

	Technical Specification for Verification and Inspection of Corn Moisture Meters	S/N	CNMV 59-2	
		Rev.	1	
A、This Technical Specification is enacted pursuant to Paragraph 2, Articles 14 and 16 of the Weights and Measures Act.				
B、The date of promulgation, document number, date of enforcement and content of amendment are listed as follows:				
Rev.	Date of Promulgation	Document No. (Ching-Piao-Szu-Tsu)	Date of Enforcement	Content of Amendment
1	103.11.06	No.10340009860	105.07.01	
C、This Specification is formulated with reference to the following international specifications: OIML R59 Moisture meters for cereal grain and oilseeds (1984)				
Date of Promulgation 06.11.103	Bureau of Standards, Metrology and Inspection, Ministry of Economic Affairs		Date of Enforcement 01.07.105	

1. Scope

- 1.1 This specification applies to corn moisture meters (hereinafter referred to as the moisture meter) subject to verification and inspection by measuring the moisture content of the corn kernels and indicating the reading of moisture content directly.
- 1.2 The principle of measurement of meters may be based on any physical or physicochemical method, e.g., electrical method, heating method or electromagnetic to measure the corn kernels moisture content.

2. Definition

- 2.1 Moisture content = (moisture mass in corn kernels / mass of cereal kernels sampled) x 100%.
- 2.2 Category A moisture meter: Automatic moisture meter, which are provided with printing devices for the result of measurement.
- 2.3 Category B moisture meters: Moisture meters which do not comply with the requirements relating to moisture meters of Category A, but are able to provided the measurement result.

3. General Requirement

- 3.1 To prevent from condensation, the standard corn kernels for testing shall be placed in an air-tight container. When the temperature of standard corn kernels for testing and the ambient temperature reach the thermal equilibrium, then the measurement can be started.
- 3.2 Category A moisture meter shall not require the operator to judge the precise volume or weight and temperature needed to make an accurate moisture determination. External grinding, weighing, and temperature measurement operations are not permitted.
- 3.3 The use of Category B moisture meters shall follow the operating instruction and manual provide by the manufacturer.
- 3.4 Before the verification implemented, the moisture meters shall be cleaned and removed all sundries, as the manufacturer's instruction.

4. Structure

- 4.1 Each moisture meter shall bear the following information or marking at readily observable places:
 - (1) Manufacturer's name, trade-mark and address.
 - (2) Model number and serial number. If moisture measuring sub-assembly can be separated apart from the main body of meter, each part of meters shall be labeled the serial number as of the main body.
 - (3) Category (Category A or Category B).
 - (4) Measuring range of moisture content, expressed by percent (%).
 - (5) Information relating with operation.

4.2 Application method

- 4.2.1 Moisture meters with capacitance theory shall indicate the height of the sampled corn kernels in the container or the mass of the sampled corn kernels. The attached sampling container should be provided to define the sample density.
- 4.2.2 Moisture meters with resistance theory shall indicate the amount of sampled corn kernels at the location of sample cell. If compression method is applied to measure sample's resistance, a device shall be provided to maintain constant compression.

4.2.3 A sample container shall be provided with moisture meters to contain the required quantity of sample for moisture meters with heating or electromagnetic method.

4.3 Category B moisture meters with capacitance theory shall be provided appropriate sampling container to contain the required quantity of sample or indicated the required mass of the sample.

4.4 Indication of moisture meters

4.4.1 The indication of the test result shall be directly indicated by digital, the minimum scale intervals shall be 0.1%; moisture content shall be record as the percentage of the wet basis. The moisture content must not be equipped with analog indicator.

4.4.2 Category A moisture meter shall indicate or record the moisture content, mass of sample and temperature.

4.5 The height of font of the moisture meter's indicator shall not be smaller than 10mm.

4.6 No indication can be displayed on the indicator or recorded before the booting time reach the warm-up time of the moisture meter as the manufacturer specified. The warm-up time of the moisture meter shall be displayed or record clearly on indicator if the warm-up time is needed.

5. Verification, inspection and maximum permissible errors

5.1 Verification and inspection equipments: The certificates of verification equipment of moisture meters shall bear traceability with adequate uncertainty.

(1) Standard weighing instruments with minimum scale interval less than 1 mg.

(2) Oven with thermometers that readable degree not less than 150 °C and minimum scale intervals less than 0.5 °C.

5.2 The verifications and inspection procedure of moisture meters shall be carried out under the conditions of 23±3°C, 55±15% RH.

5.3 The standard corn kernels for verification and inspection shall include seven different moisture contents from 12 % to 24 % with an increment of 2 %.

5.4 Before verification and inspection, the non-ground standard corn kernels shall be placed on the evaporating plate and heated.

5.5 The non-ground standard corn kernels shall be heated in oven with temperature 103 °C for 72 hours. Measure the moisture content of standard corn kernels before and after heated X1 and X2, respectively. The difference of X1 and X2 shall not bigger than 0.3 %. Otherwise, the dried procedure shall be resumed. Take the mean value of X1 and X2 as the standard value ($\bar{X}$).

5.6 Use standard corn kernels the measurand to implement the verification procedure for three times and get the arithmetic mean value $\bar{Y}$ (if conversion table is available, the converted value will be the value). The deviation between $\bar{Y}$ and standard value ($\bar{X}$) is error of the moisture meter. The procedures of making standard corn kernels will be prescribed in other documents. The maximum permissible errors are listed in Section 5.7 and use it to judge the verification on moisture content passed or failed.

5.7 The maximum permissible error of each test shall be as the data shown in Table 1.

Table 1

Moisture content (%)	The maximum permissible errors
Moisture content <16 %	0.8%
Moisture content $\geq$ 16 %	Moisture content $\times$ 5%

6. Inspection

6.1 The equipments for inspection shall be as same as those for verification.

6.2 The inspection items may be as same as or part of those for verification.

6.3 The maximum permissible errors of the moisture meter for inspection shall be as same as the maximum permissible errors for verification.

7. Verification compliance mark and certificate

7.1 The verification compliance mark of moisture meters shall be stuck on the adjust hole or on the seam of separable housing of the main body.

7.2 A verification certificate shall be issued after the moisture meter passing verification.

7.3 The verification certificates shall include the following items: applicant, applicant's address, brand, model number, serial number, category, verification compliance mark's number, verification date, expiration date, the breed of the corn, moisture content correction table and any other necessary information.

7.4 The validity period of a moisture meter passed verification is one year commencing from the first day of the following month that the verification compliance mark affixed to the moisture meter.

8. Moisture content correction table

8.1 The version will be enforced on July 1, 2016. A correction table will be applied for moisture meters which are submitted for verification prior to June 30, 2019.

8.2 Moisture meters that a correction table needed shall be attached a notice on readily observable place to identify the necessity.