SLOVENSKI STANDARD
SIST EN ISO 2160:1999

01-november-1999

Nadomeģļ a:
SIST EN ISO 2160:1998

Nafni proizvodi – Korozivnost na baker – Preskus z bakrenim trakom (ISO 2160:1998)

Petroleum products - Corrosiveness to copper - Copper strip test (ISO 2160:1998)

Mineralölerzeugnisse - Korrosionwirkung auf Kupfer - Kupferstreifenprüfung (ISO 2160:1998)

Produits pétroliers - Action corrosive sur le cuivre - Essai a la lame de cuivre (ISO 2160:1998)

Ta slovenski standard je istoveten z: **EN ISO 2160:1998**

ICS:

75.080	Naftni proizvodi na splošno	Petroleum products in general

SIST EN ISO 2160:1999 **en**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 2160

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Supersedes EN ISO 2160:1995

English version

Petroleum products - Corrosiveness to copper - Copper strip test (ISO 2160:1998)

Produits pétroliers - Action corrosive sur le cuivre - Essai à la lame de cuivre (ISO 2160:1998)

Mineralölerzeugnisse - Korrosionwirkung auf Kupfer - Kupferstreifenprüfung (ISO 2160:1998)

This European Standard was approved by CEN on 15 September 1998.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

The text of the International Standard ISO 2160:1998 has been prepared by Technical Committee ISO/TC 28 "Petroleum products and lubricants" in collaboration with Technical Committee CEN/TC 19 "Petroleum products, lubricants and related products", the secretariat of which is held by NNI.

This European Standard supersedes EN ISO 2160:1995.

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 1999, and conflicting national standards shall be withdrawn at the latest by March 1999.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

NOTE FROM CEN/CS: The foreword is susceptible to be amended on reception of the German language version. The confirmed or amended foreword, and when appropriate, the normative annex ZA for the references to international publications with their relevant European publications will be circulated with the German version.

Endorsement notice

The text of the International Standard ISO 2160:1998 was approved by CEN as a European Standard without any modification.

INTERNATIONAL STANDARD

ISO 2160

Third edition
1998-09-15

Petroleum products — Corrosiveness to copper — Copper strip test

Produits pétroliers — Action corrosive sur le cuivre — Essai à la lame de cuivre

Reference number
ISO 2160:1998(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 2160 was prepared by Technical Committee ISO/TC 28, *Petroleum products and lubricants*.

This third edition cancels and replaces the second edition (ISO 2160:1985), of which it constitutes a technical revision.

Annexes A and B of this International Standard are for information only.

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Petroleum products — Corrosiveness to copper — Copper strip test

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

1 Scope

This International Standard specifies a method for the determination of the corrosiveness to copper of liquid petroleum products and certain solvents. Volatile products, having a maximum vapour pressure of 124 kPa at 37,8 °C are included.

Volatile products with a vapour pressure above 124 kPa at 37,8 °C should be tested according to ISO 6251 (see caution below). Electrical insulating oils should be tested according to ISO 5662.

CAUTION — Some products, particularly natural gasolines, may have a significantly higher vapour pressure than is characteristic for their class, even if below 124 kPa at 37,8 °C. For this reason, extreme caution should be exercised to ensure that the pressure vessel containing such material is not placed in a bath at 100 °C. Such samples may develop sufficient pressure at 100 °C to rupture the pressure vessel and cause damage and/or injury.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3170:1988, *Petroleum liquids — Manual sampling.*

ISO 3171:1988, *Petroleum liquids — Automatic pipeline sampling.*

3 Principle

A polished copper strip is immersed in a specified volume of sample and heated under conditions of temperature and time that are specific to the class of material being tested. Aviation fuels and natural gasolines are tested in a pressure vessel, and other products are tested under atmospheric pressure (see also the note in 8.1). At the end of the heating period, the strip is removed, washed, and the colour assessed against corrosion standards.

4 Reagents and materials

4.1 Wash solvent

2,2,4-trimethylpentane (isooctane) of minimum 99,75 % purity is the referee solvent, but any volatile sulfur-free hydrocarbon solvent that shows no tarnish when tested by the procedure of this International Standard for 3 h at 50 °C is suitable.

4.2 Polishing materials

4.2.1 Silicon-carbide paper or cloth, of varying degrees of fineness, including 65 µm (240 grit) grade.

4.2.2 Silicon-carbide powder, of 105 µm (150 mesh) size.

4.2.3 Absorbent cotton (cotton wool).

NOTE — Commercial grade is suitable, but pharmaceutical grade is most commonly available.

5 Apparatus

5.1 Copper strips, cut from smooth-surfaced, hard temper, cold-finished electrolytic-type copper of more than 99,9 % purity; electrical busbar stock is generally suitable.

The strips shall be 75 mm ± 5 mm in length, 12,5 mm ± 2 mm in width, and 1,5 mm to 3,0 mm in thickness.

When the strips show pitting or deep scratches that cannot be removed by the specified polishing procedure, or when the surfaces become deformed on handling, they shall be discarded.

5.2 Pressure vessel, constructed of stainless steel and of the dimensions shown in figure 1.

The vessel shall be capable of withstanding a test pressure of 700 kPa gauge.

NOTE — Alternative designs for the vessel cap and synthetic rubber gasket may be used, provided that the internal dimensions of the vessel are the same as those shown in figure 1.

5.3 Test tubes, of borosilicate glass, of nominal 25 mm x 150 mm.

The internal dimensions shall be checked with a metal strip of the maximum length given in 5.1 and not more than the median dimensions for width and thickness. When 30 ml of liquid is added, a minimum of 5 mm shall be above the top surface of the strip.

5.4 Test baths

5.4.1 General

All test baths shall have sufficient heat capacity to raise the product temperature to within ± 1 °C of the test temperature within 15 min.

5.4.2 Liquid bath for pressure vessel, capable of maintaining the product at the specified test temperature ± 1 °C.

The bath shall be constructed of non-transparent material and shall be deep enough to submerge one or more pressure vessels (5.2) completely during the test. It shall be fitted with suitable supports to hold each pressure vessel in a vertical position when submerged.

5.4.3 Bath for test tubes, capable of maintaining the product at the specified test temperature ± 1 °C.

Liquid baths shall be constructed of non-transparent material, and shall be fitted with suitable supports to hold each test tube (5.3) in a vertical position to a depth of 100 mm ± 5 mm. Solid block baths shall meet the same temperature control and immersion conditions, and shall be checked for temperature measurement (heat transfer) for each product class, by running tests on tubes filled with 30 ml of product plus a metal strip of the nominal dimensions given in 5.1, plus a temperature sensor.

5.5 Temperature sensor, for indicating the test temperature.

For liquid baths, a total immersion liquid-in-glass thermometer is suitable, with graduations of 1 °C or less. It shall be submerged in the liquid such that not more than 25 mm of the thread extends above the liquid surface.

NOTE — The ASTM 12C/IP 64C thermometer is suitable.

5.6 Polishing vice or holder, for holding copper strips firmly without marring the edges while polishing.

The strip shall be held tightly, and the surfaces of the strip that is being polished shall be supported above the surface of the holder.

NOTE — A suitable apparatus is illustrated in figure 2.

5.7 Viewing test tubes, for protecting corroded copper strips during close inspection or during storage, of such dimensions to allow the introduction of a copper strip (5.1) and made of glass which is free of striae or similar defects.

NOTE — A suitable “flat” tube is illustrated in figure 3.

5.8 Forceps, spade-ended, with either stainless steel or polytetrafluoroethylene (PTFE) tips.

5.9 Corrosion standards[1)]**,** for the evaluation of tarnish at the end of the test.

Further details on the composition and maintenance of these standards are given for information in annex A.

5.10 Timing device, electronic or manual, accurate to 1,0 s.

6 Samples and sampling

6.1 Unless otherwise specified, samples shall be taken according to the procedures described in ISO 3170 or ISO 3171.

6.2 Samples that are required to be tested against a “low-tarnish” strip classification shall be collected in clean, dark-glass bottles, or other suitable containers that will not affect the corrosive properties of the liquid. Appropriate plastic containers are suitable for some low-volatility products, but not for gasolines. Avoid the use of tinplate containers for samples, since they may contribute to sample corrosiveness.

6.3 Fill the container as completely as possible and close it immediately after sampling. Take care to protect the sample from direct sunlight, or even diffused daylight. Carry out the test as soon as possible after receipt, and immediately after opening the container.

6.4 If suspended water (haze) is observed in the test sample, or when filling the test tube (5.3), dry the sample by filtering a sufficient volume of it through a medium rapidity qualitative filter paper into a clean, dry test tube. Carry out this operation in a darkened room or under a light-protected shield.

NOTE — Contact of the copper strip with water before, during, or after the completion of the test period will cause staining, making it difficult to evaluate the strips.

1) Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, USA.