SLOVENSKI STANDARD
SIST EN ISO 4263-3:2010

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Nadomešča:
SIST EN ISO 4263-3:2006

Nafta in sorodni proizvodi - Določevanje staranja inhibiranih olj in tekočin s preskusom TOST - 3. del: Brezvodni postopek za sintetične hidravlične tekočine (ISO 4263-3:2010)

Petroleum and related products - Determination of the ageing behaviour of inhibited oils and fluids using the TOST test - Part 3: Anhydrous procedure for synthetic hydraulic fluids (ISO 4263- 3:2010)

Mineralölerzeugnisse und verwandte Produkte - Bestimmung des Alterungsverhaltens von inhibierten Ölen und Flüssigkeiten unter Anwendung des TOST-Verfahrens - Teil 3: Wasserfreies Verfahren für synthetische Druckflüssigkeiten (ISO 4263-3:2010)

Pétrole et produits connexes - Détermination du comportement au vieillissement des fluides et huiles inhibés au moyen de l'essai TOST - Partie 3: Méthode anhydre pour les fluides hydrauliques synthétiques (ISO 4263-3:2010)

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Petroleum and related products - Determination of the ageing behaviour of inhibited oils and fluids using the TOST test - Part 3: Anhydrous procedure for synthetic hydraulic fluids (ISO 4263-3:2010)

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN ISO 4263-3:2010) has been prepared by Technical Committee ISO/TC 28 "Petroleum products and lubricants" 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of an identical text or by endorsement, at the latest by April 2011, and conflicting national standards shall be withdrawn at the latest by April 2011.

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

This document supersedes EN ISO 4263-3:2006.

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Endorsement notice

The text of ISO 4263-3:2010 has been approved by CEN as a EN ISO 4263-3:2010 without any modification.

INTERNATIONAL STANDARD

ISO 4263-3

Second edition
2010-10-15

Petroleum and related products — Determination of the ageing behaviour of inhibited oils and fluids using the TOST test —

Part 3: Anhydrous procedure for synthetic hydraulic fluids

Pétrole et produits connexes — Détermination du comportement au vieillissement des fluides et huiles inhibés au moyen de l'essai TOST — Partie 3: Méthode anhydre pour les fluides hydrauliques synthétiques

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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 2.

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.

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ISO 4263-3 was prepared by Technical Committee ISO/TC 28, *Petroleum products and lubricants*.

This second edition cancels and replaces the first edition (ISO 4263-3:2006), of which it is a minor revision with changes to the title, Clause 3 (last sentence), 8.8, 8.9 and 10.1 plus some minor editorial modifications.

ISO 4263 consists of the following parts, under the revised general title *Petroleum and related products — Determination of the ageing behaviour of inhibited oils and fluids using the TOST test*:

— *Part 1: Procedure for mineral oils*

— *Part 2: Procedure for category HFC hydraulic fluids*

— *Part 3: Anhydrous procedure for synthetic hydraulic fluids*

— *Part 4: Procedure for industrial gear oils*

NOTE As of the date of publication of this revised edition of ISO 4263-3, the current editions of Parts 1, 2 and 4 still retained the old four-part title: *Petroleum and related products — Determination of the ageing behaviour of inhibited oils and fluids — TOST test* — Part X: ....

Petroleum and related products — Determination of the ageing behaviour of inhibited oils and fluids using the TOST test —

Part 3:
Anhydrous procedure for synthetic hydraulic fluids

WARNING — The use of this part of ISO 4263 can involve hazardous materials, operations and equipment. This part of ISO 4263 does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this part of ISO 4263 to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1 Scope

This part of ISO 4263 specifies a method for the determination of the ageing behaviour of synthetic hydraulic fluids of categories HFDR, HFDU, HEES and HEPG as defined, for example, in ISO 12922[4] and ISO 15380[5]. The ageing is accelerated by the presence of oxygen and metal catalysts at elevated temperature, and the degradation of the fluid is followed by changes in acid number. Other parts of ISO 4263 specify similar procedures for the determination of ageing behaviour of mineral oils and specified categories of fire-resistant fluids used in hydraulic and other applications.

NOTE Other signs of fluid deterioration, such as the formation of insoluble sludge, catalyst coil corrosion or decrease in viscosity, can occur which indicate oxidation of the fluid, but are not reflected in the calculated oxidation lifetime. The correlation of these occurrences with field service is under investigation.

This test method can be used to compare the oxidation stability of fluids that are not prone to contamination with water. However, because of the large number of individual field-service applications, the correlation between the results of this test and actual service performance can vary markedly, and is best judged on experience.

The precision of this test method for synthetic hydraulic fluids is not known because interlaboratory data are not available. This method might not be suitable for use in specifications or in the event of disputed results as long as these data are not available. However, precision for inhibited turbine oils is given in Clause 11 for guidance as an indication of the precision that could be obtained for synthetic hydraulic fluids.

2 Normative references

The following referenced documents are indispensable for the application 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 3170:2004, *Petroleum liquids — Manual sampling*

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods*

ISO 7537:1997, *Petroleum products — Determination of acid number — Semi-micro colour-indicator titration method*

3 Principle

A test portion is reacted, in the absence of light, at 95 °C with oxygen and a steel and copper catalyst coil. Small aliquots of the fluid are withdrawn at regular intervals and the acid number is measured (see the Note in Clause 1). The test is continued until an acid number increase of 2,0 mg of potassium hydroxide (KOH) per gram of test portion is reached and the number of hours is recorded as the oxidation lifetime. For some requirements, the test may be discontinued at a fixed number of hours (e.g. 500 h or 1 000 h) when the value of the acid number has still not increased by 2,0 mg of KOH per gram of test portion.

4 Reagents and materials

4.1 Water, unless otherwise specified, in accordance with the requirements of grade 2 of ISO 3696:1987. Potable water means tap water, unless normal piped supplies are contaminated with particulate or highly soluble mineral content.

4.2 Heptane (C_7H_{16}), of minimum purity 99,75 %.

4.3 Acetone (CH_3COCH_3), of general purpose reagent grade (GPR).

4.4 Propan-2-ol ($CH_3CHOHCH_3$), of general purpose reagent grade (GPR).

4.5 Oxygen, of minimum purity 99,5 %, supplied through a pressure-regulation system adequate to maintain the specified flow rate throughout the test duration.

Supply from an oxygen cylinder should be via a two-stage regulation system and a needle valve to improve the consistency of gas-flow regulation.

WARNING — Use oxygen only with equipment validated for oxygen service. Do not allow oil or grease to come into contact with oxygen and clean and inspect all regulators, gauges and control equipment. Check the oxygen-supply system regularly for leaks. If a leak is suspected, turn off immediately and seek qualified assistance.

4.6 Cleaning solutions

4.6.1 Strong oxidizing acid solution

The reference strong oxidizing cleaning solution on which precision was based, is chromosulfuric acid (see the following warning), but alternative non-chromium containing solutions, such as ammonium persulfate in concentrated sulfuric acid (8 g/l), have been found to give satisfactory cleanliness. A 10 % solution of three parts of hydrochloric acid (1 mol/l) and one part of orthophosphoric acid (concentrated GPR grade) removes iron oxide deposits.

WARNING — Chromosulfuric acid is a health hazard. It is toxic, a recognized carcinogen as it contains Cr(VI) compounds, highly corrosive and potentially hazardous in contact with organic materials. When using a chromosulfuric acid cleaning solution, eye protection and protective clothing are essential. Never pipette the cleaning solution by mouth. After use, do not pour cleaning solution down the drain, but neutralize it with great care owing to the concentrated sulfuric acid present, and dispose of it in accordance with standard procedures for toxic laboratory waste (chromium is highly dangerous to the environment).

Strongly oxidizing acid cleaning solutions that are chromium-free are also highly corrosive and potentially hazardous in contact with organic materials, but do not contain chromium which has special disposal problems.

