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Standards

Irish Standard  
I.S. EN 62041:2010

# Safety of transformers, reactors, power supply units and combinations thereof - EMC requirements (IEC 62041:2010 (EQV))

## I.S. EN 62041:2010

*Incorporating amendments/corrigenda issued since publication:*

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I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

<i>This document replaces:</i> EN 62041:2003	<i>This document is based on:</i> EN 62041:2010 EN 62041:2003	<i>Published:</i> 17 December, 2010 6 November, 2003
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EUROPEAN STANDARD

**EN 62041**

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2010

ICS 29.180; 33.100

Supersedes EN 62041:2003

English version

**Safety of transformers, reactors, power supply units and combinations thereof -  
EMC requirements  
(IEC 62041:2010)**

Sécurité des transformateurs, bobines  
d'inductance, blocs d'alimentation et des  
combinaisons de ces éléments -  
Exigences CEM  
(CEI 62041:2010)

Sicherheit von Transformatoren, Drosseln,  
Netzgeräten und entsprechenden  
Kombinationen -  
EMV-Anforderungen  
(IEC 62041:2010)

This European Standard was approved by CENELEC on 2010-12-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

**CENELEC**

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

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## Foreword

The text of document 96/358/FDIS, future edition 2 of IEC 62041, prepared by IEC TC 96, Transformers, reactors, power supply units, and combinations thereof, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62041 on 2010-12-01.

This European Standard supersedes EN 62041:2003.

This EN 62041:2010 includes the following significant technical changes with respect to EN 62041:2003:

- the frequency range for tests according to EN 61000-4-3 has been extended above 1 GHz according to technologies used in this frequency area;
- the testing requirements according to EN 61000-4-11 have been amended significantly;
- the inclusion of a clause on tests in series production;
- the inclusion of a new clause on measurement uncertainty; and
- the inclusion of requirements on DC **power ports** and telecommunication **ports**.

It has the status of a product family EMC standard in accordance with IEC Guide 107:2009, *Electromagnetic compatibility – Guide to the drafting of electromagnetic compatibility publications*.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2011-09-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2013-12-01

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 62041:2010 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60065	NOTE	Harmonized as EN 60065.
IEC 60601-1	NOTE	Harmonized as EN 60601-1.
IEC 60950-1	NOTE	Harmonized as EN 60950-1.
IEC 61010-1	NOTE	Harmonized as EN 61010-1.
IEC 61204-3	NOTE	Harmonized as EN 61204-3.
IEC 61347-1	NOTE	Harmonized as EN 61347-1.
IEC 62040-2	NOTE	Harmonized as EN 62040-2.
CISPR 11	NOTE	Harmonized as EN 55011.

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61000-3-2	-	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current $\leq 16$ A per phase)	EN 61000-3-2	-
IEC 61000-3-3	-	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current $\leq 16$ A per phase and not subject to conditional connection	EN 61000-3-3	-
IEC 61000-3-11	-	Electromagnetic compatibility (EMC) - Part 3-11: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current $\leq 75$ A and subject to conditional connection	EN 61000-3-11	-
IEC 61000-3-12	-	Electromagnetic compatibility (EMC) - Part 3-12: Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current $> 16$ A and $\leq 75$ A per phase	EN 61000-3-12	-
IEC 61000-4-2	-	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	EN 61000-4-2	-
IEC 61000-4-3	-	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3	-
IEC 61000-4-4	-	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	-
IEC 61000-4-5	-	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	-

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<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61000-4-6	-	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	-
IEC 61000-4-11	-	Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests	EN 61000-4-11	-
IEC 61000-6-3	-	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments	EN 61000-6-3	-
IEC 61000-6-4	-	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments	EN 61000-6-4	-
IEC 61558	Series	Safety of power transformers, power supplies, reactors and similar products	EN 61558	Series
CISPR 14-1	2005	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission	EN 55014-1	2006
CISPR 16-1-2	2003	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-2: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Conducted disturbances	EN 55016-1-2	2004
CISPR 16-2-1	2008	Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-1: Methods of measurement of disturbances and immunity - Conducted disturbance measurements	EN 55016-2-1	2009
CISPR 16-2-3	-	Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-3: Methods of measurement of disturbances and immunity - Radiated disturbance measurements	EN 55016-2-3	-
CISPR 22 (mod)	-	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	EN 55022	-

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# SAFETY OF TRANSFORMERS, REACTORS, POWER SUPPLY UNITS AND COMBINATIONS THEREOF – EMC REQUIREMENTS

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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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- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International standard IEC 62041 has been prepared by Technical Committee 96: Transformers, reactors, power supply units and combinations thereof.

This second edition cancels and replaces the first edition published in 2003. It constitutes a technical revision.

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

- the frequency range for tests according to IEC 61000-4-3 has been extended above 1 GHz according to technologies used in this frequency area;
- the testing requirements according to IEC 61000-4-11 have been amended significantly;
- the inclusion of a clause on tests in series production;
- the inclusion of a new clause on measurement uncertainty, and
- the inclusion of requirements on DC **power ports** and telecommunication **ports**.



It has the status of a product family EMC standard in accordance with IEC Guide 107:2009, *Electromagnetic compatibility – Guide to the drafting of electromagnetic compatibility publications*.

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

FDIS	Report on voting
96/358/FDIS	96/367/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.

This standard is to be used in conjunction with IEC 61558 series.

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 this publication, the words in **bold** are defined in Clause 3 of this standard and in the IEC 61558 series.

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 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 from the date of publication.

# SAFETY OF TRANSFORMERS, REACTORS, POWER SUPPLY UNITS AND COMBINATIONS THEREOF – EMC REQUIREMENTS

## 1 Scope

This international product family standard applies to **transformers, reactors, power supply** units and combinations thereof covered by the IEC 61558 series of standards. This standard deals with the electromagnetic compatibility requirements for emission and immunity within the frequency range 0 Hz - 400 GHz. No measurement needs to be performed at frequencies where no requirement is specified.

**Transformers, reactors, power supply** units and combinations thereof delivered with or incorporated in an appliance or equipment should follow the relevant EMC standard applicable to that appliance or equipment. However, this standard may be used as a guide to test the **transformers, reactors, power supply** units and combinations thereof separately before incorporating them in the appliance or equipment.

This EMC standard covers performance only. Other operations of the **transformers, reactors** and **power supply** units (e.g. simulated faults in the electric circuitry for testing purposes or functional safety due to the effects of the electromagnetic phenomena, or evaluation of human being for exposure to electromagnetic fields (EMF)) have not been taken into consideration in this standard.

NOTE When **EUT** (Equipment under Test) is used, it covers **transformers, reactors, power supply** units and combinations thereof where applicable.

This standard does not apply to:

- uninterruptible **power supplies** (UPS) covered by IEC 62040 series;
- **power supply** units covered by IEC 61204-3,  
(i.e. DC-DC converters, DC power and distribution equipment and **power supply** units for use in applications covered by IEC 60950-1, IEC 61010-1, IEC 60601-1, IEC 60065 and IEC 62368-1);
- **power supplies** and converters for use with or in products covered by IEC 61347-1.

## 2 Normative references

The following referenced documents are indispensable for the application 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 61000-3-2, *Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current  $\leq 16$  A per phase)*

IEC 61000-3-3, *Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection*

IEC 61000-3-11, *Electromagnetic compatibility (EMC) – Part 3-11: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems – Equipment with rated current  $\leq 75$  A and subject to conditional connection*

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