

Takistus- ja kaarkeevitusseadmete ja nendega seotud protsessidest tingitud elektromagnetväljade (0 Hz kuni 300 GHz) inimesele toimiva mõju hinnangu põhistandard

Basic standard for the evaluation of human exposure to electromagnetic fields from equipment for resistance welding and allied processes

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 50505:2008 sisaldab Euroopa standardi EN 50505:2008 ingliskeelset teksti.

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**Basic standard for the evaluation
of human exposure to electromagnetic fields
from equipment for resistance welding
and allied processes**

Norme de base destinée à l'évaluation
de l'exposition humaine
aux champs électromagnétiques émanant
du matériel de soudage par résistance
et des techniques connexes

Grundnorm für die Bewertung
der menschlichen Exposition gegenüber
elektromagnetischen Feldern
von Einrichtungen zum Widerstands-
schweißen und für verwandte Verfahren

This European Standard was approved by CENELEC on 2008-03-01. 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.

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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

This European Standard was prepared by the Technical Committee CENELEC TC 26B, Electric resistance welding.

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This European Standard shall be read in conjunction with EN 50445.

This European Standard has been prepared under mandates M/305 and M/351 given to CENELEC by the European Commission and the European Free Trade Association.

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1 Scope

This European Standard applies to equipment for resistance welding and allied processes designed for use in industrial or domestic environments.

NOTE 1 Typical allied processes are resistance hard and soft soldering or resistance heating achieved by means comparable to resistance welding equipment.

This European Standard establishes a suitable evaluation method for determining the electromagnetic fields in the space around the equipment and defines standardized operating conditions and measuring distances. It provides a method to show conformity with guidelines or requirements concerning human exposure to electromagnetic fields.

The Directive 2006/95/EC of the European Parliament and the Council [1], Article 2, stipulates that the Member States take all appropriate measures to ensure that electrical equipment may be placed on the market only if, having been constructed in accordance with good engineering practice in safety matters in force in the Community, it does not endanger the safety of persons, domestic animals or property when properly installed and maintained and used in applications for which it was made. The principal elements of those safety objectives are listed in Annex I Clause 2.b. This standard may be used in conjunction with EN 50445 for demonstration of conformity to the Council Directive with reference to human exposure to electromagnetic fields (EMF). There are additional requirements covered by Article 2 and Annex I Clause 2.b, which are not included in this document.

The Council Recommendation 1999/519/EC [2] provides Basic Restrictions and Derived reference levels for exposure of the general public. This standard may be used for demonstration of resistance welding equipment conformity to the Council Recommendation on this basis, but there may be additional specific national or international requirements which are not included.

The ICNIRP Guidelines [3], on limits of exposure to static magnetic fields as well as for limiting exposure in time varying electric, magnetic and electromagnetic fields, provide Basic restrictions and Derived reference levels for both occupational and general exposure. This standard may be used for demonstration of equipment conformity to ICNIRP Guidelines on this basis, but there may be additional national or international requirements which are not included.

It is also possible to use this document as a basis to demonstrate conformity of resistance welding equipment to other national and international guidelines or requirements with regard to human exposure from EMF, for example Council Directive 2004/40/EC [4] on the minimum health and safety requirements regarding the exposure of workers to the risk arising from physical agents (electromagnetic fields), or the requirements of the Directive 98/37/EC [5]. In these cases, other restrictions and levels than those referenced above may be used.

Other standards may apply to equipment covered by this standard. In particular this standard can not be used to demonstrate electromagnetic compatibility with other equipment; nor does it specify any product safety requirements other than those specifically related to human exposure to electromagnetic fields.

The frequency range covered is 0 Hz to 300 GHz.

NOTE 2 Procedures to demonstrate conformity are not specified for the whole frequency range.

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 50392	2004	Generic standard to demonstrate the compliance of electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (0 Hz – 300 GHz)
EN 50445	2008	Product family standard to demonstrate compliance of equipment for resistance welding, arc welding and allied processes with the basic restrictions related to human exposure to electromagnetic fields (0 Hz – 300 GHz)
EN 61566	1997	Measurement of exposure to radio-frequency electromagnetic fields – Field strength in the frequency range 100 kHz to 1 GHz (IEC 61566:1997)
EN 62226-1	2005	Exposure to electric or magnetic fields in the low and intermediate frequency range – Methods for calculating the current density and internal electric field induced in the human body – Part 1: General (IEC 62226-1:2004)
EN 62226-2-1	2005	Exposure to electric or magnetic fields in the low and intermediate frequency range – Methods for calculating the current density and internal electric field induced in the human body – Part 2-1: Exposure to magnetic fields – 2D models (IEC 62226-2-1:2004)
EN ISO/IEC 17025	2005	General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2005)
IEC 61786	1998	Measurement of low-frequency magnetic and electric fields with regard to exposure of human beings – Special requirements for instruments and guidance for measurements
ISO 669	2000	Resistance welding – Resistance welding equipment – Mechanical and electrical requirements

3 Definitions

3.1 General

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

3.1.1

averaging time (t_{avg})

appropriate time over which exposure is averaged for purposes of determining conformity

3.1.2

basic restrictions

restrictions on exposure to electric, magnetic and electromagnetic fields that are based directly on established health effects and biological considerations

3.1.3

compliance boundary

spatial border outside which any point of investigation is deemed to be compliant

3.1.4

conductivity (σ)

ratio of the conduction current density in a medium to the electric field strength