific materials to which the test flame is applied in order to check compliance of the toy with requirements in 4.2 to 4.5 are considered to comply with this requirement if the toy meets its appropriate requirements in 4.2 to 4.5.

— materials with a piled surface which produce *surface flash* when a flame is applied to the tested material under the conditions described in 5.5.1 and 5.5.2.

Piled surfaces showing non rapid spread of flame to an area remote from the test flame are considered to meet this requirement.

In addition, toys shall not contain *flammable gases*, *extremely flammable liquids, highly flammable liquids*, *flammable liquids,* and flammable gels except as provided for below:

— *flammable liquids* and flammable gels supplied in sealed containers having a maximum volume of 15 ml per container;

— *highly flammable liquids* and *flammable liquids* being entirely retained within a porous material in capillary channels of writing instruments;

— *flammable liquids* with a viscosity greater than 260×10^{-6} m^2/s when determined in accordance with ISO 2431:2011, 5.1.4, Figure 1, using cup No. 6;

— *highly flammable liquids* contained in *chemical toys.*

4.2 Toys to be worn on the head

See A.4.

4.2.1 General

The requirements of 4.2 apply to:

— beards, moustaches, wigs, etc. made from *hair*, pile, or *material that behaves in a similar manner to hair;*

— moulded and fabric masks;

— hoods, headdresses, etc.;

— flowing elements of toys to be worn on the head;

but not to paper novelty hats of the type usually supplied in party crackers.

When a product incorporates several features, for example a hat with an attached mask and *hair*, each part shall be tested separately to the applicable sub-clause relevant to that particular part of the toy.

Attachments made from elastic or string, which is used for the purpose of securing a mask, hat, etc. on the head shall not be tested.

http://www.china-gauges.com/

4.2.2 Beards, moustaches, wigs, etc. made from *hair,* pile, or *material that behaves in a similar manner to hair* (e.g. free-hanging ribbons, paper, cloth strands, or other flowing elements), which protrude 50 mm or more from the surface of the toy

When determining whether materials are required to be tested under 4.2.2, the distance by which the material protrudes shall be measured without applying tension to the protruding part, e.g. curly *hair* is not straightened. Plaits or braided *hair* shall be fully released and combed, where possible, before testing.

When tested according to 5.2, the duration of flaming shall not be more than 2 s after the removal of the test flame.

In addition, if ignition occurs, the maximum burnt length of *hair,* pile, or *material that behaves in a similar manner to hair* shall not be

a) more than 50 % of the greatest initial length, when the initial length was 150 mm or more, or

b) more than 75 % of the greatest initial length, when the initial length was less than 150 mm.

http://www.china-gauges.com/

4.2.3 Beards, moustaches, wigs, etc. made from *hair*, pile, or *material that behaves in a similar manner to hair* (e.g. free-hanging ribbons, paper, cloth strands, or other flowing elements), which protrude less than 50 mm and more than 5 mm from the surface of the toy

Beards, moustaches, wigs, etc. made from *hair,* pile, or *material that behaves in a similar manner to hair* which protrude 5 mm or less from the surface of the toy are regarded as headdresses and are covered by 4.2.5.

When tested in accordance with 5.3, the duration of flaming shall not be more than 2 s after the removal of the test flame, and the maximum distance between the upper edge of the burnt area and the point of application of the test flame shall not be more than 70 mm.

4.2.4 Full or partial moulded head masks

When tested in accordance with 5.3, the duration of flaming shall not be more than 2 s after the removal of the test flame. The maximum distance between the upper edge of the burnt area and the point of application of the test flame shall not be more than 70 mm.

This requirement does not apply to moulded eye masks nor face masks that neither cover the chin nor a cheek as they are covered by 4.2.5.

4.2.5 Flowing elements of toys to be worn on the head (except those covered by 4.2.2 and 4.2.3), hoods, headdresses, etc. and masks not covered by 4.2.4 which partially or fully cover the head (e.g. fabric and cardboard masks, eye masks, face masks), but excluding those items covered by 4.3

When tested in accordance with 5.4, the rate of spread of flame of the test sample shall not exceed 10 mm/s or the test sample shall self-extinguish.

This requirement does not apply if it is not possible to obtain a sample from a single toy as described in 5.4.1.

4.3 Toy disguise costumes and toys intended to be worn by a child in play

See A.5.

This requirement does not apply if it is not possible to obtain a sample from a single toy as described in 5.4.1.

When tested in accordance with 5.4, the rate of spread of flame of the test sample shall not exceed 30 mm/s or the test sample shall self-extinguish.

If the rate of spread of flame is between 10 mm/s and 30 mm/s, the appropriate part(s) of the toy and the packaging shall be permanently marked with a statement similar to the following:

"**Warning! Keep away from fire.**"

See ISO 8124-1:2012, B.2.1, for guidance.

4.4 Toys intended to be entered by a child

See A.6.

These are toys that at least partially enclose a child and include e.g. toy tents, wigwams and play tunnels, but do not include open canopies. The requirements apply to toys made of flexible materials such as fabric and vinyl. They do not apply to rigid materials.

http://www.china-gauges.com/

If the material has non-identical surfaces, both sides shall be tested.

When tested in accordance with 5.4, the rate of spread of flame of the test sample shall not exceed 30 mm/s or the test sample shall self-extinguish.

If the test sample has a rate of spread of flame greater than 20 mm/s when tested in accordance with 5.4, there shall be no *flaming debris* or *molten drips.*

If the rate of spread of flame is between 10 mm/s and 30 mm/s, the appropriate part(s) of the toy and the packaging shall be permanently marked with a statement similar to the following:

"**Warning! Keep away from open flame.**"

See ISO 8124-1:2012, B.2.1, for guidance.

This requirement does not apply if it is not possible to obtain a sample from a single toy as described in 5.4.1.

4.5 Soft-filled toys

See A.7.

The requirements of this subclause do not apply to soft-filled toys or soft-filled parts of a toy that cannot be cuddled or hugged by a child during play.

The requirements of this clause do not apply to toys which, when positioned in accordance with 5.5.3, present a maximum unhindered vertical soft-filled height of 150 mm or less. *Soft filled toys* shall be tested as supplied, including any clothing or cover present with the toy and, if considered to be more onerous, with the clothes or cover removed if removal can be accomplished without damage to the clothes, cover, or toy.

When tested in accordance with 5.5, the rate of spread of flame on the surface shall not be more than 30 mm/s or the toy shall self-extinguish.

5 Test methods

5.1 General

5.1.1 Precautionary information

It is the responsibility of those using these test methods to do so in a safe manner. Burning materials can produce smoke and toxic gases and therefore protective measures are required for the safety of operators. Fire extinguishers should be readily available to hand.

5.1.2 Test burner

The test flame shall be obtained from a burner as described in ISO 6941:2003, Annex A, and shall be operated with butane or propane gas.

The type of gas used shall be specified in the results, for the sake of consistency.

5.1.3 Conditioning and test chamber

Before each test, the toys or samples shall be conditioned for at least 7 h in an atmosphere having a temperature of (21 ± 5) °C and a relative humidity of (65 ± 5) %.

Carry out the tests in a test chamber in which the movement of air is less than 0,2 m/s at the start of the test and is not affected by operation of mechanical apparatus during the test. It is essential that the volume of air in the test chamber is not affected by a reduction in the level of oxygen concentration. When an open-fronted chamber is used for the test, ensure that the test sample is at least 300 mm from the walls of the chamber. Maintain the chamber at 10 °C to 30 °C and at a relative humidity of 15 % to 80 % prior to the test being carried out.

http://www.china-gauges.com/

The samples shall be tested within 5 min of removal from the conditioning atmosphere.

5.1.4 Test flame

Light the burner described in 5.1.2 and pre-heat for a minimum of 2 min.

The required height of the flame shall be measured from the end of the burner tube to the top of the flame with the burner in the vertical position.

5.2 Test relating to beards, moustaches, wigs, etc. made from *hair,* pile, or *material that behaves in a similar manner to hair* (e.g. free-hanging ribbons, paper, cloth strands, or other flowing elements), which protrude 50 mm or more from the surface of the toy

5.2.1 Test flame

Adjust the flame height to (20 ± 2) mm.

5.2.2 Test burner position

Position the burner vertically.

5.2.3 Test performance

Measure the length of the *hair*, pile, or *material that behaves in a similar manner to hair* and position the toy so that the largest dimension of the *hair*, pile, or *material that behaves in a similar manner to hair* hangs vertically or as near vertically as possible.

Apply the test flame for (2 ± 0,5) s to the lower edge or ends of the sample material so that the flame penetrates the element by approximately 10 mm.

If ignition occurs, measure the duration of flaming and the burnt length, i.e. the maximum length of the *hair*, pile, or *material that behaves in a similar manner to hair* that has been burnt.

5.3 Test relating to beards, moustaches, wigs, etc. made from *hair*, pile, or *material that behaves in a similar manner to hair* (e.g. free-hanging ribbons, paper, cloth strands, or other flowing elements), which protrude less than 50 mm from the surface of the toy, and full or partial moulded head masks

See A.8.

5.3.1 Test flame

Adjust the flame height to (20 ± 2) mm.

5.3.2 Test burner position

Move the burner to an angle of 45°.

5.3.3 Test performance

Position the toy vertically.

Apply the test flame to the toy for (5 ± 0,5) s, so that the test flame makes contact between 20 mm and 30 mm above the lower edge of the toy and/or attachment and at a distance of approximately 5 mm measured horizontally from the closest point of the burner tube, to the surface of the toy.

If ignition occurs, measure the duration of flaming and the maximum distance between the upper edge of the burnt area and the point of application of the flame.

http://www.china-gauges.com/

5.4 Test relating to flowing elements of toys to be worn on the head (except those covered by 4.2.2 and 4.2.3), hoods, headdresses, etc. and masks not covered by 4.2.4 which partially or fully cover the head (e.g. fabric and cardboard masks, eye masks, face masks), toy disguise costumes and toys intended to be entered or worn by a child

See A.9.

5.4.1 Preparation of sample

Each test shall be carried out on a single new toy.

If advice to the consumer (e.g. a care label on the toy or its packaging)

— indicates that the toy is not intended to be washed, it shall not be washed or soaked before testing,

— recommends a method of washing or cleaning, the toy shall be treated before testing in accordance with these recommendations which are regarded as instructions from the manufacturer, and

— gives no information relating to washing or cleaning the toy, if it is likely to be washed during its life or exposed to rain shall be treated, before testing, in accordance with the following instructions,

  immerse the test sample(s) in tap water (at approximately 20 °C) at a ratio of at least 1:20 mass of test sample(s) to volume of water, and allow it/them to stand for 10 min. Drain and repeat twice. Rinse by immersing the test sample(s) in demineralized water for 2 min. Drain and dry by a method appropriate to the test sample(s) and, where appropriate, restore the pile as near as possible to its original condition.

Cut test samples with dimensions of at least 610 mm × 100 mm from each material available on the toy. Each test sample shall be made from one material. Where possible, the sample should not include seamed edges or edges decorated with lace trimmings. As seams modify the rate of spread of flame, they shall be placed in the upper part of the sample holder.

Where there is insufficient material to prepare a full sample as described above, two equal pieces of the same material from the same single toy with dimensions of 310 mm × 100 mm can be used so that when they overlap, a full sample of at least 610 mm × 100 mm is obtained. In order to ensure that there is no gap at the overlap, staples can be used to secure the join.

As the rate of spread of flame can be different with the direction of the fabric, where there is enough material, cut the test sample with the length corresponding to the vertical direction of the toy when in use.

For toys corresponding to 4.3 (toy disguise costumes and toys intended to be worn by a child in play), if the costume is intended to be reversible and the material has non-identical surfaces, both sides of the material shall be tested. In this case, a second sample is prepared and can be from a second toy if there is insufficient material to obtain two samples from the same toy.

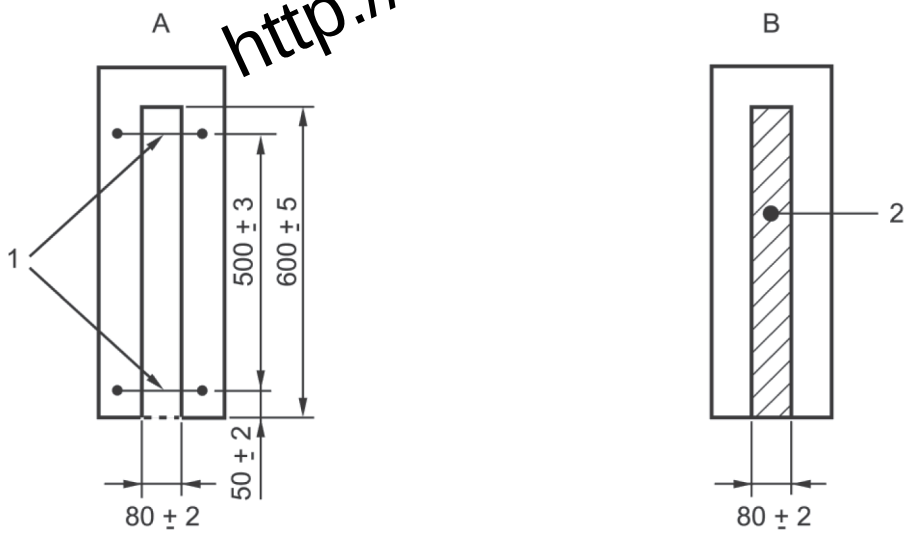
For toys corresponding to 4.4 (toys intended to be entered by a child), if the material has non-identical surfaces, both sides of the material shall be tested. In this case, a second sample is prepared and can be from a second toy if there is insufficient material to obtain two samples from the same toy.

http://www.china-gauges.com/

5.4.2 Holding the test sample

Place the test sample on the sample holder as shown in Figure 1, slightly tensioned to avoid creases, waving, or curling.

Dimensions in millimetres



Key

1 100 % cotton marker threads
2 test sample
A top side
B underside

Figure 1 — Test relating to flowing elements of toys to be worn on the head (except those covered by 4.2.2 and 4.2.3), hoods, headdresses etc. and masks not covered by 4.2.4 which partially or fully cover the head (e.g. fabric and cardboard masks, eye masks, face masks), toy disguise costumes, toys intended to be worn by a child in play and toys intended to be entered by a child

For toys corresponding to 4.2.5 (flowing elements of toys to be worn on the head) and 4.3 (toy disguise costumes and toys intended to be worn by a child in play), the outside surface of the material when in use, shall be positioned face up.

Attach the marker threads at points A and B of Figure 2 across the sample at no more than 2 mm from the surface of the sample, with a device to indicate when the marker thread is severed.

Position the sample holder at (45 ± 1)° to the horizontal.

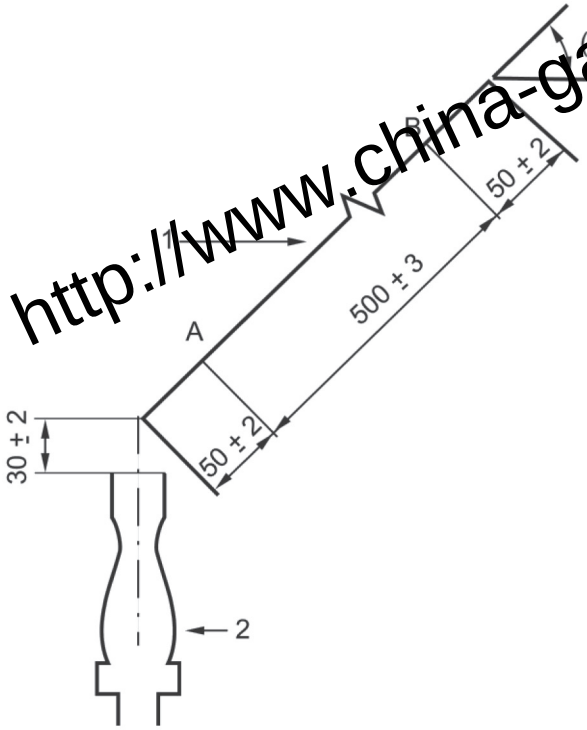
5.4.3 Test flame

Adjust the flame height to (40 ± 3) mm.

5.4.4 Test burner position

Position the burner vertically in order to have a distance between the edge and the top of the burner of (30 ± 2) mm (see Figure 2).

Dimensions in millimetres



http://www.china-gauges.com/

Key

1 test sample
2 burner
A location of 100 % cotton marker threads
B location of 100 % cotton marker threads

Figure 2 — Gas burner

5.4.5 Test performance

Maintain the burner with the flame as indicated above for (10 ± 1) s.

If ignition occurs, start the timing device when the first marker thread is severed by the flame and stop it when the second marker thread is severed.

5.4.6 Results

If, after applying the flame, the sample fails to ignite and if the first marker thread is not severed, the rate of spread of flame is equal to 0.

If ignition occurs and the first marker thread is severed and the flame extinguishes before severing the second marker thread, the material tested is considered as self-extinguishing.

If the second marker thread is severed, note the time and calculate the rate of spread of flame in mm/s. Round the resulting value to the nearest mm/s.

5.5 Test for soft-filled toys

5.5.1 Test flame

Adjust the flame height to (20 ± 2) mm.

5.5.2 Test burner position

Move the burner to an angle of 45°.

5.5.3 Test performance

Position the toy vertically, i.e. with the head uppermost if it has one, or otherwise so that the toy presents the maximum unhindered soft-filled vertical area of its surface to the spread of flame.

Apply the test flame to the toy for (3 ± 0,3) s so that the distance between the edge of the burner tube and the toy is approximately 5 mm and the test flame makes contact between 20 mm and 50 mm above the lower edge of the most flammable material of the toy, as predetermined, and is not less than 120 mm from the top surface of the toy.

If the test flame application point for the most flammable material cannot be located at a distance 120 mm or more from the top surface of the toy, the next most flammable material located 120 mm or more from the top surface of the toy shall be chosen for the application of the test flame.

NOTE 1 In general, predetermination of the most flammable material should be carried out by observation of the flame spread while the sample is burning during the first test. Samples that self-extinguish with little damage occurring can be tested using a test flame application point on a different material; higher up the sample, provided that the self-extinguishing flame has been remote from the area of new material.

After removal of the test flame, measure the time taken for the flame to spread on the surface of the toy until the top of the flames first reach the height of the uppermost toy surface.

If ignition occurs and the flame extinguishes before reaching the height of the uppermost toy surface, the tested toy is considered as self-extinguishing.

NOTE 2 If the straight vertical distance between the point of application of the flame and the uppermost toy surface is 500 mm or more, the test can be stopped when the top of the flames reach a height of 500 mm from the point of application of the test flame. The rate of spread of flame is then calculated using the time elapsed to reach this point.

http://www.china-gauges.com/

Annex A
(informative)

Background and rationale for this part of ISO 8124

http://www.china-gauges.com/

A.1 Introduction

This part of ISO 8124 sets safety requirements for those toys that could pose a significant risk of injury to a child from the hazards presented by their potential to catch fire.

Several databases were consulted during the preparation of the initial standard, including those of the United Kingdom's 'Home Accident Surveillance System' and the United States' 'Consumer Product Safety Commission'. There was no indication from these sources that accidents were occurring due to direct contact of children with burning material in toys.

A.2 General

This Annex sets out the main categories of toys that are dealt with in this part of ISO 8124, but it should be noted that there are categories of flammable materials which are prohibited in all toys.

A.3 General requirements

See 4.1.

Materials with the same behaviour in fire as celluloid can be defined as those which readily catch fire after brief contact with a source of ignition and which continue to burn or to be consumed after removal of the ignition source. In this case, only solids that ignite instantaneously (at the time of contact with a source of ignition) and are rapidly consumed should fall into this category. Plastics, paper, textiles, etc. will all burn, but should normally not be considered as materials with the same behaviour in fire as celluloid.

In the context of the requirement for materials with the same behaviour in fire as celluloid, no validated test method has been established. However, some evaluations made on a strip of celluloid material (8 cm long) coming from a table tennis ball have shown that, when a flame is applied under the conditions described in 5.5.1 and 5.5.2 to the lower edge of the strip placed vertically, it ignites instantaneously and shows a rate of spread of flame of approximately 400 mm/s.

A piece of paper with a grammage (weight) of 80 g/m^2 and a dimension of 21 cm by 29,7 cm tested under the same conditions have shown a rate of spread of flame of approximately 110 mm/s.

These values should be taken into consideration if further assessment of the material is required.

Flammable liquids and flammable gels in sealed containers of less than 15 ml, e.g. containers of glue and paint are considered not to pose a significant risk from ignition.

A.4 Toys to be worn on the head

See 4.2.

This clause is intended to cover those articles with elements that could become ignited without the child's knowledge, for example, when blowing candles on a Birthday cake. *Hair*, pile, or *material that behaves in a similar manner to hair* would present the highest *flammability* hazard in this respect. Therefore,

specific requirements have been set for these materials, based on their protruding length (length of the material measured from the surface of the toy to the end of the material).

Anything protruding upwards, e.g. feathers on top of a Native American headwear, should not be regarded as falling into this category.

In addition to the duration of flaming, 4.2.2 establishes requirements regarding the maximum burnt length of *hair*, pile, or *material that behaves in a similar manner to hair;* and 4.2.3 establishes requirements for the maximum burnt area measured at the surface of a toy.

Beards, moustaches, wigs, etc. made from *hair*, pile, or *material that behaves in a similar manner to hair*, which protrudes 5 mm or less from the surface of the toy, are regarded as presenting a *flammability* hazard similar to headdresses and have therefore been considered as such.

The categories of toys covered by 4.2.5 are those not already covered by 4.2.1 to 4.2.4.

However, if they incorporate several features e.g. *hair,* each part shall be tested to the applicable clause relevant to that particular part of the toy.

http://www.china-gauges.com/

Flowing elements are those that are wider than *hair* or ribbon, and dangle unsupported such that they could inadvertently contact a flame, e.g. a veil attached to a hat.

The following examples provide guidance on the applicability of the requirements of 4.2 to various types of toys to be worn on the head.

Table A.1

Picture	Brief description of the toy to be worn on the head/comments	4.2.2	4.2.3	4.2.4	4.2.5
	This toy is made out of textile material. The black side elements do not flow and shall not be regarded as material with similar features to hair or pile; it is regarded as a headdress.				X
	This toy is made of brown pile material protruding less than 5 mm from the surface of the toy; it is therefore considered as a headdress. (If it was protruding more than 5 mm, but less than 50 mm, 4.2.3 would have been applicable). The black ears are regarded as material that behaves in a similar manner to hair or pile as they are flowing elements which hang close to the head and continue to move on their own after the head is rotated then stopped. They protrude more than 50 mm from the surface of the toy.	X (black ears)			X (brown head-dress)

Table A.1

Picture	Brief description of the toy to be worn on the head/comments	4.2.2	4.2.3	4.2.4	4.2.5
	The black antennas are made of plastic material and the brown material is textile; both elements are regarded as headdress.				X
	Black and purple materials are textile; they are regarded as hood/headdress.				X
	The white mask is made of plastic material and is moulded to the contours of the face. The black material is textile. The two cloth strands are regarded as material that behaves in a similar manner to hair or pile as they are flowing elements which hang close to the head and continue to move on their own after the head is rotated then stopped. They protrude more than 50 mm from the surface of the toy. The rest of the black material is regarded as a hood.	X (black cloth strand)		X (white mask)	X (black hood)
	Translucent material is textile surrounded by metallic frame; it is regarded as headdress. The pink material is a ribbon made of textile. These ribbons are regarded as material that behaves in a similar manner to hair or pile as they are flowing elements which hang close to the head and continue to move on their own after the head is rotated then stopped. They protrude more than 50 mm from the surface of the toy.	X (pink ribbons)			X (headdress)

http://www.china-gauges.com/

Table A.1

Picture	Brief description of the toy to be worn on the head/comments	4.2.2	4.2.3	4.2.4	4.2.5
	This mask is made of EVA material; it is not moulded to the contours of the face. The ears are not flowing elements which hang close to the head and continue to move on their own after the head is rotated then stopped.				X
	This headband is made of textile material and feathers. Feathers are upright and do not hang or flow and shall not be regarded as hair or pile material according to 4.2.2 or 4.2.3. The whole toy is regarded as a headdress.				X
	This headband is made of textile material and feathers. Upright feathers do not hang or flow and shall not be regarded as hair or pile material according to 4.2.2 or 4.2.3. The feathers hanging on the back of the head hang or flow like hair. They protrude more than 50 mm from the surface of the toy.	X (hanging feathers)			X (headband and upright feathers)
	This toy is intended to be placed on the head, children's face is not covered (brown area represent the area where child's face will appear). It is entirely made of textile material with pile protruding less than 5 mm from the surface of the toy. The orange, red, and yellow elements are not flowing elements like hair which hang close to the head and continue to move on their own after the head is rotated then stopped. The whole toy is regarded as a hood/headdress.				X

http://www.china-gauges.com/

Table A.1

Picture	Brief description of the toy to be worn on the head/comments	4.2.2	4.2.3	4.2.4	4.2.5
	The mask is made of plastic material and is moulded to the contours of the face. The purple hair is protruding more than 50 mm from the surface of the toy.	X (purple hair)		X (mask)	
	The white element to attach the toy to the head is made of plastic material and the pink and green materials are textile. The pink and green elements hanging down are not regarded as material that behaves in a similar manner to hair or pile as they are not flowing elements which hang close to the head and continue to move on their own after the head is rotated then stopped. The whole toy is regarded as a headdress.				X
	The black hat is made of felt and is surrounded with white pile material. The white pile material is not regarded as material that behaves in a similar manner to hair or pile according to 4.2.2 and 4.2.3 as it is not flowing elements which hang close to the head. It is regarded as a flowing element not covered by 4.2.2 and 4.2.3, but covered by 4.2.5 as it is for the felt material (headdress).				X (felt and white pile materials)
	The black element to attach the toy to the head is made of plastic material and the pink and black materials of the ears are textile. The ears are not regarded as material that behaves in a similar manner to hair or pile as they are not flowing elements which hang close to the head and move when the head is rotated. The whole toy is regarded as a headdress.				X

http://www.china-gauges.com/

Table A.1

Picture	Brief description of the toy to be worn on the head/comments	4.2.2	4.2.3	4.2.4	4.2.5
	The hat is made of cardboard material; it is regarded as headdress. The blue and pink elements attached on top are made of textile material and are regarded as material that behaves in a similar manner to hair or pile. They are flowing elements which hang close to the head and move when the head is rotated. They protrude more than 50 mm from the surface of the toy.	X (pink and blue textile material)			X (cardboard hat)
	The mask is made of plastic material and is moulded to the contours of the face; it is regarded as a full moulded head mask.			X	
	This helmet is made of plastic material with red hair on top which is not flowing like hair; it is not regarded as a wig with hair or pile material according to 4.2.2 or 4.2.3. The whole toy is regarded as a headdress with flowing elements (red hair) not covered by 4.2.2 and 4.2.3.				X
	The mask is made of plastic material and is intended to be secured to the head with elastic or string and is moulded to the contours of the face; it is regarded as a partial moulded head mask.			X	

http://www.china-gauges.com/

Table A.1

Picture	Brief description of the toy to be worn on the head/comments	4.2.2	4.2.3	4.2.4	4.2.5
	Hat and eye patch are made of textile material; they are both regarded as headdress.				X
	The blue headband and the white shroud are made of textile material. The white textile material is not regarded as material that behaves in a similar manner to hair or pile as it is not made of cloth strands, continuously surrounding the head, and covering the shoulders. The whole toy is regarded as a hood/headdress.				X (blue headband and white shroud)
	This eye mask is made of cardboard material and is moulded to the contours of the face; it is excluded from 4.2.4 and is covered by 4.2.5.				X
	This headband is made of textile material and a feather. The feather is upright and does not hang or flow and is not regarded as hair or pile material according to 4.2.1 or 4.2.2. The whole toy is regarded as a headdress.				X

http://www.china-gauges.com/

A.5 Toy disguise costumes and toys intended to be worn by a child in play

See 4.3.

These include e.g. fairies, superheroes, doctors' outfits, and long flowing capes not attached to headwear covered by 4.2.5. To ensure a wider range of testing (principally, to cover small sizes of costumes), the

test sample can be constructed from two equal parts with both parts to be taken from the same toy. Toys with insufficient material to take a sample in this manner are considered not to pose a significant risk from ignition.

A.6 Toys intended to be entered by a child

See 4.4.

These include e.g. toy tents, puppet theatres, wigwams, and play tunnels which enclose the child and restrict rapid exit. Products such as canopies with open sides are not included as the child's ability to exit rapidly is not restricted. It is thought unlikely that any such toy would escape testing because of insufficient sample size.

The *flaming debris* requirement has been limited to those materials that have a rate of flame spread greater than 20 mm/s. Products produced from nylon and other man-made materials can produce *flaming debris* and yet are extensively used in the production of children's clothing because they have a relatively slow rate of flame spread. This has led to the use of more hazardous materials that meet the *flaming debris* requirement, but have a more rapid spread of flame.

Rigid materials are not tested because they are hard to ignite and slower to burn. There is no data to suggest a hazard with these materials.

A.7 Soft-filled toys

See 4.5.

The title of this requirement in the previous version of this part of ISO 8124 was "4.5 *soft-filled toys* (animals and dolls) with a piled or textile surface". However, it was considered not relevant to restrict the scope to the shape of the toy and its surface material, and the title was therefore changed to include all *soft-filled toys*.

The requirements now apply to all *soft-filled toys* that can be cuddled or hugged by a child (for example a teddy bear or a play mat). However, those *soft-filled toys* or soft-filled parts of toys which cannot be cuddled or hugged by a child during play (for example, the soft-filled rim of a pushchair or a non-removable soft-filled mattress of a toy cot) continue to be excluded from the scope of this clause.

A.8 Test relating to full or partial moulded head masks

See 5.3.

The lower edge of the toy is considered to be the bottom of the toy when placed on the head.

A.9 Test relating to toy disguise costumes and toys intended to be entered by a child

See 5.4.

The U-shaped double frame has been designed to ensure that the material is secured throughout the test. When materials are subjected to heating, they react differently depending upon the type. There is a tendency for some materials to shrink away from the flame source. By specifying the sample holder, this effect has been minimized and inconsistencies between the laboratories reduced. The important criterion here is not the speed of ignition, but the rate of flame spread.

There are practical difficulties in testing toys that have seamed edges and edges decorated with trimmings. When it is possible to prepare a representative sample without their inclusion, this should be done.

http://www.china-gauges.com/

Annex B
(informative)

Significant technical changes between this part of ISO 8124 and the previous version

http://www.china-gauges.com/

B.1 General

Table B.1

Clause/Paragraph/ Table/Figure	Change
3	Terms and definitions of “hair”, “soft-filled toys”, “flammable gas”, “flammable liquid”, “highly flammable liquid” amended. Terms and definitions of “extremely flammable liquid”, “chemical toy”, “materials with similar features”, “moulded head masks” added.
4.1	The term “highly flammable solids” has been removed as no definition exists and because it is embedded into “materials with the same behaviour as celluloid”. The conditions used to observe a surface flash have been added.
4.2.3	Beards, moustaches, wigs, etc. made from hair, pile, or material that behaves in a similar manner to hair which protrude 5 mm or less from the surface of the toy are regarded as headdresses
4.2.4	Moulded eye masks and face masks that neither cover the chin nor a cheek, are covered by 4.2.5.
4.5	Title changed to include all soft-filled toys.
5.3.3	Upper height limitation for the application of the test flame added.
5.4.2	Tolerances for the test equipment values added.
5.4.4	Tolerances for the test equipment values added.
5.5.3	Clarification for the application of the test flame added.
6	Clause 6 “Test report” removed.
NOTE The technical changes referred to above include the significant technical changes from the revised International Standard, but is not an exhaustive list of all modifications from the previous version.	

Bibliography

[1] EN 71-5, *Safety of toys — Part 5: Chemical toys (sets) other than experimental sets*

[2] EN 1103:2005, *Textiles — Fabrics for apparel — Detailed procedure to determine the burning behaviour*

[3] ISO/IEC Guide 50:2002, *Safety aspects — Guidelines for child safety*

[4] ISO/IEC Guide 51:1999, *Safety aspects — Guidelines for their inclusion in standards*

[5] ISO/IEC Guide 71:2001, *Guidelines for standards developers to address the needs of older persons and persons with disabilities*

[6] IEC 62115, *Electric toys — Safety*

http://www.china-gauges.com/

NATIONAL ANNEX A
(National Foreword)

A-1 MARKING

A-1.1 The following shall be marked legibly and indelibly on each toy:

Name of the manufacturer and/or his authorized representative and/or registered trade-mark, if any.

A-1.2 The following shall be marked legibly and indelibly on toy packing:

a) Name of the article;
b) Country of origin;
c) Manufacturer's or his authorized representative's name and address and trade-mark, if any;
d) Batch No./Code No.;
e) Month and year of manufacture;
f) Instructions, for use and storage;
g) Safety directions, if any;
h) Other provisions of the *Packaging Commodity Act*;
j) Usage's Age Group; and
k) Any loose part along with the article or any other information.

http://www.china-gauges.com/

A-2 BIS CERTIFICATION MARKING

The product may also be marked with the Standard Mark.

A-2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act,* 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

http://www.china-gauges.com/

(*Continued from second cover*)

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 8124-1 : 2012[1] Safety of toys — Part 1: Safety aspects related to mechanical and physical properties	IS 9873 (Part 1) : 2017 Safety of toys: Part 1 Safety aspects related to mechanical and physical properties (*third revision*)	Identical with ISO 8124-1 : 2014

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'.

http://www.china-gauges.com/

[1)]Since revised in 2014.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

http://www.china-gauges.com/

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc No.: PCD 12 (2902).

Amendments Issued Since Publication

Amendment No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices: *Telephones*

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002 — 2323 7617, 2323 3841

Eastern : 1/14, C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi, KOLKATA 700054 — 2337 8499, 2337 8561, 2337 8626, 2337 9120

Northern : Plot No. 4-A, Sector 27-B, Madhya Marg, CHANDIGARH 160019 — 26 50206, 265 0290

Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113 — 2254 1216, 2254 1442, 2254 2519, 2254 2315

Western : Manakalaya, E9 MIDC, Marol, Andheri (East), MUMBAI 400093 — 2832 9295, 2832 7858, 2832 7891, 2832 7892

Branches : AHMEDABAD. BENGALURU. BHOPAL. BHUBANESWAR. COIMBATORE. DEHRADUN. DURGAPUR. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. JAMMU. JAMSHEDPUR. KOCHI. LUCKNOW. NAGPUR. PARWANOO. PATNA. PUNE. RAIPUR. RAJKOT. VISAKHAPATNAM.

Published by BIS, New Delhi