

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 212

ESSENTIAL OILS

SAMPLING

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BRIEF HISTORY

The ISO Recommendation R 212, *Essential Oils. Sampling*, was drawn up by Technical Committee ISO/TC 54, *Essential Oils*, the Secretariat of which is held by the Repartição de Normalização (IGPAI).

Work on this question by the Technical Committee began in 1952 and led in 1953 to the adoption of a first Draft ISO Recommendation.

This first Draft ISO Recommendation (No. 56) was circulated to all the ISO Member Bodies for enquiry. As the results of this consultation were not considered satisfactory, the Technical Committee presented a second Draft ISO Recommendation, which was circulated to all the Member Bodies in July 1959 and which was approved, subject to a few modifications of an editorial nature, by the following Member Bodies:

Australia	Israel	Portugal
Belgium	Italy	Romania
Burma	Japan	Sweden
Chile	Mexico	Turkey
Czechoslovakia	Netherlands	United Kingdom
Germany	New Zealand	U.S.S.R.
India	Poland	Yugoslavia

One Member Body opposed the approval of the Draft:

France

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in September 1961, to accept it as an ISO RECOMMENDATION.

ESSENTIAL OILS

SAMPLING

1. PURPOSE

Samples are drawn for the purpose of determining the organoleptic, physical and chemical characteristics of consignments of essential oils.

This ISO Recommendation lays down general guidance for the sampling of essential oils.

2. DEFINITION

By *sampling* a consignment of an essential oil is meant collecting a small portion (called the sample) representative of the properties and composition of the consignment of the sampled essential oil.

3. METHOD

The difficulties encountered in sampling are often considerable and depend upon such factors as the number and capacity of the containers, the physical state of the substance, the presence of solid natural constituents and separated impurities.

In order to obtain a representative sample, the procedure may have to be varied considerably. Sampling should consequently be entrusted to experienced personnel able to cope with unforeseen circumstances.

Samples should be packed in hermetically stoppered glass containers. In order to comply with international agreements on the carriage of dangerous products, the head space should be between 5 per cent and 10 per cent of the volume of the container, depending on the method of transport adopted.

It is recommended that all samples be transported with special care, that they be kept in a cool place and protected from light and from excessive variations of temperature.

4. IMPLEMENTS

All implements intended for the preparation of samples should be washed and dried before use and be, if possible, of standard types.

The implements should be made of a material that is not attacked by the essential oil to be sampled.

Examples of suitable implements are:

4.1 Implements for liquid essential oils

- 4.1.1 Agitators
- 4.1.2 Syringes
- 4.1.3 Thiefs
- 4.1.4 Core samplers
- 4.1.5 Zone samplers
- 4.1.6 Cocks
- 4.1.7 Pumps
- 4.1.8 Siphons

4.2 Implements for solid or pasty essential oils

- 4.2.1 Spatulas
- 4.2.2 Triers
- 4.2.3 Half-round triers

4.3 Containers for samples

Glass containers should be used, protected from breakage and light. These containers should be of such capacity that they may be filled as described in section 3. They should be hermetically sealed with a cork suitably protected, if necessary, by tinfoil or by parchment.

For pasty or solid substances, the containers should have wide necks.

5. PROCEDURE

5.1 Inspection

The first operation of the sampling procedure is inspection of the consignment.

The physical consistency of essential oils can be one of the following:

- liquid (occurring most frequently),
- solid,
- a mixture of liquid and solid,
- pasty.

It is desirable, where possible, to ascertain whether the material in each of the containers of the consignment is uniform in appearance and, in the case of a liquid, whether any or all of the consignments contain separated solids, water or other impurities. When, owing to the nature of the container, this cannot be done directly, portions of the material should be withdrawn by means of an appropriate implement (see clause 4.1), so that specimens from the surface and from the bottom can be examined. If the container has a cock or bung-hole at the bottom, specimens from the lower part may be withdrawn through this.

5.2 Homogenization

It is necessary to ensure that the sample taken from each container is a fair average of its contents. Homogenization is obtained as follows:

- 5.2.1** In the case of liquid products, it is sufficient to shake the container, to use some form of agitator (see clause 4.1.1) or to homogenize by injection of nitrogen or deoxygenated air.
- 5.2.2** In the case of essential oils in a solid or pasty condition or composed of mixed solid and liquid phases, these are mixed, when possible, by shaking and by exposing the container to a higher temperature, or by warming it artificially until the contents are liquefied. The maximum limit of the heating temperature, if necessary, will be specified in the individual standard for the essential oil.
- 5.2.2.1** When total liquefaction cannot be attained, a series of partial samples should be withdrawn by means of an appropriate implement (see clause 4.2) and in the manner indicated under clause 5.3.

The partial samples should be bulked and homogenized. From this bulk three representative samples should be drawn.

5.3 Sampling

5.3.1 *Large capacity containers* (tanks, tankcars, etc.)

Five partial samples should be withdrawn from each container, at depths from the upper surface approximately equal to:

1. 10 per cent of the total depth,
2. one-third of the total depth,
3. half of the total depth,
4. two-thirds of the total depth,
5. 90 per cent of the total depth.

For each container, the five partial samples should be bulked and homogenized. From this bulk three representative samples should be drawn.

Should there be impurities or water at the bottom or at the surface of the essential oil, a sample of such layer should be withdrawn separately, thoroughly mixed and divided into three similar portions (see clause 5.1).

These specimens should not be added to the five partial samples referred to above, but should be retained and marked separately so that the nature of the impurities can be ascertained.

5.3.2 *Other containers* (drums, jugs, carboys, flasks, bottles, etc.)

The essential oil should be sampled at random, in accordance with the following table:

Total number of containers in the consignment	Minimum number of containers to be sampled
1 to 3	each container
4 to 20	3
21 to 60	4
61 to 80	5
81 to 120	6
above 120	one in every twenty

If inspection reveals no impurities or water, one partial sample should be withdrawn from each container, the contents having first been homogenized.

If inspection reveals the presence of impurities or water near the bottom or at the surface, specimens containing such foreign matter should be withdrawn separately from each container, as described in the last paragraph of clause 5.3.1. Such specimens will be kept and marked separately. More than one partial sample may have to be withdrawn from the bulk, the number of such samples and the depth from which they are withdrawn depending upon the size of the container. Partial samples should not be withdrawn from distances from the upper surface or bottom inferior to 10 per cent of the total depth.

In every case, the partial samples taken from all the containers should be bulked and homogenized. From this bulk three representative samples should be drawn.

5.3.3 *Observations concerning costly essential oils*

Small containers are generally used for packing costly essential oils.

The bulk sampling depends on the number of containers used: the combined partial samplings, however, should not exceed the quantities necessary for a normal analysis. The parties concerned should agree in advance as to the size of the bulk sample and the manner in which it should be done.