

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 1447

GREEN COFFEE BEANS

DETERMINATION OF MOISTURE CONTENT
(ROUTINE METHOD)

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BRIEF HISTORY

The ISO Recommendation R 1447, *Green coffee beans – Determination of moisture content (Routine method)*, was drawn up by Technical Committee ISO/TC 34, *Agricultural food products*, the Secretariat of which is held by the Magyar Szabványügyi Hivatal (MSZH).

Work on this question led to the adoption of Draft ISO Recommendation No. 1447, which was circulated to all the ISO Member Bodies for enquiry in February 1968. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Brazil	Israel	Spain
Chile	Norway	Turkey
France	Poland	United Kingdom
Hungary	Portugal	U.S.S.R.
India	Romania	
Iran	South Africa, Rep. of	

The following Member Bodies opposed the approval of the Draft :

Colombia
Czechoslovakia
Netherlands
U.S.A.

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

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DETERMINATION OF MOISTURE CONTENT

(ROUTINE METHOD)

INTRODUCTION

The routine method for the determination of the moisture content of green coffee beans is based on the principle of the compensation of errors leading to a low result (moisture not completely vaporized, oxidation of products) and errors leading to a high result (volatilization of substances other than water).

It is observed, indeed, that the loss in mass after the first period in the oven is less than the moisture content determined by the basic reference method, and that the total loss in mass after the second period of drying is greater than this moisture content. The loss in mass after the first period in the oven may, therefore, be considered as an underestimate of the moisture content.

The compensation between these two errors is made by means of an empirical correction which is determined experimentally.

1. SCOPE

This ISO Recommendation describes a routine method for the determination of the moisture content of green coffee beans.

2. DEFINITION

By the "moisture" of green coffee is meant conventionally the loss in mass determined under the operating conditions described.

The moisture content is expressed as a percentage by mass.

3. PRINCIPLE

Drying of the sample of beans at a temperature of $130 \pm 2^\circ\text{C}$, at atmospheric pressure, in two stages with an intermediate rest period, in order to redistribute uniformly the moisture in the bean.

The result thus obtained is regarded as agreeing with that provided by the basic reference method (see ISO Recommendation R 1446, *Green coffee beans – Determination of moisture content (Basic reference method)*).

4. APPARATUS

- 4.1 *Electrically heated constant-temperature oven* having effective ventilation and regulated in such a way that the temperature of the air and of the plates carrying the samples is $130 \pm 2^\circ\text{C}$ in the vicinity of the samples.

The oven should have a heating capacity such that when it is previously set at a temperature of 130°C , it is again able to reach this temperature in less than 45 minutes (preferably in less than 30 minutes) after the insertion of the maximum number of test portions that can be dried simultaneously.

- 4.2 *Dish with lid*, of corrosion-resistant metal or of glass, with an effective surface area of at least 18 cm² (for example 50 mm minimum diameter and 25 to 30 mm deep).
- 4.3 *Desiccator* containing reagent-grade phosphorus pentoxide or any other effective dehydrating agent.
- 4.4 *Analytical balance*.

5. PROCEDURE

5.1 Test portion

Tare the empty dried dish (4.2) with its lid. Introduce approximately 5 g of green coffee beans taken from the laboratory sample*. This test portion should be spread over the bottom of the dish in a single layer of beans. If the test portion contains a heavy impurity (nail, stone, piece of wood, etc.), discard the test portion and take a new portion from the laboratory sample. Cover the dish with its lid and weigh the dish plus lid plus test portion to the nearest 0.002 g.

5.2 Determination

- 5.2.1 *First period in the oven*. Place the dish (4.2) containing the test portion in the oven at a temperature of 130 °C (4.1), on its lid. Remove it after a period of 6 hours ± 15 minutes; cover it with the lid and place it in the desiccator (4.3). After cooling to ambient temperature (from 30 to 40 minutes after placing it in the desiccator), weigh it, still closed. After weighing, replace the dish in the desiccator for at least 15 hours.
- 5.2.2 *Second period in the oven*. Under the same conditions as specified in clause 5.2.1, replace the dish (4.2) in the oven at a temperature of 130 °C and let it remain there for 4 hours ± 15 minutes. Remove it, allow it to cool to ambient temperature in the desiccator (4.3) and weigh again.
- 5.2.3 *Number of determinations*. Carry out at least two determinations on the same sample.

6. EXPRESSION OF RESULTS

6.1 Method of calculation and formulae

- 6.1.1 *First period in the oven*. The loss in mass (P_1) during the first drying in the oven, expressed in grammes per 100 g of original sample, is obtained from the following formula :

$$P_1 = (m_0 - m_1) \times \frac{100}{m_0}$$

where

m_0 is the initial mass, in grammes, of the test portion;

m_1 is the mass, in grammes, of the test portion after the first 6 hour period in the oven.

- 6.1.2 *Second period in the oven*. The loss in mass (P_2) during the 6 + 4 = 10 hours period in the oven, expressed in grammes per 100 g of initial sample, is obtained from the following formula :

$$P_2 = (m_0 - m_2) \times \frac{100}{m_0}$$

where

m_0 is the initial mass, in grammes, of the test portion;

m_2 is the mass, in grammes, of the test portion after the second 4 hour period in the oven.

* See ISO Recommendation R ..., *Green coffee beans – Sampling* (in preparation). Pending the completion of that ISO Recommendation, the term "laboratory sample" is used in the English text to denote the sample as delivered to the laboratory.