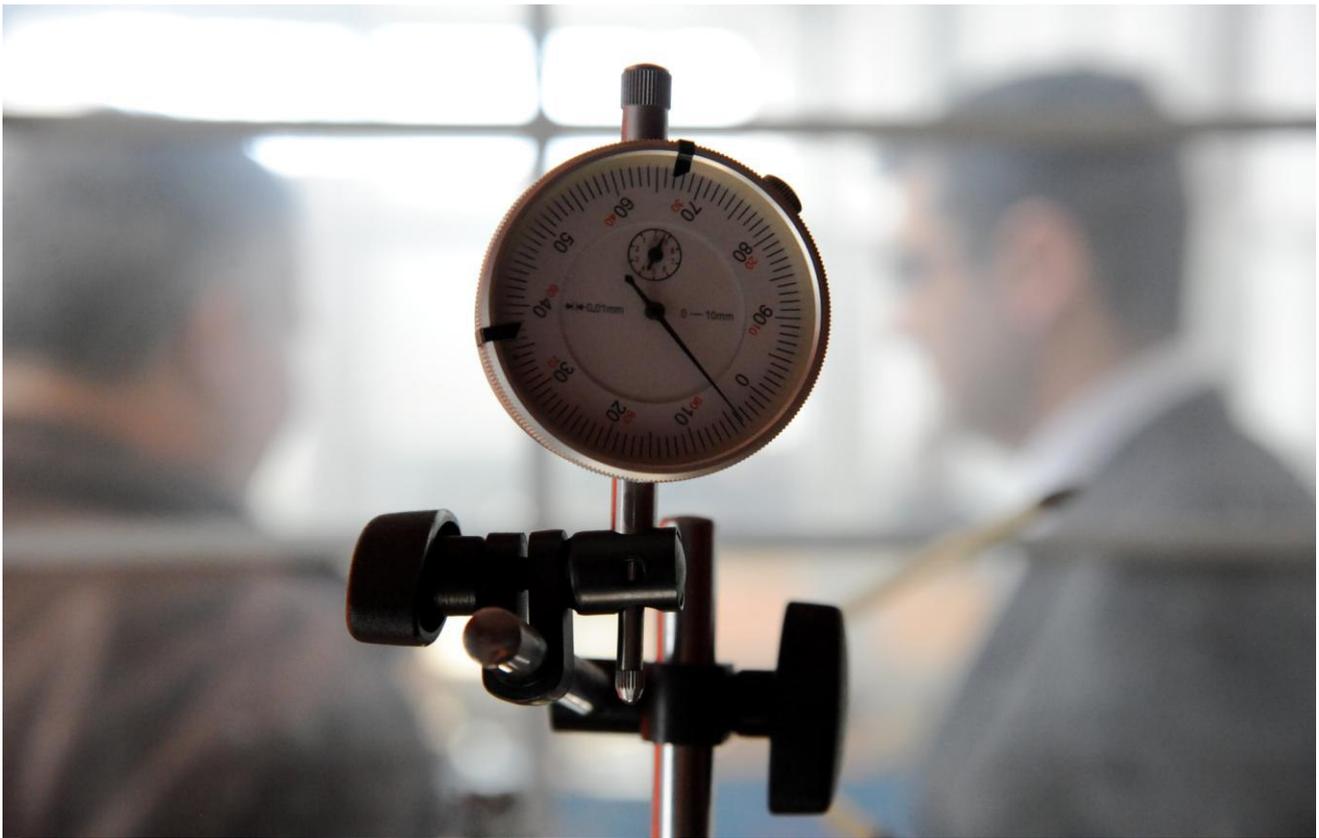


Technical Inputs



National Standard of People's Republic of China

GB/T 5502

Inspection of grain and oils

Determination of processing degree of rice and other grain kernels

Imprint

Published by the

Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

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As at

September 2014

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On behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ)

ICS 67.040

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National standard of the People's Republic of China

GB/T 5502

Replaces GB/T 5502—1985

Inspection of grain and oils

**Determination of processing degree of rice and other grain
kernels**

Issue date: Nov. 4, 2008

Implementation date: Jan 20, 2009

**Issued by General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China
Standardization Administration of the People's Republic of China**

Forword

This standard replaces GB/T 5502-1985 *Inspection of Grain and Oilseeds—Determination of Processing Degree of Rice and Other Grain Kernels*.

Compared with GB/T 5502-1985, the main changes of this standard are as follows:

- Increases normative references;
- Increases terms and definitions;
- Increases description of principles;
- Increases requirements of sampling and sample reduction;
- Increases result judgment and indication.

This standard is proposed by State Administration of Grain.

This standard is under the jurisdiction of the National Standardization Technical Committee of Grain and Oils.

This standard is mainly drafted by: Hubei Quality Supervision and Inspection Station of Grain and Oil Products, Liaoning Grain and Oils Inspection and Supervision Institute

Main drafters of this standard are: Ni Shanshan, Liu Zihao, Wu Lili, Wang Zhiming, Qiao Lina.

The old version which is replaced by this standard is:

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**Inspection of grain and oils—
Determination of processing degree of rice and other grain kernels**

1. Scope

This standard specifies the terms and definitions, principles, reagents and materials, instrument and equipment, sampling and sample reduction, detection procedure, result judgment and indication concerns determination of processing degree of rice and other grain kernels.

This standard applies to the inspection of processing degree of commodity rice.

2. Normative references

The following standards contain provisions which, referred by this standard, constitute provisions of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. However, it is encouraged for each party entering agreement according to this standard to decide whether to use the latest versions of these documents. In addition, the latest versions of all reference documents without dates are applicable to the standard.

GB 5491 Inspection of grain and oilseeds sampling and sample reduction

GB/T 6682 Water for analytical laboratory use—Specification and test methods
(GB/T 6682-2008, ISO 3696: 1987, MOD)

3. Terms and definitions

The following terms and definitions are applicable to the standard.

3.1 Processing degree

Husk content left on the back crease and surface of rice

3.2 Under milled kernel

Kernels whose husk is almost removed and the husk content left on the surface of which is less than one third.

4. Principle

Direct comparison: determining the processing degree by comparing rice to standard samples which contains certain processing degree

Staining method: the sensory property of different rice tissue to the molecule of various dyeing groups is different, after dyeing treatment, tissues of rice present different colors, thereby, the processing degree of rice is determined.

5. Reagents and materials

Use analytical reagent only unless otherwise specified. Water for laboratory use should be in accordance with at least the requirement of third-level water specified in GB/T 6682.

5.1 Carbol fuchsin solution: take 0.5 g phenol into 10 ml 95% ethanol, add 1 g fuchsin basic, to be dissolved, and dilute to 500 ml with water, after fully mixing, store in a brown bottle.

5.2 1.25% sulfuric acid solution: use the cylinder to take 7.2 ml concentrated sulfuric acid whose proportion is 1.84 and concentration 95%~98%, inject the acid into a container filled with 400 ml~500 ml water, and then dilute the acid with water until the mixed fluid reaches 1000 ml.

5.3 Sultan-III ethanol saturated solution: weighing sultan-III about 0.4 g, add 100 ml 95% of ethanol match into it as saturated solution.

5.4 50% ethanol solution.

5.5 Standard sample about determination of processing degree of rice and other grain kernels.

6. Apparatus

6.1 Evaporating dish or petri dish, ϕ 90 mm.

6.2 Balance: division value 0.1 g.

6.3 Cylinder: 10 ml, 100 ml.

- 6.4 Electric thermostatic water bath.
- 6.5 Volumetric flask: 100 ml, 1000 ml.
- 6.6 Magnifier: 5 times~20 times.
- 6.7 White porcelain.
- 6.8 Glass rod, tweezers.

7. Sampling and sample reduction

Carry out sampling and sample reduction according to GB5491.

8. Examination steps

8.1 Determination of rice processing degree

8.1.1 Direct comparison method

Weigh samples about 50 g from the average samples, and compare the 50 g samples directly with sample standard of determination of processing degree.

By observing the husk content left on the back crease and surface of rice, judge the determination of processing degree.

8.1.2 Staining method

8.1.2.1 Staining of carbol fuchsin solution

Weigh samples about 20 g from the average samples, take out without selection 50 whole kernels, put the kernels into two separate evaporating dish (6.1) (or petri dish), remove floating bran with clean water and pour away the water. Inject several milliliters of carbol fuchsin solution (5.1) to cover the rice and soak the rice for about 20s. Pour the staining solution after the rice is colored, wash it 2~3 times with water. Use 1.25% sulfuric acid solution (5.2) to wash 2 times, each time for about 30s. Pour away sulfuric acid solution and then wash it 2~3 times. At the same time, weigh standard sample of determination of processing degree (5.5) about 20 g, and repeat the above steps. The husk content of rice turns to red purple, endosperm turns to light red.

8.1.2.2 Sultan-III ethanol solution staining method

According to 8.1.2.1, count out 50 whole kernels from the standard samples

and test samples, use sultan-III ethanol saturated solution (5.3) to cover the rice, and then immerse the rice in the heating bath ($70^{\circ}\text{C} \sim 75^{\circ}\text{C}$) for about 5mins to color the rice. Pour the staining solution, use 50% ethanol solution (5.4) to wash redundant pigment. Cortex and germ turns to red, endosperm is non-staining.

8.2 Determination of broomcorn processing degree

Weigh samples of 20 g (m) from the average samples, pick out milky white grains by identifying each grain and weigh the grains (m_1).

8.3 Determination of other rice processing degree

Determination of processing degree of rice (millet, broomcorn millet, millet rice, ect.) and standard sample (5.5) by sensual inspection.

8.4 Sample observation

Put rice on the white porcelain (6.7), check the rice under natural light visually with magnifier (6.6).

9. Results determination and expression

9.1 Results determination

9.1.1 Direct comparison method

Observe test samples and standard samples to compare with the husk content left on grains. Compared with samples with determination of processing degree of rice and other grain kernels (5.5), test samples with higher husk content left has lower determination of processing degree.

9.1.2 Staining method

Compared with test samples and standard samples, judge the staining range of cortex: if the staining range of cortex of more than half of the above sample rice is less than that of the standard sample, the processing degree is relatively higher and vice versa.

9.1.3 Calculation of milky white grains

Milky white grains content of broomcorn (X) is calculated according to formula (1):

$$X = \frac{m_1}{m} \times 100\% \quad \dots\dots\dots (1)$$

Where:

X—mass of milky white grain in broomcorn, %;

*m*₁—quality of milky white grains, in the unit of gram (g)

m—quality of test sample, in the unit of gram (g)

Parallel test shall be carried out twice for each sample, the absolute difference value between two tests should not exceed 1.0%. The average of the two test data is regarded as the test result, which keeps 1 bit behind the decimal point.

9.2 Results expression

At the same time, select two samples for inspection. If the results are inconsistent, then select another two samples. The consistent result is regarded as the final result. The inspection result is expressed as: determination of processing is higher than X level; determination of processing is lower than X level; determination of processing matches X level.

Content of milky white grains in rice presents the determination of processing broomcorn.

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