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NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

GB/T 8190.3-2025

Replacing GB/T 8190.3-2003

Reciprocating internal combustion engines - Exhaust emission measurement - Part 3: Test procedures for measurement of exhaust gas smoke emissions from compression ignition engines using a filter type smoke meter

往复式内燃机 排放测量 第3部分：使用滤纸式烟度计测量压燃式发动机排气烟度的测试规程

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 3 of GB/T 8190 "Emission Measurement of Reciprocating Internal Combustion Engines". GB/T 8190 has already published the following parts.

---Part 1: Test Bench Measurement System for Gas and Particulate Emissions;

---Part 2: Field Measurements of Gas and Particulate Emissions;

---Part 3: Test Procedure for Measuring Exhaust Smoke Opacity of Compression-Ignition Engines Using a Filter Paper Smoke Meter;

---Part 4: Steady-state and transient test cycles for engines of different applications;

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---Part 5: Experimental Fuels;

---Part 6: Measurement Results and Test Report;

---Part 7: Determining the Engine Family;

---Part 8: Determination of Engine System Groups;

---Part 9: Test cycles and procedures for bench measurement of exhaust smoke opacity under transient operating conditions of compression-ignition engines;

---Part 10: Test cycles and procedures for field measurement of exhaust smoke opacity under transient conditions of compression ignition engines.

This document replaces GB/T 8190.3-2003 "Emission Measurement of Reciprocating Internal Combustion Engines - Part 3: Definition of Exhaust Smoke Opacity under Steady-State Conditions".

Compared with GB/T 8190.3-2003, the main technical changes in the "Measurement Methods" are as follows, except for structural adjustments and editorial modifications.

a) The scope has been changed (see Chapter 1, Chapter 1 of the 2003 edition);

b) Terms and definitions related to opacity meters have been removed (see sections 3.2-3.5 and 3.9 of the 2003 edition), and Bosch opacity values have been added.

Terms and definitions for exhaust components related to exhaust smoke opacity (see 3.4, 3.7-3.9);

c) The measurement method for opacity meters has been removed (see Chapter 4 of the 2003 edition);

d) Installation requirements for filter paper smoke meters have been added (see 4.3.1);

e) Engine operating condition requirements have been added (see 4.3.2).

This document is equivalent to ISO 8178-3:2019 "Emissions measurement of reciprocating internal combustion engines - Part 3: Measurement using filter paper smoke meters".

Test procedure for exhaust smoke opacity of compression ignition engines.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Machinery Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Standardization of Internal Combustion Engines (SAC/TC177).

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Introduction

Compared to on-road engines, off-road engines have a very wide power range and structural forms, and can be used in many different applications.

use.

GB/T 8190 aims to rationally formulate test procedures for non-road engines, so as to contribute to regulations controlling gas and particulate emissions.

The drafting of engine technical specifications and engine certification have been simplified and made more cost-effective.

To achieve the above objectives, GB/T 8190 adopts three basic principles.

---First principle. Classify applications according to the similar operating characteristics of the engines in order to minimize the number of test cycles, while ensuring these...

The test cycle energy represents the actual operating conditions of the engine.

---Second principle. Emission measurement results are expressed according to the effective power specified in GB/T 8190.1, which ensures that when the engine...

The experiment need not be repeated when the application changes.

---Third principle. Introduce the concept of engine families. Within this family, engines with similar emission characteristics and similar structures can...

It is represented by the engine with the highest emissions in this family.

GB/T 8190 is equivalent to ISO 8178.ISO 8178 is under the jurisdiction of ISO/TC70/SC8 and was published between 1994 and 2006.

It consists of 11 parts.

---Part 1: Test Bench Measurements of Gases and Particulate Emissions. The aim is to establish the gas and particulate emission standards for reciprocating internal combustion engines under steady-state conditions.

Test bench measurement and evaluation methods for particulate emissions.

---Part 2: Field Measurement of Gas and Particulate Emissions. The aim is to establish the gas and particulate emission standards for reciprocating internal combustion engines under steady-state and transient operating conditions.

Methods for on-site testing and assessment of particulate matter and particulate emissions.

---Part 3: Definition and Measurement Method of Exhaust Smoke Opacity under Steady-State Operating Conditions. The purpose is to establish the definition and measurement method of exhaust smoke opacity under steady-state operating conditions for

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reciprocating internal combustion engines.

Methods for measuring smoke exhaust characteristics. One method is to assess the extinction of the smoke exhaust by measuring the brightness of a light beam; another method...

The carbon soot content is assessed by measuring the blackness of the filter paper.

---Part 4: Steady-state test cycles for engines of different applications. The purpose is to establish methods for measuring and evaluating the connection to the dynamometer.

Steady-state test cycle of gas and particulate emissions from reciprocating internal combustion engines.

---Part 5: Test Fuel. The purpose is to establish the recommended use of test fuels for emissions measurements according to the emission test cycle described in ISO 8178-4.

The fuel used.

---Part 6: Measurement Results and Test Reports. The purpose is to establish the data format for reporting emission measurement results of reciprocating internal combustion engines.

---Part 7: Determining the Engine Family. The purpose is to establish the technical specifications used to determine the engine family and select the source engine.

parameter.

---Part 8: Engine Group Determination. The purpose is to establish the technical specifications for determining the engine group and selecting the source engine for the group.

The parameters.

---Part 9: Test Cycles and Procedures for Transient Exhaust Smoke Measurement on Compression-Ignition Engines. The purpose is to ensure...

Test cycles and procedures for evaluating the exhaust smoke opacity of compression ignition engines on a test bench.

---Part 10: Test Cycles and Procedures for Field Measurement of Exhaust Smoke Opacity under Transient Operating Conditions of Compression-Ignition Engines. The purpose is to establish...

Test cycles and procedures for evaluating exhaust smoke opacity of compression ignition engines under field conditions.

---Part 11: Test bench measurement of gaseous and particulate emissions from engines used in non-road mobile machinery under transient operating conditions. The purpose is to...

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