

INTERNATIONAL STANDARD

ISO
1110

Second edition
1987-04-15



INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
ORGANISATION INTERNATIONALE DE NORMALISATION
МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Plastics — Polyamides — Accelerated conditioning of test specimens

Plastiques — Polyamides — Conditionnement accéléré d'éprouvettes

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ISO 1110:1987

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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.

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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 1110 was prepared by Technical Committee ISO/TC 61, *Plastics*.

This second edition cancels and replaces the first edition (ISO 1110:1975), of which it constitutes a technical revision.

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Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Plastics — Polyamides — Accelerated conditioning of test specimens

0 Introduction

Various properties of polyamides depend upon their moisture content. Reproducible values of these properties can only be obtained with specimens having a specified moisture content. Such specimens are obtained by conditioning, i.e. by allowing them to reach equilibrium in an atmosphere with a specified temperature and relative humidity.

The rate of moisture absorption and, therefore, the rate of conditioning, is a function of the temperature. This rate is very low at room temperature. For example, a 4 mm thick test specimen of PA66 requires more than a year to attain its equilibrium moisture content in the standard atmosphere 23/50 (ISO 291). To condition specimens in a relatively short period of time, higher temperatures are required. Such a method for accelerated conditioning is presented in this International Standard.

1 Scope and field of application

This International Standard describes a method for the accelerated conditioning of test specimens of polyamides and copolyamides. It is applicable to grades containing fillers and other additives, but not to grades containing more than 2 % (m/m) extractables.

The equilibrium moisture content attained by this method is close to the equilibrium moisture content obtained in the standard atmosphere 23/50. The values of mechanical properties obtained after accelerated conditioning according to this method may differ slightly from those obtained after conditioning in the standard atmosphere 23/50.

2 References

ISO 291, *Plastics — Standard atmospheres for conditioning and testing*.

ISO 483, *Plastics — Methods for maintaining constant relative humidity in small enclosures by means of aqueous solutions*.¹⁾

1) At present at the stage of draft. (Revision of ISO/R 483 : 1966.)

3 Principle

The test specimens are stored in an atmosphere of 70 ± 1 °C and (62 ± 1) % relative humidity (psychrometric temperature difference of $10 \pm 0,3$ K) until the equilibrium moisture absorption has virtually been reached.

4 Apparatus

4.1 Cabinet, with closed air circulation by a fan, capable of maintaining a temperature of 70 °C within a tolerance of ± 1 °C and a psychrometric temperature difference of 10 K within a tolerance of $\pm 0,3$ K, corresponding to a relative humidity of (62 ± 1) %.

4.2 If a cabinet as described in 4.1 is not available:

4.2.1 Oven, capable of maintaining the temperature at 70 ± 1 °C.

4.2.2 Closed container, for example a desiccator, partially filled with a saturated aqueous solution of potassium iodide according to the general procedure specified in ISO 483.

NOTE — Leave excess salt in contact with the solution throughout the conditioning. The specimens may become slightly discolored by the absorption of iodine.

4.3 Analytical balance, accurate to 0,1 mg.

5 Procedure

Place the test specimens in the preheated cabinet (4.1) or in the closed container (4.2.2) in the oven (4.2.1). By suitable means, for example racks, ensure that the surface of each specimen is almost completely exposed to the surrounding atmosphere.

After conditioning for a period of time t_1 , as indicated in the table, remove the specimens from the cabinet or the container, allow them to cool for 1 h in the standard atmosphere 23/50

(ISO 291) and weigh them to the nearest 0,1 mg. Thereafter, continue the accelerated conditioning of the specimens and repeat the weighings, as above, at intervals of time t_2 as indicated in the table. The periods of time t_1 and t_2 shall not be less than 1 day.

When three consecutive weighings lie within a tolerance of 0,1 %, the conditioning is assumed to be completed (see the note). Place the specimens in the standard atmosphere 23/50 (ISO 291) for at least 1 h before testing.

In the case of PA not mentioned in the table, use the values of t_1 and t_2 indicated for group II, unless a plot of the mass of the

specimens *versus* the conditioning time shows that the values for group I may be used.

NOTE — Under these conditions, the specimens will have acquired a moisture content equal to at least 95 % of the equilibrium value. A prolongation of the conditioning beyond this point will have no noticeable effect on the properties of the specimens.

6 Reference procedure

In case of dispute, the test specimens shall be conditioned in the cabinet (4.1).

Table — Periods of time for accelerated conditioning

Group	PA	t_1 (days)		t_2 (days)
		in a cabinet (4.1)	in a container (4.2.2)	
I	6, 66, 11, 12, 6/66	$> 1/3 d^2^*$	$> d^2$	$> 1/8 d^2$
II	69, 610, 612, 6-3-T, 6I/6T	$> 2/3 d^2$	$> 2 d^2$	$> 1/4 d^2$

* d is the thickness, in millimetres, of the specimens.

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