International Standard

ISO 16260

Paper and board — Determination of internal bond strength

Papier et carton — Détermination de la force de cohésion interne

Second edition
2025-12

Reference number
ISO 16260:2025(en)

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

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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).

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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*, Subcommittee SC 2, *Test methods and quality specifications for paper and board*.

This second edition cancels and replaces the first edition (ISO 16260:2016), which has been technically revised.

The main changes are as follows:

— addition of a reference to possible different results, depending on the type of tester in the introduction;

— update of 5.1.6 regarding “Analog ply bond devices” and “Digital ply bond devices” and addition of Figure 3;

— update of Table 1, regarding the contact force (former mass);

— update of 5.2.2 “Aluminium platen/anvil”;

— addition of 5.2.3.1 “Reduced pendulum length";

— revision of Clause 8 “Preparation of test assemblies” and Clause 9 “Calibration”;

— update of 10.2 “Selection of instrument range”;

— addition of new Clause 12 “Comparison of results”;

— revision of Clause 13 “test report”;

— renumbered former Annex B to Annex C, with addition of the used tester type;

— addition of “Verification of device” as new Annex B;

— editorial changes.

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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Introduction

Paper and board sheets can, during printing, conversion or specific product applications, be subjected to impulses, impacts or shock loads of sufficient magnitude to cause structural failure. Commonly observed in-plane structural failures include surface picking, blistering and interior delimitation.

This document describes one method for determining the internal bond strength of a product of pulp, paper or board by measuring the energy needed to delaminate a paper or board sample in the "Z" (thickness) direction. There are other published methods[4][8] for determining “Z” or thickness direction tensile strength, but in this method, the delaminating force is applied at a rate significantly higher than in other methods. This method can, therefore, be preferred for predicting sheet performance under printing or converting conditions.

Different types of testers (mechanical and electronic) are in use for this method. The results obtained with the two types of testers may not be not comparable (see Clause 12).

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Paper and board — Determination of internal bond strength

1 Scope

This document specifies a method to measure the energy required to rapidly delaminate a test piece of paper or board. Rupture of the test piece in the "Z" or thickness direction is initiated by a pendulum having a defined mass, moving at a defined velocity.

The procedure is suitable for both single- and multi-ply papers and boards, including coated sheets and those that are laminated with synthetic polymer films. It is particularly suitable for papers and boards that can be subjected to z-direction[4][8] rapid impacts, impulses or shock loads during printing or conversion.

The test procedure entails the adherence of double-sided adhesive tape to both sides of the test piece under pressure. For this reason, the method is unsuitable for materials that can be structurally damaged by compression or are porous enough to permit migration of the tape adhesive into or through the test piece.

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.

EN 755-2:2013, *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 2: Mechanical properties*

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*

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 bond strength
average potential energy, expressed as J/m^2 of surface, required to delaminate a test piece under the conditions of the test

Note 1 to entry: The result is the difference of the potential energy before and the remaining energy after delaminating the test piece.

3.2
test assembly
test piece, laminated between two pieces of double-sided adhesive tape, with the bottom side of the lower tape adhered to a rigid metal anvil and the upper side of the upper tape adhered to an "L"-shaped aluminium platen

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