SLOVENSKI STANDARD
oSIST prEN IEC 62764-1:2021

01-julij-2021

Merilni postopki nivojev magnetnih polj, ki jih generirata elektronska in električna oprema v motornih vozilih, glede na izpostavljenost ljudi - 1. del: Nizkofrekvenčno magnetno polje

Measurement procedures of magnetic field levels generated by electronic and electrical equipment in the automotive environment with respect to human exposure - Part 1: Low frequency magnetic fields

Merilni postopki nivojev magnetnih polj, ki jih generirajo električni aparati v železniškem okolju glede na izpostavljenost človeka

Measurement procedures of magnetic field levels generated by electronic and electrical apparatus in the railway environment with respect to human exposure

Ta slovenski standard je istoveten z: **prEN IEC 62764-1:2021**

ICS:

17.220.20	Merjenje električnih in magnetnih veličin	Measurement of electrical and magnetic quantities

oSIST prEN IEC 62764-1:2021 **en**

106/547/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: **IEC 62764-1 ED1**	
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SUPERSEDES DOCUMENTS: **106/531/NP, 106/540/RVN**	

IEC TC 106 : METHODS FOR THE ASSESSMENT OF ELECTRIC, MAGNETIC AND ELECTROMAGNETIC FIELDS ASSOCIATED WITH HUMAN EXPOSURE

SECRETARIAT: Germany	SECRETARY: Mr Diego Cuartielles
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 9,TC 27,SC 62A,SC 62B,TC 69,TC 77,TC 96,TC 100,TC 124,TC 125,CISPR	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☐ EMC ☒ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY

☐ SUBMITTED FOR CENELEC PARALLEL VOTING ☒ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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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:

Measurement procedures of magnetic field levels generated by electronic and electrical equipment in the automotive environment with respect to human exposure - Part 1: Low frequency magnetic fields

PROPOSED STABILITY DATE: 2025

NOTE FROM TC/SC OFFICERS:

The TC106 secretary thanks the NC for all comments received on the NWIP stage, these comments will be worked together with CDV comments.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

MEASUREMENT PROCEDURES OF MAGNETIC FIELD LEVELS GENERATED BY ELECTRONIC AND ELECTRICAL EQUIPMENT IN THE AUTOMOTIVE ENVIRONMENT WITH RESPECT TO HUMAN EXPOSURE –

Part 1: Low frequency magnetic fields

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Technical Specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62764-1, which is a Technical Specification, has been prepared by IEC technical committee 106: Methods for the assessment of electric, magnetic and electromagnetic fields associated with human exposure.

133 The text of this Technical Specification is based on the following documents:

Draft TS	Report on voting
106/477/DTS	106/493/RVDTS

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135 Full information on the voting for the approval of this Technical Specification can be found in
136 the report on voting indicated in the above table.

137 This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

138 A list of all parts in the IEC 62764 series, published under the general title *Measurement*
139 *procedures of magnetic field levels generated by electronic and electrical equipment in the*
140 *automotive environment with respect to human exposure*, can be found on the IEC website.

141 The committee has decided that the contents of this publication will remain unchanged until the
142 maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data
143 related to the specific publication. At this date, the publication will be

144 • reconfirmed,
145 • withdrawn,
146 • replaced by a revised edition, or
147 • amended.

148 A bilingual version of this publication may be issued at a later date.

149

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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INTRODUCTION

This document specifies a methodology for determining the exposure to multiple magnetic field sources for passenger cars and light commercial vehicles including standardized operating conditions and measurement volumes and/or surfaces.

MEASUREMENT PROCEDURES OF MAGNETIC FIELD LEVELS GENERATED BY ELECTRONIC AND ELECTRICAL EQUIPMENT IN THE AUTOMOTIVE ENVIRONMENT WITH RESPECT TO HUMAN EXPOSURE –

Part 1: Low frequency magnetic fields

1 Scope

This part of IEC 62764 applies to the assessment of human exposure to low frequency magnetic fields generated by automotive vehicles. For plug-in vehicles, this includes the electric vehicle supply equipment (EVSE) and associated cables provided by the car manufacturer.

The scope of this document establishes the measurement procedure for the evaluation of magnetic field levels generated by electronic and electrical equipment (excluding intentionally transmitting equipment) in selected automotive environments, for passenger cars and commercial vehicles of categories M1 and N1 as defined in ECE/TRANS/WP.29/78/Rev.3 [1][1], with respect to human exposure. It provides standardized operating conditions and defines recommended measurements to assess compliance to the applicable exposure requirements.

This document covers the frequency range 1 Hz to 400 kHz and is applicable to any type of engine and/or internal energy source.

The scope of this document does not include procedures for assessment of human exposure to electromagnetic fields generated by wireless power transfer (WPT) equipment operating in automotive environments. Exposure assessment procedures for WPT equipment are covered by IEC TR 62905 [2].

Abnormal operation of the vehicle or equipment under test is not taken into consideration.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 61786-1:2013, *Measurement of DC magnetic, AC magnetic and AC electric fields from 1 Hz to 100 kHz with regard to exposure of human beings – Part 1: Requirements for measuring instruments*

IEC 62311:2019, *Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz to 300 GHz)*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1.1
applicable requirement
particular requirement regarding human exposure to low-frequency magnetic fields against which the vehicle under test is to be assessed using the methods outlined in this document

[1] Numbers in square brackets refer to the Bibliography.

Note to entry: Examples of such requirements can be found in [3] to [10].

3.1.2
magnetic field exposure
specific metric that are used to quantify human exposure to low-frequency magnetic fields in the applicable requirement

Note to entry: Examples of such metrics can be found in [3] to [10].

3.1.3
powertrain
main system that generates power and delivers it to the road surface

3.2 Abbreviated terms

EV	electric vehicle
EVSE	electric vehicle supply equipment
HEV	hybrid electric vehicle, including
ICEV	internal combustion engine vehicle
MHEV	mild hybrid electric vehicle
SOC	state of charge indicated to the driver
WPT	wireless power transfer

4 Measurement procedure

4.1 Measurement phases

The measurement procedure is divided into four parts regarding the operational vehicle use:

1) vehicle in stationary mode;
2) vehicle in driving mode;
3) vehicle in acceleration mode;
4) vehicle in plug-in charging mode.

These four parts are described in detail in Clause 6.

4.2 Measuring conditions

The measurements cover only sources of persistent magnetic field exposure. Continuous occurring sources, or repetitive transient sources such as fan, wipers are included. Transient electrical functions of short duration activated occasionally by the driver, passengers or the vehicle itself are not considered in this document, in particular the horn, the motorized mirror and the door-lock motor.

NOTE The rotation of the tyres can produce low-frequency magnetic fields (typically below 50 Hz, depending on the speed of the vehicle) in and surrounding the vehicle, due to the static magnetization of the tyres [11][12]. This can only contribute to measurements inside the vehicle (since no measurements are to be performed around the vehicle in dynamic mode).

The measurements are performed in the vehicle’s standard modes of operation, generating the expected highest levels of magnetic field exposure in measuring volumes that are representative of the occupant (Annex B) and bystander locations.

4.3 Test site

Measurements shall be performed in an area having ambient magnetic field exposure values of less than 10 % of the values given in the requirements in the measurement volumes.

The ambient magnetic field exposure shall be measured with or without the vehicle under test, but in conditions that are representative of the vehicle test. This measurement can be performed before each test or periodically in accordance with the laboratory’s quality management processes.

A dynamometer (or roller bench) may be used if it rotates all the driven wheels of the vehicle. It shall be set to simulate the outdoor dynamics of the vehicle including at least its steady-state torque in driving mode and its inertial mass during acceleration mode.

If an outdoor track is used, the slope of the section of the track used for the tests shall be in the range ±2 %.

NOTE In the case of a dynamometer, the ambient magnetic field exposure can depend on the torque and/or speed of the dynamometer.

4.4 Vehicle set-up

The following configuration is recommended within the passenger compartment, where practicable:

– all seats except the rearmost seats, if adjustable, centre-positioned horizontally and at the lowest position vertically;

– the rearmost seats, if horizontally adjustable, in their rearmost position;

– the headrests in the fully-back position;

– all seat backs except for the rearmost seats, if adjustable, approximately 15° back from the vertical;

– all seat backs of the rearmost seats, if adjustable, fully tilted backwards;

– the steering wheel centre-positioned vertically and horizontally.

4.5 Measurement locations

4.5.1 General

Measurements are performed in all regions of the vehicle that are accessible by the driver and passengers, and in the immediate vicinity of the vehicle for bystanders. These include the driver and passenger area (cabin), the cargo storage area, the engine and/or the electric powertrain areas, and the areas around the outside of the vehicle.

The measurement distance between the surface of any part of the vehicle and the centre of the probe shall be 0,20 m (see Annex A). This distance ensures an acceptable measurement uncertainty for a 100 cm2 probe (see Annex C).

4.5.2 Inside the vehicle

Measurements shall be performed throughout the volumes accessible in normal vehicle use cases by parts of the human body to which the applicable exposure requirements apply. These volumes shall be defined by the car manufacturer depending on the car model under test. For example, in the passenger compartment, occupants are assumed to be seated in positions where restraint systems are provided. An example of test volumes taking account of all body parts is illustrated in Figure 1.

Measurements are not required where the components are mounted (no components or parts have to be removed to perform the measurements).