
**Paper and board — Compressive
strength — Ring crush method**

*Papier et carton — Résistance à la compression — Méthode d'écrasement
avec anneau*



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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard 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*.

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 container.

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.

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Paper and board — 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 cartons and packing cases.

This International Standard applies to all paper and paperboard with a thickness in the range of 280 µm to 580 µm. It may also be used for paper and board having a thickness less than 280 µm but those results are more a reflection of the paper's stiffness than its compressive strength. For paper and board having a thickness exceeding 580 µm, it may be impossible to bend them to the circumference without disturbing the structure.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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 and apparent bulk density or apparent sheet density*

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

3 Principle

A test piece of paper or board, in the form of a narrow strip held in a ring form, is subjected to an increasing edgewise compressive force until collapse occurs.

4 Apparatus

4.1 Cutting device, consisting of a die cutter, capable of accurately cutting the test pieces to the specified dimensions with clean, sharp, parallel and straight edges.

Other cutting devices such as a double-knife cutter may be used, provided they can be shown to give similar test results. The parallelism of the test piece will be determined by the quality of the cutting device. The width of the male die or the anvil of the double-knife cutter shall be $12,7 \text{ mm} \pm 0,1 \text{ mm}$, and parallel to within 0,015 mm over its entire length.