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

GB/T 21304-2026

Replacing GB/T 21304-2007

Determination of wheat hardness - Hardness index method

小麦硬度测定 硬度指数法

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. This document replaces GB/T 21304-2007 "Determination of Wheat Hardness - Hardness Index Method". Compared with GB/T 21304-2007, the following changes are made. Aside from structural adjustments and editorial changes, the main technical changes are as follows:

- Some terms and definitions have been changed (see 3.2,.2007 edition);
- The requirements for hardness index testing instruments have been changed (see 5.1,.2007 edition of 5.1);
- Added instruments (see 5.3);
- The instrument inspection procedures have been modified (see 7.1,.2007 version 7.1);
- Instrument preheating has been removed (see 7.3 in the.2007 edition);
- Added screen pretreatment (see 7.3);
- Moisture and temperature correction factors have been changed (see Chapter 8, Chapter 8 of the.2007 edition);
- Precision requirements have been increased (see Chapter 9). Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed by the National Food and Strategic Reserves Administration. This document is under the jurisdiction of the National Technical Committee on Standardization of Grain and Oil (SAC/TC270). This document was drafted by: Henan University of Technology, Wuxi

Suibang Technology Co., Ltd., the National Academy of Food and Strategic Reserves Sciences, and Shandong Province. Provincial Grain and Oil Testing Center, Henan Provincial Grain Science Research Institute Co., Ltd., Anhui Provincial Grain and Oil Product Quality Supervision and Testing Station, Beijing Municipal Food Inspection Research Institute (Beijing Municipal Food Safety Monitoring and Risk Assessment Center), Jiangsu Provincial Grain and Oil Quality Monitoring Center, Hebei Provincial Grain and Oil Quality Testing and Information Center Service Center. The main drafters of this document are. Zhao Renyong, Tang Daowu, Yang Yunfei, Li Hui, Sun Hui, Wang Yanyan, Li Zhenhua, Yin Hao, Hu Bin, Guo Qin, and Zhang Yi. Tang Shengwen, Wang Xinwei, Tian Shuangqi, Niu Yongwu, Wang Xiangyu. The release history of this document and the document it replaces is as follows:

---First published in 2007 as GB/T 21304-2007;

---This is the first revision. Wheat hardness test. hardness index method

1. Scope This document describes a method for determining wheat hardness using the hardness index method. This document applies to the determination of wheat hardness.

5 Instruments

5.1 Wheat Hardness Index Tester. It should meet the requirements of LS/T 3704 and may be equipped with a weighing system with a weighing accuracy of $\pm 0.01\text{g}$; it may also be equipped with... A temperature measurement system with a measurement accuracy of not less than $\pm 0.5^\circ\text{C}$.

5.2 Balance. Sensitivity is 0.01g .

5.3 Thermometer. Scale division value is 0.1°C .

6 Samples

6.1 Sampling and subsampling. Performed in accordance with GB/T 5491.

6.2 Sample Pretreatment. Place the sample in the same working environment as the hardness index tester, ensuring that its temperature is approximately the same as the ambient temperature. The ambient temperature should be controlled within the range of 5°C to 45°C . The moisture content of the sample should be controlled within the range of 9% to 15%. If this requirement is not met, adjustments should be made based on the moisture content. To determine the moisture content, place the sample in a low or high humidity environment for an appropriate period of time to adjust its moisture content to the specified range. Then, remove the sample. Impurities and broken particles in it.

7 Experimental Procedure

7.1 Instrument Inspection Before testing, the sieve of the wheat hardness index tester

should be inspected. If the sieve mesh is damaged, it should be replaced immediately. When the instrument is not used for a long time or the screen is newly replaced, it should be calibrated using LS/T 1531. The calibration result should meet the wheat hardness index. Requirements for reference values of standard samples.

7.2 Weighing of the receiving hopper and screen system Weigh the hopper and screen system (including the screen and screen holder) on the balance and input the mass into the instrument's weighing system. The instrument has no weighing capability. For quantities in a system, these should be deducted from the calculation results.

7.3 Screen Pretreatment Before using a new sieve for the first time, pre-treat it 5 to 7 times with hard wheat, following the operating steps

7.4.2 to 7.4.5, to ensure the sieve is properly prepared. The mesh forms grooves. After the screen pretreatment is completed, the instrument's crushing system, receiving hopper, screen system, etc., are cleaned and ready for use.

Note. If the instrument manufacturer has pretreated the sieve, the new sieve can be used directly for the determination of the hardness index of wheat samples.

7.4 Measurement

7.4.1 Measure the ambient temperature using a thermometer, and express the result as t . Determine the moisture content of the sample according to GB 5009.3 or GB/T 5497. The result is represented by w .

7.4.2 Accurately weigh (25.00 ± 0.01) g of the prepared sample.

7.4.3 Open the end cover of the wheat hardness index tester, and align one cavity of the pulverizing system rotor (between the two blades and the recess) upwards with the feed. Close and lock the end cap at the feed inlet.

7.4.4 Open the feed hopper cover, pour all the weighed sample into the feed hopper, and close the feed hopper cover.

7.4.5 Turn on the measuring instrument and automatically stop after 50 seconds of pulverizing the sample.

7.4.6 After the measuring instrument has come to a complete stop, open the end cover and carefully remove the receiving hopper and screen system together. Clean the residue remaining on the screen. During the sweeping process, it is important to prevent the screen system from separating from the receiving hopper to avoid the residue on the screen falling into the receiving hopper and/or the material in the receiving hopper spilling out.

7.4.7 Weigh the undersize material by placing the receiving hopper and screen system together on a balance. Subtract the mass of the receiving hopper and screen system to obtain the undersize material. The mass m_1 is accurate to 0.01g.

7.4.8 Clean the crushing system, receiving hopper, and sieve system of the measuring instrument thoroughly for the next measurement.

8 Result Calculation and Representation

Instruments equipped with weighing and temperature measurement systems will automatically calculate and print the results after weighing. Instruments without weighing and temperature measurement systems will be processed according to formula (1).

9 Precision

9.1 Interlaboratory validation The interlaboratory validation results of the precision of this method are shown in Appendix A.

9.2 Repeatability In the same laboratory, by the same operator using the same equipment, following the same testing methods, and within a short period of time, the same test object is subjected to... The absolute difference between two independent test results obtained by conducting tests independently should not exceed 1.5. If the absolute difference between two independent test results exceeds 1.5, the test should be repeated.

9.3 Reproducibility In different laboratories, by different operators using different wheat hardness index meters, following the same testing method, the same test subject was subjected to... The absolute difference between two independent test results obtained by testing objects independently should not exceed 3.0. If the absolute difference between two independent test results exceeds 3.0, the wheat hardness index tester should be calibrated using LS/T 1531.