SLOVENSKI STANDARD

SIST EN 50401:2006

december 2006

Produktni standard za prikaz skladnosti stacionarne opreme za radijski prenos (110 MHz–40 GHz), namenjene za uporabo v brezžičnih telekomunikacijskih omrežjih z osnovnimi ali izvedenimi mejnimi vrednostmi v povezavi z izpostavljenostjo prebivalstva elektromagnetnim sevanjem

Product standard to demonstrate the compliance of fixed equipment for radio transmission (110 MHz - 40 GHz) intended for use in wireless telecommunication networks with the basic restrictions or the reference levels related to general public exposure to radio frequency electromagnetic fields, when put into service

ICS 17.220.20; 33.070.01

Referenčna številka
SIST EN 50401:2006(en)

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50401

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ICS 17.220.20; 33.070.01

English version

Product standard to demonstrate the compliance of fixed equipment for radio transmission (110 MHz - 40 GHz) intended for use in wireless telecommunication networks with the basic restrictions or the reference levels related to general public exposure to radio frequency electromagnetic fields, when put into service

Norme produit pour démontrer la conformité des équipements fixes de transmission radio (110 MHz - 40 GHz), destinés à une utilisation dans les réseaux de communication sans fil, aux restrictions de base ou aux niveaux de référence relatives à l'exposition des personnes aux champs électromagnétiques de fréquence radio, lors de leur mise en service

Produktnorm zum Nachweis der Übereinstimmung von stationären Einrichtungen für Funkübertragungen (110 MHz bis 40 GHz), die zur Verwendung in schnurlosen Telekommunikationsnetzen vorgesehen sind, bei ihrer Inbetriebnahme mit den Basisgrenzwerten oder den Referenzwerten bezüglich der Exposition der Allgemeinbevölkerung gegenüber hochfrequenten elektromagnetischen Feldern

This European Standard was approved by CENELEC on 2005-12-06. 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, 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

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

Ref. No. EN 50401:2006 E

Foreword

This European Standard was prepared by Technical Committee CENELEC TC 106X, Electromagnetic fields in the human environment.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50401 on 2005-12-06.

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)	2007-01-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2009-01-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directive 1999/5/EC.

Contents

1 Scope

This product standard applies to base stations as defined in Clause 3, operating in the frequency range 110 MHz to 40 GHz. The objective of the standard is to verify that such product complies with the basic restrictions directly or via compliance with reference levels related to the general public exposure to radio frequency electromagnetic fields in the frequency range 100 kHz to 40 GHz, where the general public has access and when it is put into service in its operational environment.

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.

EN 50400, *Basic standard to demonstrate the compliance of fixed equipment for radio transmission (110 MHz - 40 GHz) intended for use in wireless telecommunication networks with the basic restrictions or the reference levels related to general public exposure to radio frequency electromagnetic fields, when put into service*

Council Recommendation 1999/519/EC of 12 July 1999 on *the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)* (Official Journal L 199 of 30 July 1999)

3 Definitions

For the purposes of this document, the following terms and definitions apply.

3.1
antenna
device that serves as a transducer between a guided wave (e.g. coaxial cable) and a free space wave, or vice versa. It can be used either to emit or to receive a radio signal. In the present standard, if not mentioned, the term antenna is used only for emitting antenna(s)

3.2
average emitted power
the average emitted power is the time-averaged rate of energy transfer defined by:

$$P_{aep} = \frac{1}{t_2 - t_1} \int_{t_1}^{t_2} P(t)dt$$

where

$t_2 - t_1$ is the averaging time, t_{avg} defined as a function of frequency in the Council Recommendation 1999/519/EC of 12 July 1999;

$P(t)$ is the power radiated by the antenna at the maximum duty cycle of the equipment at the maximum power setting of the equipment

3.3
base station (BS)
fixed equipment for radio transmission used in cellular communication and/or wireless local area networks. Point-to-point communication and point-to-multipoint communication equipment integral to the above networks are also included. For the purpose of this standard, the term “base station” includes the radio transmitter(s) and the associated antenna(s)

3.4
basic restriction
restrictions on exposure to time - varying electric, magnetic, and electromagnetic fields that are based directly on established health effects. Depending upon the frequency of the field, the physical quantities used to specify these restrictions are current density (J), specific absorption rate (SAR) and power density (S)

3.5
electric field strength (*E*)
the magnitude of a field vector at a point that represents the force (*F*) on a small test charge (*q*) divided by the charge

$$E = \frac{F}{q}$$

Electric field strength is expressed in units of volt per *meter* (V/m)

3.6
magnetic field strength (H)
the magnitude of a field vector in a point that results in a force (F) on a charge q moving with the velocity v

$$F = q(v \times \mu H)$$

The magnetic field strength is expressed in units of amperes per meter (A/m)

3.7
power density
the radiant power incident perpendicular to a surface, divided by the area of the surface. The power density is expressed in units of watt per square meter (W/m²)

3.8
reference level
reference levels are provided for the purpose of comparison with exposure quantities in air. Respect of the reference levels will ensure respect of the basic restriction. In the frequency range 110 MHz to 40 GHz the reference levels are expressed as electric field strength, magnetic field strength and power density values

4 Exposure limits

The relevant limits for general public exposure specified in the Council Recommendation 1999/519/EC as Basic Restrictions or Reference Levels as well as conditions for simultaneous exposure to multiple frequency fields shall apply for the purpose of this standard.

5 Compliance assessment

When the product is put into service in its operational environment and operated in accordance with the manufacturers' specification, it fulfils the requirements of this standard if the general public is not able to freely reach (because of access restrictions or because of the site configuration) any place in the vicinity of the emitting base station antenna(s) where the total exposure to emissions in the frequency range 100 kHz to 40 GHz may exceed the limits defined in Clause 4.

The product is deemed to comply without exposure assessment if

- the maximum average emitted power for each antenna of the product is less than or equal to 250 mW,
- the maximum average emitted power for each antenna of the product is less than or equal to 1 W and the antenna(s) are installed according to the instructions provided by the manufacturer and such that the lowest radiating part of the antenna is at a height greater than or equal to 2 m above the general public walkway that gives general public access to the volume within 2 m of the product's antenna,

otherwise, exposure shall be assessed according to EN 50400 where the general public has access and where the exposure resulting from the product's RF emission is higher than 0,05 of Clause 4 limits. The assessment results shall be compared directly to the exposure limits.

6 Documentation

The compliance documentation shall include at least

1) a detailed description of the configuration of the base station in its operational environment (e.g. antenna(s) characteristics, feeders, connectors, combiners),
2) all the information, methods and their uncertainty used to determine exposure levels for the general public according to EN 50400,
3) general public access restrictions if any.

The documentation may cover several base stations with similar technical specifications and environmental conditions.

If, in accordance to Clause 5, the product when put into service is deemed to comply without exposure assessment, then the facts and conditions on which this classification is based (according to the bullet points in Clause 5) shall be stated by the manufacturer in the user instructions. No additional documentation is required in these cases.