INTERNATIONAL STANDARD

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Cigarettes — Sampling

Cigarettes — Échantillonnage

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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The committee responsible for this document is ISO/TC 126, *Tobacco and tobacco products*.

This fifth edition cancels and replaces the fourth edition (ISO 8243:2006), which has been technically revised.

Introduction

It is difficult to recommend a detailed method of sampling cigarettes, suitable for every purpose. The objective of sampling is clearly to provide a representative sample but the problem arises because the specific purpose for which tests are required affects the recommendation.

Existing national standards, rules, regulations and laws were taken into account when preparing this International Standard and two different procedures, both of which are simple and reliable, are described:

— sampling at the point of sale;

— sampling at producer's premises or importers' and distributors' warehouses.

Sampling is carried out "at one point in time" (e.g. cigarettes available for distribution from a factory/warehouse or available at a retail outlet on the market on a scheduled day). When a sample is required which represents cigarettes available over an appreciable period of time (e.g. cigarettes representing several months' production) a number of sub-period samples will be taken in a series of samplings, and the results combined.

Since this International Standard was originally written in 1981, its role in providing a basis of sampling cigarettes for the verification of on-pack declarations of smoke constituent yields has become increasingly important. For this reason a guide to the statistical evaluation and reporting of results is included to clarify the statistical basis of the confidence intervals for nicotine-free dry particulate matter (NFDPM), nicotine and carbon monoxide (CO) that are listed in Table 3.

Sampling according to Clauses 4 and 5 of this International Standard provides a representative cigarette sample that might be used for other testing purposes.

The sources of variability arising in cigarette manufacture and in the determination of smoke constituent components are described in Annex B and in ISO/TR 22305. It is recommended that determinations of smoke constituent yields should be made on the population manufactured for sale, sampled at manufacturers' factories or importers' warehouses and that because of variations in cigarette manufacture the "sampling over a period of time" mode should be used wherever possible.

Cigarettes — Sampling

1 Scope

This International Standard specifies two methods of providing representative samples of a population of cigarettes manufactured for sale. Different procedures are specified (see Table 1) according to whether sampling is undertaken at the point of sale or at a factory.

a) Sampling "at one point in time" provides for appraisal of the chosen properties of the cigarettes on that occasion. Sampling is carried out within as short a period as possible.

b) Sampling "over a period of time" provides for on-going appraisals. It can be considered for practical purposes as a series of samples each taken "at one point in time".

Table 1 — Sampling possibilities

Sampling procedures		Sampling mode	
		At one time (instantaneous)	**Over a period** (continuous)
A	At point of sale	Subclause 4.1	[a]
B	At a factory	Subclause 4.2	Clause 5

[a] Procedure A over a period of time is possible but is not specified in this International Standard.

This International Standard provides information on the statistical basis for the treatment of data and gives estimates, based on practical experience, of the typical confidence intervals for nicotine-free dry particulate matter (NFDPM), nicotine and CO yields which may be found when a product is sampled in accordance with this International Standard and smoked in accordance with the procedures specified in ISO 3308, ISO 3402, ISO 4387, ISO 8454, ISO 10315, ISO 10362-1 and ISO 10362-2.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4387, *Cigarettes — Determination of total and nicotine-free dry particulate matter using a routine analytical smoking machine*

ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*

ISO 8454, *Cigarettes — Determination of carbon monoxide in the vapour phase of cigarette smoke — NDIR method*

ISO 10315, *Cigarettes — Determination of nicotine in smoke condensates — Gas-chromatographic method*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
factory
place of manufacture or its associated distribution depots or the warehouse of an importer

3.2
sale unit
quantity of cigarettes ready to be offered for sale to the public

Note 1 to entry: The commonly sold packet of 20 cigarettes is used as the basis of this International Standard, but cigarettes are also sold loose and in other size packets.

3.3
carton
commercial package available within a factory

EXAMPLE Packets of 20 cigarettes are usually put into cartons of 200 cigarettes.

3.4
place of purchase
town, village or district within the area to be sampled, or that part of the area where the cigarettes are available

Note 1 to entry: Examples of boundaries are those of cantons, local government districts, electoral areas, postal code areas or any boundaries in accordance with the geographical context, or others.

3.5
sampling point
specific location representing different kinds of sampling points (e.g. shop, specialist tobacco shop, auto-vending machine, supermarket, place in warehouse, place in factory) from which an increment is to be taken

3.6
population
aggregate of sale units to be sampled

Note 1 to entry: The definition includes different sub-populations, three of which are given in 3.6.1, 3.6.2 and 3.6.4.

3.6.1
population available to consumers
aggregate of sale units in retail outlets in a given area, at any time in a given time period

3.6.2
population manufactured for sale
aggregate of sale units at a factory

3.6.3
stratification
division of a population into mutually exclusive and exhaustive sub-populations (called strata), which are thought to be more homogeneous, with respect to the characteristics investigated, than the total population

3.6.4
stratified sampling
in a population that can be divided into different mutually exclusive and exhaustive sub-populations (called strata), sampling carried out in such a way that specified proportions of the sample are drawn from the different strata and each stratum is sampled with at least one sampling unit

3.7
increment
sample of cigarettes taken at one time, at one sampling point

3.8
sub-increment
individual groups of cigarettes making up an increment

3.9
sub-period sample
increment taken when sampling over a period of time

3.10
laboratory sample
sample intended for laboratory inspection or testing

3.11
test sample
cigarettes for test taken at random from the laboratory sample and which are representative of each of the increments making up the laboratory sample

3.12
test portion
group of cigarettes randomly selected from the test sample for a determination

3.13
lot
definite quantity of some product, material or service, collected together and submitted for examination

Note 1 to entry: An inspection lot may consist of several batches or parts of batches.

4 Sampling mode: At one time

4.1 Procedure for sampling at the point of sale

4.1.1 Selection of the number and choice of sampling points

The number of sale units to be taken and the number of places of purchase to be randomly sampled is determined by the size of the area in which the cigarettes are sold. Select the appropriate numbers according to Table 2.

Table 2 — Sampling requirements

Total number of sampling points	Number of sampling points to be randomly sampled	Number of sale units to be taken at each sampling point for each laboratory sample
> 20	20	2
> 10 ≤ 20	10	4
≥ 5 ≤ 10	5	8
4	4	10
3	3	14
2	2	20
1	1	40

If the sampling requirements in Table 2 cannot be fulfilled, an alternative may be used with a justification in the sampling report. This may be independent of the size of the sales area, and not at random, but is satisfactory provided that a representative sample is taken. When used, a total of at least 40 sale units, when possible, shall be obtained.

NOTE Table 2 is applicable to a sample of 800 cigarettes. The choice of 800 cigarettes per sample has been the result of balancing various factors which influence the homogeneity of samples and should be large enough to obtain reliable results. Even though there was no single statistical rationale at the time the standard was developed, such sample size has proven to be sufficiently large to adequately represent a production batch and to carry out various analytical tests from the same sample. If there is more than one testing laboratory then the number of sale units is increased appropriately. It is necessary to make sure that each laboratory sample is representative of the population, e.g. if more than one carton is sampled they should be subdivided between the laboratory samples.