INTERNATIONAL STANDARD

ISO 5163

Second edition
1990-12-15

Motor and aviation-type fuels — Determination of knock characteristics — Motor method

Carburants pour moteur automobile et aviation — Détermination des caractéristiques antidétonantes — Méthode "Moteur"

Reference number
ISO 5163:1990(E)

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.

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.

International Standard ISO 5163 was prepared by Technical Committee ISO/TC 28, *Petroleum products and lubricants*.

This second edition cancels and replaces the first edition (ISO 5163:1977), of which it constitutes a minor revision.

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Introduction

The purpose of this International Standard is to accord official ISO status to a test procedure which is already used in a standardized form all over the world. The procedure in question is published jointly by the American Society for Testing and Materials (ASTM) and the UK Institute of Petroleum (IP) as method ASTM D 2700-86/IP 236/83, *Standard test method for knock characteristics of motor and aviation-type fuels by the motor method.*

In publishing this International Standard, ISO recognizes that this method is used in its original text in many member countries and that the standard equipment and many of the accessories and materials required for the method are obtainable only from specific manufacturers or suppliers. To carry out the procedure requires reference to the seven annexes to the ASTM Annual Book of Standards, Section 5, Volume 05.04, *Test methods for rating motor, diesel and aviation fuels*. These comprise over 100 pages of text and include many half-tone illustrations[1] which are essential to the installation, operation and maintenance of the ASTM-CFR[2] engine.

From the accumulated experience, in many countries, of testing the knock characteristics of motor and aviation-type fuels using the ASTM-CFR engine, the conclusion has been drawn that initiation of work with a view to using a different engine for ISO purposes would represent unnecessary duplication of effort. Furthermore, the petroleum industry has worldwide demands for motor and aviation-type fuels meeting knock characteristic requirements based on the ASTM-CFR engine test, and it is under the necessity, therefore, of having this test equipment standardized.

It is further recognized that this method for rating fuels constitutes an exceptional case in that "metrication" of operating conditions other than those already recognized would be extremely difficult. In a metricated engine, the dimensions and tolerances would be strict numerical conversions and would not reflect metric engineering practice. The engine and directly associated equipment are currently manufactured only to non-metric dimensions and tolerances, and inspection equipment to maintain these tolerances is also only available to non-metric dimensions. The essentials of the procedures for using the test engine and equipment must be strictly adhered to if comparable results are to be obtained in different laboratories.

1) An extended edition of this International Standard incorporating the abovementioned text and illustrations is in preparation.

2) The sole authorized manufacturer of the ASTM-CFR engine is the Waukesha Engine Division, Dresser Industries, Waukesha, Wisconsin 53186, USA.

For all these reasons, it has been considered desirable by Technical Committee ISO/TC 28, *Petroleum products and lubricants*, under whose technical authority this International Standard is published, to adopt without change the method as published in the Annual Book of ASTM Standards, Section 5, Volume 05.04, rather than to attempt the conversion of the basic method and annexes into an International Standard.

Motor and aviation-type fuels — Determination of knock characteristics — Motor method

WARNING — The use of this International Standard may involve hazardous materials, operations and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1 Scope

1.1 This International Standard covers the determination of the knock characteristics of motor and aviation gasolines intended for use in spark-ignition engines.

1.2 The knock characteristics of motor gasolines are reported in terms of ASTM/IP motor octane numbers.

1.3 The knock characteristics of aviation gasolines are reported in terms of aviation-method octane numbers below 100 and aviation-method performance numbers above 100.

2 Normative reference

ANSI/ASTM D 2700-86, *Standard test method for knock characteristics of motor and aviation fuels by the motor method.*

3 Test method

The test method shall be that specified in ANSI/ASTM D 2700-86.

This page intentionally left blank

This page intentionally left blank

UDC 665.733.035.3

Descriptors: petroleum products, fuels, automotive fuels, aviation fuels, gasoline, tests, determination, antiknock rating, octane number.

Price based on 1 page