



Technical Specifications for  
**WHEAT GRAIN for LOAF BREAD**

Specification reference: **Wheat grain- Generic specification**

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## **1. SCOPE**

This specification applies to **Wheat** grains purchased by WFP for making flour intended for loaf bread baking.

## **2. DEFINITIONS**

**Broken kernels** are pieces of wheat that are less than three-quarters of a whole kernel. If the piece is more than three-quarters of a kernel, it is considered whole.

**Shrunken and broken kernels** are all matter that passes through a 1.7 mm x 20 oblong-holed metal sieve.

**Degermed kernels** are wheat whose germ has been removed through the mechanical handling process or by insect attack. Degermed kernels lack the greyish discoloration that is often present with sprouted kernels.

**Ergot** is a plant disease which produces elongated fungus bodies with a purplish black exterior, a purplish white to off-white interior, and a relatively smooth surface texture.

**Sprouted grains** are Grains in which the radicle or plumule exceeded the seed coat bounds; grains from which the radicle or plumule have been removed, with clearly visible deformation and changed seed coat color in the germ area.

**Heat-damaged kernels** include kernels, pieces of wheat kernels that are materially discolored and damaged by artificial drying. They range from orange-red to very dark brown, but are not black.

**Natural stain kernels are stained kernels because of** contact with natural substances such as bunt spores, soil or weeds.

**Mouldy kernels** are discoloured, swollen and soft as a result of decomposition by fungi or bacteria. They have mould visible to the naked eye and may feel spongy under pressure.

**Damaged kernels** include kernels, pieces of wheat kernels, and other grains that are badly ground-damaged, badly weather-damaged, diseased, frost-damaged, germ-damaged, heat-damaged, insect-bored, mold-damaged, sprout-damaged, or otherwise materially damaged.

**Edible grains** include all grain other than wheat which are fit for eaten by humans.

**Organic matter** are all organic components (e.g fragments of stems, leaves, ears, awns, chaff, fragments of pests, seeds of weeds and other cultivated plants, etc) other than grains of wheat, edible grains and filth.

**Inorganic matter** is defined as any inorganic component (e.g stones, dust, plastic...).

**Filth** are impurities of animal origin, including dead insect.

## **3. REFERENCE**

## 4. PRODUCT SPECIFICATION

### 4.1 General requirements for wheat grains

• Moisture:		Max. <b>14.0 %</b>
• Organoleptic:	<b>Bright, clear appearance, natural smell and color</b>	
• Test weight:		Min. <b>74 kg/hl</b>
• Shrunken and broken kernels:		Max. <b>5.0%</b>
• Insect damaged kernels:		Max. <b>1.5%</b>
• Ergot:		Max. <b>0.05%</b>
• Sprouted kernels:		Max. <b>2.0%</b>
• Total damaged kernels:		Max. <b>6.0%</b>
• Edible grain other than wheat:		Max. <b>2.0%</b>
• Organic matter (other than edible grains of cereal):		Max. <b>1.5%</b>
• Inorganic matter:		Max. <b>0.05%</b>
• Filth:		Max. <b>0.1%</b>
• Live insect:		<b>Nil</b>

### 4.2 Requirements for flours obtained from wheat grains

Flour sample prepared from wheat grain with extraction rate of 75.0% shall have below characteristics:

• Protein content:		Min. <b>11.0%</b> on dry basis
• Wet gluten:		Min. <b>25.0%</b> on dry basis
• Hagberg falling number :		Min. <b>230</b>
• Chopin Alveograph	- W:	Min. <b>215</b>
	- P:	Min. <b>80</b>
	- L:	Min. <b>80</b>

Supplier has to guarantee that the flour obtained from wheat grains covered by this specification is suitable to make loaf bread.

If required by recipient country, Wheat needs to be obtained from non-genetically modified varieties.

### 4.3 Toxic or noxious seeds

The products covered by the provisions of this specification shall be free from the following toxic or noxious seeds in amounts which may represent a hazard to human health.

- *Crotalaria* (*Crotalaria* spp.), Corn cockle (*Agrostemma githago* L.), Castor bean (*Ricinus communis* L.), Jimson weed (*Datura* spp.), and other seeds that are commonly recognized as harmful to health.

### 4.4 Contaminants

#### 4.4.1 Heavy metals

Wheat shall be free from heavy metals in amounts which may represent a hazard to health.

#### 4.4.2 Pesticide residues

Wheat shall comply with those maximum residue limits established by the Codex Alimentarius Commission for this commodity.

#### 4.4.3 Mycotoxins

Wheat shall comply with those maximum mycotoxin limits established by the Codex Alimentarius Commission for this commodity.

#### 4.5 Hygiene

4.5.1 It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), and other Codes of Practice recommended by the Codex Alimentarius Commission which are relevant to these products.

4.5.2 To the extent possible in good manufacturing practice, the products shall be free from objectionable matter.

4.5.3 When tested by appropriate methods of sampling and examination, the products:

- shall be free from micro-organisms in amounts which may represent a hazard to health;
- shall be free from parasites which may represent a hazard to health; and
- shall not contain any substance originating from micro-organisms in amounts which may represent a hazard to health.

### 5. PACKAGING AND MARKING

As per contractual agreement.

### 6. STORING

**Wheat** must be stored under dry, ventilated and hygienic conditions.

### 7. SAMPLING REQUIREMENTS

Representative samples can be drawn according to international sampling method standards at the bagging section or in the warehouse.

For packed units, sampling frequency and reference method are showed in table 2. One laboratory samples of about 3kg is required by lot or sub-lot of 500MT maximum.

For the bulk (static and flowing), the sampling must follow the rules described in paragraphs 5.2 of ISO 24333-2009.

*Table 2: Sampling rules*

Lot or sub-lot size (MT)	Number of increment	Place of sampling	Reference
≤100	3 % of bags and minimum 50 bags (e.g. 60 increments for a lot of 100 MT, packed in 50 kg bag)	Warehouse	GAFTA 124-2
101-500	3 % of bags Examples: - 120 increments for a lot of 200 MT, packed in 50 kg bag - 180 increments for a lot of 300 MT, packed in 50 kg bag - 240 increments for a lot of 400 MT, packed in 50 kg bag - 300 increments for a lot of 500 MT, packed in 50 kg bag		

## 8. ANALYTICAL REQUIREMENTS

The principal tests in table 3 must be performed in order to check if the quality of the **Wheat** meets above requirements. Additional analyses shall be defined in case of further quality assessment.

Table 3: List of compulsory tests and reference methods

No	Tests	Requirement	Referenced method (or equivalent)
<b><i>On wheat grain sample</i></b>			
1	Moisture	Max. <b>14.0 %</b>	ISO 711-2009
2	Organoleptic	<b>Bright, clear appearance, natural smell and color</b>	<i>Visual inspection</i>
3	Test weight	Min. <b>74 kg/hl</b>	ISO 7971-1986
4	Shrunken and broken kernels	Max. <b>5.0%</b>	ISO 5223-1983
5	Insect damaged kernels	Max. <b>1.5%</b>	<i>Visual inspection</i>
6	Ergot	Max. <b>0.05%</b>	<i>Visual inspection</i>
7	Sprouted kernels	Max. <b>2.0%</b>	<i>Visual inspection</i>
8	Total damaged kernels	Max. <b>6.0%</b>	ISO 1970-1987
9	Edible grain other than wheat	Max. <b>2.0%</b>	ISO 1970-1987
10	Organic matter (other than edible grains of cereal)	Max. <b>1.5%</b>	<i>Visual inspection</i>
11	Inorganic matter	Max. <b>0.05%</b>	<i>Visual inspection</i>
12	Filth	Max. <b>0.1%</b>	<i>Visual inspection</i>
13	Live insect	<b>Nil</b>	<i>Visual inspection</i>
<b><i>On flour sample milled from wheat grain with extraction rate of 75.0%</i></b>			
14	Protein content	Min. <b>11.0%</b> , on dry basis	ICC No. 105
15	Wet gluten	Min. <b>25.0%</b> , on dry basis	ISO 21415-1
16	Hagberg falling number	Min. <b>230</b>	ISO 3093
	Chopin Alveograph		
17	W	Min. <b>215</b>	ISO 27971
18	P	Min. <b>80</b>	ISO 27971
19	L	Min. <b>80</b>	ISO 27971
20	Bread baking test	<b>Suitable for loaf bread</b>	Baking