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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 5497-2025

Replacing GB/T 5497-1985

**Inspection of grain and oils - Determination of the moisture
content of grain and oilseeds**

粮油检验 粮食、油料中水分的测定

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1 Scope

GB/T 5497-2025 is the Chinese national standard covering the reference oven method for grain moisture - the single most consequential number in the grain trade, since it decides the weight paid for and whether the lot can be stored without heating. It replaces GB/T 5497-1985, a method forty-one years old, and it is the reference against which the meters of GB/T 19878-2026 are calibrated. It was issued on 31 December 2025 and has been in force since 1 July 2026, replacing GB/T 5497-1985. The document is under the responsibility of the National Food and Strategic Reserves Administration. This page is published from the official record of the 2025 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the

document itself, delivered in full with the English translation.

This document describes the methods for determining the moisture content of grain and oilseeds. Within the constant-temperature, constant-duration drying methods described in this document, the single drying method is applicable to the determination of grain with a moisture content not exceeding 18.0 % and oilseeds with a moisture content not exceeding 13.0 %; the twice drying method is applicable to the determination of grain with a moisture content exceeding 18.0 % and oilseeds with a moisture content exceeding 13.0 %. The waterlogging suspend method is applicable to the determination of moisture content in grain, particularly in grain with high moisture levels or those in a frozen state.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 5491 Inspection of grain and oil seeds - Sampling and dividing LS/T 3705 Technical requirements and test method for quick moisture content tester of waterlogged suspend

3 Terms and definitions

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

3.1 waterlogging suspend method A method in which the object under test is completely immersed in water and weighed while suspended.

4 Constant-temperature, constant-duration drying methods

4.1 Principle Dry a specific amount of sample at a specified temperature and for a specified duration, determine the mass loss of the sample upon drying, and calculate the moisture content based on the weighing values obtained before and after drying.

4.2.1 Balance. Sensitivity of

0.001 g.

4.2.2 Electric constant-temperature drying oven. $70\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$, $105\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$, $130\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$.

4.2.3 Grinder. The grinding process is rapid and exhibits no significant heat generation, thereby preventing external air from affecting the moisture content of the specimen; the ground specimen shall meet the required particle size specifications. A disc-type moisture-preserving mill may be used, though the equipment is not limited to this type.

4.2.4 Desiccator. Containing silica gel or an equivalent effective desiccant.

4.2.5 Aluminum dish. Equipped with a tight-fitting lid; internal diameters of

15.0 cm; height between

4.2.6 Slicer or knife.

4.3 Preparation of specimens

4.3.1 Sampling and dividing are conducted in accordance with GB/T 5491; the sample dividing amount shall comply with the provisions specified in Table 1.

4.3.2 Specimens shall be prepared in accordance with the methods specified in Table 1. Immediately after preparation, the specimens shall be placed into clean, airtight containers for storage prior to use.

4.4.1.1 Place an uncovered aluminum dish with an inner diameter of

5.5 cm into an electric constant-temperature drying oven that has been pre-adjusted to $130\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ to dry for 40 min, then remove the dish, place it in a desiccator to cool to room temperature, remove it and weigh (m_0), to the nearest

0.001 g.

4.4.1.2 Use an aluminum dish to weigh out 2 g (using a

4.5 cm diameter aluminum dish) or 3 g (using a

5.5 cm diameter aluminum dish) of specimen (m_1), to the nearest

0.001 g; spread the specimen to ensure it is distributed evenly across the bottom of the dish; for oilseeds with shells, the specimen may be weighed based on the kernel-to-shell ratio, or the kernels and shells may be weighed separately. Once the temperature of the electric constant-temperature drying oven has risen to $135\text{ }^{\circ}\text{C} \sim 145\text{ }^{\circ}\text{C}$, invert the aluminum dish lid and place it over the bottom of the dish, place the aluminum dish containing the specimen into the electric constant-temperature drying oven, adjust the temperature of the electric constant-temperature drying oven to $130\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ within 5 min, and start the timer. After drying for 40 min, remove the aluminum dish, cover it with its lid, place it in a desiccator to cool to room temperature, remove it and weigh (m_2).

4.4.2.1 First drying 4.4.2.1.1 Place an aluminum dish with an inner diameter of

15.0 cm into an electric constant-temperature drying oven that has been pre-adjusted to $105\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ (for grain) or $70\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ (for oilseeds) to dry for 30 min ~ 40 min, then remove the dish, allow it to cool naturally to room temperature, and weigh it to the nearest

0.001 g. 4.4.2.1.2 Weigh out a clean, whole-grain specimen of 30 g ~ 100 g (m_3), to the nearest

0.001 g, and place it into the aluminum dish. Spread the specimen so that it is distributed uniformly across the bottom of the dish, place the dish in an electric constant- temperature drying oven that has been pre-adjusted to $105\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ (for grain) or $70\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ (for oilseeds), and dry for 30 min to 40 min. If necessary, the drying time may be extended to ensure that the grain is dried to a moisture content not exceeding 18.0 %, and the oilseeds is dried to a moisture content not exceeding 13.0 %. Remove the dish, allow it to cool naturally to room temperature, cool for at least 2 h, then weigh it. Subtract the mass of the aluminum dish to obtain the mass of the specimen after the first drying (m_4).

4.4.2.2 Second drying Immediately take the specimen dried in accordance with

4.4.2.1 and prepare it according to the preparation methods specified in Table 1; then, subject the prepared specimen to a second drying in accordance with 4.4.1.

4.5 Calculation and expression of results

4.5.1 The moisture content of grain and oilseeds determined by single drying method is calculated according to formula (1). where. w - the moisture content of the specimen, %; m_0 - the mass of the aluminum dish, in grams (g); m_1 - the mass of the specimen and aluminum dish before drying, in grams (g); m_2 - the mass of the specimen and aluminum dish after drying, in grams (g).

4.5.2 The moisture content of shelled oilseeds, where the moisture of the kernel and shell are determined separately, is calculated according to formula (2). where. w - the moisture content of the specimen, %; w_1 - the moisture content of the kernel, %; w_2 - the moisture content of the shell, %; A - the total kernel percentage, %.

4.5.3 The moisture content of grain and oilseeds determined by twice drying method is calculated according to formula (3). where. w - the moisture content of the specimen, %; m_3 - the mass of the specimen before the first drying, in grams (g); m_4 - the mass of the specimen after the first drying, in grams (g); m_5 - the mass of the specimen before the second drying, in grams (g); m_6 - the mass of the specimen after the second drying, in grams (g).

4.5.4 Under repeatability conditions, the average value of the two independent test results obtained constitutes the determination result; the determination result is rounded to one decimal place.

4.6 Precision

4.6.1 Inter-laboratory tests The inter-laboratory test results regarding the precision of this method are presented in Annex A.

4.6.2 Repeatability The absolute difference between two independent test results obtained in the same laboratory, by the same operator, using the same equipment, and following the