

INTERNATIONAL STANDARD

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Thermoplastics pipes and fittings — Vicat softening temperature —

Part 1: General test method

*Tubes et raccords en matières thermoplastiques — Température de ramollissement Vicat —
Partie 1: Méthode générale d'essai*



Reference number
ISO 2507-1:1995(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 2507-1 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*.

This first edition of ISO 2507-1, and ISO 2507-2, cancels and replaces the second edition of ISO 2507 (ISO 2507:1982), of which it constitutes a technical revision.

ISO 2507 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 resistance poly(vinyl chloride) (PVC-HI) pipes*
- *Part 3: Test conditions for acrylonitrile/butadiene/styrene (ABS) and acrylonitrile/styrene/acrylic ester (ASA) pipes and fittings*

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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 materials in the form of pipes and fittings.

ISO 2507 comprises three parts: the first gives the general conditions under which the Vicat softening temperature of a pipe or fitting is determined, the other two parts provide the particular requirements for conducting tests on pipes and fittings of different materials (see the Foreword).

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

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Thermoplastics pipes and fittings — Vicat softening temperature —

Part 1: General test method

1 Scope

This part of ISO 2507 specifies a general method for determining the Vicat softening temperature of thermoplastics pipes and fittings. It includes the adaptation of method B of ISO 306:1994, using a force of 50 N.

This method is applicable only to thermoplastics materials for which it is possible to measure the temperature at which their rate of softening becomes rapid.

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

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 2507. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 2507 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 291:1977, *Plastics — Standard atmospheres for conditioning and testing*.

ISO 306:1994, *Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST)*.

3 Principle

Determination of the temperature at which a standard indenter, under a force of $50 \text{ N} \pm 1 \text{ N}$, penetrates 1 mm into the surface of a test piece cut from the wall of a pipe or fitting while the temperature is raised at a constant rate.

The temperature at which the penetration is 1 mm is called the Vicat softening temperature (VST), in degrees Celsius.

4 Apparatus

4.1 Rod, provided with a **load-carrying plate** (4.4), held in a **rigid metal frame** so that it can move freely in the vertical direction, the base of the frame serving to support the test piece under the indenting tip at the end of the rod (see figure 1).

If the rod and the components of the frame do not have the same coefficient of linear thermal expansion, their differential change in length introduces an error into the readings. A blank test shall be carried out for each apparatus using a test piece of rigid material with a low coefficient of expansion. This test shall cover the whole range of service temperatures and a correction term shall be determined for each temperature. If the correction term is greater than or equal to 0,02 mm, its algebraic sign shall be noted and the correction shall be applied to each test by adding it to the value observed for apparent penetration. It is recommended that the apparatus be constructed using an alloy with a low coefficient of thermal expansion.