
**Paper and board — Determination of
grammage**

Papier et carton — Détermination du grammage

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Contents

Page

Foreword.....	iv
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	1
4 Principle.....	1
5 Apparatus.....	1
6 Sampling.....	2
7 Conditioning.....	2
8 Procedure.....	2
9 Calculation and expression of results.....	3
10 Test report.....	3
Annex A (normative) Determination of grammage on an “oven-dry” and “as-taken” basis.....	5
Annex B (informative) Precision.....	6
Bibliography.....	8

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

This fourth edition cancels and replaces the third edition (ISO 536:2012), which has been technically revised. The main changes compared to the previous edition are as follows:

- several inconsistencies and imprecisions have been addressed e.g. [5.1](#) permits the nominal area of test pieces cut by the cutter to be used in calculating grammage rather than for the area of each test piece to be determined, in certain circumstances, but this was not recognised in subsequent clauses;
- sharper wording in [Clause 8](#) when a reduced test area is used;
- additional information required in [Clause 10](#);
- a more accurate description of the determinate of “as-taken” grammage near top of a reel in [A.2](#).

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.

Paper and board — Determination of grammage

1 Scope

This document specifies a method for determining the grammage of paper and board.

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 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 287, *Paper and board — Determination of moisture content of a lot — Oven-drying method*

3 Terms and definitions

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

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 **grammage**

mass per unit area

mass of a unit area of paper or board determined by a specific method of test

Note 1 to entry: Grammage is expressed in grams per square metre.

4 Principle

The area of the test pieces and their masses are determined and the grammage is calculated.

For details regarding the test method precision, see [Annex B](#).

5 Apparatus

5.1 Cutting device, capable of repeatedly cleanly cutting test pieces to within $\pm 1,0$ % of the same nominal area, for most paper and board products. This shall be checked frequently by measurement. Provided that the above accuracy is attained, the nominal area shall be used for calculating grammage.

With certain types of paper and board it will be found, after carrying out this determination of area, that test pieces cannot be cut to within $\pm 1,0$ % of the nominal area. In such instances the dimensions of each test piece shall be determined to the nearest 0,5 mm and its area calculated.

5.2 Balance, sufficiently accurate, over the range of mass for which it is used, to measure the test piece mass to within 0,5 % of the actual mass. It shall be sensitive enough to detect a change of $\pm 0,2$ % in the mass to be weighed and, if the balance is of the direct-reading type, it shall be graduated so that readings may be taken to this degree of accuracy.

5.3 Special sheet-weighing balances, designed to weigh test pieces of a given size and which indicate grammage directly, may be used, provided that the above conditions for determination of mass are fulfilled and that the area of each test piece on a single weighing is not less than 50 000 mm² (500 cm²) and not more than 100 000 mm² (1 000 cm²) (see [Clause 8](#) and [9.2](#)).

When in use, the balance shall be shielded from air currents.

6 Sampling

The selection of units and sheets and the taking of specimens shall be carried out in accordance with ISO 186. If tests are made on another type of sample, make sure that the specimens taken are representative of the sample received. If possible, take at least five specimens and take an area sufficient for at least 20 test pieces.

If the “as taken” grammage is to be determined, the influence of the ambient atmosphere on the moisture content of the specimens shall be minimised (see [A.2](#)).

7 Conditioning

For the determination of conditioned grammage, and “oven-dry” grammage, the specimens shall be conditioned in accordance with ISO 187.

8 Procedure

For the determination of conditioned grammage, prepare and weigh the test pieces in the same atmospheric conditions as used to condition the specimens. ¹⁹

For the determination of conditioned grammage and oven dry (see [A.1](#)) grammage, using the cutting device ([5.1](#)), cut test pieces from conditioned specimens. If possible, cut at least 20 test pieces from at least five specimens, taking the same number from each specimen. For the determination of “as-taken” grammage, follow the same procedure, minimising the influence of the ambient atmosphere on the moisture content of the test pieces (see [A.2](#)).

Whenever possible, each test piece shall have an area of not less than 50 000 mm² (preferably 200 mm × 250 mm) and not more than 100 000 mm². If necessary, it may be composed of several smaller pieces.

In cases where there is only a limited sample area available and it is not possible to make up a test piece comprising several smaller pieces, a test area of not less than 10 000 mm² (100 cm²) may be used. This shall be reported as a deviation from the preferred range of 50 000 mm² to 100 000 mm² specified in this document.

If the variation in area of test pieces of the type of paper or board being tested exceeds the limits specified in [5.1](#), at the moisture content at which the grammage is determined, or if it is unknown, determine the dimensions of each test piece to the nearest 0,5 mm and calculate the area of each.

Weigh each test piece on the balance ([5.2](#)) and express its mass, or indicated grammage if a special sheet-weighing balance is used ([5.3](#)), to three significant figures.

It is recommended, especially when dealing with small pieces, that contact of the test piece with bare hands be avoided.