



**Technical Specifications for:**  
**FORTIFIED WHEAT FLOUR**

Specification reference: **Fortified Wheat Flour**

Version: **4.1**

Date of issue: **23 May 2011**

## **1. SCOPE**

This specification applies to WFP **Fortified Wheat Flour**.

## **2. RAW MATERIALS**

### **2.1 Wheat**

**Fortified Wheat Flour** shall be manufactured from wheat of good quality, free from foreign materials, substances hazardous to health, excessive moisture, insect damage and fungal contamination and shall comply with all relevant national food laws and standards.

- Conform to Codex STAN 152-1985.
- Be obtained from non-genetically modified varieties (*if required by the contract*).

Wheat must be stored under dry, ventilated and hygienic conditions. Only safe insecticides (i.e. phosphine) may be used for fumigation control. Where needed, fumigation must be performed by certified operators.

### **2.2 Vitamins and minerals**

Complete micronutrient premixes must be purchased from a WFP approved supplier: BASF (Stern Vitamin), DSM, Fortitech, Nicholas Piramal, Hexagon Nutrition or their authorized dealers and GAIN premix facility. Addresses of premix suppliers are on <http://foodquality.wfp.org>

Micronutrient premixes must be delivered to the processor of **Fortified Wheat Flour** with a complete Certificate of Analysis as well as with a Proof of purchase of premixes. The two documents must be presented with other documents for payment.

Micronutrient premixes must be stored in a dry, cool and clean place where the temperature is a maximum of 25 °C.

### 3. PRODUCT SPECIFICATION

#### 3.1 General requirements

The wheat flour must be produced according to Recommended General Principles of Food Hygiene CAC/RCP 1-1969 Rev 4 – 2003. Wheat supplier warrants that the wheat flour shall conform to Codex Stan 152-1985, be freshly milled, suitable for bread making.

- Moisture content:	14 % maximum
- Ash:	0.65% maximum of dry matter
- Protein:	11 % minimum of dry matter
- Zeleny index:	30 ml minimum
- Delayed sedimentation:	Zeleny value + 5 ml minimum
- Hagberg Falling Number (HFN):	230 minimum (incl. 60 sec preparation)
- Wet gluten:	28 % minimum
- Gluten index:	85 % minimum
- Chopin Alveograph	
W:	215 minimum
P:	80 minimum
L:	80 minimum
- Fatty acid:	maximum 120 mg KOH per 100 gram dry matter

#### 3.2 Micronutrients

**Wheat flour** must be fortified to provide the following micro nutrient supplement (table 1). The incorporation rate is 250g micronutrient premix per ton of flour.

*Table 1: Micronutrient rate and chemical form*

	<b>Target</b>	<b>Chemical form</b>
Vitamin A	1.0 mg/kg	Dry vitamin A palmitate 250 n.s
Vitamin B1	4.4 mg/kg	Thiamine mononitrate
Vitamin B2	2.6 mg/kg	Riboflavin
Vitamin B3	35.0 mg/kg	Nicotinamide
Folic acid	1.0 mg/kg	Folic acid
Vitamin B 12	0.008 mg/kg	Cyancobalamin
Iron	15 mg/kg	NaFeEDTA
Zinc	30 mg/kg	Zinc oxide

#### 3.3 Safety

**Fortified Wheat Flour** shall be free from objectionable matter; not contain any substances originating from micro-organisms or any other poisonous or deleterious substances such as anti-nutritional factors, heavy metals or pesticide residues, in amounts which may represent a hazard to health.

#### 3.4 Shelf life

It shall retain above qualities for at least one year from date of manufacture when stored dry at ambient temperatures prevalent in the country of destination.

#### 4. PACKAGING

As per contractual agreement.

#### 5. MARKING

- Name of the product: **Fortified Wheat Flour**
- Net content.
- Name and address of the supplier (including country of origin).
- Batch number (or SI).
- Production date.
- Additional marking as per contractual agreement.

#### 6. STORING

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

#### 7. ANALYTICAL REQUIREMENTS

*Table 2: List of compulsory tests and reference methods*

No	Test	Recommended level	Reference method*
1	Organoleptic	Pleasant smell; Typical taste and color	
2	Moisture content	14 % maximum	ICC No 110 ISO 711-2009
3	Ash	0.65% maximum of dry matter	ICC No. 104
4	Protein	11 % minimum of dry matter	ICC No. 105
5	Zeleny index	30 ml minimum	ICC No 116 & 118 ISO 5529
6	Delayed sedimentation	Zeleny value + 5 ml minimum	
7	Hagberg Falling Number (HFN)	230 min. (incl. 60 sec preparation)	ICC No 107 ISO 3093
8	Wet gluten	28 % minimum	AACC 38-12A ICC No 155 ISO 21415-1
9	Gluten index	85 % minimum	ICC 155 AACC 3812
Chopin Alveograph			
10	W	215 minimum	AACC 54-30A ISO 27971
11	P	80 minimum	
12	L	80 minimum	
13	Fatty acid	maximum 120 mg KOH per 100 gram dry matter	ISO 7305 AOAC 14022
14	Vitamin A	1.0 mg/kg minimum	AOAC 992.04 AACC 86-03
15	Iron	15.0 mg/kg minimum	AOAC 944.02 AACC 40-41B

\* Or equivalent