



NSAI
Standards

Irish Standard
I.S. EN 50475:2008

Basic standard for the calculation and the measurement of human exposure to electromagnetic fields from broadcasting service transmitters in the HF bands (3 MHz - 30 MHz)

I.S. EN 50475:2008

Incorporating amendments/corrigenda issued since publication:

<i>This document replaces:</i>	<i>This document is based on:</i> EN 50475:2008	<i>Published:</i> 20 June, 2008
This document was published under the authority of the NSAI and comes into effect on: 14 January, 2010		ICS number: 13.28
NSAI 1 Swift Square, Northwood, Santry Dublin 9	T +353 1 807 3800 F +353 1 807 3838 E standards@nsai.ie W NSAI.ie	Sales: T +353 1 857 6730 F +353 1 857 6729 W standards.ie
Údarás um Chaighdeáin Náisiúnta na hÉireann		

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50475

June 2008

ICS 13.280

English version

**Basic standard for the calculation and the measurement
of human exposure to electromagnetic fields
from broadcasting service transmitters in the HF bands (3 MHz - 30 MHz)**

Norme de base pour le calcul et la mesure
de l'exposition humaine
aux champs électromagnétiques
des émetteurs de service de radiodiffusion
dans les bandes HF (3 MHz à 30 MHz)

Grundnorm für die Berechnung und
Messung der Exposition von Personen
gegenüber elektromagnetischen Feldern
von Rundfunksendern in den KW-Bändern
(3 MHz bis 30 MHz)

This European Standard was approved by CENELEC on 2008-04-01. 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, Bulgaria, 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

Foreword

This European Standard was prepared by the 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 50475 on 2008-04-01.

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) | 2009-04-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2011-04-01 |
-

Contents

1	Scope	5
2	Normative references	5
3	Terms and definitions	5
4	Physical quantities and units	7
5	Applicability of compliance assessment methods	8
5.1	Reference level or action level values	8
5.2	SAR and current density	8
6	SAR measurement and calculation (local and average SAR)	9
6.1	Approximate method for SAR calculation for frequencies below body resonance.....	9
6.2	Exposure situation	9
6.3	Polynomial expansion of “static” component values with frequency	10
7	Current density (3 MHz – 10 MHz)	11
8	Measurement of electric and magnetic field	12
9	Calculation of electric and magnetic field	12
10	Contact currents measurement and calculation	12
10.1	Generalities	12
10.2	Constraints	12
10.3	Equipment	13
10.4	Equivalent body impedance.....	13
11	Induced current calculation and measurement (10 MHz – 30 MHz)	14
11.1	Induced current calculation	14
11.2	Relation between induced current and local SAR	14
11.3	Induced current measurement	14
Annex A	(informative) Data for absorption by the Visible Human body model	15
Annex B	(informative) Compliance boundary examples	19
Bibliography	21

Figures

Figure 1 – Contact current measurement.....	13
Figure 2 – Equivalent body impedance	13
Figure A.1 – Calculated whole-body SAR values for the displayed polarisation for the inhomogeneous Visible Human body model on conducting ground using currently-accepted values for relative permittivity and conductivity at each frequency	15
Figure A.2 – Corresponding polarised E- and H-component parts of the whole-body SAR	15
Figure A.3 – Model of the antenna considered	17
Figure A.4 – Plot of the SAR calculated on the basis of the model of Visible Human on the basis of calculated field strengths of the electric and magnetic field in front of the studied short wave curtain antenna	18
Figure B.1 – Model of the antenna considered	19
Figure B.2 – Plot of the E-field strength calculated on NEC-2 basis in front of a short wave curtain antenna	20
Figure B.3 – Plot of the H-field strength calculated on NEC-2 basis in front of a short wave curtain antenna	20

Tables

Table 1 – Assessment methods for each antenna region.....	8
Table 2 – Assessment methods for each antenna region.....	8
Table A.1 – Whole-body specific absorption rate for the inhomogeneous Visible Human body model on conducting ground for the different plane-wave polarisation orientations	16
Table A.2 – “Static” components of the whole-body specific absorption rate for the inhomogeneous Visible Human body model on conducting ground for the different plane-wave polarisation orientations.....	16
Table A.3 – Polynomial expansion coefficients with respect to frequency for the static components of the whole-body specific absorption rate for the inhomogeneous Visible Human body model on conducting ground	17

1 Scope

This standard applies to short wave broadcast transmitters and installations operating in the frequency range 3 MHz to 30 MHz.

The objective of the standard is to specify, for such a frequency band, basic information allowing the definition of a method for assessment of compliance related to human exposure to radio frequency electromagnetic fields.

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 50413, *Basic standard on measurement and calculation procedures for human exposure to electric, magnetic and electromagnetic fields (0 Hz – 300 GHz)*

EN 55016 series, *Specification for radio disturbance and immunity measuring apparatus and methods (CISPR 16 series)*

ENV 13005:1999, *Guide to the expression of uncertainty in measurement*

3 Terms and definitions

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

3.1

action values

the magnitude of directly measurable parameters, provided in terms of electric field strength (E), magnetic field strength (H), magnetic flux density (B) and power density (S), at which one or more of the specified measures in 2004/40/EC [2] must be undertaken. Compliance with these values will ensure compliance with the relevant exposure limit values of 2004/40/EC [2]

3.2

antenna

device that serves as a transducer between a guided wave (e.g. coaxial cable) and a free space wave, or vice versa

3.3

basic restriction

restrictions on exposure to time-varying electric, magnetic, and electromagnetic fields that are based directly on established health effects as given in 1999/519/EC [1]

3.4

broadcasting service

radio communication service in which the transmissions are intended for direct reception by the general public. This service may include sound transmissions, television transmissions or other types of transmission

3.5

compliance distance

minimum distance from the antenna to a point of investigation where field level is deemed to be compliant to the limits

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- Looking for additional Standards? Visit Intertek Inform Infostore
 - Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-