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Third edition
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Paper and board — Testing of cores —

Part 4: Measurement of dimensions

Papier et carton — Essais des mandrins —

Partie 4: Mesurage des dimensions

Reference number
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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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 6, *Paper, board and pulps*.

This third edition cancels and replaces the second edition (ISO 11093-4:2016), which has been technically revised.

The main changes are as follows:

— due to roundness deviation of paper cores with an internal diameter >180 mm and a wall thickness of <3 mm in 6.2.2, a maximum value for the internal diameter of ≤180 mm and a minimum value for the wall thickness of ≥3 mm has been added for Method A;

— the number of methods for determining the internal diameter has been increased from two to four and the remaining methods have been renamed;

— Figure 2 has been changed (5 levels of calibrated mandrel instead of 11 levels);

— information under Figure 2 has been added;

— a new Figure B.2 has been added.

A list of all parts in the ISO 11093 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Paper and board — Testing of cores —

Part 4: Measurement of dimensions

1 Scope

This document specifies test methods for the determination of the internal diameter, the external diameter, the wall thickness and the length of paper and board cores.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 11093-1, *Paper and board — Testing of cores — Part 1: Sampling*

ISO 11093-2, *Paper and board — Testing of cores — Part 2: Conditioning of test samples*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
internal diameter
d
dimension of the internal width of the cylindrical core

Note 1 to entry: See Figure 1.

3.2
external diameter
D
dimension of the external width of the cylindrical core

Note 1 to entry: See Figure 1.

3.3
wall thickness
s
distance between the inner and outer surfaces of the core

Note 1 to entry: See Figure 1.

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3.4
length
l
distance between the two ends of the core

Note 1 to entry: See Figure 1.

3.5
deformation
visual surface changes that can affect test results

EXAMPLE Seams, lab joints and cutting burrs.

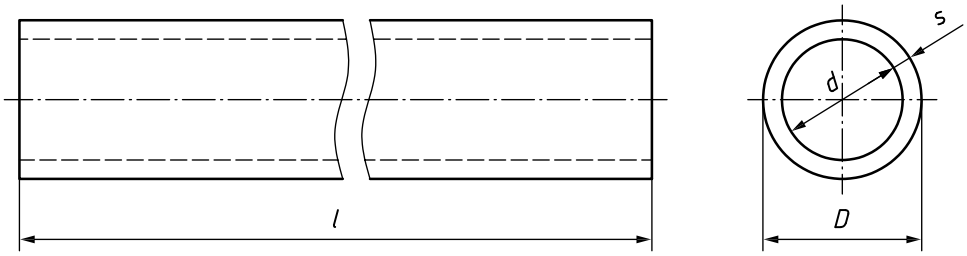


Figure 1 — Diagram of a core showing dimension lines

4 Sampling

Samples shall be taken in accordance with ISO 11093-1.

NOTE For the purpose of measuring the length, the specimen constitutes the test piece.

5 Conditioning

Test pieces shall be conditioned in accordance with ISO 11093-2.

6 Measurement of internal diameters

6.1 General

Four methods for determining the internal diameter are available. They are of differing accuracy and speed. The method used shall be compatible with the type of core being measured and shall be specified and reported.

— Method A: Internal tri-point micrometer (see Figure A.1);

— Method B: Internal vernier calliper (see Figure B.1 to Figure B.3);

— Method C: Calibrated step mandrel;

— Method D: By calculation from the external diameter and wall thickness.

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