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**Safety of toys —**

**Part 1:**

**Safety aspects related to mechanical  
and physical properties**

*Sécurité des jouets —*

*iTEH Standards*

*Partie 1: Aspects de sécurité relatifs aux propriétés mécaniques et  
physiques*

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## Foreword

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

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://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](http://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 voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html)

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

This fifth edition cancels and replaces the fourth edition (ISO 8124-1:2014). A list of the main technical changes made to the previous edition is given in [Annex G](#).

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

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## **Introduction**

This document is largely based upon existing standards in the European Union (EN 71-1) and in the United States of America (ASTM F963).

Compliance with the requirements of this document will minimize potential hazards associated with toys resulting from their use in their intended play modes (normal use) as well as unintended play modes (reasonably foreseeable abuse).

This document will not, nor is it intended to, eliminate parental responsibility in the appropriate selection of toys. In addition, this document will not eliminate the need for parental supervision in situations where children of various ages may have access to the same toy(s).

Although [Annexes A, B, C, D, E](#) and [F](#) are for information purposes only, they are crucial for the correct interpretation of this document.

The safety of electric toys is described in IEC 62115.

When age indications are required for safety labelling purposes, they may be given in either months or years.

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## Safety of toys —

### Part 1: Safety aspects related to mechanical and physical properties

#### 1 Scope

The requirements in this document apply to all toys, i.e. any product or material designed or clearly intended for use in play by children under 14 years of age. They are applicable to a toy as it is initially received by the consumer and, in addition, they apply after a toy is subjected to reasonably foreseeable conditions of normal use and abuse unless specifically noted otherwise.

The requirements of this document specify acceptable criteria for structural characteristics of toys, such as shape, size, contour, spacing (e.g. rattles, small parts, sharp points and edges, and hinge-line clearances) as well as acceptable criteria for properties peculiar to certain categories of toy (e.g. maximum kinetic energy values for non-resilient-tipped projectiles and minimum tip angles for certain ride-on toys).

This document specifies requirements and test methods for toys intended for use by children in various age groups from birth to 14 years. The requirements vary according to the age group for which a particular toy is intended. The requirements for a particular age group reflect the nature of the hazards and the expected mental and/or physical abilities of a child to cope with them.

This document also requires that appropriate warnings and/or instructions for use be given on certain toys or their packaging. Due to linguistic problems which may occur in different countries, the wording of these warnings and instructions is not specified but given as general information in [Annex B](#). It should be noted that different legal requirements exist in many countries with regard to such marking.

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This document does not purport to cover or include every conceivable potential hazard of a particular toy or toy category. Except for labelling requirements indicating the functional hazards and the age range for which the toy is intended, this document has no requirements for those characteristics of toys which represent an inherent and recognized hazard which is integral to the function of the toy.

**EXAMPLE 1** An example of such a hazard is the sharp point necessary for the proper function of a needle. The needle is a hazard which is well understood by the purchaser of a toy sewing kit, and the functional sharp-point hazard is communicated to the user as part of the normal educational process of learning to sew as well as at the point of purchase by means of cautionary labelling on the product's packaging.

**EXAMPLE 2** As a further example, a two-wheeled toy scooter has inherent and recognized hazards associated with its use (e.g. instability during use, especially while learning). The potential hazards associated with its structural characteristics (sharp edges, pinch hazards, etc.) will be minimized by compliance with the requirements of this document.

Products not included within the scope of this document are:

- a) bicycles, except for those considered to be toys, i.e. those having a maximum saddle height of 435 mm (see [E.1](#), general);
- b) slingshots;

**NOTE** “Slingshots” are also known as “catapults” and are usually held in the hand; examples are given in [Figure 1](#). Toy versions of medieval catapults and trebuchets are not exempt from this document; an example is given in [Figure 2](#).



**Figure 1 — Examples of slingshots (not within the scope of this document)**



**Figure 2 — Medieval toy catapult (within the scope of this document)**

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- c) darts with metal points;
- d) home and public playground equipment;
- e) compressed air- and gas-operated guns and pistols (see [E.1](#));
- f) kites (except for the electric resistance of their strings, which is included);
- g) model kits, hobby and craft items, in which the finished item is not primarily of play value;
- h) sporting goods and equipment, camping goods, athletic equipment, musical instruments and furniture; however, toys which are their counterparts are included.

It is recognized that there is often a fine distinction between, for example a musical instrument or a sporting item and its toy counterpart. The intention of the manufacturer or distributor, as well as normal use and reasonably foreseeable abuse, determines whether the item is a toy counterpart or not;

- i) models of aircraft, rockets, boats and land vehicles powered by combustion engines; however, toys which are their counterparts are included (see [E.1](#));
- j) collectible products not intended for children under 14 years of age;
- k) holiday decorations that are primarily intended for ornamental purposes;
- l) aquatic equipment intended to be used in deep water, swimming-learning devices and flotation aids for children such as swim-seats and swim-aids;
- m) toys installed in public places (e.g. arcades and shopping centres);
- n) puzzles having more than 500 pieces or without a picture, for specialists;
- o) fireworks including percussion caps, except percussion caps specifically designed for toys;

- p) products containing heating elements intended for use under the supervision of an adult in a teaching context;
- q) steam engines;
- r) video toys that can be connected to a video screen and operated at a nominal voltage greater than 24 V;
- s) babies' pacifiers (dummies);
- t) faithful reproduction of firearms;
- u) electric ovens, irons or other functional products operated at a nominal voltage greater than 24 V;
- v) bows for archery with an overall relaxed length exceeding 120 cm;
- w) fashion jewellery for children (see [E.1](#)).

## 2 Normative references

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

ISO 4287, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method*

ISO 11201, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections*

ISO 11202, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying approximate environmental corrections*

ISO 11204, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying accurate environmental corrections*

IEC 61672-1, *Electroacoustics — Sound level meters — Part 1: Specifications*

## 3 Terms and definitions

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

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

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

NOTE The requirements in this document are applicable to certain age ranges. For interpretation of these age ranges, see [E.43](#) (age-break terminology).

### 3.1

#### accessible

<part or component> any area of the toy that can be contacted by any portion forward of the collar of the accessibility probe as described in [5.7](#) (accessibility of a part or component)

**3.2**

**aquatic toy**

article, whether inflatable or not, intended to bear the mass of a child and used as an instrument of play in shallow water

Note 1 to entry: Bathroom toys and beach balls are not considered aquatic toys.

**3.3**

**arrow**

projectile in the form of a shaft with a length of 150 mm or more, intended to be discharged from a bow held by the user

**3.4**

**backing**

material adhering to flexible plastic sheeting

**3.5**

**ball**

spherical, ovoid or ellipsoidal object, usually but not always designed or intended to be thrown, hit, kicked, rolled, dropped or bounced

Note 1 to entry: This definition includes balls attached to a toy or article by a string, elastic cord or similar tether and also any multi-sided object formed by connecting planes into, and any novelty item of, a generally spherical, ovoid or ellipsoidal shape designed or intended to be used as a ball.

Note 2 to entry: This definition does not include dice, or balls permanently enclosed inside pinball machines, mazes or similar outer containers. A ball is permanently enclosed if, when tested according to 5.24 (reasonably foreseeable abuse), it is not removed from the outer container.

**3.6** <https://standards.iteh.ai>  
**battery-operated toy** Document Preview  
toy having at least one function dependent on electricity and powered by batteries

**3.7**

**burr**

roughness caused by not cleanly severing or finishing the material

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**3.8**

**close-to-the-ear toy**

toy that is intended to be used close to the ear, i.e. the sound-emitting part of such a toy is normally put against the ear of a child

EXAMPLE Toy cellphones or toy telephones that emit sounds from the handpiece.

**3.9**

**collapse**

sudden or unexpected folding of a structure

**3.10**

**cord**

narrow piece of flexible textile or non-textile material, the length of which is significantly greater than the thickness and width

EXAMPLE Cord includes elastic material, monofilament polymeric material, tape, ribbon, rope, strap, chain, woven and twisted material and string, as well as certain weak and long springs.

Note 1 to entry: Electrical cables (see 3.81) are not considered to be cords. Accessible electrical wires (e.g. between a battery box and a sound source in a soft filled toy) which are not electrical cables are, however, considered to be cords.

**3.11****crushing**

injury to part of the body resulting from compression between surfaces

**3.12****C-weighted peak sound pressure level**

$L_{pCpeak}$

peak sound pressure level obtained when using standardized C-weighting

**3.13****dart**

projectile in the form of a shaft less than 150 mm in length that is intended to be thrown or blown

**3.14****discharge mechanism**

component of the toy, separate from the projectile, which releases or propels the projectile into free flight

**3.15****driving mechanism**

assembly of linked parts or components (e.g. gears, belts and winding mechanisms), at least one of which moves, powered by a source (e.g. electrical or mechanical means) independent of a child

**3.16****edge**

line, formed at the junction of two surfaces, whose length exceeds 2,0 mm

**3.16.1****curled edge**

edge in which the portion of the sheet adjacent to the edge is bent into an arc and forms an angle of less than 90° with the base sheet

Note 1 to entry: See [Figure 3](#).

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**3.16.2****hemmed edge**

edge in which the portion of the sheet adjacent to the edge is folded back on the sheet itself through an angle of approximately 180°, so that the portion of the sheet adjacent to the edge is approximately parallel to the main sheet

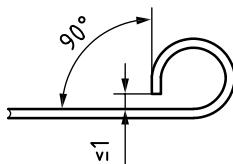
Note 1 to entry: See [Figure 3](#).

**3.16.3****rolled edge**

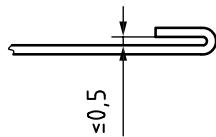
edge in which the portion of the sheet adjacent to the edge is bent into an arc and forms an angle between 90° and 120° with the main sheet

Note 1 to entry: See [Figure 3](#).

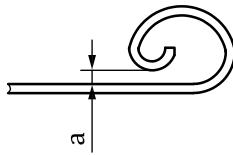
Dimensions in millimetres



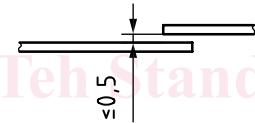
a) Rolled edge



b) Hemmed (folded) edge



c) Curled edge



d) Typical lap joint

**Key**

a no limit

ISO 8124-1:2018

Figure 3 — Edges

<https://standards.iteh.ai/catalog/standards/ISO/ISO-25613-49b6-8d59-ce73d2715b6f/iso-8124-1-2018>**Document Preview****3.17****A-weighted equivalent sound pressure level** $L_{pAeq}$ 

level of a steady-state sound which, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound

**3.18****expanding material**

material whose volume expands when exposed to water

**3.19****explosive action**

sudden release of energy characterized by the rapid expansion or bursting of a material

**3.20****fastener**

mechanical device which attaches two or more elements together

EXAMPLE      Screws, rivets and staples.

**3.21****feathering**

bevelling of an edge (or decrease in thickness moving toward the edge) caused during shearing or cutting of material