INTERNATIONAL STANDARD

ISO 12192

Second edition
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Paper and board — Determination of compressive strength — Ring crush method

Papier et carton — Détermination de la résistance à la compression — Méthode d'écrasement en anneau

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 12192 was prepared by Technical Committee ISO/TC 6, *Paper, board and pulps*, Subcommittee SC 2, *Test methods and quality specifications for paper and board*.

This second edition cancels and replaces the first edition (ISO 12192:2002), which has been technically revised. In the revision, the instrument is clarified in accordance with ISO 13820, relevant terms are defined, a precision statement is added, and other minor text corrections have been made. Significant technical changes in this revision include an expansion of the scope of the method to thinner specimens (lower grammage) and a clarification of the procedure to indicate testing with alternating sides of the test piece facing outward.

Introduction

Fibreboard shipping containers are frequently subjected to in-plane compressive forces during shipment or storage. Therefore, resistance to crushing is an important measure of the performance characteristics of the containers.

The resistance to crushing depends on the design of the containers and on the in-plane crush resistance of the components of the board from which it is made. The in-plane crush resistance of these components can be measured by the ring crush test.

Paper and board — Determination of compressive strength — Ring crush method

1 Scope

This International Standard specifies a method for the determination of the edgewise compressive strength (ring crush resistance) of paper and paperboard, especially board used in the manufacture of fibreboard shipping containers.

This International Standard is applicable to all paper and paperboard with a thickness in the range 100 µm to 580 µm. For samples having a thickness below 280 µm, test values can result from a combination of both buckling failure and pure compression.

NOTE For samples having a thickness exceeding 580 µm, strain within the sample arising from bending the test piece into a cylinder might affect the test result (see References [6] and [7] in the Bibliography).

2 Normative references

The following referenced documents are indispensable for the application 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 186, *Paper and board — Sampling to determine average quality*

ISO 187, *Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples*

ISO 534, *Paper and board — Determination of thickness, density and specific volume*

ISO 13820, *Paper, board and corrugated fibreboard — Description and calibration of compression-testing equipment*

3 Terms and definitions

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

3.1
compressive strength
maximum compressive force per unit length that a test piece of paper or board can withstand until the onset of failure

NOTE The compressive strength is expressed in kilonewtons per metre.

3.2
ring crush resistance
maximum compressive force per unit length that a narrow test piece bent into the form of a cylinder (ring) can withstand on its edge without failure under the conditions defined in this International Standard

NOTE The ring crush resistance is expressed in kilonewtons per metre.

3.3
ring-crush-resistance index
ring crush resistance divided by the grammage

NOTE The ring-crush-resistance index is expressed in kilonewton metres per gram.