



EAS 1:2010  
ICS 67.060

## EAST AFRICAN STANDARD

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Wheat flour — Specification

EAST AFRICAN COMMUNITY

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## Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in East Africa. It is envisaged that through harmonized standardization, trade barriers which are encountered when goods and services are exchanged within the Community will be removed.

In order to meet the above objectives, the EAC Partner States have enacted an East African Standardization, Quality Assurance, Metrology and Test Act, 2006 (EAC SQMT Act, 2006) to make provisions for ensuring standardization, quality assurance, metrology and testing of products produced or originating in a third country and traded in the Community in order to facilitate industrial development and trade as well as helping to protect the health and safety of society and the environment in the Community.

East African Standards are formulated in accordance with the procedures established by the East African Standards Committee. The East African Standards Committee is established under the provisions of Article 4 of the EAC SQMT Act, 2006. The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the procedures of the Community.

Article 15(1) of the EAC SQMT Act, 2006 provides that "Within six months of the declaration of an East African Standard, the Partner States shall adopt, without deviation from the approved text of the standard, the East African Standard as a national standard and withdraw any existing national standard with similar scope and purpose".

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

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East African Community

P O Box 1096

**Arusha**

Tanzania

Tel: 255 27 2504253/8

Fax: 255-27-2504481/2504255

E-Mail: [eac@eachq.org](mailto:eac@eachq.org)

Web: [www.each.int](http://www.each.int)

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## Introduction

This revised standard has incorporated the specific compositional requirements for wheat flour. The standard has prescribed the permissible levels of food additives in wheat flour. Microbiological requirements for wheat flour have also been stipulated.

In the preparation of this East African Standard, the following sources were consulted extensively:

*United States Standards for Wheat*, Effective May 2006

*Wheat*, Official Grain Grading Guide, August 1, 2009, Canadian Grain Commission

Department of Agriculture, Regulation Gazette No. 6225, 10 July 1998, Agricultural Product Standards Act, 1990 (Act No. 119 of 1990), *Regulations relating to the grading, packing and marking of wheat intended for sale in the Republic of South Africa* + Amendment of 19 July 2002, No. 23622 and Amendment of 19<sup>th</sup> August 2003, No. 25370

Department of Agriculture, Regulation Gazette No. 22658, 11 September 2001, Agricultural Product Standards Act, 1990 (Act No. 119 of 1990), *Standards for grades of Class Bread Wheat, Class Biscuit Wheat and Class Durum Wheat*

Department of Agriculture, Regulation Gazette No. 30782, 22 February 2008, Agricultural Product Standards Act, 1990 (Act No. 119 of 1990), *Regulations relating to the grading, packing and marking of wheat products intended for sale in the Republic of South Africa*

## Wheat flour — Specification

### 1 Scope

This East African Standard prescribes the requirements and methods of test for wheat flour (other than durum wheat flours) intended for baking and other modes of human consumption.

### 2 Normative references

The following normative documents contain provisions which, through reference in this text constitute provisions of this East African Standard. For dated references, subsequent amendments to, or revisions of any of these publications do not apply. However, parties to agreements based on this East African Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies.

EAS 35, *Edible salt — Specification*

EAS 38, *Labelling of prepackaged foods — Specification*

EAS 39, *Hygiene in the food and drink manufacturing industry — Code of practice*

EAS 41-9, *Fruits, vegetables and derived products — Sampling and methods of test — Part 9: Determination of copper content — Photometric method*

EAS 41-14, *Fruits, vegetables and derived products — Sampling and methods of test — Part 14: Determination of arsenic content — Silver diethyldithiocarbamate spectrophotometric method*

EAS 51, *Grades of wheat grain — Specification*

EAS 82, *Milled cereal products — Methods of test*

EAS 100, *Foodstuffs — Methods of determination of lead*

EAS 103, *Schedule for permitted food additives*

EAS 79, *Cereals and pulses as grain — Methods of sampling*

ISO 16050, *Foodstuffs — Determination of aflatoxin B1, and the total content of aflatoxins B1, B2, G1 and G2 in cereals, nuts and derived products — High-performance liquid chromatographic method*

### 3 Definitions

#### 3.1

##### **wheat flour**

shall be the product made from milling clean wheat grains conforming to the requirements of EAS 51

#### 3.2

##### **enriched flour**

is the wheat flour, to which vitamins and minerals as specified in Clause 5 have been added

#### 3.3

##### **white wheat flour**

obtained by milling wheat grains at low extraction rates that leaves negligible amounts of bran

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## 3.4

### **bakers flour**

white wheat flour obtained by milling high protein wheat intended for bread making

## 3.5

### **household or home baking flour**

white wheat flour obtained by milling wheat grades or blends of hard and soft wheat intended for domestic use

## 3.6

### **biscuit flour**

white wheat flour obtained by milling a blend of hard and soft wheat with a high percentage of soft wheat for biscuit manufacture

## 3.7

### **cracker flour**

white wheat flour obtained by milling low protein wheat with no improvers

## 3.8

### **self-raising flour**

white wheat flour obtained by milling a blend of soft and hard wheat to which raising agents are added

## 3.9

### **standard flour**

wheat flour obtained by milling wheat grains at a higher extraction than home baking flour

## 3.10

### **wholemeal flour**

wheat flour obtained by milling the entire wheat grain to fine particle size without any separation

## 3.11

### **atta flour**

wholemeal flour with coarse particles

## 4 Minimum quality requirements

### 4.1 General requirements for wheat flour

4.1.1 All types of wheat flour shall have the characteristic colour and shall be free from any objectionable flavours and odours.

4.1.2 The flour shall be free from insects, worms, fungal infestation, rodent contaminations and foreign matter.

4.1.3 The flour shall not contain flour from other cereals. However, the addition of malted barley flour not exceeding 1% is permissible in the case of baker's flour.

4.1.4 The flour shall be produced under GMP conditions.

4.1.5 The shelf life shall be three months for wholemeal and atta, but six months for all other flours.

### 4.2 Compositional requirements for wheat flour

The types of wheat flour shall comply with the compositional requirements given in Table 1 and shall be free of potassium bromate.

Table 1 — Compositional requirements/limits

| Types of flour            | Moisture content, max. %, m/m | Fibre content, max. %, m/m | Total ash content, max. %, m/m | Residue on sieving through 180 micron-sieve, max. % | Protein content, min. %, m/m | Mixture of acid-ingredients and sodium bicarbonate added, max. %, m/m |
|---------------------------|-------------------------------|----------------------------|--------------------------------|---|------------------------------|---|
| <b>White wheat flour:</b> |                               |                            |                                |   |                              |   |
| Baker's flour             | 13.5                          | 1.0                        | 0.70                           | 0.80  | 11.0                         |   |
| Home baking flour         | 13.5                          | 1.0                        | 0.70                           | 0.80  | 9.0                          | –   |
| Biscuit flour             | 13.5                          | 1.0                        | 0.55                           | 0.50  | 8.0                          | –   |
| Cracker flour             | 13.5                          | 1.0                        | 0.70                           | 0.50  | 8.0                          | –   |
| Self-raising flour        | 13.5                          | 1.0                        | 2.0                            | 0.80  | 8.0                          | 4.5   |
| Standard flour            | 13.5                          | 1.5                        | 1.10                           | 30.0  | 11.0                         | –   |
| Atta flour                | 13.5                          | 2.0                        | 2.0                            | 55.0  | 12.0                         | –   |
| Whole-meal flour          | 13.5                          | 2.0                        | 2.0                            | 30.0  | 12.0                         | –   |
| Test methods              |                               |                            |                                |   |                              |   |

#### 4.2.2 Self-raising flour

In addition to the specifications in Table 1, compositional requirements for self-raising wheat flour may contain the following:

##### 4.2.2.1 Edible salt conforming to EAS 35.

##### 4.2.2.2 Acid ingredients

The acid ingredients shall be one or any combination of the following:

- i) sodium acid pyrophosphate;
- ii) mono acid calcium phosphate;
- iii) isodium aluminium phosphate;
- iv) sodium bicarbonate shall be in sufficient amounts to provide not less than 0.4 % of available carbon dioxide.

## 5 Heavy metal contaminants

These, if present, shall not exceed the limits specified in Table 2.

Table 2 — Limits for heavy metal contaminants in wheat flour

| Contaminant  | Maximum limit<br>ppm | Test method |
|--------------|----------------------|-------------|
| Arsenic (As) | 1.0                  | EAS 41-14   |
| Lead (Pb)    | 0.5                  | EAS 100     |
| Copper (Cu)  | 2.0                  | EAS 41-9    |

## 6 Permissible additives

For improving the quality of flour or production of enriched flour the following substances may be added in quantities specified in EAS 103.

### 6.1 Vitamins and minerals

*Including but not limited to:*

|  | <i>Level</i>                      |
|--|-----------------------------------|
| i) thiamine (Vitamin B <sub>1</sub> )    | 4.5 ppm to 5.5 ppm;               |
| ii) riboflavin (Vitamin B <sub>2</sub> ) | 2.7 ppm to 3.3 ppm;               |
| iii) niacin (niacin amide)               | 35.5 ppm to 44.4 ppm;             |
| iv) Vitamin D                            | 250 to 1 000 International Units; |
| v) zinc;                                 |                                   |
| vi) iron.                                |                                   |

### 6.2 Improvers

Improvers may be added singly or in combination, including but not limited to:

|                            | <i>Maximum permitted level</i> |
|----------------------------|--------------------------------|
| i) ascorbic acid           | 200 ppm;                       |
| ii) potassium persulphate  | 100 ppm;                       |
| iii) ammonium persulphate  | 250 ppm;                       |
| iv) mono calcium phosphate | 2 500 ppm;                     |
| v) chlorine dioxide        | 30 ppm.                        |

NOTE Azodicarbonamide (ADA) shall not be used at all.

### 6.3 Bleachers (added singly)

|                      | <i>Maximum permitted level</i> |
|----------------------|--------------------------------|
| i) nitrogen peroxide | GMP;                           |
| ii) benzoyl peroxide | 150 ppm.                       |

### 6.4 Diastatically actives (singly or combined)

|   | <i>Maximum permitted level</i> |
|---|--------------------------------|
| i) malt flour (milled from highly diastatic barley) | GMP;                           |
| ii) fungal enzyme (amylolyse or MYL-X)              | 45 ppm.                        |

NOTE All food additives shall be of food grade quality.

## 7 Hygiene

The flour shall be prepared under good hygienic practices in compliance to EAS 39.

### 7.1 Microbiological limits

The flour shall not contain any pathogenic microbes and shall also comply with the microbiological limits given in Table 3.

**Table 3 — Microbiological requirements**

| Types of micro-organism           | Max. number of counts permissible | Method of test |
|-----------------------------------|-----------------------------------|----------------|
| Total viable counts               | 10 <sup>5</sup> per g             | EAS 217        |
| <i>Coliforms</i> , per g          | Shall be absent                   |                |
| <i>Escherichia coli</i> , per g   | Shall be absent                   |                |
| <i>S. aureas</i> , per g          | Shall be absent                   |                |
| <i>Salmonella</i> , per 25 g      | Shall be absent                   |                |
| Yeasts and moulds, per g          | 10 <sup>3</sup>                   | Annex A        |
| Bacterial rope spore count, per g | 10 <sup>2</sup>                   |                |

### 7.2 Aflatoxin

The total aflatoxin level shall not exceed 10 ppb, with aflatoxin B<sub>1</sub> not exceeding 5 ppb when tested in accordance with ISO 16050.

## 8 Packaging

**8.1** The product shall be packed in food grade material that ensures product safety and integrity.

**8.2** The package fill shall comply with the relevant Legal Metrology requirements.

**8.3** The disposal of used packages and expired wheat flour shall be done in compliance with the Environmental Management and Coordination Acts of the Partner States on disposal of liquid and solid wastes.

## 9 Labelling

In addition to the provisions of EAS 38, the following shall be legibly and indelibly shown:

- i) name and type of product;
- ii) brand name;
- iii) name and physical address of the manufacturer/packer/importer;
- iv) batch or code number;
- v) declaration of additives used;
- vi) net weight in grams/kilograms;
- vii) date of manufacture;

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- viii) expiry date;
- ix) storage instruction;
- x) declared as “Human Food”;
- xi) country of origin;
- xii) instructions for disposal of used packages;
- xiii) Caution “Store and transport away from any contaminants such soaps, detergents, petroleum products, spices and other aromatic substances”.

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**Annex A**  
(normative)

**Determination of bacterial rope spore count**

**A.1 Reagents**

- A.1.1 Peptone water**, 0.1 %, sterilized.
- A.1.2 Tryptone glucose**, (extract (TGE) agar).
- A.1.3 Tryptone**, 5.0 g.
- A.1.4 Yeast extract**, 2.5 g.
- A.1.5 Glucose (dextrose)**, 1.0 g.
- A.1.6 Sodium chloride**, 6.5 g.
- A.1.7 Agar**, bacteriological grade (see Note) 15.0.
- A.1.8 Water**, distilled, 1 000.0 mL.
- A.1.9 Final pH**, 7.0 + 0.1.

NOTE Granulated or chopped shreds, practically free from thermophilic bacteria, shall be used.

**A.2 Procedure**

Weigh 22 g of flour in a suitable sterile container and transfer to 100 mL of sterile 0.1 % peptone water in a conical flask containing sterile sand or glass beads. Disperse by blending on a shaker for about 2 min. Dilute the blended material further 1:10, 1:100, 1:1 000, 1:10 000, etc., by dilution technique, using sterile peptone water.

**A.2.1** Prepare tryptone glucose extract (TGE) agar or any other suitable medium 100 mL per 250 mL conical flask. Prepare one additional flask of medium to serve as a sterility control. Sterilize at 121 °C for 15 min and then cool to 45 °C in a water bath. Pipette volumes of blended material into a set of flasks of TGE agar while they are held in the water bath; ten millilitres into the first, one millilitre into the second and one millilitre of each dilution into the third, fourth and fifth TGE flask, and so on. Gently agitate the flask to disperse the blended material throughout the medium.

**A.2.2** Transfer the flask without delay to a water bath adjusted to 85 °C to 90 °C and hold for 30 min with gentle shaking occasionally to assist heat distribution. After 30 min of heat treatment, cool the flasks to about 45 °C without allowing the agar to congeal. Pour the 100 mL medium in each flask representing the test material and sterility control into a set of 5 sterile petri dishes in approximately equal volumes that is about 20 mL per plate. When agar has solidified, invert the plates and incubate at 35 °C for 48 h.

**A.2.3** Count the surface and sub-surface colonies. The sum of the colonies on the set of 5 plates poured from TGE agar, containing 10 mL of blended food material represent the number of aerobic and mesophilic spores per gram of material. Similarly, 1 mL of the blended and 1 mL of each dilution are equal to 0.01, 0.001 per gram, and shall be multiplied by the respective dilution factor. Generally, the set of plates showing about 30 – 60 colonies per plate are to be chosen for counting purposes.

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### A.3 Precautions and limitations

**A.3.1** The procedure permits enumeration of aerobic and mesophilic spores in food samples containing relatively higher number of spores by higher dilution of the sample prior to heat treatment.

**A.3.2** Certain thermophilic strains may also be indicated in this method in which case these shall be determined with an additional pre-heat treatment at 150 °C – 200 °C (to knock off all spores and account only for thermophiles) and their numbers be subtracted from the spore count.

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