



FDEAS 128:2011  
ICS 67.060.10

## FINAL DRAFT EAST AFRICAN STANDARD

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Milled rice — Specification

**EAST AFRICAN COMMUNITY**

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HS 1006.30.00

*Draft for comments only — Not to be cited as East African Standard*

## **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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## Introduction

This standard has been developed to take into account:

- the needs of the market for the product;
- the need to facilitate fair domestic, regional and international trade and prevent technical barriers to trade by establishing a common trading language for buyers and sellers.
- the structure of the CODEX, UNECE, USA, ISO and other internationally significant standards;
- the needs of the producers in gaining knowledge of market standards, conformity assessment, commercial cultivars and crop production process;
- the need to transport the product in a manner that ensures keeping of quality until it reaches the consumer;
- the need for the plant protection authority to certify, through a simplified form, that the product is fit for cross-border and international trade without carrying plant disease vectors;
- the need to promote good agricultural practices that will enhance wider market access, involvement of small-scale traders and hence making farming a viable means of wealth creation; and
- the need to ensure a reliable production base of consistent and safe crops that meet customer requirements.

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## Milled rice — Specification

### 1 Scope

This East African Standard specifies the requirements and methods of sampling and test for milled rice of the varieties grown from *Oryza spp.* intended for human consumption..

### 2 Normative references

The following normative documents contain provisions which, through reference in this text constitute provisions of this East African Standards

ISO 605, *Pulses — Determination of impurities, size, foreign odours, insects, and species and variety — Test methods*

ISO 711, *Cereals and cereal products — Determination of moisture content (Basic reference method)*

ISO 712, *Cereals and cereal products — Determination of moisture content — Routine reference method*

ISO 5223, *Test sieves for cereals*

ISO 6639-1, *Cereals and pulses — Determination of hidden insect infestation — Part 1: General principles*

ISO 6639-2, *Cereals and pulses — Determination of hidden insect infestation — Part 2: Sampling*

ISO 6639-3, *Cereals and pulses — Determination of hidden insect infestation — Part 3: Reference method*

ISO 6639-4, *Cereals and pulses — Determination of hidden insect infestation — Part 4: Rapid methods*

ISO 13690, *Cereals, pulses and milled products — Sampling of static batches*

ISO 16050, *Foodstuffs — Determination of aflatoxin B<sub>1</sub>, and the total content of aflatoxin B<sub>1</sub>, B<sub>2</sub>, G<sub>1</sub> and G<sub>2</sub> in cereals, nuts and derived products — High performance liquid chromatographic method*

EAS 38, *Labelling of prepackaged foods — Specification*

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

EAS 217, *Methods for the microbiological examination of foods*

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

CODEX Stan 193, *Codex general Standards for contaminants and toxins in Food and Feed*

### 3 Terms and Definitions

For the purpose of this East African Standard, the following definitions shall apply.

#### 3.1

##### **milled rice**

whole or broken kernels of rice (*Oryza spp* from which the hulls and at least the outer bran layers have been removed.

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### 3.2

#### **Bran**

a by product from milling consisting of the outer (pericarp) layers of the kernel with part of the germ

### 3.3

#### **aromatic milled rice**

special varieties of rice (*Oryza sativa* L. *scented*) that have a distinctive and characteristic aroma; e.g., basmati and jasmine rice

### 3.4

#### **broken kernels**

pieces of rice that are less than three-quarters of a whole kernel and includes grains of rice in which part of the endosperm is exposed or rice without a germ. If the piece is more than three-quarters of a kernel, it is considered whole.

### 3.5

#### **brown rice**

hole or broken kernels of rice from which the hulls have been removed

### 3.6

#### **chalky kernels**

head rice or broken kernel of non-parboiled rice, except wax rice, whose whole surface has an opaque and floury appearance

### 3.7

#### **chip**

part of kernel which passes through a metal sieve with round perforations 1.4 mm in diameter

### 3.8

#### **Variety**

There are four classes of milled rice. The following four classes shall be based on the percentage of whole kernels, and types of rice:

Long Grain Milled Rice.  
Medium Grain Milled Rice.  
Short Grain Milled Rice.  
Mixed Milled Rice.

- (1) **Long grain milled rice** shall consist of milled rice which contains more than 25.0 percent of whole kernels of milled rice and in Grades 1 through 4 not more than 10.0 percent of whole or broken kernels of medium or short grain rice.
- (2) **Medium grain milled rice** shall consist of milled rice which contains more than 25.0 percent of whole kernels of milled rice and in Grades 1 through 4 not more than 10.0 percent of whole or broken kernels of long grain rice or whole kernels of short grain rice.
- (3) **Short grain milled rice** shall consist of milled rice which contains more than 25.0 percent of whole kernels of milled rice and in Grades 1 through 4 not more than 10.0 percent of whole or broken kernels of long grain rice or whole kernels of medium grain rice.
- (4) **Mixed milled rice** shall consist of milled rice which contains more than 25.0 percent of whole kernels of milled rice and more than 10.0 percent of "other types" as defined in 3.1.

### 3.9

#### **damaged kernels/defective kernels**

kernels, pieces of rice kernels, and other grains that are badly ground-damaged, badly weather-damaged, diseased, frost-damaged, germ-damaged, heat-damaged, injured-by-heat, insect-bored, field fungi, skinned, mould-damaged, shot or sprout-damaged, dark tipped, pink-stained, over-dried damaged, bin burnt, storage mould affected or rotted, smut, stained or otherwise materially damaged.

**3.10****extra-well-milled rice**

rice obtained by milling husked rice in such a way that all of the bran and almost all of the embryo have been removed

**3.11****foreign matter**

all organic and inorganic material other than pearl millet, broken kernels, other grains and filth.

**3.12****glutinous milled rice**

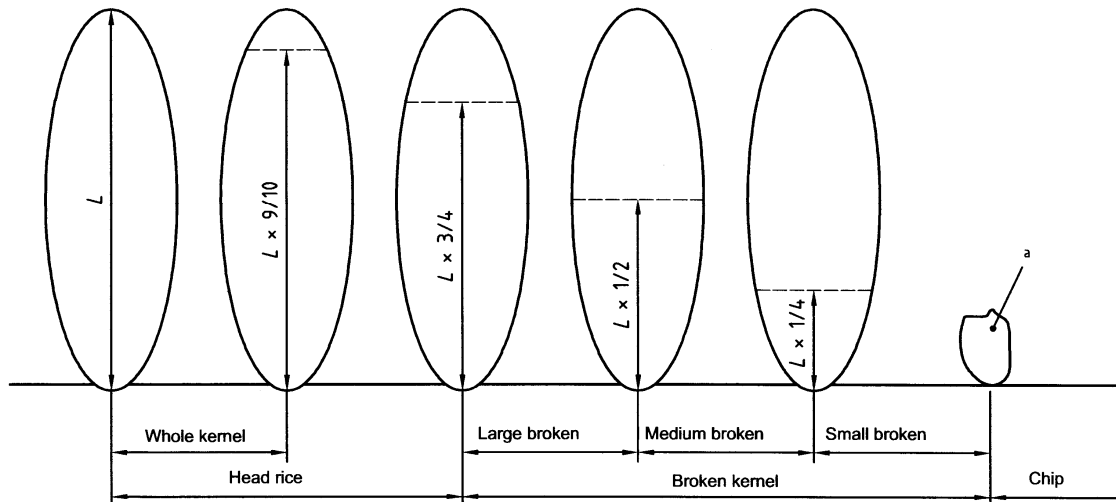
special varieties of rice (*Oryza sativa* L. *glutinosa*) which contain more than 50 percent chalky kernels and have a white and opaque appearance. For long grain, medium grain, and short grain milled rice, Grade 1 shall contain not more than 1.0 percent of nonchalky kernels, Grade 2 not more than 2.0 percent of nonchalky kernels, Grade 3 not more than 4.0 percent of nonchalky kernels, Grade 4 not more than 6.0 percent of nonchalky kernels. For second head milled rice, Grade 1 shall contain not more than 4.0 percent of nonchalky kernels, Grade 2 not more than 6.0 percent of nonchalky kernels, Grade 3 not more than 10.0 percent of nonchalky kernels and Grade 4 not more than 15.0 percent of nonchalky kernels. For screenings milled rice, there are no grade limits for percent of nonchalky kernels. For brewers milled rice, the special category "Glutinous milled rice" is not applicable.

**3.13****granulated brewers milled rice**

granulated brewers milled rice shall be milled rice which has been crushed or granulated so that 95.0 percent or more will pass through a 5 sieve, 70.0 percent or more will pass through a 4 sieve, and not more than 15.0 percent will pass through a 2 1/2 sieve.

**3.14****head rice**

whole kernel or part of the kernel with a length greater than or equal to 75 % of the average length of the test sample kernels (see Figure 1)



<sup>a</sup> Not passing through a round perforation of 1.4 mm in diameter

L is the average length

**Figure 1 — Size of kernels, broken kernels and chips**

**3.15****heat-damaged kernels**

whole or broken kernels of rice which are materially discoloured and damaged as a result of heating and parboiled kernels in nonparboiled rice which are as dark as, or darker in color than, the interpretive line for heat-damaged kernels.

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NOTE This category includes the kernel that is yellow/dark yellow in the case of non-parboiled rice and orange/dark orange in the case of parboiled rice, due to a microbiological alteration.

### 3.16

#### **immature kernel/malformed kernel**

head rice or broken kernel which is unripe and/or badly developed

### 3.17

#### **insect/pest damaged**

grains eaten in part by stored grain insects and any field pests of grains including *Heliothis spp.* Grains may have a hole (commonly referred to as bored) or have a chewed appearance on any part of the grain.

### 3.18

#### **large broken kernel**

part of kernel with a length less than three-quarters but greater than one half of the average length of the test sample kernels

### 3.19

#### **medium broken kernel**

part of kernel with a length less than or equal to one half but greater than one quarter of the average length of the test sample kernels (Figure 1)

### 3.20

#### **paddy kernels**

whole or broken unhulled kernels of rice; whole or broken kernels of brown rice, and whole or broken kernels of milled rice having a portion or portions of the hull remaining which cover 12.5 % or more of the whole or broken kernel

### 3.21

#### **parboiled milled rice**

milled rice in which the starch has been gelatinized by soaking, steaming, and drying. Grades 1 to 4, inclusive, shall contain not more than 10.0 percent of ungelatinized kernels. Grades 1 and 2 shall contain not more than 0.1 percent, Grades 3 and 4 not more than 0.2 percent of non parboiled rice. If the rice is:

- (1) Not distinctly coloured by the parboiling process, it shall be considered "Parboiled Light";
- (2) distinctly but not materially colored by the parboiling process, it shall be considered "Parboiled";
- (3) materially colored by the parboiling process, it shall be considered "Parboiled Dark."

The colour levels for "Parboiled Light," "Parboiled," and "Parboiled Dark" shall be in accordance with the interpretive line samples for parboiled rice.

NOTE The maximum limits for "Chalky kernels," "Heat-damaged kernels," "Kernels damaged by heat", and the "Colour requirements" are not applicable to the special grade "Parboiled milled rice."

### 3.22

#### **partly gelatinized kernel**

head rice or kernel of parboiled rice which is not fully gelatinized and shows a distinct white opaque area

### 3.23

#### **peck**

head rice or broken kernel of parboiled rice of which more than 25 % of the surface is dark brown or black in colour due to the parboiling process

**3.24****poisonous, toxic and/or harmful seeds**

any seed which if present in quantities above permissible limit may have damaging or dangerous effect on health, organoleptic properties or technological performance such as Jimson weed — datura (*D. fastuosa* Linn and *D. stramonium* Linn.) corn cokle (*Agrostemma githago* L., *Machai Lallium remulenum* Linn.) Akra (*Vicia* species), *Argemone mexicana*, Khesari and other seeds that are commonly recognized as harmful to health

**3.25****red**

head rice or broken kernel having a red bran covering more than 25 % of its surface

**3.26****red-streaked kernel**

head rice or broken kernel with red bran streaks of length greater than or equal to 50 % of that whole kernel, but where the surface covered by these red streaks is less than 25 % of the total surface

**3.27****rotten kernels**

kernels that are discoloured, swollen and soft as a result of decomposition by fungi or bacteria. They may feel spongy under pressure. There is a single tolerance for the total of binburnt, severely mildewed, mouldy, and rotten kernels.

**3.28****sieves**

- (a) **5 plate** — A laminated metal plate 0.14209inch thick, with a top lamina, 0.05109-inch thick, perforated with rows of round holes 0.0781 (5/64) inch in diameter, 5/32 inch from center to center, with each row staggered in relation to the adjacent rows, and a bottom lamina 0.091-inch thick, without perforations.
- (b) **6 plate** — A laminated metal plate 0.142-inch thick, with a top lamina 0.051-inch thick, perforated with rows of round holes 0.0938 (6/64) inch in diameter, 5/32 inch from center to center, with each row staggered in relation to the adjacent rows, and a bottom lamina 0.09109inch thick, without perforations.
- (c) **2 1/2 sieve** — A metal sieve 0.032-inch thick, perforated with rows of round holes 0.0391 (2 1/2/64) inch in diameter, 0.075-inch from center to center, with each row staggered in relation to the adjacent rows.
- (d) **4 sieve** — A metal sieve 0.032-inch thick, perforated with rows of round holes 0.0625 (4/64) inch in diameter, 1/8 inch from center to center, with each row staggered in relation to the adjacent rows.
- (e) **5 sieve** — A metal sieve 0.032-inch thick, perforated with rows of round holes 0.0781 (5/64) inch in diameter, 5/32 inch from center to center, with each row staggered in relation to the adjacent rows.
- (f) **5 1/2 sieve** — A metal sieve 0.032-inch thick, perforated with rows of round holes 0.0859 (5 1/2/64) inch in diameter, 9/64 inch from center to center, with each row staggered in relation to the adjacent rows.
- (g) **6 sieve** — A metal sieve 0.032-inch thick, perforated with rows of round holes 0.0938 (6/64) inch in diameter, 5/32 inch from center to center, with each row staggered in relation to the adjacent rows.
- (h) **6 1/2 sieve** — A metal sieve 0.032-inch thick, perforated with rows of round holes 0.1016 (6 1/2/64) inch in diameter, 5/32 inch from center to center, with each row staggered in relation to the adjacent rows.

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- (i) **30 sieve** — A woven wire cloth sieve having 0.0234-inch openings, with a wire diameter of 0.0153 inch.

### 3.29

#### **Under-milled rice**

milled rice which is not equal to the milling requirements for "well milled," and "reasonably well milled" rice. Grades 1 and 2 shall contain not more than 2.0 percent, Grades 3 and 4 not more than 5.0 percent of well-milled kernels.

### 3.30

#### **Un-gelatinized kernels**

whole or broken kernels of parboiled rice with distinct white or chalky areas due to incomplete gelatinization of the starch

### 3.31

#### **well milled kernels**

whole or broken kernels of rice from which the hulls and practically all of the germs and the bran layers have been removed

*NOTE* this factor is determined on an individual kernel basis and applies to the special grade Under-milled milled rice only.

### 3.32

#### **whole kernels**

unbroken kernels of rice and broken kernels of rice which are at least three-fourths of an unbroken kernel

## 4 Quality requirements

### 4.1 Raw materials

The rough or brown rice from which the milled rice is obtained shall be of sound quality, free from sand, have characteristic odour and flavour complying with the relevant East African Standards

### 4.2 General requirements

4.2.1 Milled rice shall meet the following general requirements/limits as determined using the relevant standards listed in Clause 2:

- a) shall be the dried mature grains of edible *Oryza spp*;
- b) shall be clean, wholesome, uniform in size, colour and shape;
- c) shall be safe and suitable for human consumption;
- d) shall be free from abnormal flavours, musty, sour or other undesirable odour, obnoxious smell and discolouration;
- e) shall be free from micro-organisms and substances originating from micro-organisms, fungi or other poisonous or deleterious substances in amounts that may constitute a hazard to human health.

### 4.3 Specific requirements

#### 4.3.1 Grading

Milled rice grains for human consumption shall be graded into three grades on the basis of the tolerable limits established in Table 1 which shall be additional to the general requirements set out in this standard.

### 4.3.2 Ungraded milled rice

Shall be milled rice which does not fall within the requirements of Grades 1, 2, and 3 of this standard but is not rejected rice grains.

*Note: For Tanzania and Burundi this requirement shall not apply.*

### 4.3.3 Reject grade milled rice

This comprises milled rice which has objectionable odour, off flavour, living insects or which do not possess the quality characteristics specified in Table 1. It cannot satisfy the conditions of ungraded milled rice and shall be graded as reject milled rice and shall be regarded as unfit for human consumption.

**Table 1 — Specific requirements**

Characteristics	Maximum limits			Test Method
	Grade 1	Grade 2	Grade 3	
Broken, %	5	7	15	ISO 605
Heat damaged rice, %	1	1.5	2.0	
Damaged rice, %	1.5	2	3.0	
Chalky <sup>a</sup> %	2	4	10	
Red or red streaked, %	2	6	12	
immature grains, %	1	1.5	2	
Other contrasting varieties, %	1	2	3	
Organic matter, %	0.1	0.2	0.5	
Inorganic matter, %	0.1	0.1	0.1	
Paddy grains, %	0.3	0.3	0.3	
Live weevils/kg	Nil	Nil	Nil	
Filth, %	0.1	0.1	0.1	
Moisture contents, %	13	13	13	EAS 82/ISO 712
Total Aflatoxin (AFB1+AFB2+AFG1+AFG2), ppb	10			ISO 16050
Aflatoxin B1 only, ppb	5			
Fumonisin ppm	2			

## 5 Contaminants

### 5.1 Heavy metals

Milled rice shall comply with those maximum limits for heavy metals established by the Codex Alimentarius Commission for this commodity.

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## 5.2 Pesticide residues

Milled rice shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity

*Note: where the use of certain pesticides is prohibited by some Partner States, then it shall be notified to all Partner States accordingly.*

## 5.3 Mycotoxin limits

Milled rice shall comply with those maximum mycotoxin limits established by the Codex Alimentarius Commission for this commodity. In particular, total aflatoxin levels in milled rice for human consumption shall not exceed 10 µg/kg (ppb) with B<sub>1</sub> not exceeding 5 µg/kg (ppb) when tested according to ISO 16050.

## 6 Hygiene

**6.1** Milled rice shall be produced, prepared and handled in accordance with the provisions of appropriate sections of EAS 39

**6.2** When tested by appropriate standards of sampling and examination listed in Clause 2, the products:

- shall be free from microorganisms in amounts which may represent a hazard to health and shall not exceed the limits stipulated in Table 2;
- shall be free from parasites which may represent a hazard to health; and
- shall not contain any substance originating from microorganisms in amounts which may represent a hazard to health.

**Table 2 — Microbiological limits**

	Type of micro-organism	Limits	Test method
i)	Yeasts and moulds, max. per g	10 <sup>2</sup>	EAS 217
ii)	<i>S.aureus</i> per 25 g	Not detectable	
iii)	<i>E. Coli</i> , max. per g	Not detectable	
iv)	<i>Salmonella</i> , max. per 25 g	Not detectable	

## 7 Packaging

**7.1** Milled rice shall be packed in suitable packages which shall be clean, sound, free from insect, fungal infestation and the packing material shall be of food grade quality.

**7.2** Milled rice shall be packed in containers which will safeguard the hygienic, nutritional, technological and organoleptic qualities of the products.

**7.3** The containers, including packaging material, shall be made of substances which are safe and suitable for their intended use. They shall not impart any toxic substance or undesirable odour or flavour to the product.

**7.4** Each package shall contain rice of the same type and of the same grade designation.

**7.5** If milled rice is presented in bags, the bags shall also be free of pests and contaminants.

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

## 8 Labelling

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

- i) product name as “Milled Rice”;
- ii) variety;
  - o Long grain milled rice
  - o Medium grain milled rice
  - o Short grain milled rice
  - o Mixed milled rice
- iii) grade;
- iv) name, address and physical location of the manufacturer/ packer/importer;
- v) lot/batch/code number;
- vi) net weight, in kg;

*Note: EAC partner states are signatory to the International Labour Organizations (ILO) for maximum package weight of 50kg where human loading and offloading is involved*

- vii) the declaration “Food for Human Consumption”
- viii) storage instruction as “Store in a cool dry place away from any contaminants”;
- ix) crop year;
- x) packing date;
- xi) instructions on disposal of used package;
- xii) country of origin;
- xiii) a declaration on whether the milled rice was genetically modified or not.

## 9 Sampling methods

Sampling shall be done in accordance with the EAS 79/ISO 13690.

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