



# SLOVENSKI STANDARD

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**Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test (IEC 61000-4-3:2002)**

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Electromagnetic compatibility (EMC) -- Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test

[SIST EN 61000-4-3:2003](https://standards.iteh.ai/SIST/61000-4-3-2003)

Elektromagnetische Verträglichkeit (EMV) -- Teil 4-3: Prüf- und Messverfahren - Prüfung der Störfestigkeit gegen hochfrequente elektromagnetische Felder

Compatibilité électromagnétique (CEM) -- Partie 4-3: Techniques d'essai et de mesure - Essai d'immunité aux champs électromagnétiques rayonnés aux fréquences radioélectriques

**Ta slovenski standard je istoveten z: EN 61000-4-3:2002**

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**ICS:**

33.100.20      Imunost      Immunity

**SIST EN 61000-4-3:2003**      en

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EUROPEAN STANDARD

**EN 61000-4-3**

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2002

ICS 33.100.20

Supersedes EN 61000-4-3:1996 + A1:1998 + A2:2001

English version

**Electromagnetic compatibility (EMC)  
Part 4-3: Testing and measurement techniques -  
Radiated, radio-frequency, electromagnetic field immunity test  
(IEC 61000-4-3:2002)**

Compatibilité électromagnétique (CEM)  
Partie 4-3: Techniques d'essai  
et de mesure -  
Essai d'immunité aux champs  
électromagnétiques rayonnés  
aux fréquences radioélectriques  
(CEI 61000-4-3:2002)

Elektromagnetische Verträglichkeit (EMV)  
Teil 4-3: Prüf- und Messverfahren -  
Prüfung der Störfestigkeit  
gegen hochfrequente  
elektromagnetische Felder  
(IEC 61000-4-3:2002)

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This European Standard was approved by CENELEC on 2002-04-01. 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

## CENELEC

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

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

EN 61000-4-3:2002

- 2 -

### Foreword

The text of document 77B/339/FDIS, future edition 2 of IEC 61000-4-3, prepared by SC 77B, High frequency phenomena, of IEC TC 77, Electromagnetic compatibility, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61000-4-3 on 2002-04-01.

This European Standard supersedes EN 61000-4-3:1996 + A1:1998 + A2:2001.

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) 2003-01-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2005-04-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annexes J and ZA are normative and annexes A to I are informative.

Annex ZA has been added by CENELEC.

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### Endorsement notice

The text of the International Standard IEC 61000-4-3:2002 was approved by CENELEC as a European Standard without any modification.

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## Annex ZA (normative)

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

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 60050-161	1990	International Electrotechnical Vocabulary (IEV) - Chapter 161: Electromagnetic compatibility	-	-
IEC 61000-4-6	1996	Electromagnetic compatibility (EMC) Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	1996

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INTERNATIONALE  
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**61000-4-3**

Deuxième édition  
Second edition  
2002-03

**Compatibilité électromagnétique (CEM) –**

**Partie 4-3:**

**Techniques d'essai et de mesure –**

**Essai d'immunité aux champs électromagnétiques  
rayonnés aux fréquences radioélectriques**

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**Electromagnetic compatibility (EMC) –**

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**Part 4-3:**

**Testing and measurement techniques –**

**Radiated, radio-frequency, electromagnetic field  
immunity test**

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International Electrotechnical Commission  
Международная Электротехническая Комиссия

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For price, see current catalogue

## CONTENTS

FOREWORD.....	7
INTRODUCTION.....	11
1 Scope and object.....	13
2 Normative references.....	13
3 General.....	15
4 Definitions.....	15
5 Test levels.....	21
5.1 Test levels related to general purposes.....	21
5.2 Test levels related to the protection against RF emissions from digital radio telephones.....	21
6 Test equipment.....	23
6.1 Description of the test facility.....	25
6.2 Calibration of field.....	25
7 Test set-up.....	29
7.1 Arrangement of table-top equipment.....	31
7.2 Arrangement of floor-standing equipment.....	31
7.3 Arrangement of wiring.....	31
7.4 Arrangement of human body-mounted equipment.....	33
8 Test procedures.....	33
9 Evaluation of test results.....	35
10 Test report.....	37
Annex A (informative) Rationale for the choice of modulation for tests related to the protection against RF emissions from digital radio telephones.....	51
Annex B (informative) Field generating antennas.....	61
Annex C (informative) Use of anechoic chambers.....	63
Annex D (informative) Other test methods – TEM cells and striplines.....	69
Annex E (informative) Other test facilities.....	71
Annex F (informative) Guidance for product committees on the selection of test levels.....	73
Annex G (informative) Special measures for fixed transmitters.....	79
Annex H (informative) Selection of test methods.....	81
Annex I (informative) Description of the environment.....	83
Annex J (normative) Alternative illumination method for frequencies above 1 GHz (“independent windows method”).....	87
Figure 1 – Definition of the test level and the waveshapes occurring at the output of the signal generator.....	39
Figure 2 – Example of suitable test facility.....	41
Figure 3 – Calibration of field.....	43
Figure 4 – Calibration of field, dimensions of the uniform area.....	45
Figure 5 – Example of test set-up for floor-standing equipment.....	47
Figure 6 – Example of test set-up for table-top equipment.....	49

<https://standards.iteh.ai/catalog/standards/sist/2da10822-b4d6-494b-9c74-0395e0c21e3e/sist-en-61000-4-3-2003>

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SIST EN 61000-4-3:2003

ITEH STANDARD PREVIEW



Table 1 – Test levels .....	21
Table 2 – Frequency ranges: 800 MHz to 960 MHz and 1,4 GHz to 2,0 GHz.....	21
Table A.1 – Comparison of modulation methods .....	53
Table A.2 – Relative interference levels (note 1).....	55
Table A.3 – Relative immunity levels (note 1) .....	57
Table F.1 – Examples of test levels, associated protection distances and suggested performance criteria.....	75
Table I.1 – Mobile and portable units .....	85
Table I.2 – Base stations .....	85

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SIST EN 61000-4-3:2003

<https://standards.iteh.ai/catalog/standards/sist/2da10822-b4d6-494b-9c74-039f9cc6e2da/sist-en-61000-4-3-2003>

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 4-3: Testing and measurement techniques –  
Radiated, radio-frequency, electromagnetic field immunity test

## 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.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61000-4-3 has been prepared by subcommittee 77B: High frequency phenomenon, of IEC technical committee 77: Electromagnetic compatibility.

It forms part 4-3 of IEC 61000 and replaces the first edition issued in 1995, and its amendments 1 (1998) and 2 (2000). It has the status of a basic EMC publication in accordance with IEC Guide 107.

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

FDIS	Report on voting
77B/339/FDIS	77B/344/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.

Annex J forms an integral part of this standard.

Annexes A to I are for information only.

The committee has decided that the contents of this publication will remain unchanged until 2002-08. At this date, the publication will be

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

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## INTRODUCTION

This standard is part of the IEC 61000 series, according to the following structure:

### Part 1: General

General considerations (introduction, fundamental principles)

Definitions, terminology

### Part 2: Environment

Description of the environment

Classification of the environment

Compatibility levels

### Part 3: Limits

Emission limits

Immunity limits (in so far as they do not fall under the responsibility of the product committees)

### Part 4: Testing and measurement techniques

Measurement techniques

Testing techniques

### Part 5: Installation and mitigation guidelines

Installation guidelines

Mitigation methods and devices

### Part 9: Miscellaneous

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Each part is further subdivided into sections which are to be published either as International Standards or as technical reports.

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This section is an International Standard which gives immunity requirements and test procedures related to radiated, radio-frequency, electromagnetic fields.

## ELECTROMAGNETIC COMPATIBILITY (EMC) –

### Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test

#### 1 Scope and object

This section of IEC 61000-4 is applicable to the immunity of electrical and electronic equipment to radiated electromagnetic energy. It establishes test levels and the required test procedures.

The object of this section is to establish a common reference for evaluating the performance of electrical and electronic equipment when subjected to radio-frequency electromagnetic fields. Testing is not required at frequencies other than those specified in clause 5 of this standard. The possible future introduction of new radio services which may degrade the performance of electrical and electronic equipment may result in test levels being specified in other frequency bands.

This section deals with immunity tests related to general purposes. Particular considerations are devoted to the protection against radiofrequency emissions from digital radio telephones.

NOTE Test methods are defined in this section for measuring the effect that electromagnetic radiation has on the equipment concerned. The simulation and measurement of electromagnetic radiation is not adequately exact for quantitative determination of effects. The test methods defined are structured for the primary objective of establishing adequate repeatability of results at various test facilities for qualitative analysis of effects.

This section does not intend to specify the tests to be applied to particular apparatus or systems. Its main aim is to give a general basic reference to all concerned product committees of the IEC. The product committees (or users and manufacturers of equipment) remain responsible for the appropriate choice of the tests and the severity level to be applied to their equipment.

#### 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 60050(161):1990, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

IEC 61000-4-6:1996, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 6: Immunity to conducted disturbances induced by radio-frequency fields*

### 3 General

Most electronic equipment is, in some manner, affected by electromagnetic radiation. This radiation is frequently generated by such sources as the small hand-held radio transceivers that are used by operating, maintenance and security personnel, fixed-station radio and television transmitters, vehicle radio transmitters, and various industrial electromagnetic sources.

In recent years there has been a significant increase in the use of radio telephones and other radio transmitters operating at frequencies between 0,8 GHz and 3 GHz. Many of these services use modulation techniques with a non-constant envelope (e.g. TDMA).

In addition to electromagnetic energy deliberately generated, there is also spurious radiation caused by devices such as welders, thyristors, fluorescent lights, switches operating inductive loads, etc. For the most part, this interference manifests itself as conducted electrical interference and, as such, is dealt with in other parts of this standard. Methods employed to prevent effects from electromagnetic fields will normally also reduce the effects from these sources.

The electromagnetic environment is determined by the strength of the electromagnetic field (field strength in volts per metre). The field strength is not easily measured without sophisticated instrumentation nor is it easily calculated by classical equations and formulae because of the effect of surrounding structures or the proximity of other equipment that will distort and/or reflect the electromagnetic waves.

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### 4 Definitions

For the purposes of this section of IEC 61000-4, the following definitions, together with those in IEC 60050(161) apply.

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#### 4.1

##### **amplitude modulation**

process by which the amplitude of a carrier wave is varied following a specified law

#### 4.2

##### **anechoic chamber**

shielded enclosure which is lined with radio-frequency absorbers to reduce reflections from the internal surfaces

##### 4.2.1

##### **fully anechoic chamber**

shielded enclosure whose internal surfaces are totally lined with anechoic material

##### 4.2.2

##### **semi-anechoic chamber**

shielded enclosure where all internal surfaces are covered with anechoic material with the exception of the floor, which shall be reflective (ground plane)

##### 4.2.3

##### **modified semi-anechoic chamber**

semi-anechoic chamber which has additional absorbers installed on the ground plane

**4.3****antenna**

transducer which either emits radio-frequency power into space from a signal source or intercepts an arriving electromagnetic field, converting it into an electrical signal

**4.4****balun**

device for transforming an unbalanced voltage to a balanced voltage or vice versa [IEV 161-04-34]

**4.5****continuous waves (CW)**

electromagnetic waves, the successive oscillations of which are identical under steady-state conditions, which can be interrupted or modulated to convey information

**4.6****electromagnetic (EM) wave**

radiant energy produced by the oscillation of an electric charge characterized by oscillation of the electric and magnetic fields

**4.7****far field**

region where the power flux density from an antenna approximately obeys an inverse square law of the distance.

For a dipole this corresponds to distances greater than  $\lambda/2\pi$ , where  $\lambda$  is the wavelength of the radiation

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**4.8****field strength**

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the term "field strength" is applied only to measurements made in the far field. The measurement may be of either the electric or the magnetic component of the field and may be expressed as V/m, A/m or W/m<sup>2</sup>; any one of these may be converted into the others

NOTE For measurements made in the near field, the term "electric field strength" or "magnetic field strength" is used according to whether the resultant electric or magnetic field, respectively, is measured. In this field region, the relationship between the electric and magnetic field strength and distance is complex and difficult to predict, being dependent on the specific configuration involved. Inasmuch as it is not generally feasible to determine the time and space phase relationship of the various components of the complex field, the power flux density of the field is similarly indeterminate.

**4.9****frequency band**

continuous range of frequencies extending between two limits

**4.10****induction field**

predominant electric and/or magnetic field existing at a distance  $d < \lambda/2\pi$ , where  $\lambda$  is the wavelength and the physical dimensions of the source are much smaller than distance  $d$

**4.11****isotropic**

having properties of equal values in all directions

**4.12****polarization**

orientation of the electric field vector of a radiated field