International Standard ISO 2965

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Material used as cigarette papers — Determination of air permeability

Matériaux utilisés comme papiers à cigarette — Détermination de la perméabilité à l'air

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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 2965 was developed by Technical Committee ISO/TC 126, *Tobacco and tobacco products*, and was circulated to the member bodies in June 1978.

It has been approved by the member bodies of the following countries :

Belgium	Iran	South Africa, Rep. of
Brazil	Ireland	Spain
Czechoslovakia	Italy	Switzerland
Egypt, Arab Rep. of	Korea, Rep. of	Thailand
France	Netherlands	United Kingdom
Germany, F. R.	New Zealand	USSR
Greece	Poland	Yugoslavia
India	Romania	

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

Australia
Bulgaria

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Material used as cigarette papers — Determination of air permeability

1 Scope and field of application

This International Standard specifies a method for the determination of air permeability of material used as cigarette papers.

2 Reference

ISO 3402, *Tobacco and tobacco products — Atmospheres for conditioning and testing.*

3 Definition

air permeability of a cigarette paper : The ratio of the air flow (volume per unit of time) per unit of surface area of the test piece to the difference in pressure across the test piece.

It is expressed in cubic centimetres per minute per square centimetre and per kilopascal.

4 Principle

Measurement of the volume of air passing in a given time through a test piece of a given surface area under a specified pressure difference. (The principle of measurement is shown schematically in the annex.)

5 Apparatus

5.1 Test piece holder, or several test piece holders arranged in parallel. Each test piece holder shall be free from leaks and should preferably have a circular test surface area of 2 cm^2.

5.2 Device to produce an air flow at a constant but adjustable pressure difference between the two surfaces of the test piece.

The direction of the air flow through the test piece shall be the same as in the finished product : from the exterior to the interior.

5.3 Manometer, suitable for measuring pressure differences of about 1 kPa (0,01 bar).

5.4 Suitable equipment for accurately measuring the air flow passing through the test piece.

5.5 Conditioning enclosure, regulated in accordance with the requirements of ISO 3402.

6 Sampling

Select a laboratory sample on a statistical basis.

7 Procedure

7.1 Preparation of the test sample

Select at random from the laboratory sample the number of test pieces required for the tests, plus an additional two test pieces to be used as described in 7.2.1.

Condition the test pieces in the conditioning enclosure (5.5).

7.2 Determination

7.2.1 Choice of working pressure difference

Insert in a test piece holder (5.1) a test piece from the test sample (7.1) and determine the air flow, q_1, in cubic centimetres per minute, passing through the test piece at a constant pressure difference of 0,25 kPa. Record the value obtained for q_1.

Determine the air flow, q_2, in cubic centimetres per minute, passing through the test piece at a constant pressure difference of 1,00 kPa.

Repeat the above operations on a second test piece, and calculate the mean values for q_1 and q_2 respectively. The maximum difference between the results of the two determinations of either q_1 or q_2 shall not exceed 5 % of the mean value found in each case.

If it is found, using the mean values of q_1 and q_2, that $q_2 = 4\ q_1$ to within 5 %, then the flow may be considered to be proportional to the pressure reduction. In this case any one value between 0,25 and 1,00 kPa may be chosen as the working pressure difference to be used for the tests described in 7.2.2.

However, if the above equation does not apply, a working pressure difference of 1,00 kPa shall be used.

7.2.2 Testing

Having selected the difference in pressure to be applied, carry out testing, recording the air flow passing through each test piece.

NOTE — The mean air permeability may be obtained either by calculating the mean for n groups of 10 pieces with a measuring head of 2 cm^2 or by calculating the mean of n measurements with a head having a total surface area of 10 × 2 cm^2 = 20 cm^2.

8 Expression of results

8.1 Method of calculation and formula

The air permeability, P, expressed in cubic centimetres per minute per square centimetre and per kilopascal, is given by the formula

$$P = \frac{q}{S \times \Delta p}$$

where

q is the air flow, in cubic centimetres per minute, passing through the test piece;

S is the surface area, in square centimetres, of the test piece subjected to testing;

Δp is the pressure difference, in kilopascals, between the two surfaces of the test piece.

Calculate the mean value, $\bar{q}$, of the individual air flow values obtained and calculate the mean air permeability.

8.2 Repeatability

The difference between the results of two successive determinations of mean air permeability carried out on the same sample by the same operator shall not exceed 2 % of their mean value.

9 Test report

The test report shall show the method used and the result obtained. It shall also mention any operating conditions not specified in this International Standard, or regarded as optional, as well as any circumstances which may have influenced the result.

The conditioning and testing atmospheres shall also be stated in the test report.

The test report shall state the check values (q_1 and q_2) obtained according to 7.2.1.

The test report shall give all information necessary for the complete identification of the sample.