H-56-14

International Standard 1923

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

Cellular plastics and rubbers — Determination of linear dimensions

Plastiques et caoutchoucs alvéolaires — Détermination des dimensions linéaires

Second edition — 1981-09-01

UDC 678-496.8 : 531.71

Ref. No. ISO 1923-1981 (E)

Descriptors : cellular materials, dimensional measurement.

Price based on 3 pages

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

International Standard ISO 1923 was developed jointly by Technical Committees ISO/TC 45, *Rubber and rubber products*, and ISO/TC 61, *Plastics*, and was circulated to the member bodies in May 1976.

It has been approved by the member bodies of the following countries :

Australia	India	Poland
Austria	Iran	Portugal
Belgium	Israel	Romania
Brazil	Italy	Spain
Canada	Japan	Sweden
Czechoslovakia	Korea, Rep. of	Switzerland
Finland	Mexico	Turkey
France	Netherlands	United Kingdom
Germany, F.R.	New Zealand	USA
Hungary	Philippines	USSR

No member body expressed disapproval of the document.

This second edition cancels and replaces the first edition (i.e. ISO 1923-1972), as well as ISO Recommendation R 1794-1967, of which it constitutes a technical revision.

Printed in Switzerland

Cellular plastics and rubbers — Determination of linear dimensions

1 Scope and field of application

This International Standard specifies the characteristics and the choice of the measuring equipment and procedure for determination of the linear dimensions of sheets, blocks or test specimens of cellular material (flexible and rigid).

2 Definition

For the purposes of this International Standard the following definition applies :

linear dimension : The shortest distance, measured with an instrument according to clause 3, between two specific points, between two parallel lines or between two parallel planes, defined by corners, edges or surfaces of the cellular specimen.

3 Measuring equipment

3.1 Dial gauge with a measuring surface of about 10 cm^2.

The gauging pressure shall be 100 ± 10 Pa[1] and the reading accuracy shall be 0,05 mm.

3.2 Micrometer, having a measuring surface with a minimum diameter of 5 mm, but in any case not less than five times the average diameter of the cells, permitting reading with an accuracy of 0,05 mm.

Use of a micrometer is restricted to rigid cellular materials, owing to the difficulty of determining the onset of compression of a flexible cellular material.

3.3 Sliding caliper, with a vernier permitting reading to an accuracy of 0,1 mm.

3.4 Metal rule or **metal tape,** graduated in millimetres and permitting reading to an accuracy of 0,5 mm.

4 Procedure

4.1 Choice of measuring equipment

The choice of measuring equipment shall be in accordance with the accuracy corresponding to the dimensions to be measured (see the table) :

a) When an instrument accuracy of 0,05 mm is required, a dial gauge (3.1) or micrometer (3.2) shall be used. The micrometer may be used only for specimens of rigid cellular material with a shape not permitting the use of a dial gauge.

An accuracy of 0,05 mm shall not normally be required for dimensions of more than 10 mm.

b) When an instrument accuracy of 0,1 mm is required, a sliding caliper (3.3) shall be used.

This accuracy of 0,1 mm shall not normally be required for dimensions of more than 100 mm.

NOTE — In this case, a dial gauge or micrometer (rigid cellular material only) may also be used, but then the instrument accuracy need not be better than that of a sliding caliper.

c) When an instrument accuracy of 0,5 mm is required, a metal rule or metal tape (3.4) shall be used.

NOTE — In this case, a sliding caliper may also be used, but then the instrument accuracy need not be better than that of a metal rule or metal tape.

1) Commercial dial gauges that incorporate a spring pressure may not satisfy this condition. An example of one design of an appropriate apparatus is given in the annex.

Table — Choice of measuring equipment

Values in millimetres

Range of dimensions	Required accuracy	Instrument recommended		Median of readings rounded off to the nearest millimetre
		For normal use	If the shape of the specimen permits	
< 10	0,05	Dial gauge or micrometer		0,1
> 10 to < 100	0,1	Sliding caliper	Micrometer (rigid only) or dial gauge	0,2
> 100	0,5	Metal rule or metal tape	Sliding caliper	1

4.2 Number and location of the measurements

The number of the measuring locations depends on the size and the shape of the specimen, but shall be at least five. The locations shall be as widely separated as possible, in order to give a good average.

The median of three readings at each position shall be taken and the average of the five or more median values calculated.

4.3 Measurement with dial gauge (3.1)

The measurement shall normally be made on a base plate. The base plate shall be larger than the largest dimension of the specimen that is supported by the base plate. The specimen shall rest flat upon the base plate during the measurements.

The readings of the dial gauge shall be rounded off to the nearest 0,1 mm.

4.4 Measurement with micrometer (3.2) (rigid cellular material only)

For the measurement, the plane surfaces of the micrometer shall be continuously brought together until they just touch the cellular material, without causing any distortion or damage of the surface of the specimen. The specimen shall be moved slightly back and forward. Simultaneously the plane surfaces of the micrometer shall be slowly brought together until a slight resistance to the movement is felt.

NOTE — The area of the measuring surface may be increased by measuring over metal sheet or plate.

The readings of the micrometer shall be rounded off to the nearest 0,1 mm.

4.5 Measurement with sliding caliper (3.3)

The readings of the sliding caliper shall be rounded off to the nearest 0,2 mm.

4.5.1 All materials

The caliper shall be progressively preset to smaller measurements and presented to the specimen until the setting is reached when the caliper measuring faces just touch the surfaces of the specimen without any compression or damage to the latter.

4.5.2 Rigid cellular material only

The method specified in 4.4 may be used.

4.6 Measurement with metal rule or metal tape (3.4)

The cellular material shall not be distorted or damaged by the application of the metal rule or metal tape.

The metal rule or metal tape measurements shall be rounded off to the nearest 1 mm.

5 Report

The report shall include the following particulars :

a) reference to this International Standard;

b) type and designation of the cellular material;

c) measuring equipment used;

d) dimensions in millimetres, rounded off to 0,1 mm for measurements made with dial gauge or micrometer, rounded off to 0,2 mm for measurements with sliding caliper, and rounded off to 1 mm for measurements with metal rule or metal tape;

e) any deviations from the specified test procedure.

Annex

Example of apparatus conforming to the specifications in 3.1

The apparatus consists of the following parts :

a) base plate, with adjustable support to accommodate the dimension to be measured;

b) screw micrometer, reading 0,05 mm or better;

c) aluminium plate of area 10 cm^2, to be placed on the test specimen and connected to an electric circuit, consisting of flexible wire, a battery and a lamp; the mass of the plate should be such that a pressure of 100 ± 10 Pa is exerted on the test specimen;

d) calibrated spacer gauge blocks, with a tolerance of 0,01 mm, selected according to the dimension to be measured.

The reading should be taken at the moment the lamp glows.