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Reciprocating internal combustion engines — Exhaust emission measurement —

Part 5: Test fuels

Moteurs alternatifs à combustion interne — Mesurage des émissions de gaz d'échappement —

Partie 5: Carburants d'essai

Reference number
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Foreword

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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).

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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.

This document was prepared by Technical Committee ISO/TC 70 *Internal combustion engines*, Subcommittee SC 8, *Exhaust gas emission measurement*.

This fourth edition cancels and replaces the third edition (ISO 8178-5:2015), which has been technically revised.

The main changes compared to the previous edition are as follows:

— the addition of reference fuels from EU Regulation 2017/654 exhaust emission requirements for internal combustion engines in non-road mobile machinery

— the addition of California Air Resources Board (CARB) E10 emissions certification fuel

— the addition of US Environmental Protection Agency Tier 3 E10 emissions certification fuel

— updates of fuel specifications from ISO 8217

A list of all parts in the ISO 8178 series can be found on the ISO website.

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.

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Introduction

In comparison with engines for on-road applications, engines for off-road use are made in a much wider range of power output and configurations and are used in a great number of different applications.

Since fuel properties vary widely from country to country a broad range of different fuels is listed in this document — both reference fuels and commercial fuels.

Reference fuels are usually representative of specific commercial fuels but with considerably tighter specifications. Their use is primarily recommended for test bed measurements described in ISO 8178-1.

For measurements typically at site where emissions with commercial fuels, whether listed or not in this document, are to be determined, uniform analytical data sheets (see Clause 5) are recommended for the determination of the fuel properties to be declared with the exhaust emission results.

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Reciprocating internal combustion engines — Exhaust emission measurement —

Part 5:
Test fuels

1 Scope

This document specifies fuels whose use is recommended for performing the exhaust emission test cycles given in ISO 8178-4.

It is applicable to reciprocating internal combustion engines for mobile, transportable and stationary installations excluding engines for vehicles primarily designed for road use. This document is applicable to engines used, e.g. earth-moving machines and generating sets, and for other applications.

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 4259, *Petroleum and related products – Precision of measurement methods and results – Part 1: Determination of precision data in relation to methods of test*

ISO 6974 (all parts), *Natural gas – Determination of composition and associated uncertainty by gas chromatography*

ISO 6976, *Natural gas — Calculation of calorific values, density, relative density and Wobbe indices from composition*

ISO 8178-1, *Reciprocating internal combustion engines — Exhaust emission measurement — Part 1: Test-bed measurement systems of gaseous and particulate emissions*

ISO 8178-4:2020, *Reciprocating internal combustion engines — Exhaust emission measurement — Part 4: Steady-state and transient test cycles for different engine applications*

ISO 8216-1, *Petroleum products — Fuels (class F) classification — Part 1: Categories of marine fuels*

ISO 8217, *Petroleum products — Fuels (class F) — Specifications of marine fuels*

ASTM D 4815, *A method for the determination of oxygenated compounds in reformulated fuels*

ASTM D 8221-18, *Standard Practice for Determining the Calculated Methane Number (MNC) of Gaseous Fuels Used in Internal Combustion Engines*

EN 228, *Automotive fuels – unleaded petrol – Requirements and test methods*

EN 15376, *Automotive fuels – ethanol as a blending component for petrol – Requirements and test methods*

EN 15489, *Ethanol as a blending component for petrol – Determination of water content – Karl Fischer coulometric titration method*

EN 16726, *Gas infrastructure - Quality of gas - Group H*

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