

BDS 1237 : 1989

**Bangladesh Standard
SPECIFICATION FOR
GRADES OF WHEAT**



BANGLADESH STANDARDS AND TESTING INSTITUTION
116-A, TEJGAON INDUSTRIAL AREA, DHAKA - 1208

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Bangladesh Standard SPECIFICATION FOR GRADES OF WHEAT

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0. FOREWORD

0.1 This Bangladesh Standard was adopted by the Bangladesh Standard and Testing Institution on 9 December 1989 after the draft finalized by the Cereals, Pulses and Their products Sectional Committee had been approved by the Agricultural and Food Products Divisional Committee.

0.2 The development of grain grading is essential for the establishment of standards so that the producer may be paid for the quality of the products that he produces. Even a small amount of knowledge and experience in grain grading helps the producer to secure proper payment for the grain he sells. Standardization mainly aid orderly marketing and efficient buying and selling.

Upto the present there was no nationally drawn grading system, resulting in a rough and ready grading of the wheat offered for sale in the domestic market or procurement centre. Both the buyer and seller depend upon those qualities which can be judged by sight smell or touch. This subjective grading system has given rise to marketing malpractices such as the mixing of inferior quality wheat with a certain proportion of high quality wheat and the selling of the mixture under the label of better quality wheat.

0.3 In the preparation of this standard the Committee took into consideration the views of the producers, consumers, technologist and testing authorities, research workers and the Govt. and Semi-Govt. Departments and has related the standard to the producing and trade practices followed in the country in this field.

0.4 In the preparation of this standard assistance derived from the following publications are acknowledged with thanks :

Grain Inspection Handbook II-U.S.D.A., U.S.A Grade designation and definition of quality of common wheat-Directorate of Agricultural Marketing of India.

And also suggestion received from Ministry of Food and Bangladesh Agricultural Research Instituted

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with BDS : 103 : 1960*. The number of significant places retained in rounded off value shall be the same as that of the specified value in the standard.

1. SCOPE

1.1 This standard specification covers the system of classifying and grading of wheat.

* Methods of rounding off numerical values

2. TERMINOLOGY

2.1 Wheat — The grain of common wheat (*Triticum Aestivum*), club wheat (*T. Compactum* Host), and Durum wheat, which, before the removal of dockage, consists of 50 percent or more of one more of these wheats and not more than 10 percent of other grains and which, after the removal of dockage contains 50 percent or more of whole kernels of one or more of these wheats.

2.2 Dockage — All matter other than wheat which can be removed readily from a test portion of the original sample by use of an approved device.

2.3 Stones — These are concerted earthy or mineral matter and other substances of similar hardness that do not disintegrate readily in water.

2.4 Shrunken and broken kernels — These shall be kernels and pieces of kernels of wheat and all other matter that will readily pass through on 1.62 mm x 9.525 mm oblong-hole sieve.

2.5 Damaged Kernels — These are kernels, pieces of wheat kernels and other grains that are badly ground damaged, badly weather damaged, diseased, frost damaged, heat damaged, insect bored, mold damaged, sprout damaged, or otherwise materially damaged in the sample after the removal of dockage and shrunken and broken kernels.

2.6 Heat-damaged kernels — These are kernels, pieces of wheat kernels, and other grains that are materially discolored and damaged by heat which remain the sample after the removal of dockage and shrunken and broken kernels.

2.7 Foreign material — This is all matter other than wheat which remains in the sample after the removal of dockage and shrunken broken kernels.

2.8 Contrasting classes — These shall be durum wheat, white wheat, and unclassified wheat in the classes hard red spring wheat and hard red winter wheat; hard red spring, hard red winter wheat, soft red winter wheat, white wheat, and unclassified wheat in the class durum wheat; and hard red spring wheat, durum wheat, hard red winter wheat, and unclassified wheat in the class white wheat.

2.9 Wheat of other classes — These shall consist of the total of all the classes other than the predominating class and shall include contrasting classes.

2.10 Test weight (kg/hl) — Test weight (kg/hl) is the weight of the grain required to fill a level hundred litre measure. Test weight is a grading factor in all grains.

3. GENERAL REQUIREMENTS

3.1 Protein (N X 5.7) content should be 11.0 percent minimum for hard wheat and 9.5 percent minimum for soft wheat at 12.0 percent moisture basis when tested by the method prescribed in Appendix — A of BDS 1188 : 1987*.

* Specification for wheat flour for use by Biscuit Industry

BDS 1237 : 1989

3.2 The wheat shall be free from any unpleasant odour, insect infestation, fermentation, deterioration and rancidity and admixture with obnoxious and deleterious matters and poisonous weed seeds.

4. CLASSIFICATION

4.1 Wheat shall be divided into the following classes with subclasses :

4.1 Hard red spring wheat — All varieties of hard red spring wheat.

4.2 Durum wheat — All varieties of white (Amber) durum wheat. This class shall be divided into the following three subclasses:

4.2.1 Hard amber durum wheat — Durum wheat with 75 percent or more of hard and vitreous kernels of amber color.

4.2.2 Amber durum wheat — Durum wheat with 60 percent or more but less than 75 percent of hard and vitreous kernels of amber color.

4.2.3 Durum wheat — Durum wheat with less than 60 percent of hard and vitreous kernels of amber color.

4.3 Hard red winter wheat — All varieties of hard red winter wheat.

4.4 Soft red winter wheat — All varieties of soft red winter wheat.

4.5 White wheat — All varieties of white wheat. This class shall be divided into the following three classes :

4.5.1 Hard white wheat — White wheat with 75 percent or more of hard kernels. It may contain not more than 10 percent of white club wheat.

4.5.2 Soft white wheat — White wheat with less than 75 percent of hard kernels. It may contain not more than 10 percent of white club wheat.

4.5.3 White club wheat — White club wheat containing not more than 10 percent other white wheat.

5. BANGLADESH WHEAT

The following classes/sub-classes of wheat are grown in Bangladesh :

5.1 Hard red spring — Varieties released so far : Inia 66, Tanori 71, Jupateco 73, Sonora 64.

5.2 Hard white spring — Varieties released : Ananda, Kanchan, Akbar, Balaka, Aghrani, kalyansona, Pavon 76, Norteno 67, Sonalika (medium hard), Barkat (medium hard).

NOTE — Other classes/sub-classes of wheat have not been released so far.

6. Wheat shall be divided into five distinct grades on the basis of the composition and quality factors as specified in Table 1.

TABLE 1. GRADE REQUIREMENTS FOR WHEAT

(1) SL. NO	(2) GRADING FACTOR	(3) GRADE REQUIREMENTS					(4) METHODS OF TEST REF. TO	
		GRADE-I	GRADE-II	GRADE-III	GRADE-IV	GRADE-V	APPEN- DIX IN THIS STAND- ARD	APPENDIX OF BDS 952 : 1981†
1.	Test weight, kg/hl, Min	77.0	75.0	73.0	72.0	70.0	A-1	—
2.	Moisture, percent by mass, Max	13.5	13.5	13.5	13.5	13.5	—	A
3.	Heat-damaged kernels, percent, Max	0.2	0.2	0.5	1.0	3.0	A-7	—
4. *	Damaged kernels (total), percent, Max	2.0	4.0	7.0	10.0	15.0	A-8	—
5.	Shrunken and bro- ken, percent, Max	3.0	5.0	8.0	12.0	20.0	A-9	—
6. **	Defects (total), per- cent, Max	4.0	6.0	8.0	12.0	20.0	A-10	—
7.	Foreign matters percent, Max	0.5	1.0	1.5	2.0	2.5	A-11	—
8.	Contrasting cla- sses, percent, Max	1.0	2.0	3.0	10.0	10.0	A-12	—
9. ***	Wheat of other classes (total) percent, Max	3.0	5.0	10.0	10.0	10.0	A-13	—

† Specification for grades of milled rice

* Damaged kernels (total) include heat-damaged kernels.

** Defects (total) include damaged kernels (total), foreign material and shrunken and broken kernels. The sum of these 3 factors may not exceed the limit for defects.

*** Wheat of other classes (total) include contrasting classes.

NOTE Grades (iv) and (v) will be considered as sub-standard grade.

7. PACKING AND MARKING

7.1 PACKING

7.1.1 Wheat shall be packed in sound jute gunny sacks weighing 50 or 85 kgs net on the basis of 13.5 percent moisture content or as agreed to between the buyer and the seller

TABLE 2. CONTRASTING CLASSES OF WHEAT

CLASS	CONTRASTING CLASSES
Hard red winter and Hard red spring wheat	Durum, white, and unclassified wheat
Durum wheat	Hard red spring, hard red winter, soft red winter, white, and unclassified wheat
Soft red winter wheat	Durum and unclassified wheat
White wheat	Durum, hard red winter, hard red spring, and unclassified wheat

7.2 MARKING

7.2.1 Each bag shall be properly labelled in big letters containing the following information or as agreed between the buyer and the seller :

- Type, variety and grade ;
- Net mass in kilograms ;
- Name of T.P.C/LSD (optional).

8. SAMPLING

8.1 The lot should be stacked in such a way that samples can be drawn without hindrance or delay.

8.2 Drawing of representative samples should be in accordance with the method prescribed in Appendix — B of BDS 952 : 1981*

9. ANALYSIS

9.1 Wheat shall be analysed according to the method prescribed in Appendix — A.

APPENDIX — A

(Clause 9.1)

ANALYSIS OF WHEAT

A-1 TEST WEIGHT DETERMINATION

A-1.1 Kilograms per hecto litre (kg/hl)

A-2 APPARATUS : 1.0 litre kettle (ohaus type) with inside dimension of 11.5 cm in diameter and 10 cm in height. The kettle is calibrated to contain 1000 ml. of water ± 1 ml at 20°C.

A-3 HOPPER : With inside diameter of the top 20 cm. and that of bottom 3 cm and having a height of 18 cm.

A-4 STROKER : Length 30 cm breadth 4.5 cm, and thickness 1.0 cm.

A-5 SCALE : A beam scale indicating test weight in kg/hl.

A-6 PROCEDURE

A-6.1 Make sure that the apparatus is level and balanced.

A-6.2 Make sure that value at the bottom of the hopper is closed.

* Specification for grades of milled rice.

A-6.3 Pour the work sample completely into hopper.

A-6.4 Centre the hopper over the kettle.

A-6.5 Open the valve quickly to allow the grain to fill the kettle. The work sample shall be of sufficient size to cause an overflow on all sides of the kettle.

A-6.6 Move the hopper assembly away from the kettle.

A-6.7 Level the grain in the kettle by making three full length zigzag motions with the stroker.

A-6.8 Carefully hang the kettle of grain on the load loop of the beam scale.

A-6.9 Move the beam weights until the beam is completely balanced and read kg/hl, weight directly from the beam scale.

A-7 HEAT DAMAGED KERNELS

Heat damaged kernels are separated by handpicking. The determination shall be made on a representative portion of approximately 50 grams cut from the work sample after the removal of dockage and shrunken and broken kernels.

A-8 DAMAGED KERNELS

Damaged kernels are separated by handpicking. The determination shall be made on a representative portion of approximately 15 grams cut from the work sample after the removal of dockage and shrunken and broken kernels.

A-9 SHRUNKEN AND BROKEN KERNELS

The determination of shrunken and broken kernels shall be made on a representative portion of approximately 250 grams cut from the work sample after the removal of dockage using the following method :

- a) Apparatus : Slot sieve of aperture size 1.625 mm X 9.525 mm.
- b) Procedure :
 - i) Mount the appropriate sieve on a bottom pan.
 - ii) Place the 250 grams portion in the centre of the sieve.
 - iii) Hold the sieve level in both hands, with elbows close to the direction of body through and the sieve perforations parallel to the direction of movement.
 - iv) In steady motion, move the sieve from right to left approximately 25 cm and then return from left to right.
 - v) Repeat this operation 30 times.
 - vi) All material passing through the sieve shall be considered shrunken and broken kernels. The material lodged in the perforations shall be returned to the wheat which remained on top of the sieve.

A-10 TOTAL DEFECTS

Total defects shall be the sum of damaged kernels (Total), foreign material and shrunken and broken kernels.

A-11 FOREIGN MATERIAL

Foreign material is separated by handpicking. The determination shall be done on a representative portion of approximately 50 grams cut from the work sample after the removal of dockage and shrunken and broken kernels.

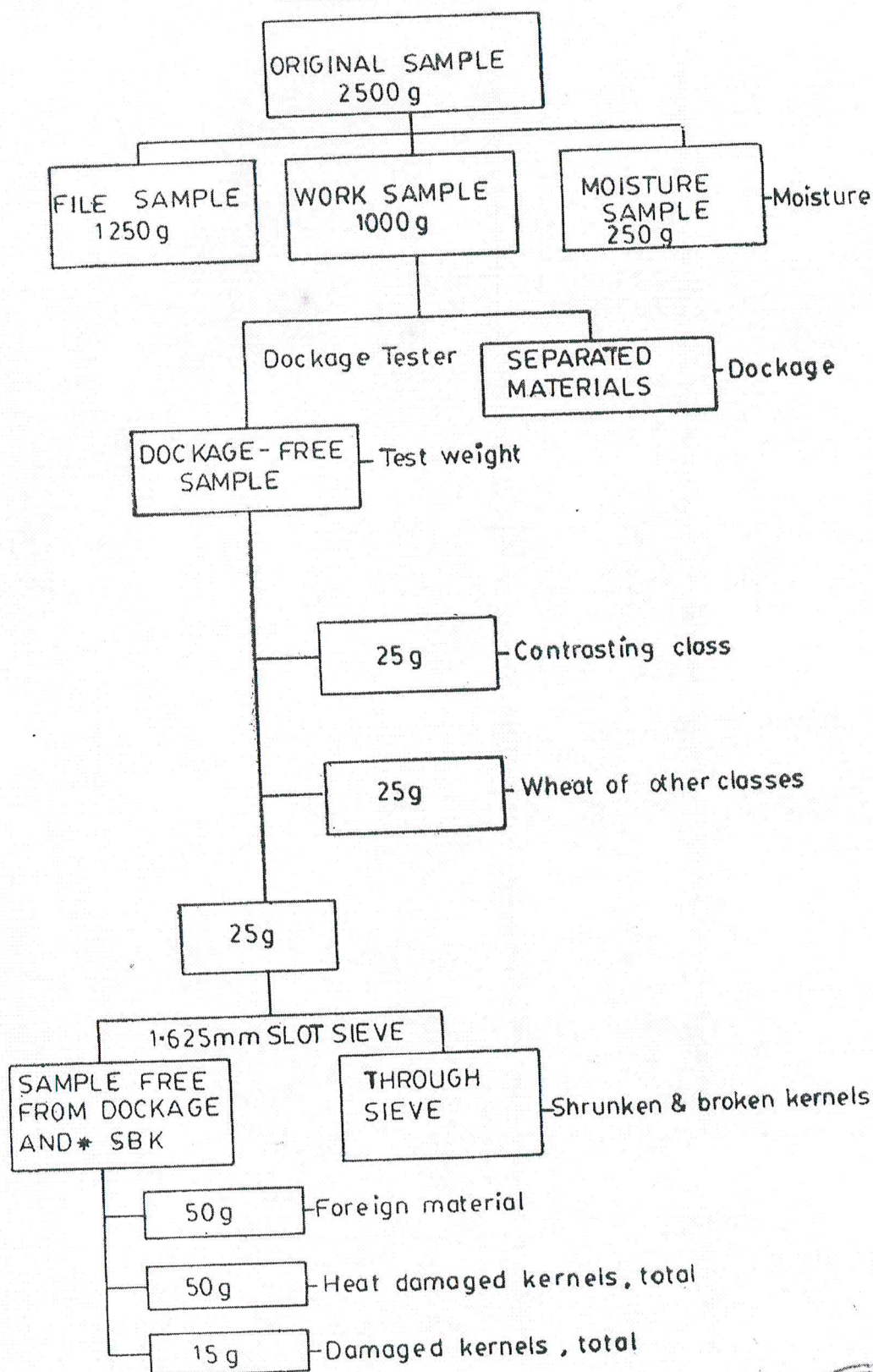
A-12 CONTRASTING CLASSES

Contrasting classes of wheat are separated by handpicking. The determination shall be made on a representative portion of approximately 25 grams cut from the work sample after the removal of dockage. Kernel and varietal characteristics shall be used in making this determination.

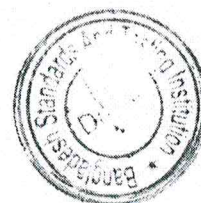
A-13 WHEAT OF OTHER CLASSES

Wheat of other classes are separated by handpicking. The determination shall be made on a representative portion of approximately 25 grams cut from the work sample after the removal of dockage. Kernel and varietal characteristics shall be used in making this determination.

ANALYSIS OF WHEAT BREAKDOWN



* SBK = Shrunken & broken kernels.



INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>	<i>Definition</i>
Force	newton	N	1 N = 1 kg.m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²

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