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**Tobacco — Sampling of batches of raw  
material — General principles**

*Tabac — Échantillonnage des lots de matières premières — Principes  
généraux*

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## 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.

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 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 126, *Tobacco and tobacco products*, Subcommittee SC 2, *Leaf tobacco*.

This third edition cancels and replaces the second edition (ISO 4874:2000), of which it constitutes a minor revision.

The changes compared to the previous edition are as follows:

- a table of contents has been added;
- the mandatory Normative references clause ([Clause 2](#)) has been added and the subsequent clauses have been renumbered
- definitions in [Clause 3](#) have been editorially revised for clarity.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

# Tobacco — Sampling of batches of raw material — General principles

## 1 Scope

This document specifies the general principles to be applied when sampling batches of raw tobacco in order to assess either

- the mean value of one or more of its characteristics, or
- the heterogeneity of one or more of its characteristics.

Manufactured tobacco products, including products intended for sale or distribution, are specifically not included in the scope of this document.

This document is applicable to the sampling of batches of raw tobacco of the following types:

- a) leaf tobacco:
  - 1) flue cured;
  - 2) air cured;
  - 3) sun cured;
  - 4) fire cured;
- b) pretreated raw tobacco:
  - 1) which has undergone fermentation (in packages not intended for retail or wholesale sales or distribution, in bulk, in chambers);
  - 2) which has been partially or completely stemmed;
  - 3) which is in the form of stems;
  - 4) which is in the form of waste and remnants;
  - 5) which has been reconstituted in the form of strips.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

### 3.1

#### **characteristic**

physical, mechanical, dimensional, chemical, biological, botanical or organoleptic property of tobacco

EXAMPLE Leaf position, colour, ripeness, leaf length.

### 3.2

#### **batch**

definite quantity of tobacco that is produced under conditions that are presumed to be uniform with respect to one or more of its *characteristics* (3.1)

Note 1 to entry: This notion implies generally that the batch consists of tobaccos of the same origin belonging to the same variety.

### 3.3

#### **consignment**

quantity of tobacco delivered at one time

Note 1 to entry: The consignment may consist of one or more *batches* (3.2) or parts of batches.

### 3.4

#### **sampling unit**

unit part of the *consignment* (3.3)

Note 1 to entry: It is separately packaged (bale, wooden or cardboard case, basket or sack).

Note 2 to entry: For bulk tobacco, a consignment with a total mass of  $m$  kg should be considered to be composed of  $m/100$  sampling units.

Note 3 to entry: The definition of the term "sampling unit" as given in this document is a special case of the general definition given in ISO 3534-2, and it applies only to raw tobacco.

### 3.5

#### **stratified sampling**

sampling carried out in such a way that specified proportions of the sample are drawn from different strata for a population that can be divided into different subpopulations called strata

### 3.6

#### **increment**

quantity of tobacco taken at one time from a *sampling unit* (3.4) in order to form part of a *single sample* (3.7)

### 3.7

#### **single sample**

basic sample

sample obtained by combining  $N$  *increments* (3.6) taken from a *sampling unit* (3.4) so as to be as representative as possible of this unit

### 3.8

#### **gross sample**

sample that is a combination of all *single samples* (3.7)

### 3.9

#### **reduced sample**

sample that is taken from the gross sample and is representative of the *gross sample* (3.8)

### 3.10

#### **laboratory sample**

sample intended for laboratory inspection or testing, and which is representative of the gross sample

Note 1 to entry: It may consist of

- a) one or more single samples;

- b) the gross sample;
- c) a *reduced sample* (3.9) of the gross sample.

### 3.11

#### **test sample**

sample prepared for testing, taken at random from the *laboratory sample* (3.10), representative of the gross sample

## 4 Contractual arrangements

The contract between the interested parties shall state:

- a) at what stages of production and delivery sampling shall be carried out;
- b) the party or parties responsible for carrying out the sampling and under whose control;
- c) the characteristics to be determined;
- d) the laboratory or laboratories that will perform the analyses;
- e) the maximum interval of time admissible between sampling and analysis. (This interval should be as short as possible.)

## 5 Sampling

### 5.1 General

It is important that the laboratory receive a representative sample which has not been damaged or changed during transport or storage.

If it is necessary to sample tobacco taken from cigarettes, the procedures listed in ISO 8243:2013, 4.1.3 should be used.

### 5.2 Sampling equipment

The equipment that is used for sampling the tobacco shall be appropriate for the determination of the characteristics that are specified in [Clause 4 c\)](#). If physical characteristics such as leaf dimensions or particle size distribution are to be determined, then the sampling equipment shall not alter these characteristics. The sampling equipment shall be clean and dry, and shall not affect any subsequent determination.

### 5.3 Containers for samples and storage precautions

The containers used for collecting the samples shall be made of a chemically inert material. They shall be airtight and preferably opaque.

The samples shall be kept in a dry and cool place protected against light, and in an odour-free environment to prevent contamination, microbial growth, infestation or other situations which would affect organoleptic properties.

## 6 Procedure

### 6.1 General

The procedure shall include the following steps:

- a) labelling of samples for proper identification;

- b) selection of sampling units;
- c) extraction of increments and constitution of single samples;
- d) constitution of the gross sample;
- e) constitution of reduced samples;
- f) preparation of the laboratory sample(s).

If heterogeneity is of interest as well as mean values, analyses of several laboratory samples is necessary. In these circumstances, the laboratory samples is usually taken from a single sample or a gross sample comprising not more than two or three single samples.

## 6.2 Treatment of damaged sampling units

The treatment of damaged sampling units depends on the aim of the analyses.

- a) If the damage to the tobacco is irrelevant with respect to the characteristics to be determined (for example, disease markings when assessing the length of the leaf), sample damaged units in the same way as undamaged units.
- b) If the assessment may be affected by the damage, the damaged sampling units shall be sampled separately and a record made.
- c) If the damage to the tobacco is such that the tobacco is unusable for the assessment of the characteristics to be determined, do not sample that sampling unit.

It can be necessary to grade the damage to the tobacco in the damaged sampling units into several classes and obtain sufficient increments from the damaged sampling units.

## 6.3 Selection of sampling units

### 6.3.1 General

The selection of sampling units may be carried out by random sampling or by periodic systematic sampling.

The choice of the method to be employed depends on the nature of the consignment. If the batches in the consignment are not identified, random selection of the sampling units is recommended. If the batches in the consignment are marked with successive numbers indicating a production order, then periodic sampling to select sampling units may be suitable.

### 6.3.2 Selecting the sampling units at random

Draw the sampling units at random from the consignment in such a manner that each unit has the same probability of being selected. Repeat this process until the required number ( $n$ ) of sampling units has been drawn.

### 6.3.3 Selecting the sampling units by periodic systematic sampling

If there are  $N$  sampling units in the consignment and these sampling units have been identified on a systematic basis (for example, the order of production) and numbered from 1 to  $N$ , a periodic systematic sampling of  $n$  sampling units consists in the taking of  $n$  units:

$$h, h + k, h + 2k, \dots, h + (n - 1)k$$

where  $h$  and  $k$  are whole numbers satisfying the relationships

$$nk \leq N < n(k + 1) \text{ and } h \leq k$$

with  $h$  being generally taken at random from the first  $k$  whole numbers.

## 6.4 Extraction of increments and constitution of single samples

### 6.4.1 Composition

The minimum increment shall be constituted in accordance with one of the following specifications, according to the circumstances:

- a) three packets of leaves tied together (hands);
- b) 50 leaves (for leaves not tied together before delivery);
- c) 500 g of tobacco (oriental tobacco, threshed or completely stemmed tobacco, stems, remnants, or reconstituted tobacco).

### 6.4.2 Number of increments

At least three increments shall be taken from each sampling unit. If only three increments are taken, the first of them should be taken from the upper third of the sampling unit, the second from the middle third, and the third from the lower third. Take the increments in such a way that no sites of removal are centred on the same vertical line through the unit.

If more than three increments are taken, they should be evenly distributed in the sampling unit.

### 6.4.3 Size of single samples

Each single sample is composed of all increments taken from the same unit.

The size and composition of the samples shall be appropriate to

- a) the type of tobacco,
- b) the size of the sampling unit, and
- c) the type and number of determinations to be carried out.

NOTE Examples of typical sample sizes are given in [Annex A](#).

### 6.4.4 Tobacco in bulk

Tobacco in bulk shall be notionally divided into sampling units as indicated in Note 2 in [3.4](#). These notional units shall be sampled as specified in [6.4.1](#) to [6.4.3](#).

In this case, it is also necessary to draw up a stratified sampling plan appropriate to the dimensions of the bulk sample.

## 7 Sampling report

The sampling report shall contain the following information:

- a) the type and origin of the tobacco;
- b) the consignment number as well as any batch number or numbers;
- c) the total mass of the batch;
- d) the method of packing;
- e) the number of packages and their unit mass, and whether the mass is net or gross;
- f) the number of damaged packages and their unit mass, and whether the mass is net or gross;
- g) the appearance of the tobacco;
- h) the purpose of the sampling and the characteristics to be determined;
- i) the number of units sampled;
- j) the number, nature and original position of the increments;
- k) the description of the single samples (kind, consistency, unit mass);
- l) the number of single samples;
- m) if applicable, the composition of the gross sample and its mass;
- n) if applicable, the method of reducing the gross sample as well as the composition of the reduced sample and its mass;
- o) the composition and the mass of the laboratory sample(s) and the method by which they have been obtained and conserved;
- p) the names and signatures of the party/parties who carried out the sampling;
- q) date of sampling.

## **Annex A** (informative)

### **Example of sampling**

#### **A.1 Tobacco in hands**

A consignment of 100 t in 200 kg bales (for a total of 500 bales).

Number of units sampled: 15 bales.

Single sample: 9 hands (minimum).

Gross sample: 135 hands (minimum).

#### **A.2 Threshed tobacco**

A consignment of 10 t in 500 kg hogsheads (for a total of 20 hogsheads).

Number of units sampled: 4 hogsheads.

Single sample: 1,5 kg (minimum).

Gross sample: 6 kg (minimum).

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