
Road vehicles — Road load —

**Part 1:
Determination under reference
atmospheric conditions**

Véhicules routiers — Résistance sur route —

*Partie 1: Détermination dans les conditions atmosphériques de
référence*



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 10521-1 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 5, *Engine tests*.

This first edition, together with ISO 10521-2, cancels and replaces ISO 10521:1992, which has been technically revised.

ISO 10521 consists of the following parts, under the general title *Road vehicles — Road load*:

- *Part 1: Determination under reference atmospheric conditions*
- *Part 2: Reproduction on chassis dynamometer*

Introduction

It is known that wind gives much influence to vehicle road-load measurement on test roads. Therefore, no international standards or national standards/regulations allowed conducting on-road tests under windy (e.g. 3 m/s or more) conditions in terms of measurement accuracy. In this standard, wind effect correction methodology is newly introduced into the conventional coastdown method and torquemeter method, and it offers wider (up to wind speed of 10 m/s) opportunity of on-road tests. In addition, more realistic road load can be simulated even under lower wind conditions.

This part of ISO 10521 also adopts the off-road road-load measurement method as the comparable alternative. The method is based on the separation of the total road load into two components, aerodynamic drag and rolling resistance, where the former is measured in a wind tunnel and the latter with a chassis dynamometer. This alternative enables the standard users to carry out road-load measurement regardless of atmospheric conditions or other requirements necessary for the on-road test. It is not the scope of this standard to define all requirements of wind-tunnel design or test practice. Nevertheless, the standard users are encouraged to conduct the measurement with state-of-the-art wind-tunnel technologies and to respect the highest quality management standards such as ISO 17025, so as to secure the measurement reliability and repeatability.

In view of accessibility of the standard, International Standard ISO 10521 is divided into two parts in this second edition in order to provide two separate standards for the two different technical aspects, determination of road load and reproduction of road load on chassis dynamometer.

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Road vehicles — Road load —

Part 1:

Determination under reference atmospheric conditions

1 Scope

This part of ISO 10521 specifies methods of determining the road load of road vehicles for subsequent test purposes, for example, fuel consumption tests or exhaust emission measurements. This determines the road load of a vehicle running on a level road under reference atmospheric conditions. It is achieved by either the coastdown method, the torque-meter method or the wind-tunnel/chassis-dynamometer method.

This part of ISO 10521 is applicable to motor vehicles, as defined in ISO 3833, up to a gross vehicle mass of 3 500 kg.

2 Normative references

The following referenced documents are indispensable for the application 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 3833, *Road vehicles — Types — Terms and definitions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3833 and the following apply.

3.1

total resistance

total force-resisting movement of a vehicle, measured either by the coastdown method or by the wind-tunnel/chassis-dynamometer method, including the friction forces in the drive-train

3.2

running resistance

torque-resisting movement of a vehicle, measured by the torque-meter installed in the drive-train of a vehicle, including the friction torque in the drive-train downstream of the torque-meter

3.3

road load

general meaning of the force or torque which opposes the movement of a vehicle, including total resistance and/or running resistance

3.4

aerodynamic drag

resistance of the air to the motion of a vehicle