

Methods of testing

Plastics —

Part 9: Sampling and test specimen preparation —

Method 940B: Preparation of test specimens of amorphous thermoplastics with a specified reversion by injection moulding rectangular plates

[ISO title: Plastics — Amorphous thermoplastics — Preparation of test specimens with a specified reversion — Part 2: Plates]

IMPORTANT NOTE. Before reading this method it is essential to read BS 2782-0, Introduction, issued separately.

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National foreword

This method has been prepared under the direction of the Plastics Standards Committee and is identical with ISO 2557-2 *“Plastics — Amorphous thermoplastics — Preparation of test specimens with a specified reversion — Part 2: Plates”*, published in 1986 by the International Organization for Standardization (ISO). It is a revision of BS 2782:Method 940B:1981, which was identical with ISO 2557-2:1979 and which has been withdrawn.

This standard differs from BS 2782:Method 940B:1981 principally in the following respects.

- a) The term “reversion” is used in place of “shrinkage” throughout the document and related definitions have been included accordingly.
- b) The text is based upon publication of the method of test for reversion separately from ISO 2557-1, specifically as ISO 8328 (see “Cross-references” and “Additional information” in this national foreword).
- c) Moulding conditions are specified in part by requirements for the average injection velocity, with the introduction of an associated reference to ISO 294 and hence BS 2782:Method 910A.
- d) The term “bar” is used in place of “strip” for reference to the form of test specimen profile covered by ISO 2557-1 and hence BS 2782:Method 940A.
- e) The title of the 1986 edition of ISO 2557-2 differs from that of the 1979 edition in the following respects:
 - 1) the term “specified reversion” replaces “defined level of shrinkage”;
 - 2) the terms “moulding material”, “rectangular” and “injection moulding” have been deleted.

The title of BS 2782:Method 940B has been changed to adopt the term “specified reversion” but retains reference to the key feature of “injection moulding rectangular plates”, which distinguishes this method from that of BS 2782:Method 940A.

Terminology and conventions. The text of the International Standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

The comma has been used as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Wherever the words “part of ISO 2557” and “International Standard” appear, referring to this standard, they should be read as “British Standard”.

Cross-references

International Standard	Corresponding British Standard
	BS 2782 <i>Methods of testing plastics</i>
ISO 294:1975	Method 910A:1977 <i>Injection moulding test specimens of thermoplastic materials</i> (Identical)
ISO 2557-1:1976	Method 940A:1981 <i>Preparation of test specimens of amorphous thermoplastic moulding material with a defined level of shrinkage in the form of parallelepipedic bars by compression moulding and injection moulding</i> (Identical)

The related British Standard to ISO 2818:1980 is BS 2782:Method 930A:1977 “*Preparation of test specimens by machining*”, which is identical with the 1974 edition of ISO 2818. A revision of ISO 2818:1980 is in preparation and is expected to be more acceptable as a basis for revision of BS 2782:Method 930A:1977.

There is no British Standard corresponding to ISO/DIS 8328 because the method of test to be provided thereby is incorporated in the 1981 edition of BS 2782:Method 940A, by alignment with the 1976 edition of ISO 2557-1.

Additional information. The following apply.

a) Pending publication of ISO 8328, for the purposes of **3.3** reference should be made to BS 2782:Method 940A:1981 for details of the heat treatment applicable to obtain test specimens in their basic state. In thus making any reference to ISO 2557-1:1976, pending the publication of the revision referred to in clause **2** or pending the publication of ISO 8328, allowances need to be made for use in BS 2782:Method 940B:1989 of the term “reversion” in contexts where the term “shrinkage” was used in ISO 2557-1:1976 and hence BS 2782:Method 940A:1981.

b) Attention is drawn to the fact that many thermoplastics materials specifications, national and international, current at the date of publication of this standard use the term “shrinkage” for either:

1) moulding shrinkage, i.e. the difference in dimensions between a moulding and the mould cavity in which it was moulded, both the mould and the moulding being at normal room temperature when measured (term **3.5.17** of BS 1755-1:1982); or

2) the percentage change in length when a (moulded) specimen is subjected to a (further) specified heat treatment.

For item 2) the term “reversion” is used in the 1986 editions of DIS 8328 and DIS 2557-1, which were accepted by Technical Committee ISO/TC 61 for publication, and hence also in this edition of BS 2782:Method 940B. Hence unless and until such specifications adopt the term “reversion” in place of “shrinkage” where applicable, it may be necessary to appreciate those contexts where the use of these two terms remains synonymous.

c) Attention is drawn to the introduction to BS 2782:Method 940A (clause **0**) which also applies to this Method. The introduction states that “for industrial purposes, the conditions of similar state are reasonably fulfilled when the measured shrinkages of test specimens produced by a specified heat treatment are equal”.

Subsequent to the publication of ISO 2557-1, experimental evidence has shown that this might not always be the case. Mouldings of the same amorphous polymer giving similar shrinkage have shown significantly different mechanical properties (e.g. tensile strength), and mouldings giving significantly different shrinkage have shown similar tensile strength. This apparently results especially from extreme changes in processing conditions and may be a consequence of different types or distributions of orientation within the specimen. These effects may be aggravated by unequal cooling, leading to different shrinkages on the two sides of the specimen (see **7.1** of BS 2782:Method 940B) which may result from using inserted plates to reduce the mould thickness (see **6.2** of BS 2782:Method 940B).