SLOVENSKI STANDARD
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Penjeni polimerni materiali - Postopek štetja celic za gibki in trdi poliuretan

Cellular Plastics - Cell count procedure for flexible and rigid polyurethane

Schaumstoffe - Verfahren zur Zellenzählung für weich-elastische und harte Schaumstoffe aus Polyurethan

Plastiques alvéolaires - Mode opératoire de dénombrement des alvéoles des polyuréthanes souples et rigides

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Foreword

This document (EN 15702:2008) has been prepared by Technical Committee CEN/TC 249 “Plastics”, the secretariat of which is held by NBN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2009, and conflicting national standards shall be withdrawn at the latest by June 2009.

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1 Scope

This European Standard specifies a method for determining the cell count of flexible and rigid cellular polyurethane.

2 Terms and Definitions

For the purposes of this document, the following term and definition applies:

cell count
number of cells per 25 mm in the cellular polyurethane under specified conditions

3 Apparatus

3.1 The apparatus shall consist of a magnifying device (of sufficient power to allow identification of each cell) with a scale, calibrated in millimetres, capable of measuring a length of 25 mm to an accuracy of at least ± 0,1 mm. A 25 mm cloth-counting glass is normally adequate.

3.2 In the case of very fine celled foams optical fatigue may be experienced and in this event the use of a smaller glass (10 mm or 15 mm) and arithmetic conversion is permitted.

3.3 A X10 magnifying device is adequate for a cell count of 40 or less.

4 Test specimens

4.1 Preparation

If the material shows a predominant direction of the cellular structure (orientation of the cells), the test specimens shall be cut in such a way that both axes of the cells can be measured.

4.2 Shape and dimensions

The test specimen may consist of any sample which is free of skin and has a plane surface large enough to accommodate the counting glass. A 50 mm x 50 mm x 3 mm sample is recommended. Samples shall be cut with a sharp blade in such a manner that the cells are not damaged.

Specimen surfaces showing marked variation in the cellular structure from place to place shall not be measured unless specifically required.

4.3 Number of test specimens

Five test specimens shall be used.

If there is a noticeable difference in the cell count in specimens taken from different locations in the sample, the specimen location shall be as agreed upon by the interested parties.

5 Procedure

5.1 Lay the test specimens on a flat horizontal surface, without strain. Place the counting device on the surface of the test specimen and count the actual number of cells against the counting edge of the glass.

5.2 Where there is marked anisotropy in the cell dimensions, at least two counts shall be made. The directions shall be chosen such that the maximum and minimum dimensions of the cells are used to perform this test.

5.3 Some individuals can find it difficult to count very fine celled foams. Therefore the top surface of the cellular structure may be lightly shaded. For un-pigmented or pale coloured materials, a black felt-tipped marker should be used. The top surface of dark coloured foams may be lightly coated with white typewriter correction fluid. Such fluids do not normally cause swelling or distortion of the cellular structure but should be left to dry thoroughly before the counting procedure is performed.

6 Precision

6.1 General

The precision of CEN procedure was determined in accordance with ISO/TR 9272. The ITP (Interlaboratory test programme) was conducted in 2007. Six participants from UK laboratories tested two grades of flexible polyester urethane foam. Both grades were white (un-pigmented), Foam type “A” was of fine uniform cell structure and Foam type “B” had much larger cells. All samples were cut horizontally from commercially produced block and were counted in two directions – parallel to the axis of the foaming conveyor and at right angles. Cell counts were performed on two separate days. All laboratories found it beneficial to lightly shade the top layer of cells using a black felt-tipped marker.

6.2 Results

The precision results for the two materials are given in Tables 1 and 2. The number of test pieces in each measurement was five.

Table 1 — Precision results Foam Type “A”

Direction	Mean (Cells/25mm)	Repeatability S_r	Reproducibility S_R
Along	55	1,12	5,33
Across	55	0,58	4,40

Table 2 — Precision results Foam Type “B”

Direction	Mean (Cells/25mm)	Repeatability S_r	Reproducibility S_R
Along	15	0,87	1,01
Across	15	0,76	1,17

7 Test report

The test report shall include the following information:

a) direction(s) in which the cell count was made;

b) average number of cells per 25 mm;

c) power of the magnifying device and size of counting glass;

d) whether surface shading was used to assist the counting;

e) any deviation from the testing and conditioning procedures specified.