INTERNATIONAL STANDARD 187

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Paper and board — Conditioning of samples

Papier et carton — Conditionnement des échantillons

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FOREWORD

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 187 was developed by Technical Committee ISO/TC 6, *Paper, board and pulps,* and was circulated to the member bodies in March 1975.

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The member bodies of the following countries expressed disapproval of the document on technical grounds :

Bulgaria
Germany

This International Standard cancels and replaces ISO Recommendation R 187-1961, of which it constitutes a technical revision.

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Paper and board — Conditioning of samples

0 INTRODUCTION

This International Standard specifies a method that is to be considered as the standard method in the absence of any previous agreement.

The ideal would be for a single atmosphere to be used for conditioning and/or testing, but this is not possible because of the diversity of climates and the different conditions of conversion and use of paper and board.

There is now a marked trend towards the use of atmosphere 23/50 and this is therefore given as the preferred atmosphere. Atmosphere 20/65 is, however, still widely used. Atmosphere 27/65 is in widespread use in tropical climates. In certain fields of usage, other atmospheres may be required for particular purposes.

The physical properties of paper are affected materially by its moisture content, which, in turn, is dependent on the humidity of the surrounding atmosphere. In order that tests may be made on paper in a defined physical state, it is brought into equilibrium with an atmosphere of standardized temperature and relative humidity, and tested in that atmosphere.

The moisture content of a given paper in equilibrium with a given atmosphere varies according to whether the equilibrium is reached by sorption or desorption of moisture. This hysteresis influences those physical properties that change with moisture content; it is recommended that the equilibrium condition be attained by a sorptive process.

1 SCOPE

This International Standard specifies the conditioning atmospheres and the method for conditioning samples of paper and board before and during testing.

2 FIELD OF APPLICATION

This International Standard applies to all papers and boards, but not to containers and packages manufactured from paper and board.

3 REFERENCE

ISO 554, *Standard atmospheres for conditioning and/or testing — Specifications.*

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4 PRINCIPLE

Exposure of the samples to a conditioning atmosphere in such a manner that a state of moisture content equilibrium is reached between the paper or board and this atmosphere.

5 DEFINITIONS

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

5.1 relative humidity (R.H.) : The ratio of the absolute humidity of the air to the humidity of air saturated with water vapour at the same temperature and pressure.

NOTE — This ratio is usually expressed as a percentage. At ordinary atmospheric temperatures, this ratio is almost exactly equal to the ratio of the actual vapour pressure to the saturation vapour pressure at the same (dry bulb) temperature.

5.2 conditioning : The establishment of a moisture content equilibrium between samples of paper or board and an atmosphere of specified temperature and relative humidity. This equilibrium is considered to be attained when the results of two consecutive weighings of the samples, carried out at an interval of not less than 1 h, do not differ by more than a specified amount.

The establishment of moisture content equilibrium is accepted as ensuring that the paper is in a stable physical state, but in special circumstances, conditioning may have to be prolonged until the desired physical equilibrium is attained. Such circumstances are not within the scope of this method.

6 CONDITIONING ATMOSPHERES

Designation	Temperature	Relative humidity	Remarks
	°C	%	
23/50	23 ± 1	50 ± 2	Preferred atmosphere
27/65	27 ± 1	65 ± 2	For tropical countries
20/65	20 ± 1	65 ± 2	–

Unless otherwise stated in the relevant specifications or test method, or agreed between the interested parties, atmosphere 23/50 shall be used.

NOTE – The temperature and relative humidity conditions are those specified in ISO 554. The tolerances quoted are the reduced or close tolerances specified in ISO 554.

7 EQUIPMENT

7.1 Room and measuring instrumentation

The room in which conditioning is carried out shall be provided with automatic equipment for bringing the air to standard conditions of temperature and relative humidity and for so circulating it that these conditions are uniformly maintained at all relevant points within it. It is recommended that a recording hygrometer, periodically checked by a standard method (for example with wet and dry bulb thermometers), be kept in the test space for checking purposes.

7.2 Determination of temperature and relative humidity

The relative humidity of the conditioning air shall be determined by a reliable method. Where a wet and dry bulb hygrometer is used, it shall be placed in an air current of the speed required by the tables used. This shall be not less than 2 m/s.

When the two thermometers of the hygrometer are at the same temperature, their bulbs being dry, the difference in reading shall not exceed 0,2 °C.

8 PROCEDURE

8.1 Preliminary treatment of samples

For tests in which the hysteresis of the equilibrium moisture content may lead to important errors, the samples shall be desiccated before conditioning, for 24 h in air of relative humidity between 20 and 35 % and a temperature not above 40 °C.

For many purposes, there is no objection to omitting this preliminary treatment.

8.2 Conditioning

The samples shall be so suspended that the conditioning air has free access to all their surfaces until they reach the equilibrium moisture content. This equilibrium is considered to be attained when the results of two consecutive weighings do not differ by more than 0,25 % of the total mass (see 5.2).

NOTE – With good air circulation, a conditioning period of 4 h is usually sufficient for paper. A minimum time of 5 to 8 h will be required for lighter boards.

Boards of high grammage and specially treated materials may require a conditioning period of 48 h or longer.

9 TEST REPORT

The test report shall include the following particulars :

a) reference to this International Standard;

b) the conditioning atmosphere used (23/50, 27/65 or 20/65);

c) the time taken to condition the paper or the board;

d) whether the paper or the board was desiccated before conditioning.

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