Diesel fuel - Assessment of lubricity using the high-frequency reciprocating rig (HFRR) - Part 1: Test method (ISO 12156-1:2023)

EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 12156-1:2023 sisaldab Euroopa standardi EN ISO 12156-1:2023 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 12156-1:2023 consists of the English text of the European standard EN ISO 12156-1:2023.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 27.09.2023.	Date of Availability of the European standard is 27.09.2023.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

Diesel fuel - Assessment of lubricity using the high-frequency reciprocating rig (HFRR) - Part 1: Test method (ISO 12156-1:2023)

Carburant diesel - Évaluation du pouvoir lubrifiant au banc alternatif à haute fréquence (HFRR) - Partie 1: Méthode d'essai (ISO 12156-1:2023)

Dieselkraftstoff - Bewertung der Schmierfähigkeit mit dem Hochfrequenz-Rundlaufprüfstand (HFRR) - Teil 1: Prüfverfahren (ISO 12156-1:2023)

This European Standard was approved by CEN on 3 September 2023.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN ISO 12156-1:2023) has been prepared by Technical Committee ISO/TC 28 "Petroleum and related products, fuels and lubricants from natural or synthetic sources" in collaboration with Technical Committee CEN/TC 19 “Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin” the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2024, and conflicting national standards shall be withdrawn at the latest by March 2024.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 12156-1:2018.

Any feedback and questions on this document should be directed to the users’ national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Endorsement notice

The text of ISO 12156-1:2023 has been approved by CEN as EN ISO 12156-1:2023 without any modification.

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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.

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 document 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 28, *Petroleum and related products, fuels and lubricants from natural or synthetic sources*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 19, *Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fifth edition cancels and replaces the fourth edition (ISO 12156-1:2018), which has been technically revised.

The main changes are as follows:

— the scope has been broadened;

— a new precision statement has been added using linear transformation as required by ISO 4259-1;

— “Method B” Visual Observation has been removed.

A list of all parts in the ISO 12156 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.

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 using 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 biodiesel blends has been validated through 15 years of field experience and anecdotal data.

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 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 to determine the applicability of any other restrictions for this purpose.

1 Scope

This document specifies a test method using the high-frequency reciprocating rig (HFRR) with a digital camera, for assessing the lubricating property of petroleum-based middle distillate fuels, paraffinic diesel fuels, and biodiesel blends, with or without lubricity enhancing additives, and with HFRR wear scar diameters (WSDs) of 350 µm to 700 µm.

This test method applies to fuels used in diesel engines.

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

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

ISO 3170, *Petroleum liquids — Manual sampling*

ISO 3171, *Petroleum liquids — Automatic pipeline sampling*

ISO 3290-1, *Rolling bearings — Balls — Part 1: Steel balls*

ISO 5272, *Toluene for industrial use — Specifications*

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

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method*

ISO 21920-3, *Geometrical product specifications (GPS) — Surface texture: Profile — Part 3: Specification operators*

ASTM D4306:2020, *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.