SLOVENSKI STANDARD
SIST ISO 9512:1995

01-maj-1995

Cigarete - Določanje prezračevanja - Definicije in merilni postopki

Cigarettes -- Determination of ventilation -- Definitions and measurement principles

Cigarettes -- Détermination du taux de ventilation -- Définitions et principes de mesurage

Ta slovenski standard je istoveten z: **ISO 9512:1993**

ICS:

65.160	Tobak, tobačni izdelki in oprema	Tobacco, tobacco products and related equipment

SIST ISO 9512:1995 **en**

INTERNATIONAL STANDARD

ISO 9512

First edition
1993-04-01

Cigarettes — Determination of ventilation — Definitions and measurement principles

Cigarettes — Détermination du taux de ventilation — Définitions et principes de mesurage

Reference number
ISO 9512:1993(E)

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9512 was prepared by Technical Committee ISO/TC 126, *Tobacco and tobacco products*, Sub-Committee SC 1, *Physical and dimensional tests*.

Annex A of this International Standard is for information only.

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Cigarettes — Determination of ventilation — Definitions and measurement principles

1 Scope

This International Standard specifies a method for the determination of ventilation applicable to cigarettes.

It applies in particular to the testing of cigarettes during manufacture.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3402:1991, *Tobacco and tobacco products — Atmosphere for conditioning and testing.*

ISO 8243:1991, *Cigarettes — Sampling.*

3 Definitions

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

3.1 ventilation: Any entry of air into an unlit cigarette other than through its front area.

3.2 front area: That end of a cigarette which is to be lit.

3.3 dilution: Effect of ventilation on the smoke yield.

3.4 ventilation air flow: Flow of air entering an unlit cigarette other than through the front area of the cigarette.

It is expressed in cubic centimetres per second.

3.5 total ventilation: Total amount of lateral air entering the cigarette other than through the front area of the cigarette.

3.6 degree of ventilation: Ratio of the ventilation air flow to the total air flow leaving the cigarette at the mouth end, measured under the same pressure, temperature and hygrometric conditions. It is expressed as a percentage. [See figures 1 b), 1 c) and 1 d).]

Under standard conditions, the total ventilation air flow, Q, is 17,5 $cm^3/s \pm 0,15$ cm^3/s.

3.7 components of total ventilation: Air entering through the cigarette paper, and through the materials comprising and attaching the filter to the tobacco rod, contributing to the total ventilation.

NOTE 1 These components are illustrated in figures 1 b), 1 c) and 1 d).

Total ventilation may be separated into main components and other components which can be useful in special cases.

3.7.1 Main components

3.7.1.1 filter ventilation: Air entering the cigarette through the filter joining paper (tipping paper) between the covered part of the mouth end and the beginning of the tobacco rod. [See figure 1 b).]

3.7.1.2 paper ventilation: Air entering the cigarette through the envelope covering the whole length of the tobacco rod. [See figure 1 b).]

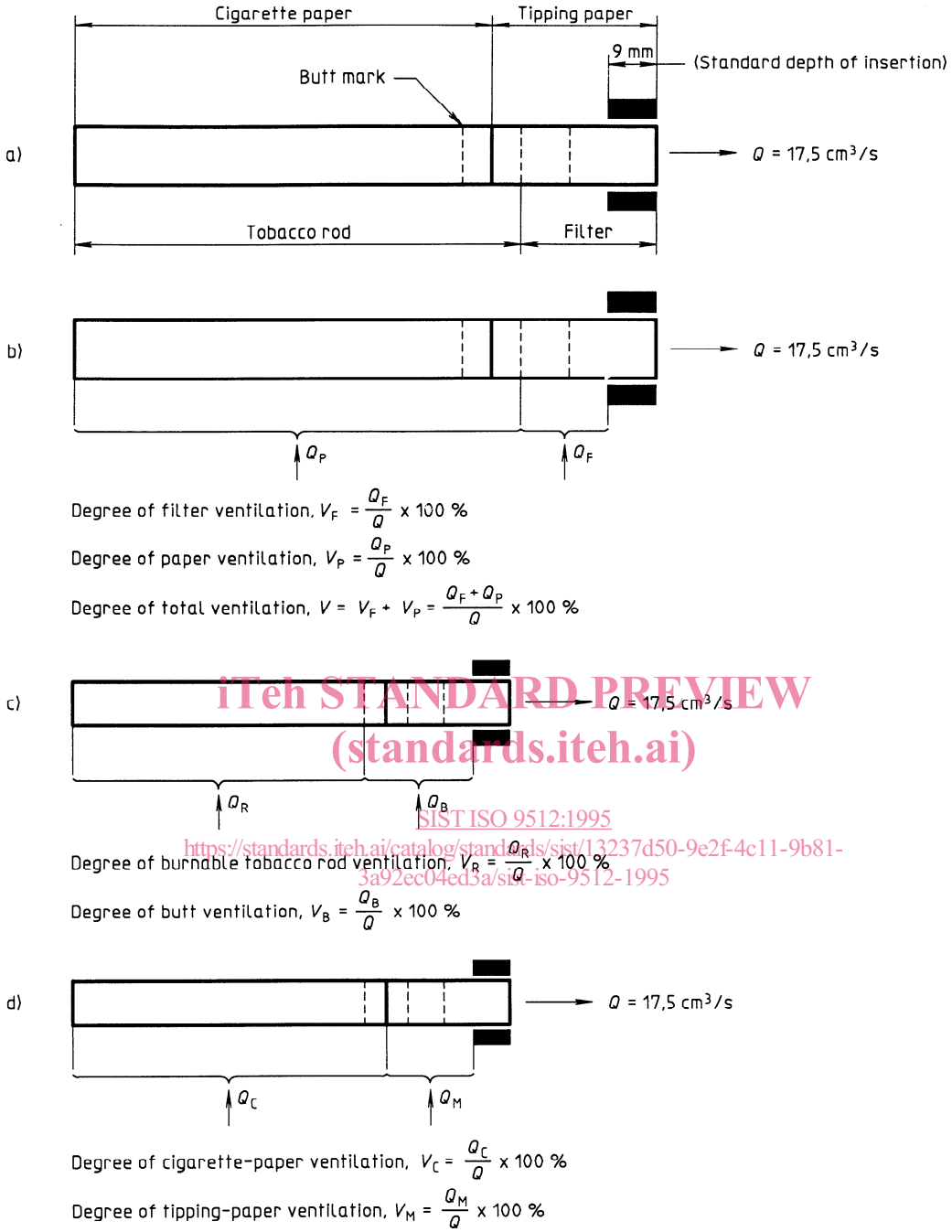

Figure 1 — Different degrees of ventilation

3.7.2 Examples of other components

3.7.2.1 butt ventilation: Air entering the cigarette between the covered part of the mouth end of the cigarette and the position defined by the butt length appropriate to the cigarette. [See figure 1 c).]

3.7.2.2 burnable tobacco rod ventilation: Air entering the cigarette through its paper between the position defined by the butt length appropriate to the cigarette and the end of the cigarette which would be lit. [See figure 1 c).]

3.7.2.3 tipping-paper ventilation: Air entering the cigarette through the filter joining paper (tipping paper) between the covered part of the mouth end and the tobacco rod end of the tipping paper. [See figure 1 d).]

3.7.2.4 cigarette-paper ventilation: Air entering the cigarette through the cigarette paper between the

end of cigarette which would be lit and the beginning of the tipping paper. [See figure 1 d).]

4 Principle

Air is drawn in the standard smoking direction through an unlit cigarette at a constant flow. The amount leaving the mouth end is measured and the individual components of ventilation are partitioned by the apparatus and measured separately. The degrees of ventilation are calculated.

5 Standard conditions

5.1 Measurements shall be made under ambient test conditions corresponding to the atmosphere specified in ISO 3402.

5.2 Cigarettes shall be conditioned prior to measurement in an atmosphere as specified in ISO 3402 for not less than 48 h.

5.3 The apparatus used shall allow separate assessment of the ventilation components shown in figure 1.

5.3.1 The cigarettes shall be held in the measurement apparatus by a cigarette holder. The depth of insertion in the holder shall be 9 mm ± 0,5 mm. [See figure 1 a).]

5.3.2 The design of the apparatus shall take into account the facts that:

— any areas of the cigarette gripped by the apparatus may affect the ventilation of the part sealed, and

— the external pressure at all parts of the cigarette other than that enclosed in the cigarette holder should be within 10 Pa of the ambient pressure.

5.4 Measurements shall be made on unlit cigarettes.

5.5 The direction of air flow in the cigarette shall be that which would occur when the cigarette is smoked.

5.6 The air flow leaving the cigarette shall be constant and correspond to a mean volumetric flow of 17,5 $cm^3/s \pm 0,15$ cm^3/s.

6 Apparatus

There are three principal types of measurement apparatus.

6.1 Bubble flow meter

The pressure drop due to such apparatus shall not be greater than 10 Pa at 17,5 $cm^3/s \pm 0,15$ cm^3/s. See note 3 in 8.1.

6.2 Flow sensor

a) Element with a known relationship between the flow and the measured pressure difference. The pressure drop at 17,5 $cm^3/s \pm 0,15$ cm^3/s shall not be greater than 10 Pa.

b) Hot-wire anemometer: care shall be taken during calibration to ensure that the flow registered by such a device represents the total flow in the tube where it is installed.

6.3 Rotary flow meter

It is necessary to provide physical compensation for the large pressure drops associated with this type of flow meter in order to obtain no more than 10 Pa variation in atmospheric pressure around the cigarette.

NOTE 2 It is unlikely that theoretical corrections can be applied because of the very large changes in air flow within the cigarette due to pressure differences.

7 Sampling

Laboratory samples shall have been taken in accordance with ISO 8243.

8 Procedure

8.1 Conditioning

Condition the test samples as specified in 5.2.

NOTE 3 If a bubble flow meter is used for the measurement of the ventilation air flow, moisture from it can change the moisture content of the cigarettes if they are positioned downstream and the flow continues for long periods.

8.2 Inspection of apparatus

Check the apparatus to ensure that any seals and connections are satisfactorily leak-free. The apparatus should be checked at two or three levels of degree of ventilation.

NOTE 4 A combination of orifices or capillaries, available commercially, can provide a suitable standard test piece for this check. The reproducibility obtained by use of these standard test pieces is of the order ± 1,0 % of the measured values.

8.3 Determination of mass flow or volumetric flow

8.3.1 Carry out this measurement according to the instructions provided with the apparatus used (see clause 6), on at least 20 cigarettes.

The volumetric air flow leaving the cigarette shall be 17,5 $cm^3/s \pm 0,15\ cm^3/s$.

8.3.2 If a mass flow meter is used for measuring the ventilation air flow, the meter shall be calibrated for the flow leaving the cigarette at the defined volumetric flow.

8.3.3 If a volumetric flow meter is used for measuring the ventilation air flow, a compensation for the differences in pressure of the flows of air entering and leaving the cigarette shall be made in order to express volumetric flows under the same conditions of pressure.

8.3.4 In both cases, one can compensate for these problems and for different atmospheric pressures by calibrating the measuring device. This can be achieved by inserting a ventilation standard with the same pressure drop as the sample to be tested, and then adjusting the meter to show the correct values of the different degrees of ventilation (i.e. 0 % and 100 %) for different flow rates (see figure 2).

9 Expression of results

The calculation of the results depends upon the way the measurement was carried out. It follows directly from the definitions given in clause 3. The degrees of ventilation are expressed as a percentage by mass or by volume.

10 Test report

In particular, the test report shall include, in detail, the method of flow measurement used.

The test report shall specify the result(s) obtained. It shall also mention all operating details not specified in this International Standard or regarded as optional, together with details of any incidents which may have influenced the test result(s).

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

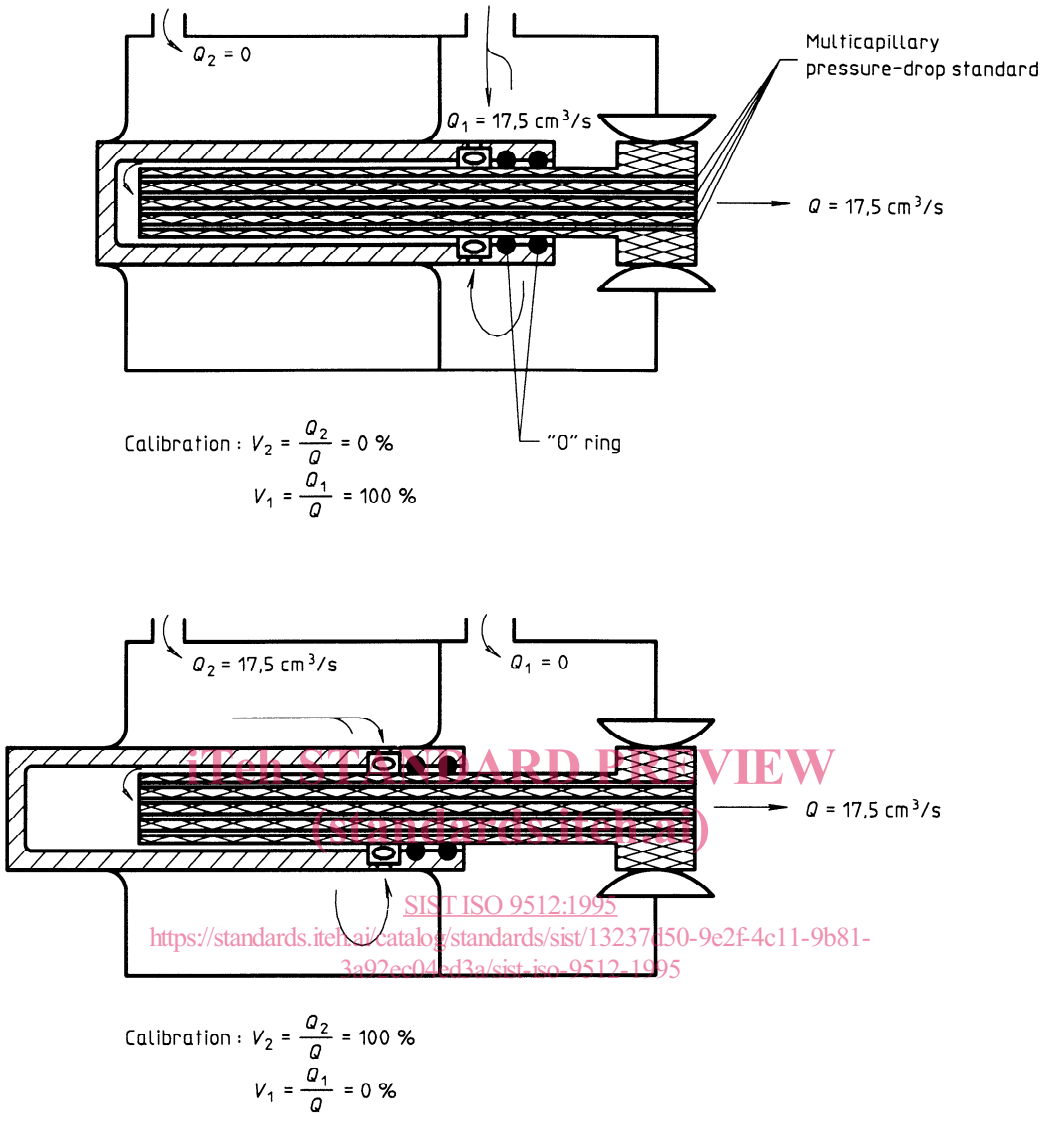

Figure 2 — Calibration test piece for ventilation meter