INTERNATIONAL STANDARD

ISO 8124-1

Second edition
2009-03-15

AMENDMENT 2
2012-03-15

Safety of toys —

Part 1: Safety aspects related to mechanical and physical properties

AMENDMENT 2: Magnets

Sécurité des jouets —

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

AMENDEMENT 2: Aimants

Reference number
ISO 8124-1:2009/Amd.2:2012(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

Amendment 2 to ISO 8124-1:2009 was prepared by Technical Committee ISO/TC 181, *Safety of toys*.

Safety of toys —

Part 1:
Safety aspects related to mechanical and physical properties

AMENDMENT 2: Magnets

Page 3, Terms and definitions

Add the following definitions:

3.23
functional magnet in electrical or electronic components of toys
any magnet necessary for the function of motors, relays, speakers and other electrical or electronic components in a toy where the magnetic properties are not part of the play pattern of the toy

Renumber subsequent definitions accordingly.

3.38
magnetic component
any part of a toy which contains an attached or fully or partially enclosed magnet

3.39
magnetic/electrical experimental set
toy containing one or more magnets intended for carrying out educational experiments involving both magnetism and electricity

Renumber subsequent definitions accordingly.

Page 36, Clause 4

Add the following requirements:

4.30 Magnets and magnetic components

See Clause E.44.

The requirements in 4.30.1 and 4.30.2 do not apply to functional magnets in electrical or electronic components of toys.

4.30.1 Magnetic/electrical experimental sets intended for children 8 years and over

Magnetic/electrical experimental sets intended for children 8 years and over that contain magnetic components shall carry a warning (see B.2.21 for guidance) if they both:

— have a magnetic flux index greater than 50 kG^2mm^2 (0,5 T^2mm^2) when tested according to 5.32 (magnetic flux index), and

— fit entirely in the cylinder when tested according to 5.2 (small parts test).

NOTE Requirements for magnetic/electrical experimental sets intended for children under 8 years are given in 4.30.2.

4.30.2 All other toys with magnets and magnetic components

a) Any loose-as-received magnet(s) and magnetic component(s) either shall have a magnetic flux index less than 50 kG^2mm^2 (0,5 T^2mm^2) when tested in accordance with 5.32 (magnetic flux index), or shall not fit entirely in the cylinder when tested in accordance with 5.2 (small parts test).

b) Wooden toys, toys intended to be used in water and mouth pieces of mouth-actuated toys with magnets or magnetic components shall be tested in accordance with 5.34 (soaking test for magnets) before being tested in accordance with 4.30.2 c).

c) The following tests shall be carried out in the prescribed order on all unique magnetic component(s). The components used for this testing shall not have been previously subjected to normal use and reasonably foreseeable abuse tests. Any magnet(s) and magnetic component(s) that become liberated from a toy, or from a loose-as-received magnetic component either shall, when tested according to the subclauses listed below, have a magnetic flux index less than 50 kG^2mm^2 (0,5 T^2mm^2) when tested in accordance with 5.32 (magnetic flux index), or shall not fit entirely in the cylinder when tested according to 5.2 (small parts test).

- 5.31 (tension test for magnets);
- 5.24.2 (drop test) or, if applicable, 5.24.3 (tip over test for large and bulky toys);
- 5.24.5 (torque test);
- 5.24.6.1 (tension test, general procedure);
- 5.24.6.2 [tension test for seams in soft-filled (stuffed) toys, beanbag-type toys and other similar filled toys], if applicable;
- 5.33 (impact test for magnets);
- 5.24.7 (compression test), for magnets that are accessible but cannot be grasped [as specified in 5.24.6.1 (general procedure)];
- 5.31 (tension test for magnets).

NOTE 1 Examples of unique magnetic components are rods of different sizes or shapes containing magnets.

NOTE 2 If the toy contains one magnet, the component holding the magnet is considered to be a unique component.

NOTE 3 An example of a magnet that is accessible but cannot be grasped is a magnet that is recessed.

Page 49, 5.14

Replace the third paragraph with the following*:*

Drop a steel ball with a diameter of (16 ± 0,15) mm and mass of (16,9 ± 0,7) g from a height of (130 ± 0,5) cm onto the horizontal upper surface of the toy in the area that would cover the eyes in normal use.

Page 54, 5.24.1

Add the following note at the end of the subclause:

NOTE The tests specified in 4.30.2 are carried out in the order specified in 4.30.2 on a toy, or part of a toy, that has not been previously tested according to this subclause (5.24).

Page 71, Clause 5

Add the following test methods:

5.31 Tension test for magnets

See 4.30.2 c).

5.31.1 Principle

These tests simulate the intended or reasonably foreseeable play pattern. It is recognized that toys may contain a single magnet or a combination of magnets, magnetic components and/or metal mating parts; the tests are designed to simulate a reasonably foreseeable play pattern using these components to attach and detach the magnetic parts.

For toys that contain more than one magnet/magnetic component, the test specified in 5.31.2 shall be carried out unless it is not possible to perform the test without damaging the toy. In the latter case, the test shall be carried out using the reference disc, as described in 5.31.4.

NOTE An example of a case where it is not possible to perform the test in 5.31.2 with magnet(s) or magnetic component(s) without damaging the toy, is a toy figurine with one accessible but non-graspable magnet in each foot.

Toys that contain one magnet only and a mating metal component shall be tested according to 5.31.3.

Toys that contain one magnet only and no mating metal component, shall be tested according to 5.31.4, since this simulates a play pattern where the toy is attached and detached to a surface that is not delivered with the toy.

5.31.2 Toys with magnets or magnetic components

Identify the magnet or magnetic component in the toy that is most likely to be able to detach. The identified magnet or magnetic component shall be subjected to the tension test for magnets.

If it is not possible to determine which magnet or magnetic component(s) in the toy is most likely to be able to detach the magnet under test, it is permissible to repeat the test with another magnet or magnetic component from the toy.

Without damaging the toy, place the magnet or magnetic component in the orientation of attraction, as close as possible, making contact if possible, to the magnet to be tested. Gradually apply a pulling force to the magnet/magnetic component until it separates from the magnet under test. Perform the test 10 times or until the magnet under test is detached from the toy, whichever occurs first.

Repeat the procedure for any other magnet that, in accordance with 4.30.2, shall be subjected to the tension test for magnets.

5.31.3 Toys that contain one magnet only and a mating metal component

Without damaging the toy, place the metal components as close as possible, making contact if possible, to the magnet to be tested. Gradually apply a pulling force to the metal component until it separates from the magnet under test. Perform the test 10 times or until the magnet under test is detached from the toy, whichever occurs first.

5.31.4 Toys that contain one magnet only and no mating metal component

5.31.4.1 Apparatus

5.31.4.1.2 Nickel disc with a minimum nickel content of 99 %, a diameter of (30 ± 0,5) mm and thickness of (10 ± 0,5) mm.

5.31.4.2 Procedure

Without damaging the toy, place the flat part of the disc as close as possible to the magnet to be tested, making contact if possible. Gradually apply a pulling force to the disc until it separates from the magnet under test. Perform the test 10 times or until the magnet under test is detached from the toy, whichever occurs first.

5.32 Magnetic flux index

5.32.1 General

See 4.30.1, 4.30.2 a) and c).

5.32.2 Principle

The magnetic flux index is calculated based on the results from measurements of the flux density and the pole surface area.

5.32.3 Apparatus

5.32.3.1 Direct current field Gauss meter, with a resolution of 5 G, capable of determining the field to an accuracy of 1,5 % or better. The meter shall have an axial type probe with an active area diameter of (0,76 ± 0,13) mm and a distance between the active area and probe tip of (0,38 ± 0,13) mm.

5.32.3.2 Calliper, or **similar device**, with an accuracy of 0,1 mm.

5.32.4 Procedure

5.32.4.1 Measurement of flux density

Identify the surface of the magnet that is a pole.

Place the tip of the Gauss meter probe in contact with the pole surface of the magnet. For a magnetic component (where the magnet is fully or partially embedded in part of the toy), place the tip of the probe in contact with the surface of the component.

Maintain the probe in a position perpendicular to the surface.

Move the probe across the surface to locate the maximum absolute value of the flux density. Record the maximum absolute value of the flux density.

NOTE Since the meter can read both negative and positive values, the absolute value is used for calculations.

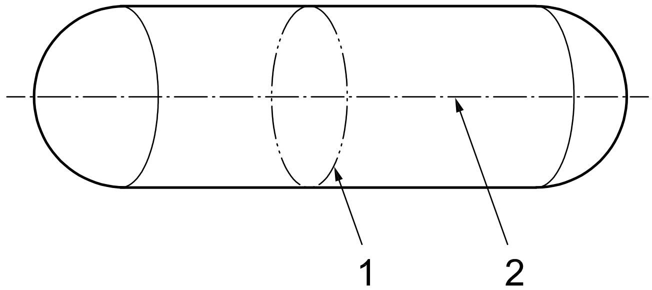
5.32.4.2 Measurement and calculation of the pole surface area

If the magnet is embedded/attached as part of a magnetic component, extract the magnet from the component, even if it is necessary to break the toy.

If the pole surface of the magnet is flat, measure the dimensions with an accuracy of ± 0,1 mm and calculate the area using the appropriate geometric formula.

If the pole is not flat (for example hemispherical), measure the maximum diameter of the magnet perpendicular to an axis through the magnetic poles (see Figure 34), with an accuracy of ± 0,1 mm and calculate the area of the corresponding cross section. For multi-pole magnets, measure and calculate the area of the largest single pole, which can be identified using magnetic field viewing film or equivalent.

NOTE An example of a multi-pole magnet is a rubberized/plastoferrite magnet, consisting of multiple strips or poles.



Key

1 maximum cross-section perpendicular to the axis

2 axis through the magnet poles

Figure 34 — Maximum diameter of magnet with a non-flat pole

5.32.5 Calculation of magnetic flux index

The flux index (kG^2mm^2) is calculated by multiplying the calculated area of the pole surface (mm^2) of the magnet by the square of the maximum flux density (kG^2).

5.33 Impact test for magnets

See 4.30.2 c).

Place the relevant component of the toy in the most onerous position on a plane horizontal steel surface and drop a metallic weight with a mass of (1 ± 0,02) kg, distributed over a diameter of (80 ± 2) mm, through a distance of (100 ± 2) mm onto the toy.

Determine whether any liberated magnets or magnetic components fit entirely in the cylinder when tested in accordance with 5.2 (small parts test).

5.34 Soaking test for magnets

See 4.30.2 b).

Submerge the toy or toy component completely in a container of demineralized water at a temperature of (21 ± 5) °C for 4 min. Remove the toy, shake off the excess water and keep the toy at room temperature for 10 min.

Perform the soaking test for a total of four cycles.

Immediately after the last cycle, determine whether any liberated magnets or magnetic components fit entirely in the cylinder when tested in accordance with 5.2 (small parts test).

Page 80, Annex B

Add the following subclause: