



SLOVENSKI STANDARD
SIST EN ISO 19363:2021

01-maj-2021

**Cestna vozila na električni pogon - Brežični prenos energije z magnetnim poljem -
Zahteve glede varnosti in interoperabilnosti (ISO 19363:2020)**

Electrically propelled road vehicles - Magnetic field wireless power transfer - Safety and interoperability requirements (ISO 19363:2020)

Elektrisch angetriebene Straßenfahrzeuge - Magnetische Energieübertragung -
Sicherheit und Interoperabilitätsanforderungen (ISO 19363:2020)

Véhicules routiers électriques - Transmission d'énergie sans fil par champ magnétique -
Exigences de sécurité et d'interopérabilité (ISO 19363:2020)

<https://standards.iteh.ai/catalog/standards/sist/a7903d62-3101-44fd-9bba-5774f1bb-fc54/sist-en-iso-19363-2021>

Ta slovenski standard je istoveten z: EN ISO 19363:2021

ICS:

43.120 Električna cestna vozila Electric road vehicles

SIST EN ISO 19363:2021

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 19363:2021

<https://standards.iteh.ai/catalog/standards/sist/a7903d62-3101-44fd-9bba-5774fdbbfc54/sist-en-iso-19363-2021>

EUROPEAN STANDARD

EN ISO 19363

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2021

ICS 43.120

English Version

Electrically propelled road vehicles - Magnetic field wireless power transfer - Safety and interoperability requirements (ISO 19363:2020)

Véhicules routiers électriques - Transmission d'énergie sans fil par champ magnétique - Exigences de sécurité et d'interopérabilité (ISO 19363:2020)

Elektrisch angetriebene Straßenfahrzeuge - Magnetische Energieübertragung - Sicherheit und Interoperabilitätsanforderungen (ISO 19363:2020)

This European Standard was approved by CEN on 1 March 2021.

CEN 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 CEN-CENELEC Management Centre or to any CEN member.

iTeh STANDARD PREVIEW

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 CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword.....	3

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 19363:2021
<https://standards.iteh.ai/catalog/standards/sist/a7903d62-3101-44fd-9bba-5774fdbbfc54/sist-en-iso-19363-2021>

European foreword

The text of ISO 19363:2020 has been prepared by Technical Committee ISO/TC 22 "Road vehicles" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 19363:2021 by Technical Committee CEN/TC 301 "Road vehicles" the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2021, and conflicting national standards shall be withdrawn at the latest by September 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

iTeh STANDARD PREVIEW

(standards.iteh.ai)

Endorsement notice

The text of ISO 19363:2020 has been approved by CEN as EN ISO 19363:2021 without any modification.

SIST EN ISO 19363:2021
<https://standards.iteh.ai/catalog/standards/sist/a7905d62-3101-44fd-9bba-5774fd1bbfc54/sist-en-iso-19363-2021>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 19363:2021

<https://standards.iteh.ai/catalog/standards/sist/a7903d62-3101-44fd-9bba-5774fdbbfc54/sist-en-iso-19363-2021>

INTERNATIONAL
STANDARD

ISO
19363

First edition
2020-04

**Electrically propelled road vehicles —
Magnetic field wireless power
transfer — Safety and interoperability
requirements**

*Véhicules routiers électriques — Transmission d'énergie sans fil par
champ magnétique — Exigences de sécurité et d'interopérabilité*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 19363:2021](https://standards.iteh.ai/catalog/standards/sist/a7903d62-3101-44fd-9bba-5774fdbbfc54/sist-en-iso-19363-2021)

<https://standards.iteh.ai/catalog/standards/sist/a7903d62-3101-44fd-9bba-5774fdbbfc54/sist-en-iso-19363-2021>



Reference number
ISO 19363:2020(E)

© ISO 2020

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 19363:2021](https://standards.iteh.ai/catalog/standards/sist/a7903d62-3101-44fd-9bba-5774fdbbfc54/sist-en-iso-19363-2021)

<https://standards.iteh.ai/catalog/standards/sist/a7903d62-3101-44fd-9bba-5774fdbbfc54/sist-en-iso-19363-2021>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword.....	v
Introduction.....	vi
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	2
4 System structure.....	4
5 Requirements regarding environmental conditions.....	5
6 Classification.....	5
7 MF-WPT power transfer requirements.....	6
7.1 General.....	6
7.2 Frequency.....	6
7.3 Geometrical operating space.....	6
7.4 Requirements for output power.....	7
7.5 Requirements for power transfer efficiency.....	8
7.6 Requirements for output voltage.....	8
7.6.1 Performance requirements at different output voltage levels.....	8
7.6.2 Voltage ripple and voltage overshoot.....	8
7.7 MF-WPT power transfer test procedure.....	8
7.7.1 General.....	8
7.7.2 Test setup.....	8
7.7.3 Test procedure.....	10
8 Requirements for communication and MF-WPT activities.....	13
9 EMC requirements.....	14
10 Safety requirements.....	14
10.1 Protection in case of unintended power transfer.....	14
10.2 Protection against electric shock.....	14
10.2.1 General.....	14
10.2.2 Insulation coordination.....	14
10.3 Protection against thermal incidents.....	15
10.3.1 General.....	15
10.3.2 Overload protection and short-circuit protection.....	15
10.4 Protection of persons against electromagnetic effects.....	15
10.4.1 General.....	15
10.4.2 Protection areas.....	15
10.4.3 Requirements for protection of persons against exposure to hazardous electromagnetic fields.....	16
10.4.4 Requirements to protect the functionality of AIMDs.....	16
10.5 Protection against overheating.....	17
11 Owner's manual and marking.....	17
11.1 Owner's manual.....	17
11.2 Marking.....	17
Annex A (normative) Reference supply power circuit for EVPCs with a rated output power $\leq 3,7$ kW.....	18
Annex B (normative) Reference supply power circuit for EVPCs with a rated output power $\leq 11,1$ kW.....	23
Annex C (informative) Example for a different implementation of a supply power circuit.....	27
Annex D (informative) Conformance demonstration for protection of persons against electromagnetic effects.....	31

Bibliography **39**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 19363:2021

<https://standards.iteh.ai/catalog/standards/sist/a7903d62-3101-44fd-9bba-5774fdbbfc54/sist-en-iso-19363-2021>

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 22, *Road vehicles, SC 37, Electrically propelled vehicles*.

This first edition cancels and replaces ISO/PAS 19363:2017, which has been technically revised. The main changes compared to the previous edition are as follows:

- MF-WPT classes and z- classes eliminated;
- compatibility classes introduced;
- reference devices changed to off-board devices and description updated;
- communication and functional requirements deleted.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

ISO 19363:2020(E)

Introduction

This document prescribes the usage of the wireless power transfer technology to charge electrically propelled road vehicles and has been developed based on ISO/PAS 19363.

Status of technological development:

This document specifies requirements for on-board components of a wireless power transfer systems. It gives guidance in terms of safety and performance and additionally addresses interoperability to off-board components from different manufacturers to, for example support the development of public wireless charging infrastructure. Even if the technology itself is well known, the implementation in a vehicle is new and demands to meet the very specific requirements of the automotive industry. This document is based on limited experience with series development and production. Current and future product developments will continuously prove (and disprove) the applicability of this document to further improve the contents, especially regarding the interoperability between systems from different manufacturers.

Cooperation during document development:

This document has been developed in intense cooperation with IEC/TC 69 WG7, which is establishing the IEC 61980 series. The IEC 61980 series covers the requirements for the off-board components in correspondence to the application of on-board components according to this document. Furthermore, SAE J2954 is standardising wireless power transfer systems in the United States of America. An exchange between the groups was continuously sustained during the document development. Even though there is no complete harmonization at this stage, several contents are comparable.

ITEH STANDARD PREVIEW

(standards.iteh.ai)

[SIST EN ISO 19363:2021](https://standards.iteh.ai/catalog/standards/sist/a7903d62-3101-44fd-9bba-5774fdbbfc54/sist-en-iso-19363-2021)

<https://standards.iteh.ai/catalog/standards/sist/a7903d62-3101-44fd-9bba-5774fdbbfc54/sist-en-iso-19363-2021>

Electrically propelled road vehicles — Magnetic field wireless power transfer — Safety and interoperability requirements

1 Scope

This document defines the requirements and operation of the on-board vehicle equipment that enables magnetic field wireless power transfer (MF-WPT) for traction battery charging of electric vehicles. It is intended to be used for passenger cars and light duty vehicles.

This document addresses the following aspects for an EV device:

- safety requirements;
- transferred power and power transfer efficiency;
- ground clearance of the EV device;
- functionality with associated off-board systems under various conditions and independent of manufacturer;
- test procedures.

EV devices that fulfil the requirements in this document are intended to operate with supply devices that fulfil the MF-WPT related requirements in the IEC 61980 series.

NOTE 1 Charging of a vehicle in motion is not considered in this edition.

NOTE 2 Bi-directional power transfer is not considered in this edition.

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.

ISO 6469-3:2018, *Electrically propelled road vehicles — Safety specifications — Part 3: Electrical safety*

ISO 20653, *Road vehicles — Degrees of protection (IP code) — Protection of electrical equipment against foreign objects, water and access*

IEC 61980-2, *Electric vehicle wireless power transfer (WPT) Systems — Part 2: specific requirements for communication between electric road vehicle (EV) and infrastructure with respect to wireless power transfer (WPT) systems*

IEC 61980-3, *Electric vehicle wireless power transfer (WPT) systems — Part 3: Specific requirements for the magnetic field power transfer systems*

ICNIRP 2010, *Guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz – 100 kHz)*

CISPR 11, *Industrial, scientific and medical equipment — Radio-frequency disturbance characteristics — Limits and methods of measurement*

IEC 60664 (all parts), *Insulation coordination for equipment within low-voltage systems*

ISO 19363:2020(E)

3 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:

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

3.1 alignment

relative position in x- and y-direction of the *secondary device* (3.15) to the *primary device* (3.9) for a given *secondary device ground clearance* (3.16)

Note 1 to entry: The coordinate system conforms with ISO 4130.

3.2 alignment tolerance area

intended *WPT* (3.22) operating area in x- and y-direction for a given *secondary device ground clearance* (3.16)

3.3 centre alignment point

geometrical centre of the *alignment tolerance area* (3.2)

Note 1 to entry: The position of the centre alignment point of an *MF-WPT system* (3.8) depends on the specific centre alignment points of the *primary device* (3.9) and *secondary device* (3.15).

3.4 electrically propelled vehicle

EV
vehicle with one or more electric drive(s) for vehicle propulsion

[SOURCE: ISO 6469-3:2018, 3.15, modified — The abbreviation "EV" has been added.]

3.5 EV device

on-board component assembly of *WPT system* (3.23)

Note 1 to entry: See [Figure 1](#).

3.6 EV power circuit EVPC

on-board component assembly, comprising the *secondary device* (3.15) and *EV power electronics* (3.7), as well as the electrical and mechanical connections

Note 1 to entry: See [Figure 1](#).

3.7 EV power electronics

on-board component that converts the power and frequency from the *secondary device* (3.15) to the DC power output of the *EVPC* (3.6)

Note 1 to entry: See [Figure 1](#).

3.8 magnetic field WPT system MF-WPT system

WPT system (3.23) using magnetic field

3.9**primary device**

off-board component that generates and shapes the magnetic field for *WPT* (3.22)

Note 1 to entry: See [Figure 1](#).

3.10**protection area**

volume in and around the vehicle that has uniform requirements with regard to effects of exposure to electromagnetic fields

3.11**rated output power**

maximum power the *EVPC* (3.6) is designed to deliver consistently during a charging cycle

3.12**rechargeable energy storage system****RESS**

rechargeable system that stores energy for delivery of electric energy for the electric drive

EXAMPLE Battery, capacitor, flywheel.

[SOURCE: ISO 6469-1:2019, 3.22]

3.13**reference EVPC**

EVPC (3.6) that serves for testing purposes

3.14**reference supply power circuit**

supply power circuit (3.19) that serves for testing purposes

3.15**secondary device**

on-board component that captures the magnetic field

Note 1 to entry: See [Figure 1](#).

3.16**secondary device ground clearance**

vertical distance between the ground surface and the lowest point of the *secondary device* (3.15) including the housing

Note 1 to entry: Note to entry: The lower surface does not need to be planar or parallel to the ground surface

3.17**steady state**

state of a system at which all state and output variables remain constant in time while all input variables are constant

[SOURCE: IEC 60050-351:2006, 351-24-09]

3.18**supply device**

off-board component assembly of *WPT system* (3.23)

Note 1 to entry: See [Figure 1](#).