INTERNATIONAL STANDARD ISO 3550

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

Tobacco and tobacco products — Cigarettes — Determination of loss of tobacco from the ends

Tabac et produits du tabac — Cigarettes — Détermination des pertes de tabac par les extrémités

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

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 3550 was drawn up by Technical Committee ISO/TC 126, *Tobacco and tobacco products,* and circulated to the Member Bodies in September 1974.

It has been approved by the Member Bodies of the following countries :

Austria	Iran	Sweden
Belgium	Ireland	Switzerland
Czechoslovakia	Italy	Turkey
France	Netherlands	United Kingdom
Germany	Poland	Yugoslavia
Hungary	Portugal	
India	South Africa, Rep. of	

No Member Body expressed disapproval of the document.

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Tobacco and tobacco products — Cigarettes — Determination of loss of tobacco from the ends

0 INTRODUCTION

The loss of tobacco from the ends of cigarettes, which particularly affects short strands, is an irritating phenomenon to which the consumer is very sensitive. Agitation of cigarettes favours this loss; it is in the smoker's pocket that this effect is most noticeable, more particularly when the packet has been opened. From this standpoint the greater a cigarette's resistance to this loss the higher its quality.

The vibrating box apparatus (sismelatophore) designed to determine, under repeatable conditions, the tendency of the ends of cigarettes to lose their contents, is described below.

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the determination of the loss of tobacco from the ends of cigarettes.

2 REFERENCES

ISO 2971, *Tobacco and tobacco products — Cigarettes and filters — Determination of nominal diameter.*

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

ISO . . ., *Tobacco and tobacco products — Cigarettes — Sampling.* 1)

3 PRINCIPLE

The method consists in subjecting a test sample of a given number of cigarettes to a random series of impacts repeated in such a way as artificially to bring about a loss of tobacco strands at the ends.

These impacts are achieved by shaking the test sample in a cubic box revolving uniformly around an axis coincident with a principal diagonal.

The tobacco loss is expressed in parts per thousand, by calculating the loss of mass of the cigarettes in a given time, referred to the initial mass of the test portion. The loss per unit area is expressed in milligrams per square centimetre, by referring the loss of mass to the cross-sectional area of the cigarettes.

4 APPARATUS

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

4.2 Vibrating box (see diagram in annex), consisting of :

a) a cubic box in methyl polymethacrylate or any other plastics material having equivalent properties, the inside edge of which measures 140 ± 5 mm, held by two trihedral supports in such a way that one of the diagonals is horizontal. One of the faces of the cubic box opens (groove or hinge).

b) one half-spindle, clamped to a timing micromotor device, which rotates the cube at 60 rev/min. The other half-spindle supports a spring which holds the cube in position during rotation; it allows the cube to be freed for filling or emptying.

c) a time-switch for regulating the time of operation of the micromotor.

4.3 Analytical balance.

5 SAMPLING

Carry out sampling by the method described in ISO . . .

6 PROCEDURE

6.1 Conditioning of test sample

Place the test sample in the conditioning enclosure (4.1) and leave until constant mass is obtained.

6.2 Test portion

Take, as the test portion, 20 cigarettes from the conditioned test sample. Take at the same time a test portion for the determination of water content according to ISO . . .

1) In preparation.

6.3 Determination

Weigh the test portion (m_1) and transfer immediately to the vibrating box (4.2); then operate the latter for 2 min.[1)]

Weigh the test portion after shaking (m_2) or weigh directly the mass of the debris collected from the appliance (Δm). In the case of filter cigarettes, cut the cigarettes flush with their filter using a razor blade; separate the tobacco from the paper. Weigh the filters as well as the paper (m_3). Weigh also the tobacco. Calculate the result in accordance with the expressions given in clause 7.

6.4 Replication

Repeat the test five to ten times according to the accuracy desired.

7 EXPRESSION OF RESULTS

7.1 Loss rate

The rate of loss of the tobacco, from the ends of cigarettes with or without filter, is given by the following formula :

Rate of loss (in parts per thousand) =

$$1\,000\left(\frac{m_1 - m_2}{m_1 - m_3}\right) \text{ or } 1\,000\left(\frac{\Delta m}{m_1 - m_3}\right)$$

where

m_1 is the initial mass, in grams, of the test portion;

m_2 is the mass, in grams, of the test portion after the determination;

m_3 is the tare mass, in grams, of the cigarette paper, the filter, the glue, etc.;

Δm is the loss of mass, in grams, of the cigarettes during the test.

7.2 Loss per unit area

The loss per unit area of the tobacco from the ends of the cigarettes is given by one of the following formulae[2)] :

a) $\Phi\,(\text{mg/cm}^2) = \dfrac{2\,\Delta m}{10\,\pi\,d^2}$ or $\dfrac{\Delta m}{20\,S}$ (see note)

for filter cigarettes

b) $\Phi\,(\text{mg/cm}^2) = \dfrac{\Delta m}{10\,\pi\,d^2}$ or $\dfrac{\Delta m}{40\,S}$ (see note)

for plain cigarettes

where

Δm is the loss of mass, in milligrams, of the cigarettes during the test;

d is the nominal diameter, in centimetres, of the cigarettes, determined in accordance with ISO 2971.

NOTE – If the cross-section of the cigarettes is not circular, replace the term πd^2 in the formula by $4\,S$, S being the area of cross-section, in square centimetres, of the cigarettes.

8 TEST REPORT

The test report shall show the method used and the results 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 results, including the water content after the test of the cigarettes submitted to the test.

The conditioning and test atmospheres shall be given in the test report. If determined, the water content of the test sample shall also be given.

The test report shall give all information necessary for the complete identification of the sample and, in particular, whether the cigarettes are provided with filters or not.

1) This duration was selected experimentally as giving good sensitivity in an acceptable time.

2) The same numerical result is obtained in practice from the following formulae :

$$\frac{20\,000\,\Delta m}{\pi\,d^2} \text{ for filter cigarettes}$$

$$\text{or } \frac{10\,000\,\Delta m}{\pi\,d^2} \text{ for plain cigarettes}$$

where

Δm is the loss of mass in grams;

d is the diameter of the cigarettes in millimetres.

ANNEX

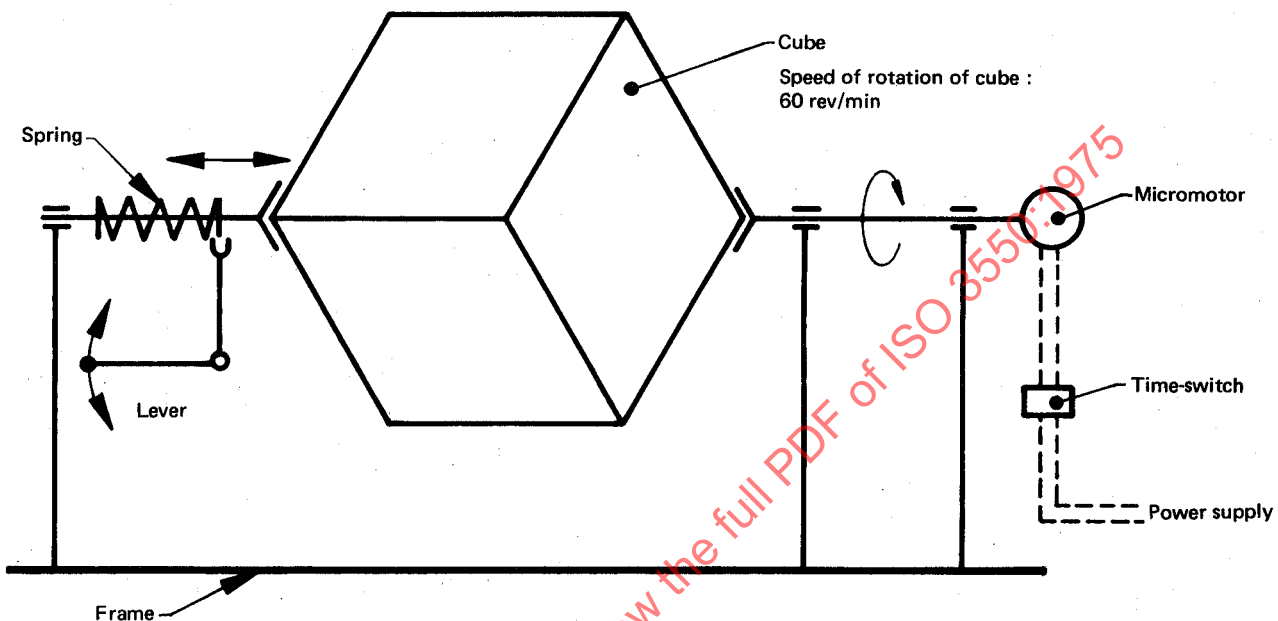

FIGURE — **Vibrating box apparatus**