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**DRAFT EAST AFRICAN STANDARD**

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**Maize grains — 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 the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

In order to achieve this objective, the Community established an East African Standards Committee mandated to develop and issue East African Standards.

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.

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.

DEAS 2 was prepared by Technical Committee EASC/TC 014, *Cereals, pulses and related products*.

This fourth edition cancels and replaces the third edition (EAS 2: 2013) which has been technically revised.

## Maize grains — Specification

### 1.0 Scope

This draft East African Standard specifies requirements, sampling and test methods for maize grains of varieties grown from common maize grains, *Zea mays indentata* L. and/or *Zea mays indurata* L. *Zea mays everta* or their hybrids intended for human consumption.

### 2.0 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

CODEX STAN 193, *General standard for contaminants and toxins in food and feed*

EAS 38, *Labelling of pre-packaged foods — Requirements*

EAS 900, *Cereals and pulses — Sampling*

EAS 901, *Cereals and pulses — Test methods*

### 3.0 Terms and definitions

For the purposes of this standard, the following terms and definitions shall apply.

#### 3.1

##### **maize (corn) grain**

shelled grain or kernel of the species *Zea mays indentata* L. (dent maize) and/or *Zea mays indurata* L. (flint maize), *Zea mays everta* and/or their hybrids

#### 3.2

##### **pest damaged grain**

grain which shows damage or owing attack by rodents, insects, mites or other pests

#### 3.3

##### **discoloured grains**

maize grains which are damaged by heat, frost, burnt spores or water

#### 3.4

##### **rotten and diseased grain**

grain affected by mould growth or bacterial decomposition or other causes that may be noticed without having to cut the grains to examine it and renders it unsafe for human consumption

#### 3.5

##### **mouldy grain**

grain with visible mycelial growth on its tip or surface

#### 3.6

##### **immature and shrivelled grain**

grain which is underdeveloped, thin and papery in appearance

### 3.7

#### **broken kernels**

pieces of maize which pass through a 4.50-mm metal sieve

### 3.8

#### **other grains**

edible grains, whole or broken, other than maize, that is, cereals, pulses and other edible legumes

### 3.9

#### **foreign matter**

all organic and inorganic material other than maize grain, broken kernels and other grains

#### 3.9.1

##### **inorganic matter**

stones, glass, pieces of soil and other mineral matter

#### 3.9.2

##### **organic matter**

any animal or plant matter (seed coats, straws, weeds) other than grain of maize, damaged maize grain, other grains, inorganic extraneous matter and harmful/toxic seeds

### 3.10

#### **harmful/noxious seeds**

seeds such as *Crotalaria* (*Crotalaria spp.*), Corn cockle (*Agrostemma githago L.*), Castor bean (*Ricinus communis L.*), Jimson weed (*Datura spp.*) which can have a damaging or dangerous effect on health, sensory properties or technological performance

### 3.11

#### **filth**

filth impurities of animal origin including dead insects

### 3.12

#### **defective/damaged grain**

pest damaged, discoloured, stained, rotten and diseased, immature and shrivelled grains and broken grain

### 3.13

#### **food grade packaging material**

material, made of substances which are safe and suitable for their intended use and which will not impart any toxic substance or undesirable odour or flavour to the product

### 3.14

#### **flint maize (corn)**

form of corn whose mature kernel has a smooth, vitreous, appearance and a rather round shape

### 3.15

#### **dent maize (corn)**

form of corn whose mature kernel has the shape of a horse's tooth with a depression in the crown

## 4.0 Classification

### 4.1 Colour

Maize shall be classified as yellow, white, red or a mixture of these colours as follows:

- a) yellow maize shall contain not more than 5 % by weight of maize of other colours. Maize grains which are yellow and/or light red in colour are considered to be yellow maize;
- b) white maize shall contain not more than 2 % by weight of maize of other colours. Maize grains which are white and/or light pink in colour are considered to be white maize; and

- c) red maize shall contain not more than 5 % by weight of maize of other colours.

## 4.2 Shape

Maize may be classified as flint or dent or their hybrids or mixtures thereof as follows:

- a) flint maize includes maize of any colour which consists of 95 % or more by weight of grains of flint maize;
- b) dent maize includes maize of any colour which consists of 95 % or more by weight of grains of dent maize; and
- c) a mixture of flint and dent maize includes maize of any colour which consists of more than 5 % but less than 95 % of flint maize.

## 5.0 Requirements

### 5.1 General requirements

Maize grain shall be practically free from foreign odours, moulds, live pests, toxic or noxious weed seeds, other edible grains.

### 5.2 Specific requirements

5.2.1 Maize grain shall comply with maximum limits given in Table 1 when tested in accordance with the test methods specified therein.

**Table 1 — Specific requirements for maize grain**

S/N	Characteristic	Maximum limit			Test method (EAS 901)
		Grade 1	Grade 2	Grade 3	
i.	Foreign matter, %, m/m	0.5	1.0	1.5	Clause 4
ii.	Inorganic matter, %, m/m	0.25	0.5	0.75	
iii.	Pest damaged grains, %, m/m	1.0	3.0	5.0	
iv.	Rotten and diseased grains, %, m/m	1	2	3	
v.	Discoloured grains, %, m/m	1.5	2.0	2.5	
vi.	Immature and shrivelled grains, %, m/m	1.0	2.0	3.0	
vii.	Filth, %, m/m	0.1			
viii.	Broken kernels, %, m/m	2.0	4.0	6.0	
ix.	Moisture, %, m/m	13.5			Clause 5

5.2.2 All grades of popcorn kernels shall be of such quality with an expansion ratio (cc/g) as specified in Table 2

**Table 2: Specific requirements for popcorn grains**

S/N	Butterfly popcorn		Mushroom popcorn	
	Grades	Expansion ratios (cc/g)	Grades	Expansion ratios (cc/g)
1.	Grade 1	39-42	Grade M1	29-32
2.	Grade 2	36-38	Grade M2	26-28
3.	Grade 3	30-35		

## 6.0 Contaminants

### 6.1 Pesticide residues

Maize grain shall comply with those pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

### 6.2 Other contaminants

**6.2.1** Maize grain shall comply with those limits for heavy metals specified in CODEX STAN 193 established by the Codex Alimentarius Commission.

**6.2.2** Maize grain shall comply with the maximum limits for mycotoxins given in Table 2 when tested in accordance with the test methods prescribed therein.

**Table 2 — Mycotoxin limits for maize grain**

S/N	Mycotoxin ( $\mu\text{g}/\text{kg}$ )	Maximum limit	Test method (EAS 901)
i.	Total aflatoxins (AFB <sub>1</sub> +AFB <sub>2</sub> +AFG <sub>1</sub> +AFG <sub>2</sub> ),	10	Clause 9 or 10
ii.	Aflatoxin B <sub>1</sub> ,	5	
iii.	Fumonisin,	2000	Clause 11 or 12

## 7.0 Hygiene

Maize grains shall be produced, prepared and handled in accordance with EAS39.

## **8.0 Packaging**

**8.1** Maize grains shall be packed in food grade packaging material which will safeguard the hygienic, nutritional and organoleptic qualities of the products.

**8.2** Each package shall be securely closed and sealed.

## **9.0 Labelling**

### **9.1 Labelling of retail containers**

In addition to the requirements in EAS 38, each package shall be legibly and indelibly labelled with the following:

- a) product name as "White Maize Grains, Yellow Maize Grains, Red Maize Grains or Mixed Maize Grains" 'Popcorn grain';
- b) grade;
- c) name, address and physical location of the producer/packer/importer;
- d) lot/batch/code number;
- e) net weight, in metric units;
- f) the declaration "Food for Human Consumption";
- g) storage instruction as "Store in a cool dry place away from any contaminants";
- h) crop year;
- i) packing date;
- j) instructions on disposal of used package;
- k) country of origin; and
- l) declaration on whether the maize was genetically modified, where applicable.

### **9.2 Labelling of non-retail containers**

Information detailed in 10.1 shall be given either on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the processor or packer as well as storage instructions, shall appear on the container.

However, lot identification and the name and address of the processor or packer may be replaced by an identification mark provided that such a mark is clearly identifiable with the accompanying documents.

## **10 Sampling**

Sampling shall be done in accordance with EAS 900.



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