



**International  
Standard**

**ISO 4106**

**Motorcycles — Engine test code —  
Net power**

*Motorcycles — Code d'essai des moteurs — Puissance nette*

**Fifth edition  
2026-03**

**Sample Document**

get full document from [standards.iteh.ai](https://standards.iteh.ai)

# Sample Document

get full document from [standards.iteh.ai](https://standards.iteh.ai)



## **COPYRIGHT PROTECTED DOCUMENT**

© ISO 2026

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

	Page
<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>vi</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Symbols</b> .....	<b>2</b>
<b>5 Standard reference conditions</b> .....	<b>3</b>
<b>6 Tests</b> .....	<b>3</b>
6.1 General.....	3
6.2 Measuring equipment and instrument accuracy.....	3
6.2.1 Torque.....	3
6.2.2 Engine speed.....	3
6.2.3 Fuel flow.....	3
6.2.4 Fuel temperature.....	3
6.2.5 Engine inlet air temperature.....	3
6.2.6 Barometric pressure.....	3
6.2.7 Back pressure in exhaust system.....	3
6.2.8 Test room humidity.....	4
6.3 Setting and test conditions.....	4
6.3.1 Equipment and auxiliaries.....	4
6.3.2 Test conditions.....	6
6.3.3 Test atmospheric conditions.....	7
6.4 Test procedure.....	7
<b>7 Torque, power and specific fuel consumption</b> .....	<b>8</b>
7.1 Calculation of measured torque, measured power and specific fuel consumption.....	8
7.2 Net torque and net power.....	8
7.2.1 General.....	8
7.2.2 Determination of correction factor $\alpha_m$ .....	8
7.2.3 Calculation of net torque and net power.....	9
7.3 Corrected net torque and corrected net power.....	9
7.3.1 General.....	9
7.3.2 Determination of correction factor $\alpha_a$ .....	10
7.3.3 Calculation of corrected net torque and corrected net power.....	10
<b>8 Test report</b> .....	<b>10</b>
8.1 General.....	10
8.2 The description of test report.....	10
8.2.1 General.....	10
8.2.2 Essential characteristics of spark-ignition engines.....	10
8.2.3 Test conditions during net power measurement.....	12
8.3 Statement of results.....	13
<b>Annex A (normative) Test method for compression-ignition engines</b> .....	<b>16</b>
<b>Annex B (informative) Example for record form of test fuel specifications</b> .....	<b>22</b>
<b>Bibliography</b> .....	<b>24</b>

## 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)).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

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 38, *Motorcycles and mopeds*.

This fifth edition cancels and replaces the fourth edition (ISO 4106:2012), which has been technically revised.

The main changes are as follows:

- the ranges of fuel temperature, engine inlet air temperature, and the applicable range of the correction factor have been expanded;
- engine inlet depression and dry atmospheric pressure have been removed from required measurement items;
- an example of the record form for test fuel specifications has been added;
- transmission component efficiencies of helical and bevel gears have been changed.

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).

# Sample Document

get full document from [standards.iteh.ai](https://standards.iteh.ai)

## Introduction

This fifth edition harmonizes some minor differences compared to the other measurement methods as much as possible to improve efficiency.

# Sample Document

get full document from [standards.iteh.ai](https://standards.iteh.ai)

# Motorcycles — Engine test code — Net power

## 1 Scope

This document specifies methods for evaluating the performance of engines designed for motorcycles as defined in ISO 3833, in particular with a view to the presentation of power curves and specific fuel consumption at full load as a function of engine speed, for net power assessment. It is applicable to reciprocating internal combustion engines (spark-ignition or compression-ignition) – excluding free-piston engines – and rotary piston engines, either naturally aspirated or pressure-charged and equipped with either mechanical pressure-charger or turbocharger. Particular specifications for the test of compression-ignition engines are specified in [Annex A](#).

## 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 15550, *Internal combustion engines — Determination and method for the measurement of engine power — General requirements*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 2710-1, ISO 15550 and the following apply.

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

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

### 3.1

#### **net power**

power obtained on a test bed at the end of the crankshaft or its equivalent at the corresponding engine speed with the equipment and auxiliaries listed in [6.3.1](#)

### 3.2

#### **corrected net power**

*net power* ([3.1](#)) corrected under the standard reference conditions

### 3.3

#### **net torque**

torque transmitted on a test bed at the end of the crankshaft or its equivalent at the corresponding engine speed with the equipment and auxiliaries listed in [6.3.1](#)

### 3.4

#### **corrected net torque**

*net torque* ([3.3](#)) corrected under the standard reference conditions

### 3.5

#### specific fuel consumption

amount of fuel consumed by an engine per unit of power and time

Note 1 to entry: The amount of the lubricants for two-stroke cycle engines is excluded.

### 3.6

#### auxiliaries

equipment and devices necessary to make the engine acceptable for service in the intended application

## 4 Symbols

For the purposes of this document, the symbols given in [Table 1](#) apply.

**Table 1 — Symbols**

Symbol	Designation	Unit
$b_e$	specific fuel consumption	g/(kW·h)
$B$	amount of fuel consumed by an engine per unit of time	g/h
$c$	coefficient of the dynamometer	m
$L$	arm length of the dynamometer	m
$n_c$	crankshaft rotation speed	min <sup>-1</sup>
$n_p$	power take-off shaft rotation speed	min <sup>-1</sup>
$N_d$	dynamometer rotation speed	min <sup>-1</sup>
$p_d$	ambient dry air barometric pressure during the test	kPa
$p_r$	standard reference total barometric pressure	kPa
$p_{sr}$	standard reference saturated water vapour pressure	kPa
$p_{sy}$	ambient saturated water vapour pressure during the test	kPa
$p_y$	ambient total barometric pressure during the test	kPa
$P$	measured power	kW
$P_o$	corrected net power	kW
$P_y$	net power	kW
$r_g$	reduction gear ratio	–
$t$	measured torque	N·m
$t_o$	corrected net torque	N·m
$t_y$	net torque	N·m
$T_r$	standard reference ambient air temperature	K
$T_y$	engine inlet air temperature during the test	K
$W$	dynamometer braking load	N
$\alpha_a$	correction factor for ambient test conditions	–
$\alpha_m$	correction factor for efficiency of the transmission	–
$\eta_i$	efficiency of each element constituting the transmission	–
$\eta_t$	efficiency of the transmission which is located between the crankshaft and the measurement point	–
$\phi_r$	standard reference relative humidity	%
$\phi_y$	ambient relative humidity during the test	%

## 5 Standard reference conditions

For the purpose of determining the power and fuel consumption of an engine, the following standard reference conditions shall be used:

- standard reference total barometric pressure:  $p_r = 100$  kPa;
- standard reference air temperature:  $T_r = 298,2$  K;
- standard reference relative humidity:  $\phi_r = 30$  %.

NOTE A relative humidity of 30 % at a temperature of 298,2 K corresponds to a water pressure of 1 kPa. The corresponding dry barometric pressure is 99 kPa.

## 6 Tests

### 6.1 General

This test method is used for verifying the net power of an engine type with the declared values. It presents engine performance at full power/torque as a function of engine speed by generating curves of corrected net torque, corrected net power and specific fuel consumption.

### 6.2 Measuring equipment and instrument accuracy

#### 6.2.1 Torque

The dynamometer torque-measuring system shall have an accuracy of  $\pm 1$  % in the range of scale values required for the test. The torque-measuring system shall be calibrated to take into account friction losses. The accuracy may be  $\pm 2$  % for measurements carried out at a power less than 50 % of maximum power.

#### 6.2.2 Engine speed

The engine-speed measuring system shall have an accuracy of  $\pm 0,5$  % of reading.

#### 6.2.3 Fuel flow

The fuel-flow measuring system shall have an accuracy of  $\pm 1$  % of reading.

#### 6.2.4 Fuel temperature

The fuel-temperature measuring system shall have an accuracy of  $\pm 1$  K.

#### 6.2.5 Engine inlet air temperature

The air-temperature measuring system shall have an accuracy of  $\pm 1$  K.

#### 6.2.6 Barometric pressure

The barometric-pressure measuring system shall have an accuracy of  $\pm 70$  Pa.

#### 6.2.7 Back pressure in exhaust system

The system used to measure the back pressure (differential pressure) in the exhaust system shall have an accuracy of  $\pm 25$  Pa.