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

GB/T 19878-2026

Replacing GB/T 19878-2005

**General specification for grain moisture meters using
capacitance and resistance methods**

电容法和电阻法粮食水分测定仪通用技术条件

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5 Requirements

5.1 Working Environment Conditions The moisture meter should be able to operate normally under the following environmental conditions.

- a) Ambient temperature. 0°C~40°C;
- b) Relative humidity not exceeding 75%;
- c) Power supply voltage. AC220V 10%-15%, or DC (including battery power);
- d) There are no electromagnetic fields or mechanical vibrations in the surrounding area that could affect the normal operation of the moisture meter.

5.2 Appearance and Structure The appearance and structure of the moisture meter should meet the following requirements.

- a) Complies with the requirements of section

5.2 of GB/T 12519-2021;

- b) The main unit, measuring cylinder, measuring cup, and other components of the moisture meter are manufactured according to the drawings and technical documents approved in accordance with the prescribed procedures;
- c) The surface of the plastic casing is free from cracks, fading, and permanent stains, as

well as obvious deformation and scratches;

d) The metal casing surface is coated without exposing the underlying metal, and is free from blistering, corrosion, gaps, burrs, pitting, scratches, coating peeling, and pinholes;

e) The buttons are sensitive and the knobs rotate smoothly;

f) Its structure and enclosure provide adequate protection against accidental contact with live parts.

5.3 Reading device

5.3.1 Moisture meter reading device with pointer.

a) The scale markings should be clear, and the width of the pointer tip should be consistent with the width of the scale line;

b) The pointer should rotate clockwise, and the rotation should be uniform and smooth, without any obvious jumping.

5.3.2 Moisture meter reading device with display screen.

a) Numbers, text, images, symbols, and signs displayed against different backgrounds, such as bright light or dim light, should be conspicuous, neat, and clear;

b) The connectors of the display device should be secure and reliable, and should not fall off due to vibration.

5.4 Moisture content measurement range The manufacturer should specify the full range of moisture content measurement for major grain varieties and the main moisture content measurement methods in the product instruction manual. The scope should meet the requirements of Table 1.

5.5 Measurement Performance

5.5.1 Moisture content measurement time The time from sample placement to completion of a single measurement and data acquisition (excluding pre-selection, quantification of samples, and instrument warm-up time).

a) Capacitive moisture meter. should not exceed 30 seconds;

b) Resistance moisture meter. should not exceed 1 minute.

5.5.2 Accuracy of Moisture Content Measurement The maximum permissible error for major grain varieties, namely. the difference between the moisture content measured by a moisture meter and the direct drying method specified in GB 5009.3-2016. The difference between the results of moisture content determination by the method should not exceed the accuracy specified in Table 2.

5.5.3 Repeatability of Moisture Content Measurement The standard deviation of repeatability for the measurement of major grain varieties should not exceed the standard deviation of repeatability specified in Table 2.

5.6 Electrical Performance

5.6.1 Undervoltage alarm When a moisture meter is powered by batteries, there should be a warning when the voltage is low, such as displaying a low voltage indicator (text or symbol) or an audible or visual alarm.

5.6.2 Electromagnetic Compatibility The electromagnetic compatibility of a moisture meter should meet the following requirements.

a) The DC power supply variation immunity (mains power supply) meets the requirements of

12.1 in GB/T 42554-2023.

b) The AC power supply change (grid power supply) complies with the requirements of

12.2 in GB/T 42554-2023.

c) Power supply interference complies with the requirements of section

12.3 of GB/T 42554-2023.

d) Electromagnetic interference tests shall comply with the requirements of Chapter 13 of GB/T 42554-2023.

e) The built-in battery low voltage meets the requirements of

14.1 in GB/T 42554-2023.

5.7 Security

5.7.1 Insulation Resistance The insulation resistance between the power supply circuit and the outer casing of the moisture meter should not be less than 20MΩ.

5.7.2 Dielectric strength The power circuit and casing of the moisture meter should be able to withstand a 50Hz, 1500V sinusoidal AC current without any abnormal noise, breakdown, or flickering. And the arcing phenomenon.

5.8 Environmental adaptability

5.8.1 Climate and Environmental Adaptability Under operating conditions, the moisture meter should function normally under both high and low temperatures; under non-operating conditions, the moisture meter should be able to withstand constant temperature fluctuations. Store in hot and humid conditions or at low temperatures.

5.8.2 Adaptability to the transportation environment When not in operation, the moisture meter should function normally after impact and free fall, with no loosening, displacement, or damage to components, and the casing should be intact. It should not deform. Drop testing allows the product to be used with its original packaging box.

5.9 Stability Under normal operating conditions, the moisture analyzer should be able to work continuously and stably for one week without any measurement or calibration performance failures.

5.10 Durability The moisture meter should be tested multiple times under normal operating conditions without any power supply or mechanical failures.

5.11 Moisture meter calibration function If the moisture meter's error exceeds the standard, the moisture meter should have at least one of the following calibration methods.

- a) Calibration is performed by adjusting the potentiometer (changing the instrument's zero point or gain) to correct the instrument's coefficients;
- b) Calibration is performed by determining the deviation value based on the error value, either through manual input or automatic calculation by the instrument;
- c) Based on the error value, either manually input or automatically calculated by the instrument, determine the instrument's coefficients or curves for moisture content measurement. Full-range calibration.

5.12 Moisture Analyzer Self-Test Function The moisture meter should have a function to check its own operational status and be able to promptly and accurately issue operational errors or malfunction warnings. Self-test items. The requirements are specified by the product standards.

6 Test Methods

6.1 Test Conditions Except for climate adaptability tests, all tests should be conducted under normal working environmental conditions, and the accuracy and repeatability of moisture content measurements should be ensured. The ambient temperature for the sex test should be $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$.

6.2 Appearance and structural inspection Visual inspection and manual checks are performed.

6.3 Inspection of the reading device Visual inspection is required.

6.4 Measurement Performance Test

6.4.1 Moisture Content Measurement Time Test Using a stopwatch, start timing immediately when the sample is placed in the container and continue until the data is obtained after one measurement. Measure the time taken during this period.