IEC 61558-2-7

Edition 3.0 2023-06
REDLINE VERSION

INTERNATIONAL STANDARD

colour inside

GROUP SAFETY PUBLICATION

Safety of ~~power~~ transformers, ~~power supplies~~ reactors, ~~and similar products~~ power supply units and combinations thereof –
Part 2-7: Particular requirements and tests for transformers and power ~~supplies~~ supply units for toys



IEC 61558-2-7:2023-06 RLV(en)



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SAFETY OF ~~POWER~~ TRANSFORMERS, ~~POWER SUPPLIES~~ REACTORS, ~~AND SIMILAR PRODUCTS~~ POWER SUPPLY UNITS AND COMBINATIONS THEREOF –

Part 2-7: Particular requirements and tests for transformers and power ~~supplies~~ supply units for toys

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 61558-2-7:2007. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 61558-2-7 has been prepared by IEC technical committee 96: Transformers, reactors, power supply units and combinations thereof. It is an International Standard.

This third edition cancels and replaces the second edition published in 2007. This edition constitutes a technical revision.

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

a) adjustment of structure and references in accordance with IEC 61558-1:2017;

b) new symbol for power supply unit with linearly regulated output voltage.

The text of this International Standard is based on the following documents:

Draft	Report on voting
96/579/FDIS	96/581/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

It has the status of a group safety publication in accordance with IEC Guide 104.

This International Standard is to be used in conjunction with IEC 61558-1:2017.

This document supplements or modifies the corresponding clauses in IEC 61558-1:2017, so as to convert that publication into the IEC standard: *Particular requirements and tests for transformers and power supply units for toys.*

A list of all parts in the IEC 61558 series published under the general title *Safety of transformers, reactors, power supply units and combinations thereof,* can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

Where this document states "*addition*", "*modification*" or "*replacement*", the relevant text of IEC 61558-1:2017 is to be adopted accordingly.

In this document, the following print types are used:

- requirements proper: in roman type;
- *test specifications: in italic type*;
- explanatory matter: in smaller roman type:

In the text of this document, the words in **bold** are defined in Clause 3.

Subclauses, notes, figures and tables additional to those in IEC 61558-1:2017 are numbered starting from 101; supplementary annexes are entitled AA, BB, etc.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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

IMPORTANT – The "colour inside" logo on the cover page of this document 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

IEC TC 96 has a group safety function in accordance with IEC Guide 104 for transformers other than those intended to supply distribution networks, in particular transformers and power supply units intended to allow the application of protective measures against electric shock as defined by TC 64, but in certain cases including the limitation of voltage and horizontal safety function for SELV, in accordance with IEC 60364-4-41.

The group safety function (GSF) is used because of responsibility for safety extra-low voltage (SELV) in accordance with IEC 61140:2016, 5.2.6 and IEC 60364-4-41:2005, 414.3.1 or control circuits in accordance with IEC 60204-1:2016, 7.2.4.

The group safety function is used for each part of IEC 61558-2 because different standards of the IEC 61558 series can be combined in one construction but in certain cases with no limitation of rated output power.

For example, an auto-transformer in accordance with IEC 61558-2-13 can be designed with a separate SELV-circuit in accordance with the particular requirements for IEC 61558-2-6 relating to the general requirements of IEC 61558-1.

SAFETY OF ~~POWER~~ TRANSFORMERS, ~~POWER SUPPLIES~~ REACTORS, ~~AND SIMILAR PRODUCTS~~ POWER SUPPLY UNITS AND COMBINATIONS THEREOF –

Part 2-7: Particular requirements and tests for transformers and power ~~supplies~~ supply units for toys

1 Scope

Replacement:

~~This part of IEC 61558 deals with safety aspects of **transformers for toys** and **power supplies** incorporating **transformers for toys** such as electrical, thermal and mechanical safety.~~

~~This Part 2-7 is applicable to **transformers for toys** and **power supplies** incorporating both **transformers for toys** and **electronic circuits**. This Part 2-7 is not applicable to external circuits and their components intended to be connected to the input terminals, output terminals or socket-outlets of the **transformers** and **power supplies**.~~

~~This Part 2-7 applies to **stationary** and **portable**, single-phase, air-cooled (natural or forced), **transformers for toys** and **power supplies** incorporating **transformers for toys**, having a **rated supply voltage** not exceeding 250 V a.c., a **rated supply and internal operating frequency** not exceeding 500 Hz, a **rated output** not exceeding 200 VA and a **rated output current** not exceeding 10 A.~~

~~This Part 2-7 is applicable to **independent transformers** and **transformers for specific use**.~~

~~This Part 2-7 is applicable to **dry-type transformers for toys**. The windings may be encapsulated or non-encapsulated.~~

~~The **no-load output voltage** does not exceed 33 V a.c. for **transformers for toys** and **power supplies** incorporating **transformers for toys**, or 46 V ripple-free d.c. for **power supplies** incorporating **transformers for toys,** and the **rated output voltage** does not exceed 24 V a.c. for **transformers** and **power supplies**, or 33 V ripple-free d.c. for **power supplies**.~~

~~In general, this Part 2-7 does not take into consideration children playing with the **transformers for toys** and **power supplies** incorporating **transformers for toys**.~~

~~NOTE 1 Attention is drawn to the following:~~

~~– for **transformers for toys** and **power supplies** incorporating **transformers for toys** intended to be used in vehicles, on board ships, and aircraft, additional requirements (from other applicable standards, national rules, etc.) may be necessary;~~

~~– measures to protect the **enclosure** and the components inside the enclosure against external influences such as fungus, vermin, termites, solar-radiation, and icing should also be considered;~~

~~– the different conditions for transportation, storage, and operation of the **transformers for toys** and **power supplies** incorporating **transformers for toys** should also be considered;~~

~~– additional requirements in accordance with other appropriate standards and national rules may be applicable to **transformers for toys** and **power supplies** incorporating **transformers for toys** intended for use in special environments, such as tropical environments.~~

~~NOTE 2 Future technological development of **transformers** and **power supplies** may necessitate a need to increase the upper limit of the frequencies; until then, this Part 2-7 may be used as a guidance document.~~

This part of IEC 61558 deals with the safety of **transformers for toys** and **power supply units** incorporating **transformers for toys**. **Transformers for toys** incorporating **electronic circuits** are also covered by this document.

NOTE 1 Safety includes electrical, thermal and mechanical aspects.

Unless otherwise specified, from here onward, the term **transformer** covers **transformers** for toys and **power supply units** incorporating **transformers** for toys.

This document is applicable to **stationary** and **portable** single-phase, air-cooled (natural or forced) **dry-type transformers**. The windings can be encapsulated or non-encapsulated.

This document is applicable to **independent transformers** and **transformers for specific use**.

For **power supply units** (linear) this document is applicable. For **switch mode power supply units** IEC 61558-2-16 is applicable together with this document. Where two requirements are in conflict, the most severe takes precedence.

The **rated supply voltage** does not exceed 250 V AC. The **rated supply frequency** and the **internal operating frequencies** do not exceed 500 Hz.

The **rated output** does not exceed 200 VA and a **rated output current** does not exceed 10 A.

The **no-load output voltage** does not exceed 33 V AC or 46 V ripple-free DC, and the **rated output voltage** does not exceed 24 V AC or 33 V ripple-free DC.

In general, this document does not take into consideration children playing with the **transformers**.

This document is not applicable to external circuits and their components intended to be connected to the input and output terminals or socket-outlets of the **transformers**.

Attention is drawn to the following if necessary:

- for **transformers** intended to be used in vehicles, on board ships, and aircraft, additional requirements (from other applicable standards, national rules, etc.);
- measures to protect the **enclosure** and the components inside the enclosure against external influences such as fungus, vermin, termites, solar-radiation, and icing;
- the different conditions for transportation, storage, and operation of the **transformers**;
- additional requirements in accordance with other appropriate standards and national rules can be applicable to **transformers** intended for use in special environments;
- for transformers for toys intended to be used as a battery charger for use with children additional requirements can apply.

Future technological development of **transformers** can necessitate a need to increase the upper limit of the frequencies. Until then this document can be used as a guidance document.

This group safety publication focusing on safety guidance is primarily intended to be used as a product safety standard for the products mentioned in the scope, but is also intended to be used by technical committees in the preparation of publications for products similar to those mentioned in the scope of this group safety publication, in accordance with the principles laid down in IEC Guide 104 and ISO/IEC Guide 51.

One of the responsibilities of a technical committee is, wherever applicable, to make use of basic safety publications and/or group safety publications in the preparation of its publications.

2 Normative references

This clause of IEC 61558-1:2017 is applicable except as follows:

Addition:

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

IEC 60227-1:2007, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 1: General requirements*

IEC 60245-1:2003, *Rubber insulated cables – Rated voltages up to and including 450/750 V – Part 1: General requirements*

IEC 61558-1:2017, *Safety of transformers, reactors, power supply units and combinations thereof – Part 1: General requirements and tests*

IEC 61558-2-16, *Safety of transformers, reactors, power supply units and combinations thereof – Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units for general applications*

3 Terms and definitions

~~This clause of Part 1 is applicable except as follows:~~

~~*Replacement of the third paragraph:*~~

~~When the term **transformer** is used from here forward, it covers **transformers for toys** and **power supplies** incorporating **transformers for toys where applicable**.~~

For the purposes of this document, the terms and definitions given in IEC 61558-1:2017 apply, except as follows:

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

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

Addition:

3.1.101
transformer for toys
independent safety isolating transformer designed to supply toys not fixed to, or incorporated in, toys and having a **rated output voltage** not exceeding 24 V AC

3.1.102
power supply unit for toys
power supply unit incorporating a **transformer for toys** not fixed to, or incorporated in, toys and having a **rated output voltage** not exceeding 24 V AC or 33 V ripple-free DC

4 General requirements

This clause of IEC 61558-1:2017 is applicable.