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Responsible committee: GEL/210/11 EMC - Standards Committee

Interested committees:

Title: BS EN 55011 Fragment 1 - Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement - Requirements for air-gap wireless power transfer (WPT)

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- iii) requires additional national guidance or information

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Introduction

This draft standard is based on international discussions in which the UK has taken an active part. Your comments on this draft are welcome and will assist in the preparation of the consequent standard. There is a high probability that this text could be adopted by CENELEC as a reference document for harmonization or as a European Standard. Recipients of this draft are requested to comment on the text bearing in mind this possibility.

UK Vote

Please indicate whether you consider the UK should submit a negative (with reasons) or positive vote on this draft.

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- The guidance given below is intended to ensure that all comments receive efficient and appropriate attention by the responsible BSI committee. **Annotated drafts are not acceptable and will be rejected.**
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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	(7)
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/ Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



CIS/B/749/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER:
CISPR 11/FRAG1 ED7

DATE OF CIRCULATION:
2020-09-25

CLOSING DATE FOR COMMENTS:
2020-11-20

SUPERSEDES DOCUMENTS:
CIS/B/737/CDV, CIS/B/747/RVC

IEC CIS/B : INTERFERENCE RELATING TO INDUSTRIAL, SCIENTIFIC AND MEDICAL RADIO-FREQUENCY APPARATUS, TO OTHER (HEAVY) INDUSTRIAL EQUIPMENT, TO OVERHEAD POWER LINES, TO HIGH VOLTAGE EQUIPMENT AND TO ELECTRIC TRACTION

SECRETARIAT:
Japan

SECRETARY:
Mr Satoru Ozaki

OF INTEREST TO THE FOLLOWING COMMITTEES:
TC 69, SC 77A, CIS/H

PROPOSED HORIZONTAL STANDARD:



Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.

FUNCTIONS CONCERNED:

☒ EMC

☐ ENVIRONMENT

☐ QUALITY ASSURANCE

☐ SAFETY

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Fragment 1: Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement - Requirements for air-gap wireless power transfer (WPT)

NOTE FROM TC/SC OFFICERS:

This CD considers the summary of the document B/746/RQ and deals with the first document within the series of fragments planned to be issued with respect to the topic of wireless power transfer.

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Documents

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INTRODUCTION

Editor's Note: the text of this INTRODUCTION will not be part of a final publication of the next edition of CISPR 11.

Circulation of documents related to the issue of wireless power transfer (in particular for charging of electric vehicles), started in 2017 with CD1 in June 2017 (B/663/CD, B/671/CC), CD2 in Jan 2017 (B/678/CD, B/686/CC), CDV1 in Sep 2017 (B/687/CDV, B/699A/RVC), CD3 in Aug 2018 (B/710/CD, B/717A/CC) and CDV2 in Feb 2020 (B/737/CDV).

Both above mentioned CDVs were voted negatively and from the number of comments received on the above documents, in particular on the latest CDV (B/737/CDV with a clear majority of negative votes) it seems to be that the amount of controversy as well as the number of technical issues to be solved increase from document to document. Hence CISPR/B asked in B/738/Q the NCs for their opinion about the future work on that project. The feedback from NCs is summarized in B/746/RQ and the outcome showed that the project should be split into further fragments. Starting with a fragment (A1) dealing with the least controversial items of the project.

In addition to the above situation, also other maintenance issues for CISPR 11 have been identified, partly editorial ones, partly technical ones and partly ones resulting in new sets of requirements. Those items are meanwhile covered by the fragments f2 to f7 and are circulated already to CISPR/B members for commenting.

Hence, for the time being, the maintenance of CISPR 11 is done with the following fragments:

- f1: requirements for wireless power transfer systems – definitions, measurement setups and operating modes
- f2: general maintenance issues, as for example revision of definitions and annexes (already circulated as B/739/CD)
- f3: requirements for radio beam wireless power transfer (WPT-AAD) equipment (already circulated as B/740/CD)
- f4: requirements when performing emission measurements on robots (already circulated as B/741/CD)
- f5: requirements for wired network ports (already circulated as B/742/CD)
- f6: requirements for Group 1 equipment in the frequency range above 1 GHz (already circulated as B/743/CD)
- f7: requirements for radio enabled products (already circulated as B/744/CD)

This document covers fragment f1 with a proposal for the introduction of definitions, measurement setups and operating modes related to wireless power transfer equipment.

INDUSTRIAL, SCIENTIFIC AND MEDICAL EQUIPMENT – RADIO-FREQUENCY DISTURBANCE CHARACTERISTICS – LIMITS AND METHODS OF MEASUREMENT –

Modifications in CISPR 11 – Wireless power transfer (WPT) – Definitions, measurement setups and operating modes Committee Draft (CD) – Fragment 1 (f1)

Editor's Note: this document bases on the text given in B/737/CDV, however, using only those parts which are relevant for fragment 1. The text given in BLUE characters are the changes with respect to B/737/CDV, taking into account the comments and observations described in B/747/RVC.

Start of the instruction list

3 Terms and definitions

Add the following new definitions:

3.xa

Wireless Power Transfer

WPT

transfer of electrical energy from a power source to an electrical load via electric and/or magnetic fields or electromagnetic waves

3.xb

WPT system

system realizing a WPT function and consisting of the primary equipment (i.e. the primary coil and power supply components) and another corresponding secondary equipment (i.e. one or more secondary [equipment](#), each with power rectifier components and electrical load)

NOTE to entry: [WPT systems](#) denoted as "WPT for electric vehicles" in this standard (the primary equipment of which is subject to CISPR 11) are those designed for charging or powering electric vehicles and industrial in-plant transportation systems through WPT. Examples of such vehicles or industrial transportation systems include: electric personal passenger vehicles, electric buses, trams, light vehicles (such as bike, moped, lawn mower, golf cart) and automated or non-automated in-plant transportation systems

3.xc

primary [equipment](#) (of a WPT system)

device directly connected (by means of a wired connection) to a source ~~of~~ of power, either internal or external to the device, which can transmit power wirelessly to one or more secondary [equipment](#)

3.xd

secondary [equipment](#) (of a WPT system)

power sink (energy storage, load) receiving locally the electromagnetic RF energy generated by the primary [equipment](#) by means of electromagnetic, inductive or capacitive coupling

NOTE 1 to entry: The term "local" is used differently in the context of WPT than for other types of devices subject to CISPR 11. For air-gap WPT systems, "local" includes a separation distance between the primary and secondary [WPT equipment](#) that shall not be greater than 50 cm.

3.xe

secondary test [equipment](#) (for testing of WPT primary [equipment](#))

object consisting of components with defined technical parameters, e.g. secondary coil and power electronics, and a power sink, e.g. a resistive or electronic load, replacing the secondary [equipment](#) during tests of WPT systems

83 NOTE 1 to entry: The **secondary test equipment** simulates the load to the primary **equipment** and includes a resistive
84 or electronic load.

85 **3.xf**

86 **alignment (of a WPT system)**

87 process of finding the relative position of **the primary coil to the secondary coil** for which the
88 most efficient power transfer is possible, and which **can** be indicated by means of markings on
89 the primary **equipment** or through a visual or audible indicator

90 **3.xg**

91 **fundamental frequency (of ISM equipment)**

92 frequency on which the **ISM** function of the equipment is realized

93 NOTE 1 to entry: Electromagnetic RF energy at the fundamental frequency (of **ISM** equipment) can be used in, or
94 transmitted by, or received by the equipment. This energy can be generated in the equipment but used outside the
95 equipment (e.g. WPT primary **equipment**, **X-ray diagnostic equipment**), or generated outside and used in the
96 equipment (e.g. WPT secondary **equipment**) or generated and used in the equipment (e.g. **switching mode power**
97 **supply**, **RF sterilizer**, **microwave oven**).

98 NOTE 2 to entry: Some **ISM** equipment categories do not have a fundamental frequency. Examples: **spectrum**
99 **analyser**, **frequency counter**.

100 **3.xh**

101 **WPT EV system**

102 **WPT system used for the charging of electric road vehicles (EV)**

103 **4 Frequencies designated for ISM use**

104 *Add the following paragraph below Table 1:*

105 In general, **ISM** equipment offering wireless power transfer (WPT) uses fundamental
106 frequencies in dedicated frequency ranges to ensure functional compatibility between
107 transmitting and receiving equipment. These fundamental frequencies depend on the
108 application and are determined to enable power transfer.

109 **7.3.4.1 Frequency range below 30 MHz**

110 *Add the following text after the 1st paragraph:*

111 **For the measurements of WPT EV systems, the requirements in X.4 of the Annex X apply.**

112 **7.5.1 General**

113 *Add the following text after the 1st paragraph:*

114 **The measurement arrangement when performing tests on WPT off-board power supply and**
115 **charging equipment for electric road vehicles (primary equipment of the WPT EV system) shall**
116 **be done according to X.2 of the Annex X.**

117 *Add a new sub-clause below 7.6.11.*

118 **7.6.11 WPT off-board power supply and charging equipment for electric vehicles**

119 **The load conditions for measurements of WPT EV systems are specified in X.3 of Annex X.**

120

Annex A (informative)

Examples of equipment classification

Replace the text in the existing annex A related to Group 2 equipment by the following text (changes indicated in green coloured text):

Group 2 equipment: group 2 contains all ISM RF equipment in which radio-frequency energy in the frequency range 9 kHz to 400 GHz is intentionally generated and used or only used locally, in the form of electromagnetic radiation, inductive and/or capacitive coupling, for the treatment of material, for inspection/analysis purposes, or for transfer of electromagnetic energy (e.g. for [wireless power transfer – WPT](#)).

General:

- Microwave-powered UV irradiating apparatus
- Microwave lighting apparatus
- Industrial induction heating equipment operating at frequencies above 9 kHz
- [Electromagnetic coupling](#) ~~Inductive~~ power transfer / charging equipment ^a
- Dielectric heating equipment
- Industrial microwave heating equipment
- Microwave ovens
- Medical electrical equipment
- Electric welding equipment
- Electro-discharge machining (EDM) equipment
- Demonstration models for education and training

^a Inductive or capacitive power transfer apparatus normally subject to CISPR 11, but forming part of equipment subject to other CISPR standards is excluded from the scope of CISPR 11.

Detailed:

Metal melting, billet heating, component heating, soldering and brazing, arc welding, arc stud welding, resistance welding, spot welding, tube welding, industrial laser oscillator excited by high-frequency discharge, wood gluing, plastic welding, plastic preheating, food processing, biscuit baking, food thawing, paper drying, textile treatment, adhesive curing, material preheating, short-wave diathermy equipment, microwave therapy equipment, magnetic resonance imaging (MRI), medical HF sterilizers, high-frequency (HF) surgical equipment, crystal zone refining, demonstration models of high-voltage Tesla transformers, belt generators, [WPT charging systems for electric vehicles \(EV\)](#), [WPT power supplies for automated in-plant transportation systems](#), etc.