
**Corrugated fibreboard — Determination of
edgewise crush resistance — Waxed edge
method**

*Carton ondulé — Détermination de la résistance à la compression sur
chant — Méthode du bord paraffiné*



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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 13821 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

A variety of methods for the determination of edgewise crush resistance are in use in different parts of the world. These can be classified into three groups as follows.

- a) Those in which a carefully cut rectangular test piece is tested without any special treatment or modification.
- b) Those in which the edges of the test piece to which the force is applied are waxed to prevent the test result from being influenced by "edge effects".
- c) Those in which the test piece edges are not waxed but the shape of the test piece is such that the length is substantially reduced at a point midway between the loading edges in order to induce the failure to occur away from those edges.

The dimensions of the test piece vary from one group to the other and, in group c), the methods vary according to the shape and method of reducing the length and to whether or not the test piece is held in a clamp during crushing.

The methods may not give the same numerical results, but it can be shown that most of them can be used to predict the top-to-bottom compression strength which will be achieved when the board is properly converted into a transport package.

This International Standard describes a method from group b) intended to be used for quality measurement and quality specification purposes. This particular method is selected because it correlates with the top-to-bottom compression strength of the final transport package and, of the methods giving the highest value, it is the simplest and most operationally convenient.

Corrugated fibreboard — Determination of edgewise crush resistance — Waxed edge method

1 Scope

This International Standard specifies a method for the determination of the edgewise crush resistance of corrugated fibreboard. The force is applied in the direction of the flute axis.

This method is applicable to single-wall (double-faced), double-wall, and triple-wall corrugated fibreboard. It may also be used to test samples taken from corrugated cases and other converted products.

While the method is applicable to waxed corrugated fibreboard, care must be taken that the heat used in the waxing step does not affect the corrugated structure. This is controlled by observing that failure during the test still occurs away from the loaded edges.

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

3 Principle

Subjection of a rectangular test piece of the corrugated board placed between the platens of a crush tester, with the flutes perpendicular to the platens, to a compressive force until failure occurs. The leading edges of the test piece have been reinforced by paraffin to prevent premature failure at those edges when the load is applied.

Measurement of the maximum force sustained by the test piece.

4 Apparatus and test liquid

4.1 Motor-driven, platen-type compression testing machine. The apparatus described in ISO 13820 shall be used.

4.2 Cutting equipment, enabling the cutting of test pieces according to the requirements specified in 7.2.

4.2.1 Band-saw or knife and cutting jig to prepare the test pieces. The equipment shall produce cut edges that are unfrayed, straight and perpendicular to the facings of the board.