
**Internal combustion engines —
Determination and method for the
measurement of engine power —
General requirements**

*Moteurs à combustion interne — Détermination et méthode de
mesure de la puissance du moteur — Exigences générales*

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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).

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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 70, *Internal combustion engines*.

This second edition cancels and replaces the first edition (ISO 15550:2002), of which it constitutes a minor revision.

Introduction

This document establishes the framework for ISO engine power measurement standards. By applying this framework, the disadvantages of the existence of many similar, but different, ISO standards for the definition and determination of engine power can be avoided.

This framework uses the “Core” and “Satellite” approach. The “Core” standard contains the requirements that are common to all engine applications described in the scope and the “Satellite” standard contains those requirements that are necessary to tailor power measurement and declaration to suit a particular engine application.

This document is only applicable in conjunction with a particular “Satellite” standard in order to completely specify the requirements for the particular engine application. The “Core” standard, therefore, is not a document that can stand alone, but only represents addenda to a particular “Satellite” standard used to create a complete standard together with the said “Satellite” standard.

The advantage of this approach is that the use of standards for the same or similar engines used in different applications will be rationalized and the harmonization of standards in the course of revision or development will be ensured.

This document is the “Core” standard.

This document was prepared in order to serve as the “Core” standard for making engine power measurements. It was drafted in close co-operation with technical committees ISO/TC 22 *Road vehicles*, ISO/TC 23 *Machinery for forestry and agriculture*, ISO/TC 127 *Earth moving machinery* and ISO/TC 188 *Small craft*. The prerequisite for any future modification of this document will be the formal approval of all the above technical committees. Together with the “Satellite” standard for each engine application, the “Core” standard serves as the basis for engine power declaration and measurement. Each technical committee is fully responsible for the administration of its own “Satellite” standard(s).

Any further requirements are subject to agreement between the manufacturer and customer.

Internal combustion engines — Determination and method for the measurement of engine power — General requirements

1 Scope

1.1 This document specifies standard reference conditions and methods of declaring the power, fuel consumption, lubricating oil consumption and test methods for internal combustion engines in commercial production using liquid or gaseous fuels. It is applicable to the following:

- a) reciprocating internal combustion (RIC) engines (spark-ignition or compression-ignition engines) but excluding free piston engines;
- b) rotary piston engines.

These engines can be naturally aspirated or pressure-charged either using a mechanical pressure-charger or turbocharger.

1.2 This document is applicable to engines used for the following:

- a) land, rail-traction and marine use as defined in ISO 3046-1;
- b) the propulsion of automotive vehicles as defined in ISO 1585 and ISO 2534;
- c) motorcycles as defined in ISO 4106;
- d) the propulsion of agricultural tractors and machines
- e) the propulsion of earth-moving machinery as defined in ISO 9249;
- f) the propulsion of recreational craft or other small marine craft up to 24 m hull length as defined in ISO 8665.

This document can be applied to engines used to propel road construction machines, industrial trucks and for other applications where no suitable International Standard for these engines exists.

It also can be applied to tests performed both on a test bed at a manufacturer's works as well as on site.

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 2710-1, *Reciprocating internal combustion engines — Vocabulary — Part 1: Terms for engine design and operation*

ISO 3046-4, *Reciprocating internal combustion engines — Performance — Part 4: Speed governing*

ISO 3046-5, *Reciprocating internal combustion engines — Performance — Part 5: Torsional vibrations*

ISO 3046-6, *Reciprocating internal combustion engines — Performance — Part 6: Overspeed protection*

ISO 3104, *Petroleum products — Transparent and opaque liquids — Determination of kinematic viscosity and calculation of dynamic viscosity*

ISO 15550:2016(E)

ISO 3675, *Crude petroleum and liquid petroleum products — Laboratory determination of density — Hydrometer method*

ISO 5163, *Petroleum products — Determination of knock characteristics of motor and aviation fuels — Motor method*

ISO 5164, *Petroleum products — Determination of knock characteristics of motor fuels — Research method*

ISO 5165, *Petroleum products — Determination of the ignition quality of diesel fuels — Cetane engine method*

ISO 11614, *Reciprocating internal combustion compression-ignition engines — Apparatus for measurement of the opacity and for determination of the light absorption coefficient of exhaust gas*

ASTM D 240, *Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter*

ASTM D 3338/D 3338M, *Standard Test Method for Estimation of Net Heat of Combustion of Aviation Fuels*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 2710-1, ISO 3046-4, ISO 7876-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

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

3.1 Auxiliaries and equipment

3.1.1

dependant auxiliary

item of equipment, the presence or absence of which affects the final shaft power output of the engine

3.1.2

independent auxiliary

item of equipment that uses power supplied from a source other than the engine

3.1.3

essential auxiliary

item of equipment that is essential for the continued or repeated operation of the engine

3.1.4

non-essential auxiliary

item of equipment that is not essential for the continued or repeated operation of the engine

3.1.5

standard production equipment

SPE

equipment specified by the manufacturer for a particular engine application that is fitted as standard to the engine