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**Hybrid-electric road vehicles —  
Exhaust emissions and fuel  
consumption measurements —**

**Part 2:  
Externally chargeable vehicles**

*Véhicules routiers électriques hybrides — Mesurages des émissions à  
l'échappement et de la consommation de carburant —*

*Partie 2: Véhicules rechargeables par des moyens externes*



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## 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](http://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](http://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](http://www.iso.org/iso/foreword.html).

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

This second edition cancels and replaces the first edition (ISO 23274-2:2012), which has been technically revised.

The main changes compared to the previous edition are as follows:

- deletion of former Annexes A, B and C (regional tests) because their information is obsolete;
- harmonization of terms and definitions with ISO/TR 8713 and ISO 23274-1.

A list of all parts in the ISO 23274 series can be found on the ISO website.

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](http://www.iso.org/members.html).

# Hybrid-electric road vehicles — Exhaust emissions and fuel consumption measurements —

## Part 2: Externally chargeable vehicles

### 1 Scope

This document specifies a chassis dynamometer test procedure to determine the end of the charge-depleting state (CD) and consumed electric energy during CD state.

The identification of the end of the CD state is an important step for procedures to determine exhaust emissions and fuel consumption. Final determination of exhaust emissions and fuel consumption is not included in this document.

This document applies to vehicles with the following characteristics.

- The vehicles are hybrid-electric road vehicles (HEV) with an internal combustion engine (ICE) and an on-board rechargeable energy storage system (RESS) for vehicle propulsion which is supplied with electric energy from an external electric power source.
- A CD state, in which the electric energy in the RESS from an external electric power source is consumed, is followed by a charge-sustaining (CS) state in which the fuel energy is consumed sustaining the electric energy of the RESS.
- Only batteries are assumed as the RESS of a vehicle.
- The RESS is not charged while driving unless by regenerative braking and/or by generative operation driven via the ICE.
- External charge for the purpose of conditioning of the RESS is not included.

NOTE 1 Trolleybuses and solar powered vehicles are not included in the scope.

- The vehicle is classified as a passenger car or light duty truck, as defined in the relevant regional applicable driving test (ADT) standard.
- For the ICE, only liquid fuels (for example, gasoline and diesel fuel) are used.

NOTE 2 In the case of vehicles with ICE using other fuel [for example, compressed natural gas (CNG), hydrogen (H<sub>2</sub>)], this document can apply except the measurement of consumed fuel; otherwise the measurement method for those using the corresponding fuel can apply.

- The nominal energy of the RESS is at least 2 % of the total energy of consumed fuel over an ADT

### 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/TR 8713, *Electrically propelled road vehicles — Vocabulary*

ISO 23274-1, *Hybrid-electric road vehicles — Exhaust emissions and fuel consumption measurements — Part 1: Non-externally chargeable vehicles*