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Reciprocating internal combustion engines — Exhaust emission measurement —

Part 10: Test cycles and test procedures for field measurement of exhaust gas smoke emissions from compression ignition engines operating under transient conditions

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

Partie 10: Cycles et procédures d'essai pour le mesurage sur site des émissions de fumées de gaz d'échappement des moteurs à allumage par compression fonctionnant en régime transitoire

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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 3.

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 part of ISO 8178 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 8178-10 was prepared by Technical Committee ISO/TC 70, *Internal combustion engines*, Subcommittee SC 8, *Exhaust gas emission measurement*.

ISO 8178 consists of the following parts, under the general title *Reciprocating internal combustion engines — Exhaust emission measurement*:

— *Part 1: Test-bed measurement of gaseous and particulate exhaust emissions*

— *Part 2: Measurement of gaseous and particulate exhaust emissions at site*

— *Part 3: Definitions and methods of measurement of exhaust gas smoke under steady-state conditions*

— *Part 4: Test cycles for different engine applications*

— *Part 5: Test fuels*

— *Part 6: Report of measuring results and test*

— *Part 7: Engine family determination*

— *Part 8: Engine group determination*

— *Part 9: Test cycles and test procedures for test bed measurement of exhaust gas smoke emissions from compression ignition engines operating under transient conditions*

— *Part 10: Test cycles and test procedures for field measurement of exhaust gas smoke emissions from compression ignition engines operating under transient conditions*

Annexes A, B and C form a normative part of this part of ISO 8178. Annex D is for information only.

Introduction

Throughout the world there currently exist many smoke measurement procedures in various forms. Some of these smoke measurement procedures are designed for test bed testing and may be used for certification or type-approval purposes. Others are designed for field testing and may be used in inspection and maintenance programmes. Different smoke measurement procedures exist to meet the needs of various regulatory agencies and industries. The two methods typically used are the filter smokemeter method and the opacimeter.

The objective of this part of ISO 8178 is to combine the key features of several existing smoke measurement procedures as much as is technically possible. This part of ISO 8178 is intended for the measurement of the emissions of smoke from compression ignition internal combustion engines under field conditions. It applies to engines operating under transient conditions – where the engine speed or load, or both, changes with time. It should be noted that the smoke emissions from typical well-maintained naturally-aspirated engines under transient conditions will generally be the same as the smoke emissions under steady state conditions.

Only opacimeter type smokemeters may be used for making the smoke measurements described in this part of ISO 8178. This part of ISO 8178 allows the use of either full-flow or partial-flow opacimeters. This part of ISO 8178 accounts for differences in response time between the two types of opacimeters, but does not account for any differences due to differences in temperatures at the sampling zone.