



IEC 62196-1

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COMMENTED VERSION

INTERNATIONAL STANDARD



**Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive
charging of electric vehicles –
Part 1: General requirements**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PLUGS, SOCKET-OUTLETS, VEHICLE CONNECTORS AND VEHICLE INLETS – CONDUCTIVE CHARGING OF ELECTRIC VEHICLES –**Part 1: General requirements**

FOREWORD

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This commented version (CMV) of the official standard IEC 62196-1:2022 edition 4.0 allows the user to identify the changes made to the previous IEC 62196-1:2014 edition 3.0. Furthermore, comments from IEC SC 23H experts are provided to explain the reasons of the most relevant changes.

A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.

This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.

IEC 62196-1 has been prepared by subcommittee 23H: Plugs, socket-outlets and couplers for industrial and similar applications, and for electric vehicles, of IEC technical committee 23: Electrical accessories. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2014. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) deletion of references to universal AC and DC interfaces;
- b) additional requirements for contact materials and plating;
- c) changes to the temperature rise test to include additional points of measurement;
- d) additional tests for accessories to address thermal stresses and stability, mechanical wear and abuse, and exposure to contaminants;
- e) relocation of information and requirements for DC charging to IEC 62196-3.

The text of this International Standard is based on the following documents:

Draft	Report on voting
23H/499/FDIS	23H/503/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 62196 series, published under the general title *Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles*, can be found on the IEC website.

Subsequent parts of IEC 62196 deal with the requirements of particular types of accessories. The clauses of those particular requirements supplement or modify the corresponding clauses in this document.

In this document, the following print types are used:

- requirements proper: in roman type;
- *test specifications: in italic type*;
- notes: in smaller roman type.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The "colour inside" logo on the cover page of this document 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.

INTRODUCTION

IEC 61851-~~4~~ (all parts) specifies requirements for electric vehicle (EV) conductive charging ~~equipment~~ systems.

IEC 62196 (all parts) specifies the requirements for plugs, socket-outlets, vehicle connectors, vehicle inlets and cable assemblies as described in the IEC 61851-~~4~~ series.

Some charging can be achieved by direct connection from an electric vehicle to ~~common-mains~~ standard socket-outlets connected to a supply network (mains or electrical grid).

Some modes of charging require a dedicated supply and charging equipment incorporating control and communication circuits.

IEC 62196 (all parts) covers the mechanical, electrical and performance requirements for ~~dedicated~~ plugs, socket-outlets, vehicle connectors and vehicle inlets for ~~interfacing-between~~ ~~such-dedicated-charging~~ the connection between the EV supply equipment and the electric vehicle.

The IEC 62196 series consists of the following parts:

- Part 1: General requirements, comprising clauses of a general character.
- Part 2: Dimensional compatibility and interchangeability requirements for AC pin and contact-tube accessories.
- Part 3⁴: Dimensional compatibility and interchangeability requirements for DC and AC/DC pin and contact-tube vehicle couplers.
- Part 3-1: Vehicle connector, vehicle inlet and cable assembly intended to be used with a thermal management system for DC charging.
- Part 4²: Dimensional compatibility and interchangeability requirements for DC pin and contact-tube accessories for Class II or Class III applications.
- Part 6: Dimensional compatibility and interchangeability requirements for DC pin and contact-tube couplers for applications using a system of protective electrical separation.

⁴ ~~To be published~~

² Pending publication.

PLUGS, SOCKET-OUTLETS, VEHICLE CONNECTORS AND VEHICLE INLETS – CONDUCTIVE CHARGING OF ELECTRIC VEHICLES –

Part 1: General requirements

1 Scope

This part of IEC 62196 is applicable to EV plugs, EV **1** socket-outlets, vehicle connectors, vehicle inlets, herein referred to as "accessories", and to cable assemblies for electric vehicles (EV) intended for use in conductive charging systems which incorporate control means, with a rated operating voltage not exceeding:

- 690 V AC 50 Hz to 60 Hz, at a rated current not exceeding 250 A;
- 1 500 V DC at a rated current not exceeding ~~400~~ 800 A **2**.

These accessories and cable assemblies are intended to be installed by instructed persons (IEV 195-04-02) or skilled persons (IEV 195-04-01) only.

These accessories and cable assemblies are intended to be used for circuits specified in IEC 61851-~~4~~ (all parts), which operate at different voltages and frequencies, and which ~~may~~ can include extra-low voltage and communication signals.

These accessories and cable assemblies are intended to be used at an ambient temperature between -30 °C and $+~~50~~ 40\text{ °C}$ **3**.

NOTE 1 In some countries, other requirements ~~may~~ can apply.

NOTE 2 In the following country, -35 °C applies: SE.

NOTE 3 The manufacturer can enlarge the temperature range on the condition that the specified range information is provided.

These accessories are intended to be connected only to cables with copper or copper-alloy conductors.

The accessories covered by this document are ~~for use in certain modes of charging electric vehicles~~ intended for use in electric vehicle supply equipment in accordance with IEC 61851 (all parts). ~~These modes are defined in IEC 61851-1. These definitions and a description of the types of connection (cases A, B and C), are described in IEC 61851-1:2010, 6.2 and 6.3.1.~~

This document does not apply to ~~those standardised accessories used in charging systems where the use of such accessories constructed to the requirements of other standards is permitted (e.g. in mode 1 and mode 2)~~ standard plug and socket-outlets used for mode 1 and mode 2 according to IEC 61851-1:2017, 6.2. ~~Such standardized accessories may be used for those situations (mode and case) identified in IEC 61851-1.~~

NOTE 4 In the following countries, mode 1 ~~will not be~~ is not allowed: UK, US, CA, SG.

~~This part of IEC 62196 may be used as a guide for accessories with a lesser number of contacts and lower ratings for use with light duty vehicles.~~

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 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60112, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60227 (all parts), *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

IEC 60228:2004, *Conductors of insulated cables*

IEC 60245-4, *Rubber insulated cables – Rated voltages up to and including 450/750 V – Part 4: Cords and flexible cables*

IEC 60269-1, *Low-voltage fuses – Part 1: General requirements*

IEC 60269-2, *Low-voltage fuses – Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) – Examples of standardized systems of fuses A to K*

IEC 60309-4:2006/2021, *Plugs, fixed or portable socket-outlets and ~~couplers~~ appliance inlets for industrial purposes – Part 4: Switched socket-outlets ~~and connectors~~ with or without interlock*

~~IEC 60449, Voltage bands for electrical installations of buildings~~

IEC 60529:1989, *Degrees of protection provided by enclosures (IP code)*

IEC 60529:1989/AMD1:1999

IEC 60529:1989/AMD2:2013

IEC 60664-1:2007/2020, *Insulation coordination for equipment within low-voltage supply systems – Part 1: Principles, requirements and tests*

IEC 60664-3, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60695-2-11, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products (GWEPT)*

IEC 60695-10-2, *Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test method*

IEC 60947-3:2020, *Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units*

IEC 60947-5-1, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices*

IEC 61032:1997, *Protection of persons and equipment by enclosures – Probes for verification*

IEC 61058-1:2016, *Switches for appliances – Part 1: General requirements*

IEC 61851-1:~~2010~~2017, *Electric vehicle conductive charging system – Part 1: General requirements*

IEC 61851-23:~~2014~~³, *Electric vehicle conductive charging system – Part 23: DC electric vehicle ~~charging station~~ supply equipment*

IEC 62196-2:2022, *Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 2: Dimensional compatibility requirements for AC pin and contact-tube accessories*

IEC 62196-3:2022, *Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 3: Dimensional compatibility requirements for DC and AC/DC pin and contact-tube vehicle couplers*

ISO 1456, *Metallic and other inorganic coatings – Electrodeposited coatings of nickel, nickel plus chromium, copper plus nickel and of copper plus nickel plus chromium*

ISO 2081, *Metallic and other inorganic coatings – Electroplated coatings of zinc with supplementary treatments on iron or steel*

ISO 2093, *Electroplated coatings of tin – Specification and test methods*

ISO 4521:2008, *Metallic and other inorganic coatings – Electrodeposited silver and silver alloy coatings for engineering purposes – Specification and test methods*

³ Second edition under preparation. Stage at the time of publication: IEC PRVC 61851-23:2022.

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles –
Part 1: General requirements**

**Fiches, socles de prise de courant, prises mobiles de véhicule et socles de connecteurs de véhicule – Charge conductive des véhicules électriques –
Partie 1: Exigences générales**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PLUGS, SOCKET-OUTLETS, VEHICLE CONNECTORS AND VEHICLE INLETS – CONDUCTIVE CHARGING OF ELECTRIC VEHICLES –

Part 1: General requirements

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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IEC 62196-1 has been prepared by subcommittee 23H: Plugs, socket-outlets and couplers for industrial and similar applications, and for electric vehicles, of IEC technical committee 23: Electrical accessories. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2014. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) deletion of references to universal AC and DC interfaces;
- b) additional requirements for contact materials and plating;
- c) changes to the temperature rise test to include additional points of measurement;
- d) additional tests for accessories to address thermal stresses and stability, mechanical wear and abuse, and exposure to contaminants;

e) relocation of information and requirements for DC charging to IEC 62196-3.

The text of this International Standard is based on the following documents:

Draft	Report on voting
23H/499/FDIS	23H/503/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 62196 series, published under the general title *Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles*, can be found on the IEC website.

Subsequent parts of IEC 62196 deal with the requirements of particular types of accessories. The clauses of those particular requirements supplement or modify the corresponding clauses in this document.

In this document, the following print types are used:

- requirements proper: in roman type;
- *test specifications: in italic type;*
- notes: in smaller roman type.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

<p>IMPORTANT – The "colour inside" logo on the cover page of this document 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.</p>
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INTRODUCTION

IEC 61851 (all parts) specifies requirements for electric vehicle (EV) conductive charging systems.

IEC 62196 (all parts) specifies the requirements for plugs, socket-outlets, vehicle connectors, vehicle inlets and cable assemblies as described in the IEC 61851 series.

Some charging can be achieved by direct connection from an electric vehicle to standard socket-outlets connected to a supply network (mains or electrical grid).

Some modes of charging require a dedicated supply and charging equipment incorporating control and communication circuits.

IEC 62196 (all parts) covers the mechanical, electrical and performance requirements for plugs, socket-outlets, vehicle connectors and vehicle inlets for the connection between the EV supply equipment and the electric vehicle.

The IEC 62196 series consists of the following parts:

- Part 1: General requirements, comprising clauses of a general character.
- Part 2: Dimensional compatibility and interchangeability requirements for AC pin and contact-tube accessories.
- Part 3: Dimensional compatibility and interchangeability requirements for DC and AC/DC pin and contact-tube vehicle couplers.
- Part 3-1: Vehicle connector, vehicle inlet and cable assembly intended to be used with a thermal management system for DC charging.
- Part 4¹: Dimensional compatibility and interchangeability requirements for DC pin and contact-tube accessories for Class II or Class III applications.
- Part 6: Dimensional compatibility and interchangeability requirements for DC pin and contact-tube couplers for applications using a system of protective electrical separation.

¹ Pending publication.

PLUGS, SOCKET-OUTLETS, VEHICLE CONNECTORS AND VEHICLE INLETS – CONDUCTIVE CHARGING OF ELECTRIC VEHICLES –

Part 1: General requirements

1 Scope

This part of IEC 62196 is applicable to EV plugs, EV socket-outlets, vehicle connectors, vehicle inlets, herein referred to as "accessories", and to cable assemblies for electric vehicles (EV) intended for use in conductive charging systems which incorporate control means, with a rated operating voltage not exceeding:

- 690 V AC 50 Hz to 60 Hz, at a rated current not exceeding 250 A;
- 1 500 V DC at a rated current not exceeding 800 A.

These accessories and cable assemblies are intended to be installed by instructed persons (IEV 195-04-02) or skilled persons (IEV 195-04-01) only.

These accessories and cable assemblies are intended to be used for circuits specified in IEC 61851 (all parts), which operate at different voltages and frequencies, and which can include extra-low voltage and communication signals.

These accessories and cable assemblies are intended to be used at an ambient temperature between -30 °C and $+40\text{ °C}$.

NOTE 1 In some countries, other requirements can apply.

NOTE 2 In the following country, -35 °C applies: SE.

NOTE 3 The manufacturer can enlarge the temperature range on the condition that the specified range information is provided.

These accessories are intended to be connected only to cables with copper or copper-alloy conductors.

The accessories covered by this document are intended for use in electric vehicle supply equipment in accordance with IEC 61851 (all parts).

This document does not apply to standard plug and socket-outlets used for mode 1 and mode 2 according to IEC 61851-1:2017, 6.2.

NOTE 4 In the following countries, mode 1 is not allowed: UK, US, CA, SG.

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 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60112, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60227 (all parts), *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

IEC 60228:2004, *Conductors of insulated cables*

IEC 60245-4, *Rubber insulated cables – Rated voltages up to and including 450/750 V – Part 4: Cords and flexible cables*

IEC 60269-1, *Low-voltage fuses – Part 1: General requirements*

IEC 60269-2, *Low-voltage fuses – Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) – Examples of standardized systems of fuses A to K*

IEC 60309-4:2021, *Plugs, fixed or portable socket-outlets and appliance inlets for industrial purposes – Part 4: Switched socket-outlets with or without interlock*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP code)*

IEC 60529:1989/AMD1:1999

IEC 60529:1989/AMD2:2013

IEC 60664-1:2020, *Insulation coordination for equipment within low-voltage supply systems – Part 1: Principles, requirements and tests*

IEC 60664-3, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60695-2-11, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products (GWEPT)*

IEC 60695-10-2, *Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test method*

IEC 60947-3:2020, *Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units*

IEC 60947-5-1, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices*

IEC 61032:1997, *Protection of persons and equipment by enclosures – Probes for verification*

IEC 61058-1:2016, *Switches for appliances – Part 1: General requirements*

IEC 61851-1:2017, *Electric vehicle conductive charging system – Part 1: General requirements*

IEC 61851-23:—², *Electric vehicle conductive charging system – Part 23: DC electric vehicle supply equipment*

² Second edition under preparation. Stage at the time of publication: IEC PRVC 61851-23:2022.

IEC 62196-2:2022, *Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 2: Dimensional compatibility requirements for AC pin and contact-tube accessories*

IEC 62196-3:2022, *Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 3: Dimensional compatibility requirements for DC and AC/DC pin and contact-tube vehicle couplers*

ISO 1456, *Metallic and other inorganic coatings – Electrodeposited coatings of nickel, nickel plus chromium, copper plus nickel and of copper plus nickel plus chromium*

ISO 2081, *Metallic and other inorganic coatings – Electroplated coatings of zinc with supplementary treatments on iron or steel*

ISO 2093, *Electroplated coatings of tin – Specification and test methods*

ISO 4521:2008, *Metallic and other inorganic coatings – Electrodeposited silver and silver alloy coatings for engineering purposes – Specification and test methods*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

FICHES, SOCLES DE PRISE DE COURANT, PRISES MOBILES DE VÉHICULE ET SOCLES DE CONNECTEURS DE VÉHICULE – CHARGE CONDUCTIVE DES VÉHICULES ÉLECTRIQUES –

Partie 1: Exigences générales

AVANT-PROPOS

- 1) La Commission Electrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. À cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
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- 8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
- 9) L'attention est attirée sur le fait que certains des éléments de la présente publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets.

L'IEC 62196-1 a été établie par le sous-comité 23H: Prises de courant pour usages industriels et analogues, et pour Véhicules Électriques, du comité d'études 23 de l'IEC: Petit appareillage. Il s'agit d'une Norme internationale.

Cette quatrième édition annule et remplace la troisième édition parue en 2014. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) suppression des références aux interfaces universelles en courant alternatif et en courant continu;

- b) exigences supplémentaires pour les matériaux de contact et la métallisation;
- c) modification de l'essai d'échauffement pour inclure des points de mesure supplémentaires;
- d) essais supplémentaires pour examiner les contraintes et la stabilité thermique, l'usure mécanique et une mauvaise utilisation des appareils, ainsi que leur exposition à des contaminants;
- e) déplacement des informations et exigences concernant la charge en courant continu dans l'IEC 62196-3.

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
23H/499/FDIS	23H/503/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La version française de la norme n'a pas été soumise au vote.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Le présent document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/standardsdev/publications.

Une liste de toutes les parties de la série IEC 62196, publiées sous le titre général *Fiches, socles de prise de courant, prises mobiles de véhicule et socles de connecteurs de véhicule – Charge conductive des véhicules électriques*, se trouve sur le site web de l'IEC.

Les parties suivantes de l'IEC 62196 traitent des exigences de types particuliers d'appareils. Les articles correspondant à ces exigences particulières représentent des compléments ou modifications aux articles correspondants du présent document.

Dans le présent document, les caractères d'imprimerie suivants sont utilisés:

- exigences: caractères romains;
- *modalités d'essai: caractères italiques;*
- notes: petits caractères romains.

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IMPORTANT – Le logo "colour inside" qui se trouve sur la page de couverture de ce document indique qu'elle contient des couleurs qui sont considérées comme utiles à une bonne compréhension de son contenu. Les utilisateurs devraient, par conséquent, imprimer cette publication en utilisant une imprimante couleur.

INTRODUCTION

La série IEC 61851 (toutes les parties) spécifie les exigences relatives aux systèmes de charge conductive pour véhicules électriques (VE).

La série IEC 62196 (toutes les parties) spécifie les exigences relatives aux fiches, socles de prise de courant, prises mobiles de véhicule, socles de connecteurs de véhicule et câbles de charge, qui sont décrits dans la série IEC 61851.

Certaines charges peuvent être réalisées par le raccordement direct d'un véhicule électrique aux socles de prise de courant normalisés raccordés à un réseau d'alimentation (réseau ou réseau électrique).

Certains modes de charge exigent une alimentation dédiée et des équipements de charge incorporant des circuits de contrôle et de communication.

La série IEC 62196 (toutes les parties) couvre les exigences mécaniques, électriques et de performances relatives aux fiches, socles de prise de courant, prises mobiles de véhicule et socles de connecteurs de véhicule pour la connexion entre des équipements d'alimentation pour VE et les véhicules électriques.

La série IEC 62196 est constituée des parties suivantes:

- partie 1: Exigences générales, qui comprend les articles de caractère général;
- partie 2: Exigences dimensionnelles de compatibilité pour les appareils à broches et alvéoles pour courant alternatif;
- partie 3: Exigences dimensionnelles de compatibilité pour les connecteurs de véhicule à broches et alvéoles pour courant continu et pour courants alternatif et continu;
- partie 3-1: Prise mobile de véhicule, socle de connecteur de véhicule et câble de charge prévus pour une utilisation avec un système de gestion thermique pour une charge en courant continu;
- partie 4¹: Exigences dimensionnelles de compatibilité et d'interchangeabilité pour les appareils à broches et alvéoles en courant continu pour les applications de classe II ou de classe III;
- partie 6: Exigences dimensionnelles de compatibilité et d'interchangeabilité pour les prises de courant de véhicules à broches et alvéoles en courant continu destinées aux applications utilisant un système de séparation électrique de protection.

¹ Publication à venir.

FICHES, SOCLES DE PRISE DE COURANT, PRISES MOBILES DE VÉHICULE ET SOCLES DE CONNECTEURS DE VÉHICULE – CHARGE CONDUCTIVE DES VÉHICULES ÉLECTRIQUES –

Partie 1: Exigences générales

1 Domaine d'application

La présente partie de l'IEC 62196 s'applique aux fiches VE, socles de prise de courant VE, prises mobiles de véhicule, socles de connecteur de véhicules, ci-après désignés par le terme "appareils", et aux câbles de charge pour véhicules électriques (VE) destinés à être utilisés dans les systèmes de charge conductive qui comprennent des moyens de contrôle, avec une tension assignée d'emploi n'excédant pas:

- 690 V 50 Hz à 60 Hz, à un courant alternatif assigné n'excédant pas 250 A;
- 1 500 V, à un courant continu assigné n'excédant pas 800 A.

Ces appareils et câbles de charge sont prévus pour être installés exclusivement par des personnes averties (IEV 195-04-02) ou des personnes qualifiées (IEV 195-04-01).

Ces appareils et câbles de charge sont prévus pour être utilisés dans les circuits spécifiés dans la série IEC 61851 (toutes les parties), qui fonctionnent à différentes tensions et fréquences, et qui peuvent inclure des signaux très basse tension et des signaux de communication.

Ces appareils et câbles de charge sont destinés pour une utilisation à une température ambiante comprise entre -30 °C et $+40\text{ °C}$.

NOTE 1 Dans certains pays, d'autres exigences peuvent s'appliquer.

NOTE 2 Dans le pays suivant, la température de -35 °C s'applique: SE.

NOTE 3 Le fabricant peut élargir la plage de températures à condition de fournir des informations sur la plage spécifiée.

Ces appareils sont destinés à être connectés uniquement à des câbles ayant des conducteurs en cuivre ou en alliage de cuivre.

Les appareils couverts par le présent document sont destinés à une utilisation au sein d'un système d'alimentation pour véhicule électrique conformément à la série IEC 61851 (toutes les parties).

Le présent document ne s'applique pas aux prises de courant normalisées utilisées pour les modes 1 et 2 conformément à l'IEC 61851-1:2017, 6.2.

NOTE 4 Dans les pays suivants, le mode 1 n'est pas permis: UK, US, CA, SG.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60068-2-14, *Essais d'environnement – Partie 2-14: Essais – Essai N: Variation de température*

IEC 60068-2-30, *Essais d'environnement – Partie 2-30: Essais – Essai Db: Essai cyclique de chaleur humide (cycle de 12 h + 12 h)*

IEC 60112, *Méthode de détermination des indices de résistance et de tenue au cheminement des matériaux isolants solides*

IEC 60227 (toutes les parties), *Conducteurs et câbles isolés au polychlorure de vinyle, de tension nominale au plus égale à 450/750 V*

IEC 60228:2004, *Ames des câbles isolés*

IEC 60245-4, *Conducteurs et câbles isolés au caoutchouc – Tension assignée au plus égale à 450/750 V – Partie 4: Câbles souples*

IEC 60269-1, *Fusibles basse tension – Partie 1: Exigences générales*

IEC 60269-2, *Fusibles basse tension – Partie 2: Exigences supplémentaires pour les fusibles destinés à être utilisés par des personnes habilitées (fusibles pour usages essentiellement industriels) – Exemples de systèmes de fusibles normalisés A à K*

IEC 60309-4:2021, *Fiches, socles fixes de prise de courant, prises mobiles et socles de connecteur pour usages industriels – Partie 4: Socles de prise de courant avec interrupteur, avec ou sans dispositif de verrouillage*

IEC 60529:1989, *Degrés de protection procurés par les enveloppes (Code IP)*

IEC 60529:1989/AMD1:1999

IEC 60529:1989/AMD2:2013

IEC 60664-1:2020, *Coordination de l'isolement des matériels dans les réseaux d'énergie électrique à basse tension – Partie 1: Principes, exigences et essais*

IEC 60664-3, *Coordination de l'isolement des matériels dans les systèmes (réseaux) à basse tension – Partie 3: Utilisation de revêtement, d'empotage ou de moulage pour la protection contre la pollution*

IEC 60695-2-11, *Essais relatifs aux risques du feu – Partie 2-11: Essais au fil incandescent/chauffant – Méthode d'essai d'inflammabilité pour produits finis (GWEPT)*

IEC 60695-10-2, *Essais relatifs aux risques du feu – Partie 10-2: Chaleurs anormales – Essai à la bille*

IEC 60947-3:2020, *Appareillage à basse tension – Partie 3: Interrupteurs, sectionneurs, interrupteurs-sectionneurs et combinés-fusibles*

IEC 60947-5-1, *Appareillage à basse tension – Partie 5-1: Appareils et éléments de commutation pour circuits de commande – Appareils électromécaniques pour circuits de commande*

IEC 61032:1997, *Protection des personnes et des matériels par les enveloppes – Calibres d'essai pour la vérification*

IEC 61058-1:2016, *Interrupteurs pour appareils – Partie 1: Exigences générales*

IEC 61851-1:2017, *Système de charge conductive pour véhicules électriques – Partie 1: Exigences générales*

IEC 61851-23:—², *Système de charge conductive pour véhicules électriques – Partie 23: Borne de charge en courant continu pour véhicules électriques*

IEC 62196-2:2022, *Fiches, socles de prise de courant, prises mobiles et socles de connecteurs de véhicule – Charge conductive des véhicules électriques – Partie 2: Exigences dimensionnelles de compatibilité pour les appareils à broches et alvéoles pour courant alternatif*

IEC 62196-3:2022, *Fiches, socles de prise de courant, prises mobiles de véhicule et socles de connecteur de véhicule – Charge conductive des véhicules électriques – Partie 3: Exigences dimensionnelles de compatibilité pour les connecteurs de véhicule à broches et alvéoles pour courant continu et pour courants alternatif et continu*

ISO 1456, *Revêtements métalliques et autres revêtements inorganiques – Dépôts électrolytiques de nickel, de nickel plus chrome, de cuivre plus nickel et de cuivre plus nickel plus chrome*

ISO 2081, *Revêtements métalliques et autres revêtements inorganiques – Dépôts électrolytiques de zinc avec traitements supplémentaires sur fer ou acier*

ISO 2093, *Dépôts électrolytiques d'étain – Spécifications et méthodes d'essai*

ISO 4521:2008, *Revêtements métalliques et autres revêtements inorganiques – Dépôts électrolytiques d'argent et d'alliages d'argent pour applications industrielles – Spécifications et méthodes d'essai*

² Seconde édition en cours d'établissement. Stade au moment de la publication: IEC PRVC 61851-23:2022.