



SLOVENSKI STANDARD

SIST EN 116:2015

01-oktober-2015

Nadomešča:

SIST EN 116:1998

SIST EN 116:1998/AC:1999

Dizelsko gorivo in kurilno olje za gospodinjstvo - Določevanje točke filtrirnosti z ohlajanjem - Metoda postopnega hlajenja kopeli

Diesel and domestic heating fuels - Determination of cold filter plugging point - Stepwise cooling bath method

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Dieselkraftstoffe und Haushaltsheizöle - Bestimmung des Temperaturgrenzwertes der Filtrierbarkeit - Verfahren mit einem stufenweise arbeitenden Kühlbad

SIST EN 116:2015

<https://standards.itel.ai/catalog/standards/sist/05c8d14c-03f4541-b775-dda1be1dd0d/sist-en-116-2015>
Combustibles pour moteurs diesel et pour installations de chauffage domestique - Détermination de la température limite de filtrabilité

Ta slovenski standard je istoveten z: EN 116:2015

ICS:

75.160.20 Tekoča goriva Liquid fuels

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 116

August 2015

ICS 75.160.20

Supersedes EN 116:1997

English Version

**Diesel and domestic heating fuels - Determination of cold filter
plugging point - Stepwise cooling bath method**

Combustibles pour moteurs diesel et pour installations de
chauffage domestique - Détermination de la température
limite de filtrabilité

Dieselmotorkraftstoffe und Haushaltsheizöle - Bestimmung des
Temperaturgrenzwertes der Filtrierbarkeit durch
stufenweise Abkühlung

This European Standard was approved by CEN on 15 February 2015.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

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Contents

Page

European foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	4
4 Principle	5
5 Reagents and materials	5
6 Apparatus	5
7 Sampling	14
8 Preparation of the test sample	14
9 Preparation of apparatus	14
10 Procedure	15
11 Calibration	16
11.1 General	16
11.2 Thermometers	16
11.3 Cooling unit	16
11.4 Vacuum unit	16
12 Expression of results	16
13 Precision	16
13.1 General	16
13.2 Repeatability	16
13.3 Reproducibility	17
14 Test report	17
Annex A (normative) Thermometer requirements	18
Bibliography	19

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SIST EN 116:2015

<https://standards.iteh.ai/catalog/standards/sist/05c8d14c-103f-4541-b775-ddfa1be1dd0d/sist-en-116-2015>

European foreword

This document (EN 116:2015) has been prepared by 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 February 2016, and conflicting national standards shall be withdrawn at the latest by February 2016.

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 116:1997.

Significant technical differences between this European Standard and the previous edition of EN 116 are:

- that an automated method is described in detail beside the former manual procedure;
- the scope and the precision statement have been changed based on a European Round Robin study including current available fuels for use in diesel engines. In addition, Fatty Acid Methyl Esters (FAME) and FAME blends in diesel have been checked.

An alternative technique, i.e. using a linear cooling bath, has been developed as in EN 16329 [1].

Round Robin studies conducted for this revision showed different precision values compared to the previous edition. The studies covered current situation of marketed fuels including non-fossil component or biofuels.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies a method for the determination of the cold filter plugging point (CFPP) of diesel and domestic heating fuels (see 3.1) using automated test equipment. Manual test equipment may be used, but for referee purposes only automated test equipment is allowed.

This European Standard is applicable to fatty-acid methyl esters (FAME) and to distillate fuels as well as paraffinic diesel fuels, including those containing FAME, flow-improvers or other additives, intended for use in diesel engines and domestic heating installations.

The results obtained from the method specified in this European Standard are suitable for estimating the lowest temperature at which a fuel will give trouble-free flow in the fuel system.

NOTE In the case of diesel fuels the results are usually close to the temperature of failure in service except when the fuel system contains, for example, a paper filter installed in a location exposed to the weather or if the filter plugging temperature is more than 12 °C below the cloud point of the fuel. Domestic heating installations are usually less critical and often operate satisfactorily at temperatures somewhat lower than those indicated by the test results.

The difference in results obtained from the sample “as received” and after heat treatment at 45°C for 30 min before the filtration may be used to investigate complaints of unsatisfactory performance under low temperature conditions.

WARNING — The use of this Standard can 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 users of this standard to take appropriate measures to ensure the safety and health of personnel prior to application of the standard, and fulfil statutory and regulatory requirements for this purpose.

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2 Normative references

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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.

EN ISO 3170, *Petroleum liquids — Manual sampling (ISO 3170)*

EN ISO 3171, *Petroleum liquids — Automatic pipeline sampling (ISO 3171)*

ISO 261, *ISO general purpose metric screw threads — General plan*

3 Terms and definitions

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

3.1

cold filter plugging point

CFPP

highest temperature at which a given volume of fuel fails to pass through a standardized filtration device in a specified time, when cooled under standardized conditions

4 Principle

A test portion of the fuel is cooled under the specified conditions and is drawn at intervals of 1 °C into a pipette under a controlled vacuum of 2 kPa through a standardized wire mesh filter. The procedure is repeated, as the fuel continues to cool, for each 1 °C below the first test temperature. Testing is continued until the amount of wax crystals which have separated out of solution is sufficient to stop or slow down the flow so that the time taken to fill the pipette exceeds 60 s or the fuel fails to return completely to the test jar before the fuel has cooled by a further 1 °C.

The indicated temperature at which the last filtration was commenced is recorded as the cold filter plugging point (CFPP).

5 Reagents and materials

5.1 Hydrocarbon solvents, technical grade, e.g. Heptane.

5.2 Light hydrocarbon solvent, technical grade, e.g. Isopentane.

5.3 Lintless filter paper, with particle retention of $(5 \pm 1) \mu\text{m}$.

5.4 Certified reference materials.

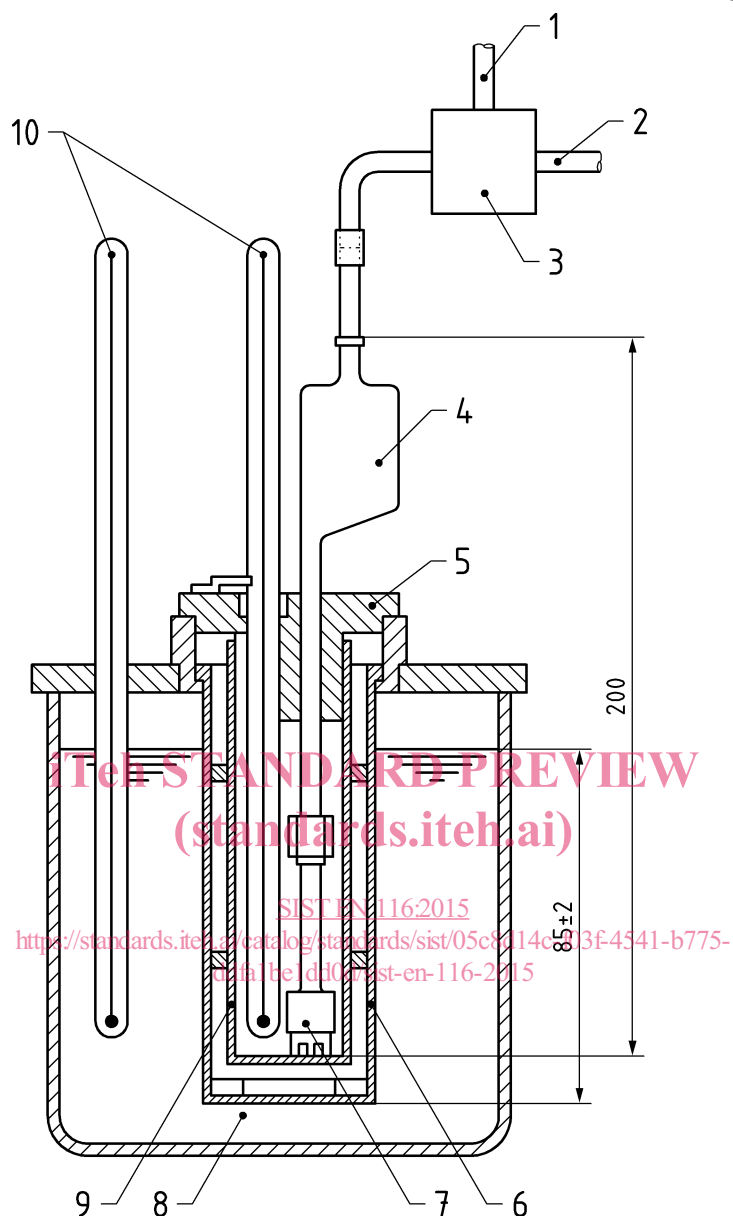
Certified reference materials may be obtained from the European Commission's Institute for Reference Materials and Measurements (IRMM), Retieseweg 111, B-2440 Brussels.

6 Apparatus

The equipment, as detailed in 6.1 to 6.11, shall be arranged as shown in Figure 1. Unless otherwise stated, all dimensions in the figures are given in mm.

IMPORTANT — Parts of the apparatus made of copper, zinc or brass can interact with bio-components like fatty acid methyl ester (FAME). Care shall be taken and parts made from alternative materials are available.

Dimensions in millimetres

**Key**

- | | |
|--------------------------|-----------------------|
| 1 atmosphere (6.7) | 6 jacket (6.2) |
| 2 vacuum regulator (6.7) | 7 filter unit (6.5.2) |
| 3 valve unit (6.7) | 8 cooling bath (6.9) |
| 4 pipette (6.5.1) | 9 test jar (6.1) |
| 5 stopper (6.4) | 10 thermometers (6.8) |

Figure 1 — General arrangement of apparatus

6.1 Test jar, cylindrical, of clear glass, flat bottomed, with an outside diameter of $(34 \pm 0,5)$ mm, a wall thickness of $(1,25 \pm 0,25)$ mm and a height of (120 ± 5) mm, having a permanent mark at the 45 ml level.

Test jars of the required dimensions may be obtained by selection from jars conforming to ISO 3016¹⁾ which specifies wider tolerances.

6.2 Jacket, watertight, cylindrical, flat bottomed, to be used as an air bath, having an inside diameter of $(45 \pm 0,25)$ mm, an outside diameter of $(48 \pm 0,25)$ mm and a height of (115 ± 3) mm.

6.3 Spacer, made from POM-C²⁾, except for the stainless steel rods with 2 mm diameter, to be placed into the jacket (6.2), conforming to the dimensions as shown in Figure 2.

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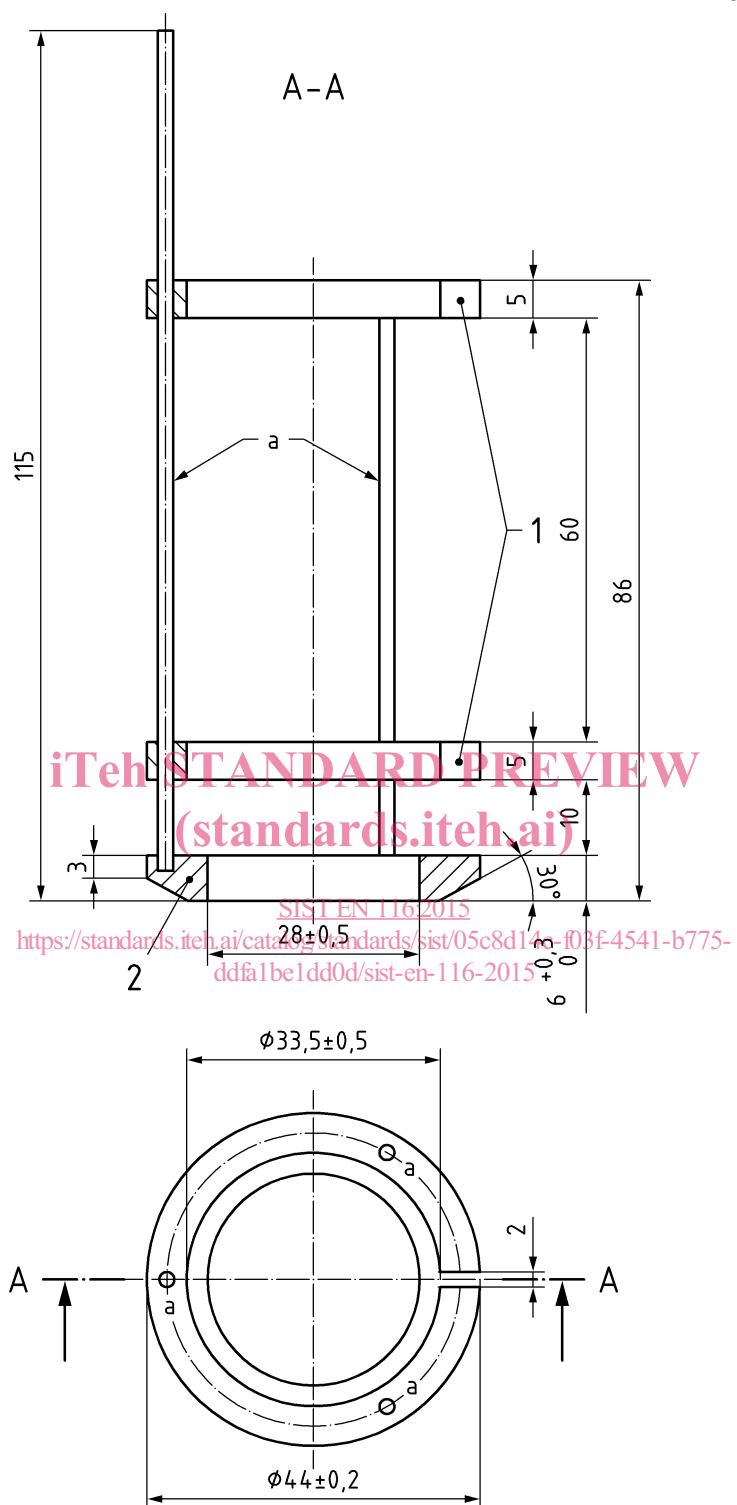
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1) ISO 3016: Petroleum products – Determination of pour point

2) POM-C Polyoxymethylen Copolymer, Trade marks e.g. DELRIN.

Dimensions in millimetres



Key

- a stainless steel wires \varnothing 2 mm
- 1 spacer
- 2 insulating rings

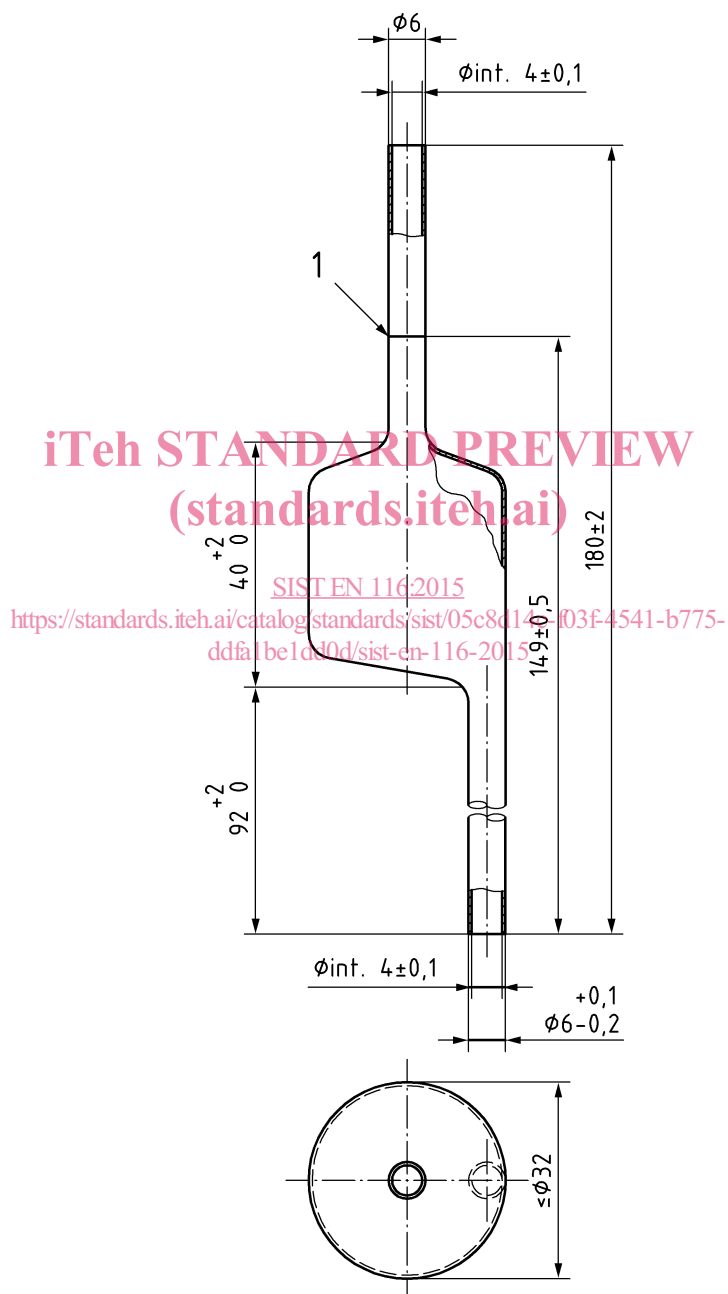
Figure 2 — Insulated ring (below) and spacer (above)

6.4 Stopper, of oil-resistant plastic and non-thermal conductive material, having three holes to accommodate the pipette (6.5), the thermometer (6.8) and to allow venting of the system and able to ensure that pipette and thermometer are safely positioned in the test jar.

6.5 Pipette with filter unit:

6.5.1 A **pipette** of clear glass with a calibration mark corresponding to a contained volume of $(20 \pm 0,2)$ ml at a point $(149 \pm 0,5)$ mm from the bottom of the pipette (see Figure 3). It shall be connected to the filter unit (6.5.2).

Dimensions in millimetres



Key

1 mark

Figure 3 — Pipette