International Standard 186

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Paper and board — Sampling to determine average quality

Papier et carton — Échantillonnage pour déterminer la qualité moyenne

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Foreword

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International Standard ISO 186 was prepared by Technical Committee ISO/TC 6, *Paper, board and pulps*.

This second edition cancels and replaces the first edition (ISO 186-1977), clause 3 and sub-clause 5.2.2 of which have been technically revised.

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Paper and board — Sampling to determine average quality

1 Scope and field of application

This International Standard specifies a method of obtaining a representative sample of a lot of paper or board for testing to determine whether or not its average quality complies with set specifications (solid and corrugated fibreboard are included — see ISO 4046).

For some tests, special methods of sampling may be necessary; these will be given in the International Standard for the appropriate method of test.

NOTE — If less than 50 % of the lot is available for sampling, then sampling will be invalid in the absence of agreement to the contrary.

This method is unsuitable for determining the variability within a lot.

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2 Reference

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ISO 4046, *Paper, board, pulp and related terms — Vocabulary.*

3 Definitions

For the purpose of this International Standard, the following definitions apply.

3.1 lot: The aggregate of paper or board of a single kind of specified characteristics produced under conditions that are presumed uniform, and available for sampling at one time.

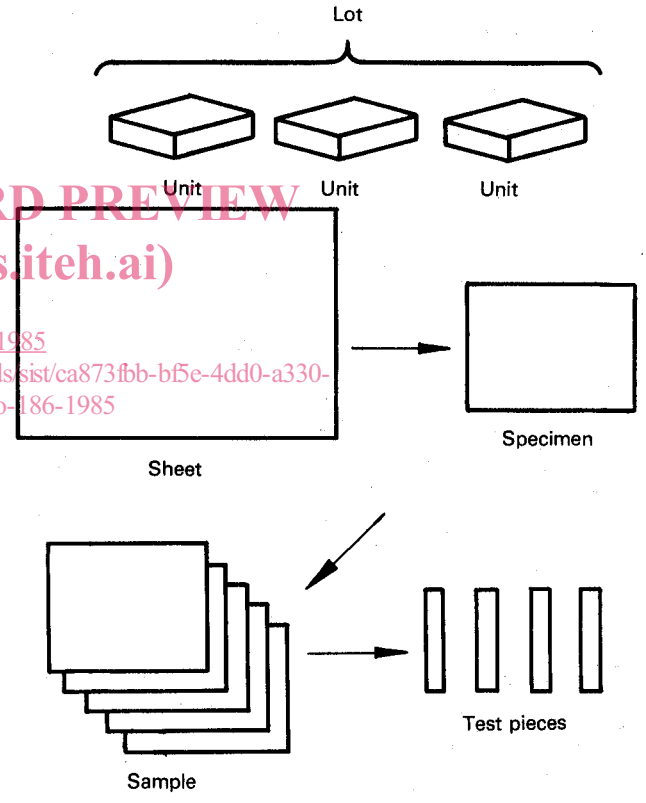
A lot comprises one or more nominally identical units. The unit may be in the form of a reel, a bale, a bundle, a parcel, the contents of a packing case, a pallet load, etc. Where the material to be tested has already been incorporated into a manufactured article (for example a packing case), the lot is the aggregate of such articles of a single kind, of specified characteristics. (See the figure.)

3.2 specimen: An area of paper or board cut to given dimensions, from the sheets (or manufactured articles) taken from the selected units. (See the figure.)

3.3 sample: The aggregate of all the specimens taken from the lot to provide information on the average quality of the lot and possibly serve as a basis for a decision on the lot. (See the figure.)

3.4 test piece: The quantity of paper or board on which the determination is carried out in accordance with the stipulations of the method of test.

It may be taken from a specimen; in some instances the test piece may be the specimen itself, or several specimens. (See the figure.)



Figure

3.5 selected at random: Taken in such a way that each part of the whole has an equal chance of being selected.

4 Principle

Withdrawal of sheets from production units selected from a lot of paper or board. Further subdivision and combination of these sheets to provide the test pieces required for various tests.

5 Procedure

5.1 Selection of units

Select the units to be sampled according to table 1.

Table 1

Size of lot (n) Units	Number of units selected	Method of selection
1 to 5	All	—
6 to 99	5	At random
100 to 399	$\frac{n^*}{20}$	At random
400 or more	20	At random

* In deciding the number of units to be selected, any remainder of less than 20 units shall be ignored.

The units selected shall be intact and in good external condition.

5.2 Selection of sheets

For each unit withdrawn from the lot, proceed as follows:

5.2.1 If the unit is a package that can be and may be completely unwrapped

a) When the unit is not subdivided (with or without a pallet)

Avoiding the three outermost sheets and all damaged sheets, take at random the same number of sheets from each unit such that the total number taken from the lot is not less than the number of test pieces required and is in conformity with table 2.

Table 2

Number of sheets in the lot	Minimum number of sheets to be taken from the lot
Not more than 1 000	10
1 001 to 5 000	15
More than 5 000	20

b) When the unit is composed of elements (reams or parcels, etc.) packaged together (with or without a pallet)

If there are 20 or more elements in each unit, assemble all the elements from the various units taken previously in accordance with table 1 and select the elements in the same way that units are selected in table 1.

If there are less than 20 elements in each unit, then select one element at random from each unit.

From each element retained, select the sheets as indicated in table 2.

c) When the unit is a reel

Remove all damaged layers from the outside of the reel; discard also three undamaged layers of paper (grammage not exceeding 224 g/m^2) or one undamaged layer of board (grammage exceeding 224 g/m^2), whichever is appropriate; cut the reel across its full width to a sufficient depth to enable the requisite number of sheets (see below) to be taken. Let the pile of cut sheets fall to each side and remove the reel.

Take at random the same number of sheets from each pile of cut sheets, selecting the sheets as indicated in table 2. For this purpose, the *number of sheets in the lot* means the number of sheets that would be formed if the reels comprising the lot were to be cut through to the core.

5.2.2 If the unit is a package that cannot be or should not be completely unwrapped

This applies, for example, to reels, pallets or possibly to reams, in store or selected by the customs.

If the machine direction of the paper or board is known, cut a window of dimensions at least 300 mm × 450 mm, with the 450 mm side in the machine direction; if the machine direction is not known, cut a window of dimensions 450 mm × 450 mm, with sides parallel to those of the unit. Cut the sheets to a sufficient depth to enable the requisite number of sheets (see below) to be taken and remove them.

Remove all damaged sheets or layers and, in addition, as the case may be

— at least three undamaged layers (or sheets) of paper (grammage not exceeding 224 g/m^2), or

— at least one undamaged layer of board (grammage exceeding 224 g/m^2).

In the case of lots consisting of less than five units it is recommended that more than one window be cut in each unit. When only one reel is available at least three and preferably five windows should be cut.

Vary the position of the window(s) within and between units.

5.2.3 If the lot consists of individual manufactured articles (see definition of *lot* in clause 3)

Take at random from the lot sufficient articles to provide the number of test pieces required and in conformity with table 3.

Table 3

Number of articles in the lot	Minimum number of articles to be taken from the lot
Not more than 1 000	10
1 001 to 5 000	15
More than 5 000	20

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5.3 Selection and cutting of specimens

Where possible, cut specimens 300 mm × 450 mm, approximately, the greater dimension being in the machine direction.

If the machine direction is not known, cut specimens 450 mm × 450 mm, approximately. Proceed as indicated in 5.3.1 to 5.3.3, according to the size of the sheets available: where manufactured articles have been selected, proceed as in 5.3.5.

Transfer the identification marks to the specimens (see 6.1.2).

NOTE — The specimen dimensions quoted allow for their later reduction in the laboratory.

5.3.1 If the sheets selected have dimensions greater than 300 mm × 450 mm

From each sheet selected according to table 2, proceed as follows:

a) Paper or board, packaged in sheet form

Cut a specimen, varying the position of selection in each sheet.

b) Paper or board in reels

Cut specimens from each sheet corresponding (approximately) to each 400 mm across the width of reel.

5.3.2 If the sheets selected have one dimension or both below the 300 mm and 450 mm referred to above, but the surface area of the sheet is greater than 0,1 m^2

From each sheet selected according to table 2, select a specimen in such a manner that its surface area is as near as possible to 0,1 m^2, preferably a little greater. Mark the machine dimension.

5.3.3 If the surface area of each sheet selected is less than 0,1 m^2

The sheets selected according to table 2 constitute the specimens.

The number of selected sheets should be sufficient to provide the necessary surface area to carry out the tests required.

5.3.4 If the sheets have been selected according to 5.2.2

These sheets constitute the specimens.

5.3.5 If the manufactured articles have been selected according to table 3

From each selected article, cut a specimen, varying the position of selection in each article.

NOTE — By agreement between the interested parties, it is permitted to take more than one specimen from each article.

6 Additional requirements

6.1 Specimens

6.1.1 Precautions

Specimens shall be kept flat, free from wrinkles and folds[1] and protected from exposure to direct sunlight, liquids, varying humidity conditions and any other harmful influences. Care shall be taken in handling specimens, as contact with the hands can appreciably affect the chemical, physical, optical, surface or other characteristics of the paper.

6.1.2 Marking

Each specimen shall be provided with identification marks sufficient to ensure that it can be recognized beyond all doubt. These marks shall be indelible; they may be limited to the number of the sampling report and the signature of the sampler. They shall, where possible, be in one corner and be as small as practicable.

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6.2 Re-sampling

6.2.1 If, as a result of an accident during sampling or testing, re-sampling is necessary, a new sample shall be taken according to the foregoing specification; unless otherwise indicated, it is permitted for the selection to be made from the same units as before.

6.2.2 In other circumstances, if re-sampling is deemed necessary, the procedure adopted shall have due regard for the foregoing specifications.

7 Sampling report

The sampling report shall include the following information:

a) reference to this International Standard;

b) the name of the person drawing the sample;

c) the name and address of the purchaser and the name of his representative;

d) the name and address of the vendor and the name of his representative;

e) the consignment reference (issue voucher, reference number, consignment, etc.);

f) the condition in which the lot appears;

g) the description of the lot (ream, reel, pallet, etc.);

1) If the specimens are in the form of very narrow strips, wind them on a core of diameter of at least 75 mm.

h) the reference of the lot and of the units, if necessary;

j) the number of units in the lot;

k) the number of units selected and, if necessary, the number of selected units retained;

m) the number of sheets selected from each unit;

n) all the circumstances of such nature as to influence results of future tests;

p) the date of the operations;

q) the place of sampling;

r) a reference corresponding to the identification marks on the samples;

s) the signature of the person carrying out the sampling;

t) any deviation from the method of sampling specified.

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