



INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 1218

PLASTICS

DETERMINATION OF THE "MELTING POINT" OF POLYAMIDES

1st EDITION

April 1970

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BRIEF HISTORY

The ISO Recommendation R 1218, *Plastics – Determination of the “melting point” of polyamides*, was drawn up by Technical Committee ISO/TC 61, *Plastics*, the Secretariat of which is held by the American National Standards Institute (ANSI).

Work on this question led to the adoption of Draft ISO Recommendation No. 1218 which was circulated to all the ISO Member Bodies for enquiry in April 1967. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	Greece	Poland
Austria	Hungary	Romania
Belgium	India	South Africa, Rep. of
Brazil	Iran	Spain
Bulgaria	Israel	Sweden
Canada	Italy	Switzerland
Czechoslovakia	Japan	Turkey
Finland	Korea, Dem. P. Rep. of	U.A.R.
France	Netherlands	U.S.A.
Germany	New Zealand	Yugoslavia

The following Member Body opposed the approval of the Draft :

United Kingdom

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in April 1970, to accept it as an ISO RECOMMENDATION.

PLASTICS

DETERMINATION OF THE "MELTING POINT" OF POLYAMIDES

1. SCOPE

- 1.1 This ISO Recommendation describes two methods for determining the "melting point" of polyamides.
- 1.2 The "melting point" is an arbitrarily determined temperature which, in fact, lies in a range of temperature which, for the homopolymers, covers a few degrees only.
- 1.3 The determination of the "melting point", however, is useful for the characterization of polyamide homopolymers. It is of less use for copolymers, which may have a much wider melting range.
- 1.4 The two methods of test described in this ISO Recommendation give results in close agreement in any one test, and quite good agreement between the two methods.
- 1.5 Methods different from the two described in this document may give very different results.

METHOD A — HEATING CHAMBER WITH CAPILLARY TUBE

2. PRINCIPLE

Determination of the temperature at which is observed, visually, the change in state of a test specimen of polyamide in a capillary tube enclosed in a heating chamber.

3. MATERIALS

Standards :

- 3.1 *Bismuth*, analytical quality, melting point 271.3 °C.
- 3.2 *Tin*, analytical quality, melting point 231.9 °C.
- 3.3 *Suitable pure compounds* of known melting point.

4. APPARATUS

- 4.1 *Melting apparatus* consisting of the following items (see Fig. 1) :
 - (a) *cylindrical metal block*, the upper part of which is hollow and forms a chamber;
 - (b) *metal plug*, with two or more holes, which allows a thermometer and one or more capillary tubes to be mounted into the metal block (a);
 - (c) *heating system for the metal block (a)*, provided, for example, by an electrical resistance enclosed in the block;
 - (d) *rheostat* for regulation of the power input, if electrical heating is used;
 - (e) *four windows* of heat-resistant glass on the lateral walls of the chamber, diametrically disposed at right angles to each other. In front of one of these windows is mounted an eye-piece for observing the capillary tube. The other three windows are used for illuminating the inside of the enclosure by means of lamps.
- 4.2 *Capillary tube* of heat-resistant glass, closed at one end, and of maximum external diameter 2 mm.
- 4.3 *Precision thermometer* graduated from 20 to 300 °C, in 1 °C intervals.

5. TEST SPECIMEN

- 5.1 Using a razor blade, take a thin section 5 mm long from the polyamide resin and place it in the capillary tube.
- 5.2 For a given polyamide two test specimens are generally sufficient.

6. PROCEDURE

- 6.1 Before using the apparatus for the first time, and whenever the thermometer is changed, calibrate the apparatus following the procedure given in clauses 6.2 to 6.7, but using, instead of the polyamide specimen, one or more of the appropriate standards from section 3 melting close to or covering the range of the melting points to be measured.
- 6.2 Insert the thermometer in position in the apparatus.