INTERNATIONAL STANDARD

ISO 4874

Second edition
2000-11-01

Tobacco — Sampling of batches of raw material — General principles

Tabac — Échantillonnage des lots de matières premières — Principes généraux

Reference number
ISO 4874:2000(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 4874 was prepared by Technical Committee ISO/TC 126, *Tobacco and tobacco products*.

This second edition cancels and replaces the first edition (ISO 4874:1981), which has been technically revised.

Annex A of this International Standard is for information only.

Tobacco — Sampling of batches of raw material — General principles

1 Scope

This International Standard 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.

NOTE If it is necessary to sample tobacco taken from cigarettes, the procedures listed in 5.1 of ISO 8243:1991 should be used. Manufactured tobacco products, including products intended for sale or distribution, are specifically not included in the scope of this International Standard.

This International Standard 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 Terms and definitions

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

2.1
characteristic
physical, mechanical, dimensional, chemical, biological, botanical or organoleptic property of tobacco

2.2
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 (for example, leaf position, colour, ripeness, leaf length)

NOTE This notion implies generally that the batch consists of tobaccos of the same origin belonging to the same variety.

2.3
consignment
quantity of tobacco delivered at one time

NOTE The consignment may consist of one or more batches or parts of batches.

2.4
sampling unit
unit part of the consignment

NOTE 1 It is separately packaged (bale, wooden or cardboard case, basket or sack).

NOTE 2 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 The definition of the term “sampling unit” as given in this International Standard is a special case of the general definition given in ISO 3534-2, and it applies only to raw tobacco.

2.5
stratified sampling
for a population that can be divided into different subpopulations (called strata), sampling carried out in such a way that specified proportions of the sample are drawn from different strata

2.6
increment
quantity of tobacco taken at one time from a sampling unit in order to form part of a single sample

2.7
single sample
basic sample
sample obtained by combining N increments taken from a sampling unit so as to be as representative as possible of this unit

2.8
gross sample
sample that is a combination of all single samples

2.9
reduced sample
sample that is taken from the gross sample and is representative of the gross sample

2.10
laboratory sample
sample intended for laboratory inspection or testing and which is representative of the gross sample.

NOTE It may consist of

a) one or more single samples;

b) the gross sample;

c) a reduced sample of the gross sample.

2.11
test sample
sample as prepared for testing, taken at random from the laboratory sample, representative of the gross sample

3 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.)

4 Sampling

4.1 General

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

4.2 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 3 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.

4.3 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.

5 Procedure

5.1 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).

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

5.2 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 may 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.

5.3 Selection of sampling units

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.

a) **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.

b) **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:

$$h, h + k, h + 2k, ..., h + (n - 1)k$$

where h and k are whole numbers satisfying the relationships

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

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

5.4 Extraction of increments and constitution of single samples

5.4.1 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) fifty 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).

5.4.2 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.

5.4.3 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.

5.4.4 Tobacco in bulk

Tobacco in bulk shall be notionally divided into sampling units as indicated in Note 2 in 2.4. These notional units shall be sampled as specified in 5.4.1 to 5.4.3.

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

6 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;