International Standard **ISO** 4874

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 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 4874 was developed by Technical Committee ISO/TC 126, *Tobacco and tobacco products*, and was circulated to the member bodies in February 1980.

It has been approved by the member bodies of the following countries :

Belgium	India	Spain
Brazil	Italy	Sri Lanka
Bulgaria	Korea, Rep. of	Sweden
China	Netherlands	Switzerland
Czechoslovakia	Philippines	Turkey
Egypt, Arab Rep. of	Poland	United Kingdom
France	Portugal	USSR
Germany, F. R.	Romania	Yugoslavia
Greece	South Africa, Rep. of	

No member body expressed disapproval of the document.

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 material 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.

2 Field of application

This International Standard is applicable to the sampling of batches of raw material of the following types :

a) leaf tobacco :

1) flue cured;

2) air cured;

3) sun cured;

4) fire cured.

b) pre-treated raw tobacco :

1) which had undergone fermentation (in packages, in bulk, in chambers);

2) which has been partially or completely stemmed;

3) in the form of stems;

4) in the form of waste and remnants;

5) which has been reconstituted in the form of strips.

3 Reference

ISO 3534, *Statistics — Vocabulary and symbols.*

4 Definitions

4.1 characteristic : A physical, mechanical, dimensional, chemical, biological, botanical or organoleptic property of tobacco.

4.2 batch : A definite quantity of tobacco which is produced under conditions which 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 a same variety.

4.3 consignment : A quantity of tobacco delivered at one time. The consignment may consist of one or more batches or parts of batches.

4.4 sampling unit : A unit part of the batch, separately packaged (bale, wooden or cardboard case, basket or sack).

NOTES

1 For bulk tobacco, a batch with a total mass of m kg shall be considered to be composed of $m/100$ sampling units.

2 The definition of the term "sampling unit" as given in this International Standard is a special interpretation of the general definition as given in ISO 3534, and applies only to tobacco.

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

4.6 increment : A quantity of tobacco taken at one time from a sampling unit in order to make part of a single sample.

4.7 single sample (basic sample) : A sample obtained by combining N increments taken from a sampling unit to be as representative as possible of this unit.

4.8 gross sample : A sample combining all single samples.

4.9 reduced sample : A sample taken from the gross sample to be representative of it.

4.10 laboratory sample : A sample intended for laboratory inspection or testing.

According to the case it consists of

a) one or more single samples;

b) the gross sample;

c) a subsample (most often).

4.11 test sample : A sample as prepared for testing. The test sample shall be representative of the laboratory sample.

5 General arrangements

5.1 Contractual arrangements

The contract between the interested parties shall state

a) at which stage of production and delivery sampling shall be carried out;

b) under whose control and responsibility sampling shall be carried out;

c) which characteristics have to be determined;

d) in which laboratory (or laboratories) the analyses shall be carried out;

e) the maximum admissible time-interval between sampling and analyses. The interval should be at short as possible;

f) under whose control and responsibility the laboratory sample shall be prepared and if it shall be prepared from the single sample, the gross sample or the subsample.

5.2 Sampling equipment

The equipment used shall be adapted to the nature of the tests to be carried out (for example : manual sampling if the leaf length is of interest, sampling by borer if a chemical characteristic is of interest, etc.).

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 air-tight and preferably opaque.

The samples shall be kept in a cool, dark place.

6 Procedure

The procedure shall include the following steps :

a) elimination of, or taking into consideration, damaged sampling units in accordance with 6.1;

b) selection of sampling units;

c) extraction of increments and constitution of single samples;

d) possible constitution of the gross sample;

e) possible constitution of the subsample;

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.

6.1 Damaged sampling units

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

For example

a) the damage may be irrelevant to the aim (e.g. disease markings when assessing length of leaf), and can be ignored;

b) the damage may be such that the damaged tobacco would not be used, in which case only undamaged increments should be taken (but additional assessment of the proportion damaged may be needed);

c) the assessment may be affected by the damage, in which case increments containing damaged tobacco need to be handled separately from the others, and a record of the number of both types of increment will be required;

d) it may be necessary to grade the damaged tobacco into several classes (e.g. slight, extensive), and obtain increments corresponding to each class.

6.2 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 batch (for example : if the bales are not marked, random sampling is recommended. If they are marked with successive numbers, periodic systematic sampling may be suitable).

6.2.1 Drawing at random

Draw the sampling units at random from the batch considered, i.e. in such a way that each unit has the same probability of being selected.

Repeat this process until the required number n of sampling units has been taken.

6.2.2 Periodic systematic sampling

If the N items in a population have been arranged on a systematic basis (for example in order of production) and numbered 1 to N, a periodic systematic sampling of n items consists in the taking of the n items numbered

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

where h and k are whole numbers satisfying the relation

$$h + (n - 1)k \leqslant N < h + nk$$

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

NOTE — The word "periodic" may be omitted if there is no risk of confusion.

6.3 Extraction of increments and constitution of single samples

6.3.1 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 product (oriental tobacco, threshed or completely stemmed tobacco, stems, remnants of reconstituted tobacco).

6.3.2 Number

The minimum number of increments taken shall be three. In this case, the first of these quantities shall be removed 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.

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

6.3.3 Size of single samples

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

The size and composition of the single samples shall be appropriate to

a) the type of product;

b) the size of the sampling unit;

c) the type of determinations to be carried out.

NOTE — Examples of typical sample sizes are given in the annex.

6.3.4 Tobacco in bulk

The bulk shall be notionally divided into sampling units as indicated in note 1 to sub-clause 4.4. These notional units shall be sampled as specified in sub-clauses 6.3.1, 6.3.2 and 6.3.3.

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

7 Sampling report

The sampling report shall contain the following information :

a) the type and origin of the tobacco;

b) alterations of state of the tobacco (e.g. mouldiness, impurities, soiling, strange odours, presence of foreign matter);

c) the date of the sampling;

d) the batch or consignment number;

e) the method of packing;

f) the total mass of the batch or consignment;

g) the number of packages and the unit mass, and whether the mass is given net or gross;

h) the appearance of the tobacco;

j) the purpose of sampling and the nature of the characteristics to be determined;

k) the number of any damaged units and their unit mass;

m) the number of units sampled;

n) the number, nature and original position of the increments;

p) the description of the single samples (kind, consistency, unit mass);

q) the number of single samples;

r) if applicable, the composition of the gross sample and its mass;

s) if applicable, the method of reducing the gross sample as well as the composition of the subsample and its mass;

t) the composition and the mass of the laboratory sample(s) and the method by which they have been obtained and conserved;

u) the names and signatures of the people who carried out the sampling.

Annex

Examples of sampling

A.1 Tobacco in hands

A batch of 100 t in 200 kg bales, i.e. 500 bales

Number of units sampled : 15 bales

Single sample : 9 hands (minimum)

Gross sample : 135 hands (minimum)

A.2 Threshed tobacco

A batch of 10 t in 500 kg casks, i.e. 20 casks

Number of units sampled : 4 casks

Single sample : 1,5 kg (minimum)

Gross sample : 6 kg (minimum)