SLOVENSKI STANDARD
oSIST prEN ISO 12156-1:2015

01-marec-2015

Dizelsko gorivo - Ocenjevanje mazalne sposobnosti z visokofrekvenčnim merilnikom (HFRR) - 1. del: Preskusna metoda (ISO/DIS 12156-1:2015)

Diesel fuel - Assessment of lubricity using the high-frequency reciprocating rig (HFRR) - Part 1: Test method (ISO/DIS 12156-1:2015)

Dieselkraftstoff - Methode zur Bestimmung der Schmierfähigkeit unter Verwendung eines Schwingungsverschleiß-Prüfgerätes (HFRR) - Teil 1: Prüfverfahren (ISO/DIS 12156-1:2015)

Carburant diesel - Évaluation du pouvoir lubrifiant au banc alternatif à haute fréquence (HFRR) - Partie 1: Méthode d'essai (ISO/DIS 12156-1:2015)

Ta slovenski standard je istoveten z: **prEN ISO 12156-1**

ICS:

75.160.20	Tekoča goriva	Liquid fuels

oSIST prEN ISO 12156-1:2015 **en**

DRAFT INTERNATIONAL STANDARD
ISO/DIS 12156-1

ISO/TC **22**/SC **7** Secretariat: **DIN**

Voting begins on:
2015-01-22

Voting terminates on:
2015-04-22

Diesel fuel — Assessment of lubricity using the high-frequency reciprocating rig (HFRR) —

Part 1:
Test method

Carburant diesel — Évaluation du pouvoir lubrifiant au banc alternatif à haute fréquence (HFRR) — Partie 1: Méthode d'essai

ICS: 75.160.20

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Reference number
ISO/DIS 12156-1:2014(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

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. www.iso.org/directives

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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. www.iso.org/patents

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 22, Road vehicles, Subcommittee SC 7, Injection equipment and filters for use on road vehicles, in collaboration with ISO/TC 28, Petroleum products and lubricants.

This third edition cancels and replaces the second edition (ISO 12156-1:2006), which has been technically revised. Details of the major changes (additions, modifications and deletions) agreed by the committee, and which affect the performance of the products or the technical requirements applicable to the products, are provided for information in Annex B.

ISO 12156 consists of the following parts, under the general title Diesel fuel — Assessment of lubricity using the high-frequency reciprocating rig (HFRR):

- Part 1: Test method
- Part 2: Limit

Introduction

All diesel fuel injection equipment has some reliance on diesel fuel as a lubricant. Wear due to excessive friction resulting in shortened life of engine components, such as diesel fuel injection pumps and injectors, has sometimes been ascribed to lack of lubricity in the fuel.

The relationship of test results to diesel injection equipment component distress due to wear has been demonstrated for some fuel/hardware combinations where boundary lubrication is a factor in the operation of the component .

Test results from fuels tested to this procedure have been found to correlate with many fuel/hardware combinations and provide an adequate prediction of the lubricating quality of the fuel. The correlation of paraffinic fuels and biodiesel blends has been validated through 15 years of field experience and anecdotal data.

This International Standard includes content and data, with permission of ASTM International, from ASTM Research Report RR:D02-1718[3] that is cited in ASTM D6079[1] and D7688[2].

Diesel fuel — Assessment of lubricity using the high-frequency reciprocating rig (HFRR) — Part 1: Test method

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

1 Scope

This part of ISO 12156 specifies a test method using the high-frequency reciprocating rig (HFRR), for assessing the lubricating property of diesel fuels, including those fuels which may contain a lubricity-enhancing additive. It defines two methods for measurement of the wear scar; Method "A" - Digital Camera, and Method "B" - Visual Observation.

This test method applies to fuels used in diesel engines.

NOTE It is not known if this test method will predict the performance of all additive/fuel combinations.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 683-17, *Heat-treated steels, alloy steels and free-cutting steels — Part 17: Ball and roller bearing steels*

ISO 3290, *Roller bearings — Balls — Dimensions and tolerances*

ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method*

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T)*

ASTM D 329, *Standard Specification for Acetone*

ASTM D4057, *Practice for Manual Sampling of Petroleum and Petroleum Products*

ASTM D4177, *Practice for Automatic Sampling of Petroleum and Petroleum Products*

ASTM D4306, *Practice for Aviation Fuel Sample Containers for Tests Affected by Trace Contamination*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
boundary lubrication
condition in which the friction and wear between two surfaces in relative motion are determined by the properties of the surfaces and the properties of the contacting fluid, other than bulk viscosity

Note 1 to entry: Metal to metal contact occurs and the chemistry of the system is involved. Physically adsorbed or chemically reacted soft films (usually very thin) support contact loads. As a result, some wear is inevitable.

3.2
lubricity
qualitative term describing the ability of a fluid to affect friction between, and wear to, surfaces in relative motion under load

Note 1 to entry: In this test method, the lubricity of a fluid is evaluated by the wear scar, measured in micrometres, produced on an oscillating ball from contact with a stationary disk immersed in the fluid operating under closely controlled conditions.

3.3
wear scar diameter
WSD
mean diameter of the wear scar produced on the test ball

4 Principle

A sample of the fluid under test is placed in a test reservoir which is maintained at the specified test temperature. A fixed steel ball is held in a vertically mounted chuck and forced against a horizontally mounted stationary steel plate with an applied load. The test ball is oscillated at a fixed frequency and stroke length while the interface with the plate is fully immersed in the fluid. The metallurgies of the ball and plate, test fluid temperature, load, frequency, stroke length, and the ambient air conditions of temperature and humidity during the test are specified. The wear scar generated on the test ball is taken as a measure of the fluid lubricity.

5 Reagents and materials

5.1 Compressed air, if required for drying the equipment (see 7.1.2), supplied at a pressure of 140 kPa to 210 kPa and containing less than 0,1 ml/m^3 hydrocarbons and less than 50 ml/m^3 water.

WARNING — Use with extreme caution in the presence of combustible material.

5.2 Acetone, in accordance with ASTM D 329.

WARNING — Extremely flammable. Vapours may cause flash fire.

5.3 Reference fluids[1]

WARNING — Flammable.

Two reference fluids, Fluid "A" – High (Good) Lubricity Reference and Fluid "B" – Low (Poor) Lubricity Reference, produced in accordance with ISO Guide 34 and ISO Guide 35, shall be used for verifying the performance of the test apparatus. They shall be clearly marked with the HFRR value (WSD) and its expanded uncertainty, expressed in micrometres. Store reference fluids in clean, borosilicate glass with an aluminium foil-lined insert cap or fully epoxy-lined metal container. Store in a dark location.

5.4 Gloves, appropriate for the reagents used.

5.5 Heptane, reagent grade

WARNING — Extremely flammable. Vapours may cause flash fire.

5.6 Isooctane, reagent grade

WARNING — Extremely flammable. Vapours may cause flash fire.

5.7 2-propanol, reagent grade

WARNING — Extremely flammable. Vapours may cause flash fire.

5.8 Wiper, wiping tissue, light-duty, lint-free, hydrocarbon-free, disposable

6 Apparatus

6.1 Test apparatus[2)], (see Figure 1), capable of engaging a steel ball loaded against a stationary steel plate with an applied load and oscillating at a fixed frequency and stroke length while the contact interface is fully immersed in a fluid according to the test conditions given in Table 1.

The fluid reservoir shall be capable of holding a test plate in a rigid manner and shall also contain the test fluid. The temperature of this reservoir, and consequently the test fluid contained in it, should be achieved by means of an electrically controlled heater pad to which the fluid reservoir is closely attached.

The apparatus control unit for controlling variable parameters shall include provision for electronic data storage and retrieval, and for electronic calibration of the stroke length.

---

1 Reference Fluids A and B are available from ASTM Monitoring Center, 6555 Penn Avenue, Pittsburgh, PA 15026-4489 USA. This information is given for the convenience of users of this part of ISO 12156 and does not constitute an endorsement by ISO of the products named. Equivalent products may be used if they can be shown to lead to the same results.

2) HFRR units, HFR2, supplied by PCS Instruments, 78 Stanley Gardens, London W3 7SZ, U.K., have been found satisfactory. This information is given for the convenience of users of this part of ISO 12156 and does not constitute an endorsement by ISO of these products. Equivalent products may be used if they can be shown to lead to the same results.