International Standard 2507

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Unplasticized polyvinyl chloride (PVC) pipes and fittings — Vicat softening temperature — Test method and specification

Tubes et raccords en polychlorure de vinyle (PVC) non plastifié — Température de ramollissement Vicat — Méthode d'essai et spécification

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2507 was developed by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, and was circulated to the member bodies in November 1980.

It has been approved by the member bodies of the following countries :

Austria	Greece	Portugal
Belgium	India	Romania
Brazil	Ireland	South Africa, Rep. of
Czechoslovakia	Israel	Spain
Denmark	Italy	Sweden
Egypt, Arab Rep. of	Japan	United Kingdom
Finland	Mexico	USA
France	New Zealand	USSR
Germany, F.R.	Poland	

The member body of the following country expressed disapproval of the document on technical grounds :

Norway

This second edition cancels and replaces the first edition (i.e. ISO 2507-1976), and also International Standard ISO 2056-1976.

Printed in Switzerland

Unplasticized polyvinyl chloride (PVC) pipes and fittings — Vicat softening temperature — Test method and specification

1 Scope and field of application

This International Standard specifies a method for the determination of the Vicat softening temperature of pipes and fittings moulded in unplasticized polyvinyl chloride (PVC) and includes the adaption, for this purpose, of method B specified in ISO 306, using a force of 49,05 N.

It also lays down the minimum permissible value of the Vicat softening temperature for pipes and fittings respectively.

2 Reference

ISO 306, *Plastics — Determination of the Vicat softening temperature of thermoplastics.*

Section one : Test method

3 Principle

Determination of the temperature at which a standard indenter, under a force of 49,05 N, penetrates 1 mm into a test piece cut from the wall of the fitting or the pipe, the temperature increasing linearly as a function of time during the period of the test.

The temperature corresponding to 1 mm penetration is called the Vicat softening temperature; its value is expressed in degrees Celsius.

4 Apparatus

The apparatus consists essentially of :

4.1 Rod, provided with a load-carrying plate 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).

4.2 Indenting tips preferably of hardened steel, 3 mm long, having a circular cross-section with an area of 1,000 ± 0,015 mm^2, fixed at the bottom of the rod. The lower surface of the indenting tip shall be plane and perpendicular to the axis of the rod and free from burrs.

4.3 Micrometer dial gauge (or any other suitable measuring instrument), graduated in divisions of 0,01 mm, to measure the penetration of the indenting tip into the test piece. The thrust of the dial gauge, which contributes to the thrust on the test piece, must be known and shall comply with the requirements of 4.4.

4.4 Load-carrying plate, fitted to the rod (see 4.1), and suitable weights located centrally so that the total thrust applied to the test piece can be adjusted to between 49,05 N and 49,54 N. The combined weight of the rod, indenting tip and load-carrying plate shall not exceed 100 g.

The construction of the apparatus shall be such that the micrometer dial gauge reading caused by the differential expansion of the system over the intended temperature range does not exceed 0,02 mm when the test piece is replaced by a piece of borosilicate glass or low thermal expansion alloy steel.

It is recommended that the apparatus be constructed of low thermal expansion alloy.

4.5 Heating bath, containing a suitable liquid (see note 1 below), in which the apparatus is immersed so that the test piece is at least 35 mm below the surface of the liquid. An efficient stirrer shall be provided. The heating bath shall be equipped with a suitable means of control so that the temperature of the liquid can be raised at a uniform rate of 50 ± 5 °C/h (see note 2 below). This rate of temperature rise shall be considered to be met if, over every 5 min interval during the test, the temperature change is within the specified limits.

NOTES

1 Water, liquid paraffin, transformer oil, glycerol and silicone oils may be suitable heat-transfer media, but other liquids may be used. In all cases, it should be established that the liquid chosen is stable at the temperatures used and does not affect the product under test.

2 A uniform rate of temperature rise can be obtained by controlling the heat either manually or automatically, although the latter is strongly recommended. One method of operation found to be satisfactory is to use an immersion heater adjusted to give the desired rate of tempera-