SLOVENSKI STANDARD
SIST EN 61000-4-22:2011

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Elektromagnetna združljivost (EMC) - 4-22. del: Preskusne in merilne tehnike - Merjenje oddajanja in odpornosti v popolnoma neodbojnih sobah (FAR) (IEC 61000 -4-22:2010)

Electromagnetic compatibility (EMC) - Part 4-22: Testing and measurement techniques - Radiated emission and immunity measurements in fully anechoic rooms (FARs)

Elektromagnetische Verträglichkeit (EMV) - Teil 4-22: Prüf- und Messverfahren - Messungen der gestrahlten Störaussendung und Prüfungen der Störfestigkeit gegen gestrahlte Störgrößen in Vollabsorberräumen (FAR)

Compatibilité électromagnétique (CEM) - Partie 4-22: Techniques d'essai et de mesure - Mesures de l'immunité et des émissions rayonnées dans des enceintes complètement anéchoïques (FAR)

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33.100.01	Elektromagnetna združljivost na splošno	Electromagnetic compatibility in general

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English version

Electromagnetic compatibility (EMC) - Part 4-22: Testing and measurement techniques - Radiated emission and immunity measurements in fully anechoic rooms (FARs)

(IEC 61000-4-22:2010)

Compatibilité électromagnétique (CEM) - Partie 4-22: Techniques d'essai et de mesure - Mesures de l'immunité et des émissions rayonnées dans des enceintes complètement anéchoïques (FAR)
(CEI 61000-4-22:2010)

Elektromagnetische Verträglichkeit (EMV) - Teil 4-22: Prüf- und Messverfahren - Messungen der gestrahlten Störaussendung und Prüfungen der Störfestigkeit gegen gestrahlte Störgrößen in Vollabsorberräumen (FAR)
(IEC 61000-4-22:2010)

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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 CISPR/A/912/FDIS, future edition 1 of IEC 61000-4-22, prepared by CISPR SC A, Radio-interference measurements and statistical methods, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61000-4-22 on 2011-02-01.

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)	2011-11-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2014-02-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61000-4-22:2010 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

[2] IEC 61000-4-3:2006 + A1:2007 NOTE Harmonized as EN 61000-4-3:2006 + A1:2008 (not modified).

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.

Publication	Year	Title	EN/HD	Year
CISPR 16-1-1	2010	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus	EN 55016-1-1	2010
CISPR 16-1-4	2010	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-4: Radio disturbance and immunity measuring apparatus - Antennas and test sites for radiated disturbance measurements	EN 55016-1-4	2010
IEC 60050-161	1990	International Electrotechnical Vocabulary (IEV) - Chapter 161: Electromagnetic compatibility	-	-
IEC 60050-394	2007	International Electrotechnical Vocabulary (IEV) - Part 394: Nuclear instrumentation - Instruments, systems, equipment and detectors	-	-

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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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International Standard IEC 61000-4-22 has been prepared by CISPR subcommittee A: Radio interference measurements and statistical methods, in cooperation with subcommittee 77B: High frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

This standard has the status of a basic EMC publication in accordance with IEC Guide 107, *Electromagnetic compatibility – Guide to the drafting of electromagnetic compatibility publications*.

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

Enquiry draft	Report on voting
CISPR/A/912/FDIS	CISPR/A/923/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.

A list of all parts of the IEC 61000 series can be found on the IEC website under the general title Electromagnetic compatibility (EMC), and of all parts of the CISPR 16 series under the general title Specification for radio disturbance and immunity measuring apparatus and methods.

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.

INTRODUCTION

This standard is part of the IEC 61000 series of standards, 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 6: Test set-up

Part 9: Miscellaneous

Each part is further subdivided into several parts, published either as international standards, as technical specifications or technical reports, some of which have already been published as sections. Others will be published with the part number followed by a dash and a second number identifying the subdivision (example: IEC 61000-6-1).

This part is an international standard that establishes the required test procedures for using fully anechoic rooms for performing radiated immunity testing and radiated emission measurements.

The main text of this standard provides all information that is common to both radiated emission measurements and immunity tests in a FAR (fully anechoic room). This includes the description of a FAR, a common set-up for equipment under test (EUT), and a harmonized validation/calibration procedure. The test methods described in this standard are based on the harmonized validation/calibration which verifies a FAR as a measurement system, including the room, antenna and associated cables simultaneously. The validation procedure determines a combined transducer factor for a FAR measurement system that is later applied to both emission measurements and immunity tests. If different sets of antennas and/or cables are used for emission measurements and immunity tests the validation/calibration process is performed twice.

Annex A (normative) provides the measurement procedure and any special considerations for performing radiated immunity tests.

Annex B (normative) provides the measurement procedure and any special considerations for performing radiated emission measurements.

Annex C (informative) provides background on the system transducer factor and simultaneous emissions/immunity validation method.

Annex D (informative) provides guidance for calculation of the uncertainty of measurement results obtained using a FAR and instrumentation in accordance with ISO/IEC Guide 98-3 [4][1)].

1) Numbers in square brackets refer to the Bibliography.

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 4-22: Testing and measurement techniques – Radiated emissions and immunity measurements in fully anechoic rooms (FARs)

1 Scope

This part of IEC 61000 considers immunity tests and emission measurements for electric and/or electronic equipment. Only radiated phenomena are considered. It establishes the required test procedures for using fully anechoic rooms for performing radiated immunity testing and radiated emission measurements.

NOTE In accordance with IEC Guide 107 [1], IEC 61000-4-22 is a basic EMC publication for use by product committees of the IEC. As stated in Guide 107, product committees are responsible for determining the applicability of the EMC standards. TC 77 and CISPR and their sub-committees are prepared to cooperate with product committees in the determination of the value of particular EMC tests for specific products.

This part establishes a common validation procedure, equipment under test (EUT) set-up requirements, and measurement methods for fully anechoic rooms (FARs) when both radiated electromagnetic emission measurements and radiated electromagnetic immunity tests will be performed in the same FAR.

As a basic measurement standard, this part of IEC 61000 does not intend to specify the test levels or emission limits to be applied to particular apparatus or system(s). Its main goal is to provide general measurement procedures to all concerned product committees of IEC or CISPR. Specific product requirements and test conditions are defined by the responsible product committees.

The methods described in this standard are appropriate for radiated emission measurements and immunity tests in the frequency range of 30 MHz to 18 GHz.

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.

CISPR 16-1-1:2010, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*

CISPR 16-1-4:2010, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Radiated disturbances*

IEC 60050-161:1990, *International Electrotechnical Vocabulary (IEV) – Part 161: Electromagnetic compatibility*

IEC 60050-394:2007, *International Electrotechnical Vocabulary (IEV) – Part 394: Nuclear instrumentation – Instruments, systems, equipment and detectors*

3 Terms and definitions

For the purposes of this document, the terms and definitions in IEC 60050-161, as well as the following, apply.

3.1
ancillary equipment
transducers (e.g. current and voltage probes and artificial networks) connected to a measuring receiver or (test) signal generator and used in the disturbance signal transfer between the EUT and the measuring or test equipment

3.2
associated equipment
AE
apparatus that is not part of the system under test, but needed to help exercise the EUT

3.3
average system transducer factor
$\overline{C}_{\mathrm{dB}}$
factor that converts a voltage at the system source/receive termination point to field strength induced or received; this parameter is calculated from the FAR validation data separately for horizontal and vertical polarization

NOTE Average system transducer factor is expressed in dB(1/m).

3.4
calibration
set of operations that establish, under specified conditions, the relationship between values of quantities indicated by a measuring instrument or measuring system, or values represented by a material measure or a reference material, and the corresponding values realized by standards

[IEC 60050-394, 394-40-43]

3.5
forward power
$P_{\mathrm{f},x}$
power to a FAR test system, recorded during the measurement of the field at a single position, x, in the test volume

NOTE Forward power is expressed in watts (W).

3.6
fully anechoic room
FAR
shielded enclosure, the entire internal surface of which is lined with radio-frequency absorbing material (RF-absorber), which absorbs electromagnetic energy in the frequency range of interest

3.7
fully anechoic room test system
FAR test system
test system comprised of a FAR and a means to generate and/or measure electromagnetic fields

NOTE Most typically this is comprised of a FAR, an antenna and other ancillary equipment and cabling.