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AMENDMENT

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Safety of toys —

Part 1: Safety aspects related to mechanical and physical properties

AMENDMENT 1: Flying toys

Sécurité des jouets —

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

AMENDEMENT 1:

Reference number
ISO 8124-1:2018/FDAM 1:2020(E)

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

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

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Safety of toys —

Part 1:
Safety aspects related to mechanical and physical properties

AMENDMENT 1: Flying toys

Replace the existing terminological entries 3.24 and 3.38 with the following:

3.24
free flight
unconstrained travel through the air

Note 1 to entry: This will include portions of unconstrained travel that may ultimately be constrained by means of a tether.

3.38
leading edge
area of the projectile or flying toy (e.g. tips, edges or protrusions) which would be expected to make contact with the eyeball

Note 1 to entry: This includes all areas on projectiles or flying toys that travel in unpredictable orientations (e.g. tumbling) that could reasonably be expected to strike the eyeball.

Add the following new terminological entries:

3.86
flying toy
toy or part of a toy intended to be launched into free flight with an on-board energy source (e.g. compressed gas, springs, electricity or inertial energy) that continues to propel the object after the initial release, for part or all of the flight

3.87
remote-controlled flying toy
flying toy with a mass of no more than 250 g, capable of being remotely controlled (e.g. by a wireless transmitter)

Note 1 to entry: Wireless transmitters are typically hand-held devices and include smart devices such as telephones and tablets.

EXAMPLE Drones and helicopters.

Replace the existing 4.19 with the following:

4.19 Flying toys

See E.33

4.19.1 General

Leading edge(s) on rigid parts of flying toys shall not protrude beyond the depth of the gauge shown in Figure 44 when tested according to 5.36 (tip assessment of rigid projectiles).

Remote-controlled flying toys shall be accompanied by instructions that give the user information on how to use the toy safely, see B.2.22.2.

4.19.2 Rotor blades on flying toys

These requirements do not apply to flying toys with propellers that normally rotate in the vertical plane, for example a propeller on an aeroplane.

Rotor blades on flying toys that present the potential for injury shall minimize the potential of rotating blades causing eye injury. One or more of the following features may accomplish this, for example:

a) The design of the toy prevents the blade ends making contact with the eyes (e.g. a protective ring around the perimeter of the rotor blade, a cage enclosing the rotor blade or rotor blades are fully enclosed and not accessible).

b) The blades are made of flexible material that easily bends when a force is applied at the outer end of the blade perpendicular to the horizontal plane of the blade, and that does not break or permanently deform when tested according to 5.24.6.6 (perpendicular tension test for rotor blades). The blade shall bend without breaking and return approximately to its initial position after the test.

c) The blade ends are "clutched" or loosely coupled to the rotor so that the ends are not directly powered by the rotor drive.

d) A partial ring around the perimeter of the rotor blade.

e) Rotor blades are designed so that the leading edge(s) are protected with a resilient material or flexible part.

Examples of designs that achieve these conditions are given in E.33, Figure E.2.

Flying toys with rotor blades that might reasonably be able to contact the face shall be accompanied by a warning about the potential hazard of rotor blades impacting the eyes or face, see B.2.22.1. This warning is not required where the design of the toy prevents the rotor blade ends making contact with the eyes [see 4.19.2, a)].

Rotor blades that are designed to be replaceable shall be accompanied by instructions that clearly indicate the steps necessary to remove and securely replace the rotor blades.

4.19.3 Rotor blades on remote-controlled flying toys

These requirements do not apply to propellers that normally rotate in the vertical plane, for example a propeller on an aeroplane.

In addition to the requirements in 4.19.2, rotor blades on remote-controlled flying toys shall conform to the following requirements:

a) rotor edges that could come into contact with the eyeball shall be visibly rounded;

b) rotor blades shall not detach when tested according to 5.24.6.7 (tension test for rotor blades).

Rotor blades that are designed to be replaceable shall be accompanied by instructions that clearly indicate the steps necessary to remove and securely replace the rotor blades.

Add the following new subclauses:

5.24.6.6 Perpendicular tension test for rotor blades

Gradually apply a (6 ± 0,5) N force at the outer end of the rotor blade, perpendicular to the major axis of the component over a period of approximately 5 s as shown in Figure XX. Maintain the force for 10 s.

Repeat the test in the opposite direction.

Determine whether the rotor blade breaks or whether it is permanently deformed.

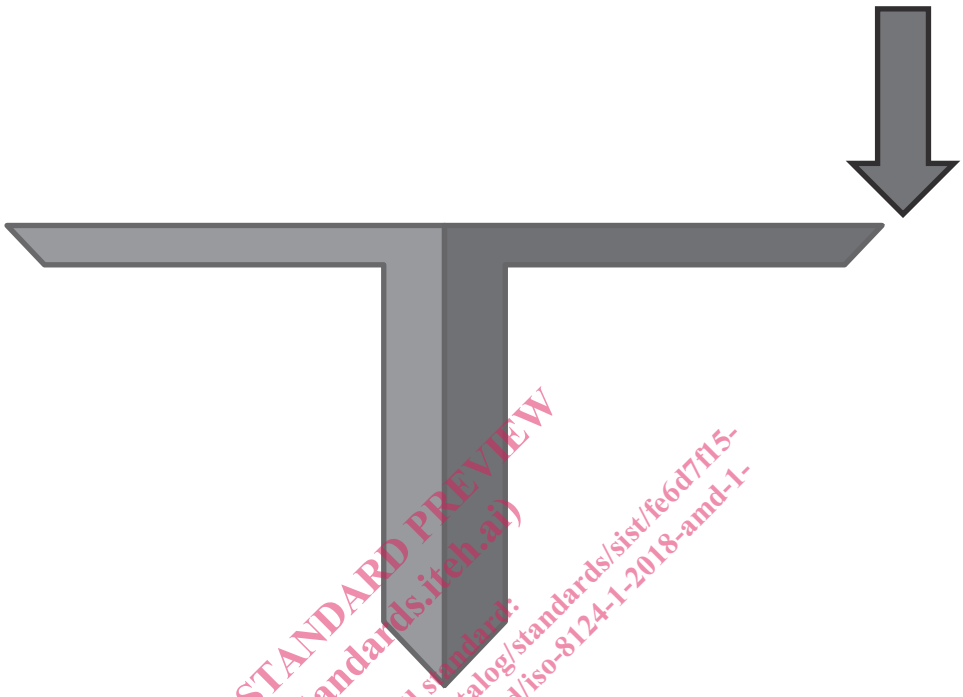


Figure XX — Force applied relative to the axis of the rotor blades

5.24.6.7 Tension test for rotor blades

Gradually apply a tensile force of (90 ± 2) N on the extremity of each rotor blade, in a parallel direction to the major axis of the rotor blade surface, so as to simulate the centrifugal force which is applied on the rotor blade during flight, over a period of approximately 5 s as shown in Figure YY. Maintain the force for 10 s. Determine whether the blade has become detached.

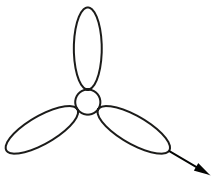


Figure YY — Force applied in a parallel direction to the rotor blade

Add the following new subclause:

B.2.26 Flying toys

See 4.19

B.2.26.1 General

Flying toys with rotor blades that might reasonably be able to contact the face and that present potential for injury, or their packaging, should carry a statement similar to the following:

"Always operate the toy away from eyes or face."

B.2.26.2 Remote-controlled flying toys

The instructions for use for remote-controlled flying toys should carry a statement containing the following information:

— a reminder that the toy must be used with caution since skill is required in order to control the flight and avoid collisions with the user, objects or third parties;

— precautions to be observed, such as "Do not touch the rotating rotor blades, avoid loose clothing or hair that could be caught in the rotor, do not fly near the face";

— advice to adult supervisors to teach children how to safely fly and control the toy;

— conditions to be observed when using the toy (e.g. flying room/area needed, indoors or outdoors, no obstacles and persons within flying range to keep the toy in line of sight, maximum operating distance);

— advice to keep the instructions for use.

Replace the existing E.33 and Figure E.2 with the following:

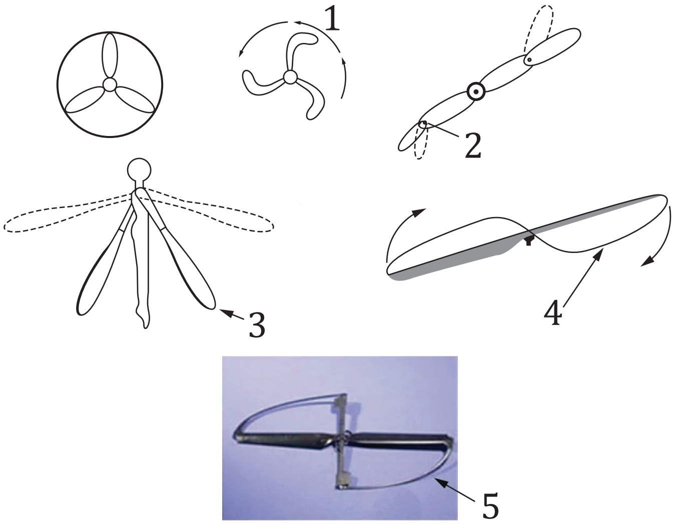
E.33 Flying toys

See 4.19

Flying toys may be powered into flight by the actions of the user, for example activating a spring or elastic, pulling a ripcord or rubbing hands, which are examples of inertial energy.

The requirements for flying toys are intended to minimize the risk of eye injury from horizontally spinning rotor blades in the event of accidental contact with the face of the user or third party.

Examples of designs that are considered to minimize risk of eye injury are shown in Figure E.2.



Key

1 direction of rotation
2 loose fit rivet
3 resilient material
4 plastic wire protector
5 partial ring protector

Figure E.2 — Examples of designs that are considered to minimize risk of eye injury

One example of a way to minimize eye injury is to ensure the ends are clutched or loosely coupled to the rotor blade drive [4.19.2 c)]. An example of such a design is given in Figure E.2, key reference 2, as a loose fit rivet.

Rotor blades on non-flying toys, or those that rotate in the vertical plane on flying toys, do not present the same risk of contact with the eyes or face and so are not covered by the requirements in 4.19; however, such toys still need to conform to applicable requirements elsewhere in this document.

Other standards contain additional requirements for remote-controlled flying objects since these are typically more powerful and require additional skill to control. The hazards presented by remote-controlled flying objects with a mass of more than 250 g are not addressed by 4.19. This mass was taken from the registration scheme for Europe and the USA on flying toys. The definition is limited by this mass since it was felt that this document could not have requirements which sufficiently minimized the hazards associated with larger or heavier remote-controlled flying objects. A maximum take-off mass (MTOM) of no more than 250 g is considered to be the mass below which, in case of impact, the energy involved is low enough to pose only some negligible safety risk.

The tension tests of 5.24.6.6 and 5.24.6.7 are reflective of the requirements of the *EC-type approval protocol No. 3*[17]. The forces selected for these requirements are believed to be based on practical reasons as an attempt to harmonize test methods.

Some flying toys employ technology that allows the user to use their hand, voice or other methods to affect the flight of the toy. Such toys are not considered to be remote-controlled.

Add the following to the Bibliography:

[17] NB Toys/2016/015 – 18th February 2016 – *EC-type approval protocol No. 3 Physical and mechanical properties for rotor blades used in remote-controlled flying toys intended for children over 8 years old (e.g. helicopters) REV 5*