SLOVENSKI STANDARD
oSIST prEN ISO 2507:2025

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Plastomerne cevi in fitingi - Temperatura zmehčišča po Vicatu: Splošna preskusna metoda in preskusni pogoji za cevi in fitinge na osnovi vinilklorida (PVC-U, PVC-C, PVC-Hi) in akrilonitrila (ABS, ASA) (ISO/DIS 2507:2025)

Thermoplastics pipes and fittings - Vicat softening temperature: General test method and test conditions for Vinyl chloride - based (PVC-U, PVC-C, PVC-Hi) and Acryl nitrile - based (ABS, ASA) pipes and fittings (ISO/DIS 2507:2025)

Rohre und Formstücke aus Thermoplasten - Vicat-Erweichungstemperatur: Allgemeines Prüfverfahren und Prüfbedingungen für Rohre und Formstücke auf Poly(vinylchlorid)- (PVC-U, PVC-C, PVC-Hi) und auf Acrylnitrilbasis (ABS, ASA) (ISO/DIS 2507:2025)

Tubes et raccords en matières thermoplastiques - Température de ramollissement Vicat: Méthode d'essai générale et conditions d'essai pour les tubes et raccords à base de chlorure de vinyle (PVC-U, PVC-C, PVC-Hi) et à base d'acryl nitrile (ABS, ASA) (ISO/DIS 2507:2025)

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ICS:

23.040.20	Cevi iz polimernih materialov	Plastics pipes
23.040.45	Fitingi iz polimernih materialov	Plastics fittings

oSIST prEN ISO 2507:2025 **en,fr,de**

DRAFT International Standard

ISO/DIS 2507

Thermoplastics pipes and fittings — Vicat softening temperature: General test method and test conditions for Vinyl chloride - based (PVC-U, PVC-C, PVC-Hi) and Acryl nitrile - based (ABS, ASA) pipes and fittings

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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 documents 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).

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 (see www.iso.org/patents).

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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 *138*, Plastics pipes, fittings and valves for the transport of fluids, Subcommittee SC 5, General properties of pipes, fittings and valves of plastic materials and their accessories – Test methods and basic specifications.

ISO 2507:1995 consists of the following parts, under the general title *Thermoplastics pipes and fittings – Vicat softening temperature:*

— *Part 1: General test method*

— *Part 2: Test conditions for unplasticized poly(vinyl chloride) (PVC-U) or chlorinated poly(vinyl chloride) (PVC-C) pipes and fittings and for high impact resistant poly(vinyl chloride) (PVC-HI) pipes.*

— *Part 3: Test conditions for acrylonitrile/butadiene/styrene (ABS) and acrylonitrile/styrene/ acrylic ester (ASA) pipes and fittings.*

This third edition cancels and replaces all three parts of the first edition (ISO 2507-1:1995; ISO 2507-2:1995; ISO 2507-3:1995), by merging all parts into one document (ISO 2507:2024) and has been technically revised.

The main changes are as follows:

— The document was modified following edition 6 of ISO 306:2022

— The procedure for test piece preparation from pipes and fittings is described more detailed

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

This International Standard is based on ISO 306.

For convenience of use, it has been considered preferable to draw up a complete document for use in determining the Vicat softening temperature of thermoplastics pipes and fittings. For further details, reference to ISO 306 is recommended.

Please note, however, that ISO 306 is applicable to materials in the form of sheets, whereas this International Standard is applicable to products in the form of pipes and fittings.

ISO 2507 gives the general conditions under which the Vicat softening temperature of pipes and fittings is determined and provides the particular requirements for conducting tests on pipes and fittings of various materials.

The basic specifications for various materials are given in the informative annexes.

Thermoplastics pipes and fittings — Vicat softening temperature: General test method and test conditions for Vinyl chloride - based (PVC-U, PVC-C, PVC-Hi) and Acryl nitrile - based (ABS, ASA) pipes and fittings

1 Scope

ISO 2507 specifies a general method for determining the Vicat softening temperature (VST) of thermoplastics pipes and fittings. It includes the adaption of method B 50 of ISO 306: 2022 using a force of 50 N and a heating rate of 50 °C/h.

It includes the particular test conditions for determining the Vicat softening temperature (VST) of unplasticized poly(vinylchloride) (PVC-U) or chlorinated poly(vinylchloride) (PVC-C) pipes and fittings, for high impact resistance poly(vinylchloride) (PVC-HI) pipes and for acrylonitrile/butadiene/styrene (ABS) and acrylonitrile/styrene/acrylic ester (ASA) pipes and fittings.

It also gives, for information, the corresponding base specifications.

It is not applicable to crystalline or semi-crystalline polymers.

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 291, *Plastics — Standard atmospheres for conditioning and testing*

ISO 306:2022, *Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST)*

ISO 472, *Plastics — Vocabulary*

ISO 16012, *Plastics — Determination of linear dimensions of test specimens*

IEC 60584-1, *Thermocouples -Part 1: EMF specifications and tolerances*

IEC 60584-3, *Thermocouples - Part 3: Extension and compensating cables - Tolerances and identification system*

IEC 60751, *Industrial platinum resistance thermometers and platinum temperature sensors*

3 Terms and definitions,

For the purposes of this document, the terms and definitions given in ISO 472 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
Penetration
distance over which the indenting tip has to penetrate into the specimen under test

Note 1 to entry: It is expressed in millimetres (mm).

3.2
Load
force applied to test specimen by means of the indenting tip

Note 1 to entry: It is expressed in Newtons (N).

3.3
Vicat softening temperature VST
temperature at which a flat-ended indenter will penetrate the specimen to a depth of 1 mm under a specified *load* (3.2) using a selected uniform rate of temperature rise.

Note 1 to entry: It is expressed in degrees Celsius (°C)

4 Principle

The temperature at which a standard indenting tip with a flat point, under a standardised load penetrates (1,00 ± 0,01) mm into the surface of a test specimen, cut from the wall of a plastics pipe or a fitting, is determined. The intending tip exerts a specified force of (50 ± 1) N perpendicular to the test specimen, while the specimen is heated at a uniform rate of (50 ± 5) °C / h.

The temperature, in degree Celsius (°C), of the specimen, measured as close as possible to the indented area at 1 mm penetration, is quoted as the VST.

5 Apparatus

5.1 Means of producing penetration

The apparatus shall be constructed essentially as shown in (Figure 1). It consists of a rigid metal frame in which a rod moves freely in the vertical direction. One end of the rod is fitted with a weight-carrying plate and the other end is equipped with an indenting tip. The base of the frame is fitted with a support plate or other suitable load-application device.

It is recommended that the rod and frame(s) be constructed of low thermal expansion material. Unless vertical parts of the apparatus have the same coefficient of linear thermal expansion, the difference in change of length of these parts during the test introduces an error in the reading of the apparent penetration of the test specimen.

At the time of manufacture, or after repair or replacement of test frame, a blank test shall be made on each apparatus using a test specimen made of rigid material having a low coefficient of expansion and a thickness comparable to that of the specimen under test. The blank test shall cover the temperature ranges to be used in the actual determination, and a correction term shall be determined for each temperature. If the correction term is 0,02 mm or greater, its value and algebraic sign shall be recorded; and the term applied to each test result by adding it algebraically to the reading of the apparent penetration of the test specimen.

NOTE Invar and borosilicate glass have been found suitable as materials for the test specimen in the blank test.

5.2 Indenter

It shall be made of hardened steel, at least 2 mm long, of circular cross-section and of area (1,000 ± 0,015) mm^2 (corresponding to an indenting tip diameter of (1,128 ± 0,008) mm) and fixed at the bottom of the rod. The indenter, when in contact with the specimen, shall be perpendicular to the rod. The tip shall be free from burrs or other imperfections.