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**Varnost močnostnih transformatorjev, napajalnikov, reaktorjev in podobnih izdelkov – 2-7. del: Posebne zahteve za transformatorje in napajalnike za igrače**

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

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COMMITTEE DRAFT FOR VOTE (CDV)  
PROJET DE COMITÉ POUR VOTE (CDV)

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Titre :

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

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Introductory note

This part 2 of IEC 61558 applies to **stationary** and **portable**, single-phase, air-cooled (natural or forced), **transformers and power supplies** for toys, having a **rated supply voltage** not exceeding 250 V a.c., a **rated supply frequency** not exceeding 500 Hz and **internal operating frequency up to 100 MHz**, a **rated output** not exceeding 200 VA and a **rated output current** not exceeding 10 A.

This standard is applicable to **dry-type transformers for toys**. The windings may be encapsulated or non-encapsulated.

ATTENTION	ATTENTION
CDV soumis en parallèle au vote (CEI) et à l'enquête (CENELEC)	Parallel IEC CDV/CENELEC Enquiry

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## SAFETY OF POWER TRANSFORMERS, POWER SUPPLIES, REACTORS AND SIMILAR PRODUCTS

### Part 2-7: Particular requirements for transformers and power supplies for toys

#### FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International standard IEC 61558-2-7 has been prepared by technical committee 96: Small power transformers, reactors and power supply units and similar products.

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

It has the status of a group safety publication in accordance with IEC Guide 104: The preparation of safety publications and the use of basic safety publications and group safety publications (1997).

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


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 3.

This part 2 is intended to be used in conjunction with the latest Edition of IEC 60558-1 and its amendments. It is based on the second edition of that standard.

This part 2 supplements or modifies the corresponding clauses in IEC 61558-1, so as to convert that publication into the IEC standard: *Particular requirements* for transformers and power supplies for toys

This standard replace Edition 1

Where a specific subclause of part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. Where this standard states "addition", "modification" or "replacement", the relevant text of part 1 is to be adapted accordingly.

In this standard, 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 the standard the words in **bold** are defined in clause 3.

Subclauses which are additional to those in part 1 are numbered starting from 101; supplementary annexes are entitled AA, BB, etc.

The committee has decided that this publication remains valid until 2009-12.

At this date, in accordance with the committee's decision, the publication will be

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

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# SAFETY OF POWER TRANSFORMERS, POWER SUPPLIES REACTORS AND SIMILAR PRODUCTS

## Part 2-7: Particular requirements for transformers and power supplies for toys

### 1 Scope

#### *Replacement:*

This International standard deals with safety aspects such as electrical, thermal and mechanical safety of transformers and power supplies for toys.

This standard is applicable to transformers and power supplies for toys incorporating electronic circuits. This standard is not applicable to external circuits and their components intended to be connected to the input and output terminals or socket- outlets of the transformer and power supplies.

This part 2 of IEC 61558 applies to **stationary** and **portable**, single-phase, air-cooled (natural or forced), **transformers and power supplies** for toys, having a **rated supply voltage** not exceeding 250 V a.c., a **rated supply frequency** not exceeding 500 Hz and **internal operating frequency up to 100 MHz**, a **rated output** not exceeding 200 VA and a **rated output current** not exceeding 10 A.

This standard 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 and power supplies, or 46 V ripple free d.c. for power supplies, 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.

This standard applies to transformer for toys being special **safety isolating transformers**.

In general, this standard does not take into consideration children playing with the transformers and power supplies for toys.

NOTE 1 – Attention is drawn to the fact that :

- Measures to protect the enclosure and the components inside the enclosure against external influences like fungus, vermin and termites, solar-radiation, and icing should also be considered.

- The different conditions for transportation, storage and operation of the transformers and power supplies for toys should also be considered.

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

NOTE 2 – Future technological development of transformers and power supplies may necessitate a need to increase the upper limit of the frequencies, until than this standard may be used as a guidance document.

### 2 Normative references

This clause of part 1 is applicable.

### 3 Definitions

This clause of part 1 is applicable except as follows:

#### *Addition:*

#### 3.1.101

##### **transformer for toys**

**safety isolating transformer** designed to supply toys and having a **rated output voltage** not exceeding 24 V a.c. or 33 V ripple-free d.c.

### 3.1.102

#### Power supplies for toys

Power supply incorporating a transformer for toys having a rated output voltage not exceeding 24 V a.c. or 33 V ripple-free d.c

## 4 General requirements

This clause of part 1 is applicable.

## 5 General notes on tests

This clause of part 1 is applicable except as follows:

When the internal operating frequency is higher than 500 Hz for switch mode power supplies the requirements of IEC 61558-2-16 shall also be fulfilled.

**5.12** This subclause is not applicable.

## 6 Ratings

*Replacement:*

**6.1** The **rated output voltage** shall not exceed 24 V a.c for transformers and power supplies for toys or 33 V ripple-free d.c. for power supplies for toys.

**6.2** The **rated output** shall not exceed 200 VA.

**6.3** The **rated supply frequency** shall not exceed 500 Hz.

**6.4** **Transformers for toys** shall have only one **rated supply voltage** not exceeding 250 V a.c.

**6.5** The **rated output current** shall not exceed 10 A.

*Compliance with the requirements of 6.1 to 6.5 is checked by inspection of the marking.*

## 7 Classification

This clause of part 1 is applicable except as follows:

**7.1** *Replacement:*

According to their protection against electric shock:

- **transformers for toys** shall be of class II construction

**7.2** *Replacement:*

According to short-circuit protection or protection against abnormal conditions:

- **inherently short-circuit-proof transformers;**
- **non-inherently short-circuit-proof transformers;**
- **fail-safe transformers.**

**7.4** *Replacement:*

According to their mobility:

- **portable transformers;**
- **stationary transformers.**

**7.5** *Replacement:*

According to their duty-type:

– **continuous operation.**

## **8 Marking and other information**

This clause of part 1 is applicable except as follows:

**8.1** Item h) *Addition:*

**Transformers for power supplies and toys** suitable for outdoor use shall be marked with the appropriated graphical symbol shown in 8.11 and IP code:

**8.1** Item n) *Modification:*

Transformers suitable for outdoor use shall be marked with the appropriate IP degree.

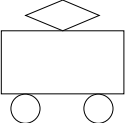
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**8.11 Addition:**

Graphical symbol	Title and description	Number of symbol in IEC 60417
	<b>Transformers for toys</b> (inherently short-circuit-proof transformers, non-inherently short-circuit-proof transformers or fail-safe transformers)	5219

**9 Protection against electric shock**

This clause of part 1 is applicable except as follows:

**9.1.2 Modification:**

The standard test finger of figure 2 is replaced by the small test finger of figure 101.

**9.1.2.1 Addition:**

It shall not be possible to gain access to **live parts** of the **input circuit**, or to metal parts separated from live parts by **basic insulation** only, even after the removal of covers, which can be removed with the aid of a tool.

**10 Change of input voltage setting**

This clause of part 1 is applicable except as follows:

**Replacement:**

**Transformers and power supplies for toys** shall have only one **rated supply voltage** or one supply voltage range.

*Compliance is checked by inspection.*

**11 Output voltage and output current under load**

This clause of part 1 is applicable except as follows:

**11.1 Modification:**

When the transformer or power supply for toys is connected to the **rated supply voltage**, at the **rated supply frequency** and loaded with an impedance which would result in the **rated output** at the **rated output voltage** and, for a.c. rated power factor, the output voltage shall not differ from the rated value by more than 10 % for a.c. or 15 % for d.c.

This requirement is applicable to all **output windings** and their tapping.

**12 No-load output voltage**

This clause of part 1 is applicable except as follows:

**Addition:**

**12.101** The **no-load output voltage** shall not exceed 33 V a.c. for transformers and power supplies for toys or 46 V ripple-free d.c. for power supplies for toys. This limitation applies even when independent **output windings**, not intended for interconnection, are connected in series.

**12.102** The difference between the **no-load output voltage** and the output voltage under load shall not be excessive.

*Compliance with the requirements of 12.101 and 12.102 is checked by measuring the **no-load output voltage** when the transformer, at ambient temperature, is connected to the **rated supply voltage at rated supply frequency**.*

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