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**ISO RECOMMENDATION
R 186**

**METHOD OF SAMPLING
PAPER AND BOARD FOR TESTING**

2nd EDITION
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This second edition supersedes the first edition

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BRIEF HISTORY

The ISO Recommendation R 186, *Method of sampling paper for testing*, was drawn up by Technical Committee ISO/TC 6, *Paper, board and pulps*, the Secretariat of which is held by the Association Française de Normalisation (AFNOR).

Work on this question by the Technical Committee began in 1958 and led, in the same year, to the adoption of a Draft ISO Recommendation.

In January 1959, this Draft ISO Recommendation (No. 268) was circulated to all ISO Member Bodies for enquiry. It was approved by 25 Member Bodies. One Member Body (Belgium) opposed the approval of the Draft.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council which decided, in February 1961, to accept it as an ISO RECOMMENDATION.

BRIEF HISTORY RELATING TO THE 2nd EDITION

Sub-Committee ISO/TC 6/SC 2 was entrusted in 1963, by the Secretariat of Technical Committee ISO/TC 6, *Paper, board and pulps*, with the preparation of the revision of the ISO Recommendation R 186-1961. This work led in 1965 to the adoption of a Draft Revision.

The new title : *Method of sampling paper and board for testing*, completes the title of the first edition : *Method of sampling paper for testing*; some amendments were made to the text.

In November 1965, this Draft Revision (No. 863) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Argentina	Iran	Romania
Australia	Ireland	South Africa,
Belgium	Israel	Rep. of
Brazil	Italy	Spain
Chile	Japan	Sweden
Czechoslovakia	Korea, Rep. of	Switzerland
Denmark	Mexico	Turkey
Finland	New Zealand	U.A.R.
France	Norway	United Kingdom
Germany	Poland	Yugoslavia
India	Portugal	

Four Member Bodies opposed the approval of the Draft :

Canada
Netherlands
U.S.A.
U.S.S.R.

The Draft Revision of ISO Recommendation R 186-1961 was then submitted by correspondence to the ISO Council which decided, in April 1968, to accept it.

The present edition (2nd Edition) embodies this revision.

METHOD OF SAMPLING

PAPER AND BOARD FOR TESTING

1. SCOPE

This ISO Recommendation specifies a method of obtaining a representative sample of a lot of paper* or board* for test purposes.

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

NOTE. – If, at the time of sampling, less than 50 % of the lot remains, sampling will be invalid in the absence of agreement to the contrary.

2. TERMINOLOGY

A consignment consists of one or more lots.

The lot is the aggregate of paper or board of a single kind, of specified characteristics.

A lot comprises of one or more similar *units*, such as reels, reams (units or assembled), bales, bundles, parcels, cases, pallets, etc.

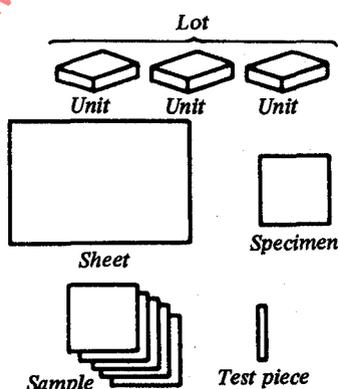
The specimens are rectangles of paper or board cut to given dimensions, from the sheets drawn from the selected units.

The sample comprises all the specimens.

A test piece comprises 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.

Selected at random means taken in such a way that each part of the whole has an equal chance of being selected.



• See the following definitions in Recommendation ISO/R 66, *Paper vocabulary – First series of terms* :

- No. 18 – Paper,
- No. 19 – Board,
- No. 22 – Solid fibreboard,
- No. 23 – Corrugated fibreboard.

3. PRINCIPLE

- (a) To withdraw from each lot a certain number of units.
- (b) To take from each of these units a certain number of sheets.
- (c) In general, to cut from these sheets the specimens from which will be taken the test pieces necessary for various tests.

4. PROCEDURE

4.1 Selection of units

The units to be sampled should be selected according to the following Table :

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

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

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

4.2 Selection of sheets

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

4.2.1 If the unit is a package that may be opened

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

Take at random the same number of sheets from each unit and as many as are necessary for the tests, or are otherwise requested, with a total of not less than 20 sheets and avoiding the outermost and all damaged sheets.

- (2) 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 previously taken as in clause 4.1 and select the elements in the same way that units are selected in clause 4.1.

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

From each element retained select the sheets as indicated in clause 4.2.1 paragraph (1).

- (3) When the unit is a reel

Take the same number of sheets from each reel and as many as are necessary for the tests, or are otherwise requested, with a total of not less than 20 sheets.

The selection from the sheets from each reel is made at random from a group of sheets obtained as follows :

Remove all damaged layers from the outside of the reel; discard in all cases at least three undamaged layers in the case of paper or at least one undamaged layer in the case of board; cut the reel across its full width to a sufficient depth to enable the requisite number of sheets to be taken. Let the cut sheets fall to each side and remove the reels.

Select the necessary sheets.

4.2.2 *If the unit is a package that may not be opened*

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

Take the same number of sheets from each unit and as many as are necessary for the tests, or are otherwise requested, with a total of not less than 20 sheets.

The selection from the sheets from the unit is made at random from a group of sheets obtained as follows :

Cut a window of 30 cm × 45 cm, with the 45 cm side in the machine direction when this is known*; if it is not known, the sheets should be approximately 45 cm × 45 cm, with sides parallel to those of the unit; cut the sheets to a sufficient depth to enable the requisite number of sheets to be taken; remove them.

Remove all damaged sheets or layers and in all cases :

- for paper, at least three undamaged layers, (or sheets)
- for board, at least one undamaged layer.

Select the necessary sheets.

Vary the position of the window from unit to unit.

4.3 Selection and cutting of specimens

The dimensions of the specimens are in principle and approximately, 30 cm × 45 cm (in order to allow for their later reduction in the laboratory), the greater of these dimensions being in the machine direction if this is known*; if it is not known, select a specimen of 45 cm × 45 cm approximately.

If necessary, cut to these dimensions the specimens from the sheets selected. In this instance, transfer the identification marks to the specimens.

4.3.1 *The sheets selected have dimensions greater than 30 cm × 45 cm*

From each sheet selected according to clause 4.2.1 :

- (1) Papers or board in sheets

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

- (2) Papers or board in reels

Cut specimens from each sheet corresponding (approximately) to each 40 cm across the width of reel.

4.3.2 *The sheets selected have dimensions below either 30 cm or 45 cm*

- (a) The surface of the sheet is greater than 1000 cm².

From each sheet selected according to clause 4.2.1 select a specimen in such a manner that its surface area is as near as possible to 1000 cm², preferably a little greater. Mark the machine dimension if it is not the longer dimension.

- (b) The surface of the sheet is less than 1000 cm².
(See clause 4.3.3 below)

* or in the direction of the flutes, in the case of corrugated board.

4.3.3 *The sheets selected have dimensions less than 30 cm and 45 cm or the surface is less than 1000 cm²*

The sheets selected according to clause 4.2.1 constitute the specimens.

The number of selected sheets should be sufficient to provide the required surface area for the determinations.

4.3.4 *The sheets have been selected according to clause 4.2.2*

These sheets constitute the specimens.

5. ADDITIONAL REQUIREMENTS

5.1 Specimens

5.1.1 Precautions

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

5.1.2 Marking

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

5.2 Re-sampling

5.2.1 If, as a result of an accident during sampling or testing, re-sampling is necessary, a new sample should be taken according to the rules set out above; unless otherwise indicated, the selection may be made from the same units as before.

5.2.2 In other circumstances, should re-sampling be deemed necessary, it is recommended that the parties concerned should agree upon the procedure to be adopted, with due regard for the principles specified above.

6. REPORTING

Any deviation from this method of sampling should be noted.

The report should indicate :

- (1) the name of the person drawing the sample,
- (2) the name and address of the purchaser and the name of his representative,
- (3) the name and address of the vendor and the name of his representative,
- (4) the consignment reference, (issue voucher, reference numbers, consignment etc.)

* If the specimens comprise very narrow strips, they should be wound on a core of a diameter of at least 75 mm.