



SLOVENSKI STANDARD
SIST EN 1821-2:2000
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Electrically propelled road vehicles - Measurement of road operating ability - Part 2: Thermal electric hybrid vehicles

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Elektrisch angetriebene Straßenfahrzeuge - Meßverfahren für Fahreigenschaften - Teil 2: Hybride Elektrofahrzeuge mit einem Verbrennungsmotor

Véhicules routiers a propulsion électrique - Mesurage des capacités routieres - Partie 2: Véhicules hybrides électriques thermiques

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Electrically propelled road vehicles - Measurement of road operating ability - Part 2: Thermal electric hybrid vehicles

Véhicules routiers à propulsion électrique - Mesurage des capacités routières - Partie 2: Véhicules hybrides électriques thermiques

Elektrisch angetriebene Straßenfahrzeuge - Meßverfahren für Fahreigenschaften - Teil 2: Hybride Elektrofahrzeuge mit einem Verbrennungsmotor

This European Standard was approved by CEN on 20 February 1999.

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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 Central Secretariat has the same status as the official versions.

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

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 301 "Electrically propelled 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of an identical text or by endorsement, at the latest by September 1999, and conflicting national standards shall be withdrawn at the latest by September 1999.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

The European Standard prEN 1821 applies to measurement of road operating ability of electrically propelled road vehicles and comprises the following parts :

- Part 1 : Pure electric vehicles ;
- Part 2 : Thermal electric hybrid vehicles ;
- Part 3 : Other electric hybrid vehicles than those fitted with a thermal machine.

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1 Scope

This standard specifies the principles, conditions and procedures of the test methods to measure the road performances of the partially electrically propelled road vehicles (Hybrid vehicles).

This standard is applicable to the concept of road performances which comprises the notions of speed, acceleration, hill climbing ability.

This standard applies to the international categories of vehicles M_1 , M_2 , M_3 , N_1 , N_2 , N_3 ¹⁾, and to motor tricycles and quadricycles²⁾ from the motorcycles types.

This standard does not apply to pure electric propelled road vehicles.

2 Normative reference

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 1821-1	1996	Electrically propelled road vehicles – Measurement of road operating ability – Part 1 : Pure electric vehicles
ISO 1176	1990	Road vehicles - Masses - Vocabulary and codes.

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3 Definitions

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For the purpose of this European Standard, the definitions from EN xxxx the following ones apply:

3.1 complete vehicle kerb mass VKM

The definition of ISO-M06 in accordance with ISO 1176 applies.

NOTE The complete vehicle kerb mass VKM includes, in addition to the definition of ISO 1176, the traction battery, on board charger, portable charger or part of it if provided as standard by the manufacturer of the vehicle.

3.2 maximum design total mass MTM

The definition of ISO-M07 in accordance with ISO 1176 applies.

NOTE The maximum design total mass MTM is defined by the vehicle manufacturer.

3.3 test mass

The test mass of the vehicle is the complete vehicle kerb mass plus:

- the total pay load if the pay load including driver is less than 180 kg ;

¹⁾ Categories of vehicles M_1 , M_2 , M_3 , N_1 , N_2 and N_3 are defined in Directive 92/53/EEC.

²⁾ Motor tricycles and quadricycles categories are defined in Directive 92/61/EEC.

- 180 kg if the pay load including driver is greater than 180 kg but less than 360 kg ;
- half the pay load including driver if the pay load is greater than 360 kg.

3.4 thermal electric hybrid vehicle

A thermal electric hybrid vehicle is an electric hybrid in which the additional other kind of energy source includes a thermal engine (i.e. Internal combustion engine, gas engine).

3.5 hybrid mode (for an electric hybrid vehicle)

An hybrid mode for an electric hybrid vehicle is an other driving mode than the pure electric mode or the pure thermal mode. All the on board energy sources are available to participate to the propulsion of the vehicle, according to the management system logic.

3.6 pure thermal mode

The pure thermal mode for a thermal electric hybrid vehicle is the driving mode when only the additional other kind of on board energy source (including the thermal engine) delivers energy for traction purpose. In this case, the on board secondary electric energy source is disconnected.

3.7 pure electric mode

A pure electric mode is the driving mode when only the secondary on board electric energy source delivers energy for traction purpose.

For definitions of primary or secondary on board electric energy source, see 3.8 and 3.9.

3.8 On board energy source

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An on board energy source is a system which delivers energy (electric or other) for traction purpose. It includes an on board energy storage, an energy delivery system and any ancillary devices. The energy storage can be fed from the outside of the vehicle.

EXAMPLE 1 For a pure electric vehicle, the on board energy source can be made of :

- for the storage : an electrochemical storage battery ;
- for the energy delivery system : cables ;
- for the ancillary devices : thermal management of the battery, on board charger, protection devices.

EXAMPLE 2 For a series thermal electric hybrid vehicle, the additional other kind of on board energy source can be made of :

- for the storage : a petrol tank ;
- for the energy delivery system : a generating set including an IC engine plus an alternator and a rectifier ;
- for the ancillary devices : electronic controllers and a cooling system.

EXAMPLE 3 For a parallel thermal electric hybrid vehicle, the additional other kind of on board energy source can be made of :

- for the storage : a petrol tank ;
- for the energy delivery system : an IC engine ;

- for the ancillary devices : electronic controllers and a cooling system.

3.9 on board primary electric energy source

An on board primary electric energy source is a system which stores energy and delivers electric energy in an unreversible process.

EXAMPLE 1 Fuel cell, the fuel for which may be fluid and gaseous (oxygen and air), and the output is electric power and associated reaction elements.

EXAMPLE 2 Generating set, the fuel for which may be liquid or gaseous, stored in a tank plus a thermal machine, electric generator(s), and the output is electric power.

3.10 maximum speed in hybrid mode

The maximum speed is the highest average value of the speed, which the vehicle can maintain in hybrid mode over a distance of 1 km according to the procedure described in 9.1.

3.11 maximum speed in pure electric mode

The maximum speed is the highest average value of the speed, which the vehicle in pure electric mode can maintain over a distance of 1 km according to the procedure described in 9.2.

3.12 acceleration 0 km/h to 100 km/h

The acceleration 0 km/h to 100 km/h is the shortest time required to accelerate the vehicle in hybrid mode from 0 km/h to 100 km/h according to the procedure described in 9.3.

3.13 acceleration 0 km/h to 50 km/h in pure electric mode

The acceleration 0 km/h to 50 km/h in pure electric mode is the shortest time required to accelerate the vehicle in pure electric mode from 0 km/h to 50 km/h according to the procedure described in 9.4.

3.14 speed uphill in pure electric mode

The speed uphill in pure electric mode is the maximum speed which the vehicle can maintain in pure electric mode at a given slope (4 %) over a distance of 1 km according to the procedure described in 9.5.

3.15 speed uphill in hybrid mode

The speed uphill in hybrid mode is the maximum speed which the vehicle can maintain in hybrid mode at a given slope (4 %) over a distance of 1 km according to the procedure described in 9.6.

3.16 maximum thirty minute speed in hybrid mode

The maximum thirty minute speed is the highest average value which the vehicle can maintain in hybrid mode for thirty minutes according to the procedure described in 9.7.

3.17 hill starting ability in pure electric mode

The hill starting ability in pure electric mode is the maximum slope on which the vehicle can start and run in pure electric mode over a distance of at least 10 m according to the principle and procedure described in 9.8.

3.18 hill starting ability in hybrid mode

The hill starting ability in hybrid mode is the maximum slope on which the vehicle can start and run in hybrid mode over a distance of at least 10 m according to the procedure described in 9.9.

3.19 dynamic loaded radius of a tyre

The effective radius of a tyre when it is deformed by the weight of the vehicle ballasted to its test mass³⁾.

4 Principle

In accordance with the test conditions and procedures defined in this standard, the execution of the test sequence defined in clause 8 permits measurement of the following road performances:

a) in hybrid mode :

- maximum speed,
- acceleration 0 km/h to 100 km/h,
- maximum thirty minute speed,
- speed uphill,
- hill starting ability.

NOTE If several driving modes are available - including a pure thermal mode - the one to give the best measured performance (for each single feature) can be selected. In that case it shall be mentioned in the test report.

b) in pure electric mode :

- maximum speed,
- acceleration 0 km/h to 50 km/h,
- speed uphill,
- hill starting ability.

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5 Parameters, units and tolerance of measurements

Table 1 defines parameters, units and tolerances of measurements.

Table 1

Parameter	Unit	Tolerance
Time	s	± 0,1 s
Distance (on board measurement)	m	± 0,5 %
Distance (off board measurement)	m	± 0,1 %
Temperature	°C	± 1 °C
Air pressure	kPa	± 1 kPa
Speed	km/h	± 1 % or ± 0,1 km/h, whichever is the greater
Mass	kg	± 0,5 %

³⁾ See the definition in Directive 92/23/EEC.