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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: Jouets volants*



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

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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 includes 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 edges on rigid parts of flying toys shall not protrude beyond the depth of the gauge shown in Figure 54 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.2.26.2).

#### 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 edges 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.2.26.1). 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 blade 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  $(6 \pm 0,5)$  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.

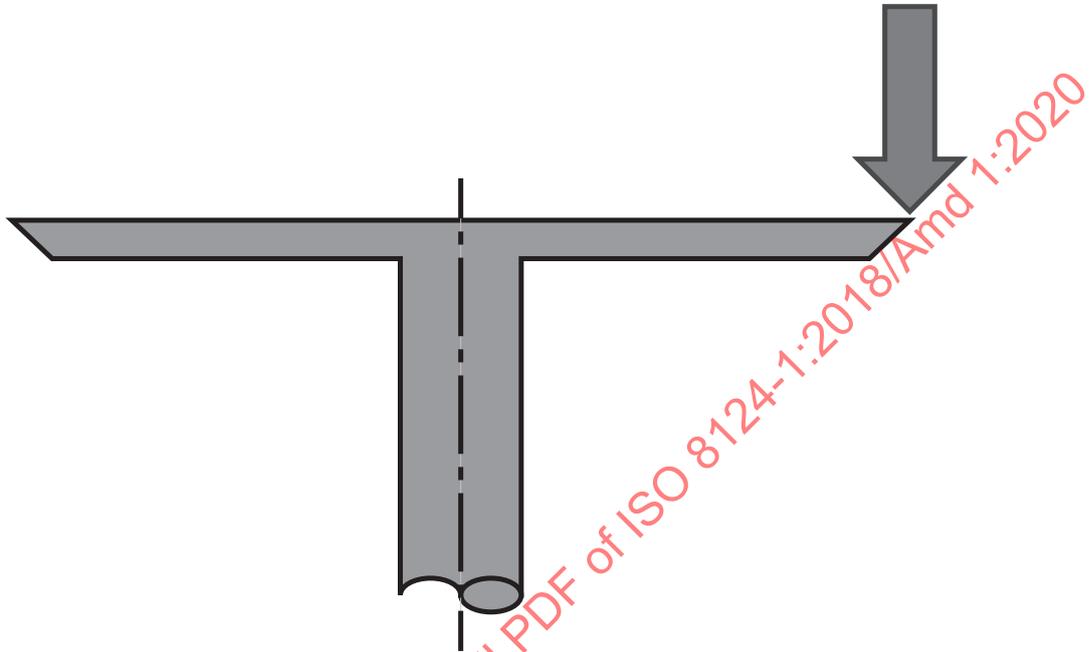


Figure XX — Force applied relative to the axis of the rotor blades

#### 5.24.6.7 Tension test for rotor blades

Gradually apply a tensile force of  $(90 \pm 2)$  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.

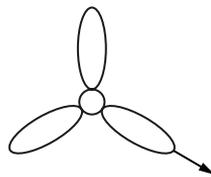


Figure YY — Force applied in a parallel direction to the rotor blade

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:

**“Warning! 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.