

Australian/New Zealand Standard™

Methods of test for plastics pipes and fittings

Method 5: Vicat softening temperature

AS/NZS 1462.5

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee PL-045, Plastics Pipe Systems Test and Calculation Methods.

This Standard is identical with and has been reproduced from ISO 2507-1:1995, *Thermoplastics pipes and fittings—Vicat softening temperature, Part 1: General test method*.

The objective of this Standard is to provide a method of test to determine the Vicat softening temperature of thermoplastics pipes and fittings. It is applicable to thermoplastics materials for which it is possible to measure the temperature at which their rate of softening becomes rapid.

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (b) In the source text 'this International Standard' should read 'this Australian/New Zealand Standard'.
- (c) A full point should be substituted for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to equivalent Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>		<i>Australian or Australian/New Zealand Standard</i>	
ISO		AS/NZS	
291	Plastics—Standard atmospheres for conditioning and testing	1327	Plastics—Standard atmospheres for conditioning and testing
306	Plastics—Thermoplastics materials—Determination of Vicat softening temperature (VST)		



METHOD

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.