IEC 62115

Edition 2.0 2017-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Electric toys – Safety

Jouets électriques – Sécurité

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IEC 62115:2017
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IEC 62115:2017-04(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRIC TOYS – SAFETY

FOREWORD

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International Standard IEC 62115 has been prepared by subcommittee IEC technical committee 61: Safety of household and similar electrical appliances.

This second edition cancels and replaces the first edition published in 2003, Amendment 1 (2004) and Amendment 2 (2010). This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

– the general conditions for tests has been rewritten and modified (Clause 5);
– the criteria for reduced testing has been modified (Clause 6);
– warnings for toys using button batteries or coin batteries have been added (7.3.3.2, 7.3.3.3);
– warnings on ride-on toys have been added (7.5);
– the requirements concerning accessibility of batteries have been updated (13.4.1 and 13.4.2);
– added requirements to cover toys placed above a child (13.4.4);

– added requirements to cover toys connected to other equipment (13.9);
– modified the requirements for safety of toys incorporating optical radiation sources (Annex E), to include requirements for using the technical LED data sheet for checking compliance with the specified accessible emission limits (AEL);
– updated the details for measurements of the optical radiation from the toy (Annex E);
– introduced an informative Annex I concerning measurement methods for toys with an integrated field source generating EMF;
– included a normative Annex J concerning safety of remote controls for electric ride-on toys.

The text of this standard is based on the following documents:

FDIS	Report on voting
61/5319/FDIS	61/5371/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

NOTE 1 The following print types are used:

– requirements: in roman type;
– *test specifications: in italic type;*
– notes: in small roman type.

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Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and associated noun are also in bold.

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The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

NOTE 2 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

The contents of the corrigendum of August 2019 have been included in this copy.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced people.

As a general rule, electric toys are designed and manufactured for particular categories of children. Their characteristics are related to the age and stage of development of the children and their intended use presupposes certain capabilities.

Accidents are frequently due to an electric toy either being given to a child for whom it is not intended or being used for a purpose other than for which it was designed. This standard does not eliminate parental responsibility for the appropriate selection of electric toys. It is assumed that when choosing an electric toy or a game, account is taken of the physical and mental development of the child who will be playing with it.

The aim of this standard is to reduce risks when playing with electric toys, especially those risks that are not evident to users. However, it has to be recognized that some electric toys have risks inherent in their use that cannot be avoided. Consideration has been given to reasonably foreseeable use, bearing in mind that children are not generally as careful as adults.

While this standard applies to new electric toys, it nevertheless takes into account the wear and tear of electric toys in use.

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The fact that an electric toy complies with this standard does not absolve parents and other persons in charge of a child from the responsibility of supervising the child. Supervision is also necessary when children of various ages have access to the same electric toy.

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This standard covers the whole range of electric toys from small button battery or coin battery operated lights to large ride-on electric toys powered by rechargeable batteries. This results in different requirements and tests according to the type of electric toy. For some electric toys, testing can be reduced if particular criteria are met (see Clause 6).

Other safety aspects of electric toys are described in the ISO 8124 series of standards.

An electric toy that complies with the text of this standard will not necessarily be judged to comply with the safety principles of the standard if, when examined and tested, it is found to have other features that impair the level of safety covered by these requirements.

A electric toy employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be judged to comply with the standard.

Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent.

IEC takes no position concerning the evidence, validity and scope of this patent right.

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ELECTRIC TOYS – SAFETY

1 Scope

This International Standard specifies safety requirements for **electric toys** that have at least one function dependant on electricity, **electric toys** being any product designed or intended, whether or not exclusively, for use in play by children under 14 years of age.

NOTE 1 Examples of **electric toys** also within the scope of this standard are

- **constructional sets**;
- **experimental sets**;
- functional **electric toys** (an **electric toy** that performs and is used in the same way as a product, appliance or installation intended for use by adults, and which may be a scale model of such product, appliance or installation);
- **electric toy** computers;
- a doll's house having an interior lamp.

Additional requirements for **experimental sets** are given in Annex A.

Additional requirements for **electric toys** incorporating optical radiation sources are given in Annex E.

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Measurement methods for **electric toys** generating electromagnetic fields (EMF) are given in Annex I.

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Additional requirements for the safety of **remote controls** for **electric ride-on toys** are given in Annex J.

If the packaging is intended to have play value then it is considered to be part of the **electric toy**.

This International Standard only covers the safety aspects of **electric toys** that relate to an electrical function.

NOTE 2 The ISO 8124 series of standards address other aspects of the safety of **electric toys**. Other horizontal product standards may also apply to **electric toys**.

This standard covers the safety of **electric toys** taking power from any source, such as batteries, transformers, solar cells and inductive connections.

NOTE 3 **Transformers for toys** (IEC 61558-2-7 for linear types or IEC 61558-2-7 and IEC 61558-2-16 for switch mode types), **battery chargers** (IEC 60335-2-29) and **battery chargers** for use by children (IEC 60335-2-29 Annex AA:) are not considered to be part of an **electric toy** even if supplied with an **electric toy**.

NOTE 4 This standard is not intended to assess the safety of batteries however it does address the safety of the **electric toy** with the batteries inserted.

This International Standard does not apply to the following products:

- automatic playing machines, whether coin operated or not, intended for public use (IEC 60335-2-82);
- **toy** vehicles equipped with combustion engines;
- **toy** steam engines;
- slings and catapults;
- electric decorative robots;

– decorative objects for festivities and celebrations;
– sports equipment, including roller skates, inline skates, and skateboards intended for children with a body mass of more than 20 kg;
– bicycles with a maximum saddle height of more than 435 mm, measured as the vertical distance from the ground to the top of the seat surface, with the seat in a horizontal position and with the seat pillar set to the minimum insertion mark;
– scooters and other means of transport designed for sport or which are intended to be used for travel on public roads or public pathways;
– electrically driven vehicles which are intended to be used for travel on public roads, public pathways, or the pavement thereof;
– aquatic equipment intended to be used in deep water, and swimming learning devices for children, such as swim seats and swimming aids;
– puzzles with more than 500 pieces;
– guns and pistols using compressed gas, with the exception of water guns and water pistols, and bows for archery over 120 cm long;
– products and games using sharp-pointed missiles, such as sets of darts with metallic points;
– functional educational products, such as electric ovens, irons or other functional products operated at a nominal voltage exceeding 24 V which are sold exclusively for teaching purposes under adult supervision;
– fireworks, including percussion caps which are not specifically designed for **electric toys**;
– products intended for use for educational purposes in schools and other pedagogical contexts under the surveillance of an adult instructor, such as science equipment;
– electronic equipment, such as personal computers and game consoles, used to access interactive software and their associated peripherals, unless the electronic equipment or the associated peripherals are specifically designed for and targeted at children and have a play value on their own, such as specially designed personal computers, key boards, joy sticks or steering wheels;
– interactive software, intended for leisure and entertainment, such as computer games, and their storage media, such as CDs;
– fashion accessories for children which are not for use in play;
– babies soothers;
– personal protective equipment including swimming goggles, sunglasses and other eye protectors as well as bicycle and skateboard helmets;
– products for collectors, provided that the product or its packaging bears a visible and legible indication that it is intended for collectors of 14 years of age and above.

  EXAMPLES of this category are

  - detailed and faithful scale models,
  - kits for the assembly of detailed scale models,
  - folk dolls and decorative dolls and other similar articles,
  - historical replicas of **electric toys**, and
  - reproductions of real firearms.

– equipment intended to be used collectively in playgrounds;
– amusement machines and personal service machines (IEC 60335-2-82);
– professional **electric toys** installed in public places (such as shopping centres and railway stations);
– products containing heating elements intended for use under the supervision of an adult in a teaching context;
– portable luminaries for children (IEC 60598-2-10);

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– blowers for inflatable activity **toys** (such as blowers for bouncy castles);

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.

IEC 60068-2-75:2014, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

IEC TR 60083, *Plugs and socket-outlets for domestic and similar general use standardized in member countries of IEC*

IEC 60086-2: 2015, *Primary batteries – Part 2: Physical and electrical specifications*

IEC 60086 (all parts), *Primary batteries*

IEC 60335-1:2010, *Household and similar electrical appliances – Safety – Part 1: General requirements*
IEC 60335-1:2010/AMD1: 2013
IEC 60335-1:2010/AMD2:2016[1)]

IEC 60335-2-29:2016, *Household and similar electrical appliances – Safety – Part 2-29: Particular requirements for battery chargers*

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IEC 60384-14, *Fixed capacitors for use in electronic equipment – Part 14: Sectional specification – Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*

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IEC 60417, *Graphical symbols for use on equipment*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
IEC 60529/AMD1:1999
IEC 60529/AMD2:2013[2)]

IEC 60695-2-11, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products (GWEPT)*

IEC 60695-2-13, *Fire hazard testing – Part 2-13: Glowing/hot-wire based test methods – Glow-wire ignition temperature (GWIT) test method for materials*

IEC 60695-10-2, *Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test method*

IEC 60695-11-5:2004, *Fire hazard testing – Part 11-5: Test flames – Needle-flame test method – Apparatus, confirmatory test arrangement and guidance*

IEC 60695-11-10, *Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods*

IEC 60730 (all parts), *Automatic electrical controls*

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1 There exists a consolidated edition 5.2 (2016) that includes edition 5 and its Amendment 1 and Amendment 2.

2 There exists a consolidated edition 2.2 (2013) that includes edition 2 and its Amendment 1 and Amendment 2.

IEC 60730-1:2013, *Automatic electrical controls – Part 1: General requirements*
IEC 60730-1:2013/AMD1:2015[3)]

IEC 60738-1, *Thermistors – Directly heated positive temperature coefficient – Part 1: Generic specification*

IEC 60990:2016, *Methods of measurement of touch current and protective conductor current*

IEC 61000-4-2: 2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*
IEC 61000-4-3/AMD1:2007
IEC 61000-4-3/AMD2:2010[4)]

IEC 61000-4-4:2012, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-5:2014, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*

IEC 61000-4-6:2013, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

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IEC 61000-4-11:2004, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests*

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IEC 61000-4-13:2002, *Electromagnetic compatibility (EMC) – Part 4-13: Testing and measurement techniques – Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests*
IEC 61000-4-13/AMD1:2009
IEC 61000-4-13/AMD2:2015[5)]

IEC 61032, *Protection of persons and equipment by enclosures – Probes for verification*

IEC 61058-1:2016, *Switches for appliances – Part 1: General requirements*

IEC 61058-1-1:2016, *Switches for appliances – Part 1-1: Requirements for mechanical switches*

IEC 61058-1-2:2016, *Switches for appliances – Part 1-2: Requirements for electronic switches*

IEC 61180, *High-voltage test techniques for low-voltage equipment – Definitions, test and procedure requirements, test equipment*

IEC 61558-2-7, *Safety of power transformers, power supplies, reactors and similar products – Part 2-7: Particular requirements and tests for transformers and power supplies for toys*

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3 There exists a consolidated edition 5.1 (2015) that includes edition 5 and its Amendment 1.

4 There exists a consolidated edition 3.2 (2010) that includes edition 3 and its Amendment 1 and Amendment 2.

5 There exists a consolidated edition 1.2 (2015) that includes edition 1 and its Amendment 1 and Amendment 2.

IEC 61558-2-16, *Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V – Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units*

IEC 62133, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications*

IEC 62233:2005, *Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure*

IEC 62471:2006, *Photobiological safety of lamps and lamp systems*

ISO 3864-1, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs and safety markings*

ISO 8124-1:2014, *Safety of toys – Part 1: Safety aspects related to mechanical and physical properties*

ISO 7000, *Graphical symbols for use on equipment – Registered symbols*

ISO 9772, *Cellular plastics – Determination of horizontal burning characteristics of small specimens subjected to a small flame*

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3 Terms and definitions

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

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NOTE 1 An Index of the defined terms and definitions in alphabetic order is provided at the end of this publication.

NOTE 2 When the terms “voltage” and “current” are used, they are root mean square (r.m.s). values unless otherwise specified.

3.1 Definitions relating to physical characteristics

3.1.1
dangerous malfunction
unintended operation of the **electric toy** that may impair safety

3.1.2
normal operation
condition under which the **electric toy** is played with as intended or in a foreseeable way when it is energized

3.1.3
rated current
current assigned to the **electric toy** by the manufacturer

Note 1 to entry: If no current is assigned to the **electric toy**, the **rated current** is the current measured when the **electric toy** is supplied at **rated voltage** and operated under **normal operation**.

3.1.4
rated power input
power input assigned to the **electric toy** by the manufacturer

3.1.5
rated voltage
voltage assigned to the **electric toy** by the manufacturer

3.1.6
working voltage
maximum voltage to which the part under consideration is subjected when the **electric toy** is supplied at its **rated voltage** and operating under **normal operation**

Note 1 to entry: The change of voltage resulting from the operation of a switch or failure of a lamp is taken into account. However, the effect of transient voltages is ignored.

3.2 Definitions relating to means of connection

3.2.1
interconnection cord set
assembly consisting of one cord with one non-rewirable plug connector and one non-rewirable connector, intended for the interconnection of the electrical supply from one electrical appliance or equipment to the **electric toy**

3.3 Definitions relating to protection against electric shock

3.3.1
clearance
shortest distance in air between two conductive parts or between a conductive part and the accessible surface

3.3.2
creepage distance
shortest distance along the surface of insulation between two conductive parts or between a conductive part and the accessible surface

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3.3.3
functional insulation
insulation between conductive parts of different potential that is necessary only for the proper functioning of the **electric toy**

IEC 62115:2017
https://standards.iteh.ai/catalog/standards/sist/cd5b079-8494-4f24-85d5-16850a9c4033/iec-62115-2017

3.4 Definitions relating to extra-low voltage

3.4.1
battery charger
equipment supplied by mains voltage, the only purpose of which is to recharge batteries

Note 1 to entry: If the batteries can be charged in the **electric toy**, and if the **electric toy** can be operated while the batteries are being charged, the **battery charger** is also considered to be a **transformer for toys** or a **power supply for toys**.

3.4.2
power supply for toys
power supply incorporating a **transformer for toys** not fixed to, or incorporated in, **electric toys** designed to have a **rated voltage** of 24 V direct current (DC) or 24 V alternating current (AC)

Note 1 to entry: **Power supplies for toys** are hereinafter also referred to as **power supplies.**

3.4.3
safety isolating transformer
transformer, the input winding of which is electrically separated from the output winding by insulation at least equivalent to double insulation or reinforced insulation, which provides a supply at safety extra-low voltage

3.4.4
transformer for toys
independent **safety isolating transformer** designed to supply **electric toys** not fixed to, or incorporated in, **electric toys** designed to have a **rated voltage** not exceeding 24 V AC