International Standard ISO 2796

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Cellular plastics, rigid — Test for dimensional stability

Plastiques alvéolaires rigides — Essai de stabilité dimensionnelle

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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 2796 was prepared by Technical Committee ISO/TC 61, *Plastics*.

This third edition cancels and replaces the second edition (ISO 2796-1980), of which it constitutes a minor revision.

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.

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Cellular plastics, rigid — Test for dimensional stability

1 Scope and field of application

This International Standard specifies a method for the determination of dimensional stability of rigid cellular plastics when subjected to specific conditions of temperature and relative humidity.

The method suggests a range of conditions from which one or more of the desired test conditions can be selected.

Additional conditions may be used as agreed upon by the purchaser and the supplier.

The term "dimensional stability of a rigid cellular plastic" implies the absence of irreversible change in dimensions in each of three directions perpendicular to each other when a test specimen of specified size is exposed to stated conditions for a specified period. In practice, such irreversible changes do occur and are measured by the method described in this International Standard.

2 References

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

ISO 1923, *Cellular plastics and rubbers — Determination of linear dimensions.*

3 Principle

Determination of the changes of linear dimensions which occur when the test specimens have been subjected to specified environments for a definite period of time and reconditioned.

4 Apparatus

4.1 Temperature or temperature and humidity controlled chamber, capable of maintaining the test specimens within the specified conditions and within the limits specified in the procedure (7.2).

4.2 Measuring instruments, capable of measuring linear dimensions in accordance with ISO 1923.

5 Test specimens

5.1 Test specimens shall be machined or sawn from the sample so as to have a smooth surface free of cracks. Foam skins shall be removed, unless otherwise specified.

5.2 The dimensions of the test specimens shall be not less than the following values:

length:	100 ± 1 mm
width:	100 ± 1 mm
thickness:	25 ± 0,5 mm

5.3 A minimum of three test specimens for each sample shall be used under each set of chosen conditions.

6 Conditioning

The test specimens shall be conditioned in one of the standard atmospheres defined in ISO 291.

7 Procedure

7.1 Measure the length and width of each test specimen at the three positions shown in the figure, and the thickness at the five positions shown, using the appropriate methods described in ISO 1923.

7.2 Expose the set of test specimens to each set of conditions specified in the relevant specification. Alternatively, test conditions may be chosen among the following:

For use at dry conditions:

−55 ± 3 °C
−25 ± 3 °C
−10 ± 3 °C
0 ± 3 °C
+23 ± 2 °C
+40 ± 2 °C
+70 ± 2 °C
+85 ± 2 °C
+100 ± 3 °C
+110 ± 3 °C
+125 ± 3 °C
+150 ± 3 °C

For use at 90 to 100 % RH:

+40 ± 2 °C
+70 ± 2 °C

Test specimens shall be laid horizontally in the test chamber not less than 25 mm apart and on rigid wire mesh or perforated metal plate such that substantially free air circulation around the test specimens occurs.

The specimens shall not be exposed to the direct radiation from heating elements.

7.3 After 20 ± 1 h, remove the test specimens and recondition them for not less than 1 h and not more than 3 h in the same atmosphere as was used for conditioning.

7.4 Measure the length, width and thickness of the test specimens as indicated in 7.1. Examine the test specimens visually.

7.5 Without unnecessary delay, expose the test specimens again to the conditions previously used.

7.6 After a total exposure time of 48 ± 2 h, repeat the procedure described in 7.3 and 7.4.

7.7 If desired, re-expose the samples to the test conditions for total exposure times of 7 days and 28 days, and repeat the procedure described in 7.3 and 7.4.

8 Expression of results

8.1 Method of calculation

The percentage change in length is given by the formula

$$100 \times \frac{l_t - l_o}{l_o}$$

The percentage change in width is given by the formula

$$100 \times \frac{b_t - b_o}{b_o}$$

The percentage change in thickness is given by the formula

$$100 \times \frac{\delta_t - \delta_o}{\delta_o}$$

where

l_o, b_o and δ_o are the mean initial dimensions and

l_t, b_t and δ_t are the mean final dimensions after 20 h, 48 h, 7 days and 28 days.

8.2 Precision and accuracy

8.2.1 The precision and accuracy of this method are not known because collaborative interlaboratory data are not available.

8.2.2 The accuracy of the measuring instruments shall be as prescribed by ISO 1923.

9 Test report

The test report shall include the following information:

a) reference to this International Standard;

b) all particulars necessary for the identification of test specimens;

c) the conditioning procedure used;

d) the test conditions employed;

e) for each exposure period, the individual percentage change in length, width and thickness of each test specimen after test;

f) for each exposure period, the average of the percentage changes in length, width and thickness after test;

g) for each exposure period, comments on any visual distortion of the test specimens;

h) any procedures not specified in this International Standard;

i) any deviation, by agreement or otherwise, from the procedure specified.

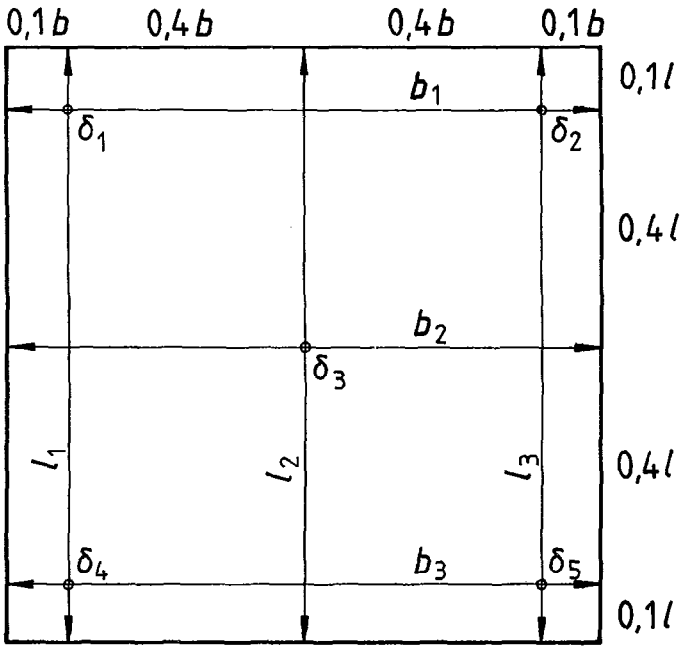

Figure — Positions for measuring dimensions