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**Edible maize starch — Specification**

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## **Foreword**

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by Technical committees are ratified by members of RSB Board of Directors for publication and gazettment as Rwanda Standards.

DRS 25 was prepared by Technical Committee RSB/TC 003, *Cereals, pulses, legumes and derived products*

In the preparation of this standard, reference was made to the following standard (s):

- 1) KS 340: 2007, Edible maize starch — Specification

The assistance derived from the above source is hereby acknowledged with thanks.

This third edition cancels and replaces the second edition (RS 25: 2015), which has been technically revised.

### **Committee membership**

The following organizations were represented on the Technical Committee on *Cereals, pulses, legumes and derived products TC* (RSB/TC 003) in the preparation of this standard.

ADMA International

Africa Improved Food (AIF)

MANOSALIWA Food Industries Ltd

Ministry of Agriculture and Animal Resources (MINAGRI)

National Industrial Research and Development Agency (NIRDA)

Radisson Blu Hotel and Convention Centre

Rwanda Consumer's Rights Protection Organization (ADECOR)

SOSOMA Industries

University of Rwanda, College of Agriculture, Animal Science and Veterinary Medicine (UR-CAVM)

ZIMA Enterprise

Rwanda Standards Board (RSB) – Secretariat

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# Edible maize starch—Specification

## 1 Scope

This Draft Rwanda Standard specifies the requirements, sampling and test methods for edible maize starch commonly referred to as edible corn starch.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

AOAC 2001.04, *Fumonisin B1 and B2 in corn and corn flakes*

AOAC 999.10, *Lead, Cadmium, Zinc, Copper, and Iron in Foods Atomic Absorption Spectrophotometry after Microwave Digestion*

ISO 3593, *Starch —Determination of ash*

RS 28, *Edible Starches — Test methods*

RS CAC/RCP 1, *Code of practice — General Principle for food hygiene*

RS EAS 38, *General standard for the labelling of pre-packaged foods*

RS ISO 10520, *Native starch — Determination of starch content — Ewers polarimetric method*

RS ISO 11085, *Cereals, cereals-based products and animal feeding stuffs — Determination of crude fat and total fat content by the Randall extraction method*

RS 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*

RS ISO 16649-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of beta-glucuronidase-positive Escherichia coli — Part 2: Colony-count technique at 44 degrees C using 5-bromo-4-chloro-3-indolyl beta-D-glucuronide*

RS ISO 20483, *Cereals and pulses — Determination of the nitrogen content and calculation of the crude protein content — Kjeldahl method*

RS ISO 21527-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds —Part 2: Colony count technique in products with water activity less than or equal to 0,95*

RS ISO 24333, *Cereals and cereal products — Sampling*

RS ISO 4833-1, *Microbiology of the food chain — Horizontal method for the enumeration of microorganisms — Part 1 Colony count at 30 degrees C by the pour plate technique*

RS ISO 5985, *Animal feeding stuffs — Determination of ash insoluble in hydrochloric acid*

RS ISO 6541, *Agricultural food products — Determination of crude fibre content — Modified Scharrer method*

RS ISO 6579-1, *Microbiology of the food chain — Horizontal method for the detection, enumeration and serotyping of Salmonella — Part 1: Detection of Salmonella spp*

RS ISO 6888-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 1: Technique using Baird-Parker agar medium*

RS ISO 712, *Cereals and cereal products — Determination of moisture content -- Reference method.*

### **3 Terms and definitions**

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

#### **3.1**

##### **edible maize starch (edible corn starch)**

product obtained from maize kernel endosperm (*Zea mays* Linn) manufactured by the wet/dry milling process.

#### **3.2**

##### **wet milling process**

milling operation which is primarily performed by steeping kernels in water for the purpose of the isolation and recovery of starch

#### **3.3**

##### **dry milling process**

obtaining the maximum yield of grits; while making the minimum amount of flour, and recovering the maximum amount of germ in the flour of large particles with the maximum oil content. Dry milling may or may not include de-germing as a preliminary step.

#### **3.4**

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

packaging 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



## 4 Requirements

### 4.1 Raw materials

Maize grains complying with RS EAS 2

### 4.2 General requirements

Edible maize starch shall:

- a) be in the form of a fine powder;
- b) be white in colour, except when prepared from yellow maize in which case it may be light creamy;
- c) be free of rancidity, adulterants, insect or fungus infestation, and from fermented musty or other objectionable odours;
- d) not contain added sweetening, flavouring, colouring agents or any foreign matter; and
- e) be free from dirt and other suspended and extraneous matter.

### 4.3 Specific requirements

Edible maize starch shall also comply with the requirements given in Table 1 when tested in accordance with test methods therein.

**Table 1 — Specific requirements for edible maize starch**

S/N.	Characteristic	Requirement	Test method
i.	Moisture, % by mass, max	12.5	RS ISO 712
ii.	Total ash % by mass, max	0.15	ISO 3593
iii.	Acid-insoluble ash , % by mass, max	0.10	RS ISO 5985
iv.	Starch content , % by mass, min	98.0	RS ISO 10520
v.	Protein , % by mass, max	0.6	RS ISO 20483
vi.	Fat ,% (m/m), max	0.15	RS ISO 11085
vii.	pH of aqueous extract	5.4-6.4	RS 28
viii.	Free acidity, expressed as ml of 0.1 N NaOH/100 g, maximum	40.0	

### 4.4 Microscopic appearance and granule size

When Edible maize starch is subjected to microscopic examination prescribed in RS 28, the granules shall conform to the following description:

- a) Maize starch granules should be polygonal or rounded in shape and appear to be quite uniform in size;
- b) the longest axis ranges from 10 µm to 30 µm (0.01 mm to 0.03 mm); and
- c) the hilum shall be fairly marked and starred with fissures but no striae shall be observed; distinct polarized crosses shall, however, be seen.

NOTE: To facilitate easy identification of the starch granules, a copy of a photomicrograph of maize starch is provided in Annex A.

#### 4.5 Particle size

When tested by the method prescribed in RS 28, not more than 2 % by mass of the material shall be retained on a 75-µm sieve and not more than 0.5 % by mass shall be retained on a 150-µm sieve.

### 5 Contaminants

#### 5.1 Heavy metals

Edible maize starch shall comply with those limits for heavy metals in Table 2 when tested in accordance with test methods specified therein

**Table 2 — Limits for heavy metal contaminants**

S/N	Heavy metal	Maximum limit, mg/kg	Test method
i.	Lead (Pb)	0.2	AOAC 999.10
ii.	Cadmium	0.1	

#### 5.2 Mycotoxins

Edible maize starch shall comply with those maximum levels of mycotoxins specified in the table 3 when tested in accordance with test methods specified therein.

**Table 3 — Maximum limits for mycotoxins**

S/N	Mycotoxins	Requirement, µg/kg, max	Test method
i.	Total Aflatoxin (AFB1+AFB2+AFG1+AFG2)	10	RS ISO 16050
ii.	Aflatoxin B1	5	
iii.	Fumonisin	2000	AOAC 2001.04

#### 5.3 Pesticide residues

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

## 6 Hygiene

6.1 Edible maize starch shall be produced, prepared and handled in accordance with RS CAC/RCP 1.

6.2 Edible maize starch shall not exceed microbiological limits given in Table 3 when tested in accordance with the test methods specified therein.

**Table 3 — Microbiological limits for edible maize starch**

S/N	Microorganisms	Maximum limit	Test method
i.	<i>Total viable count, cfu/ g, max.</i>	10 <sup>4</sup>	RS ISO 4833-1
ii.	<i>E. Coli, cfu/g max.</i>	Absent	RS ISO 16649-2
iii.	<i>Salmonella spp, per 25 g, max.</i>	Absent	RS ISO 6579-1
iv.	<i>Staphylococcus aureus, cfu/g max.</i>	Absent	RS ISO 6888-1
v.	<i>Yeasts and moulds, cfu/g, max.</i>	10 <sup>3</sup>	RS ISO 21527-2

## 7 Packaging

Edible maize starch shall be packaged in suitable food grade packaging materials that shall not affect the quality of the product.

## 8 Labelling

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

- a) name of the product as "Edible maize starch/ Edible corn starch";
- b) name, location and physical address of the manufacturer;
- c) net content;
- g) batch number;
- h) country of origin;
- i) date of manufacture;
- j) expiry date;
- d) instructions for use; and
- m) storage conditions.

## 9 Sampling

Sampling of edible maize starch shall be done in accordance with RS ISO 24333.

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**Annex A**  
(informative)

**Photomicrograph of maize starch**

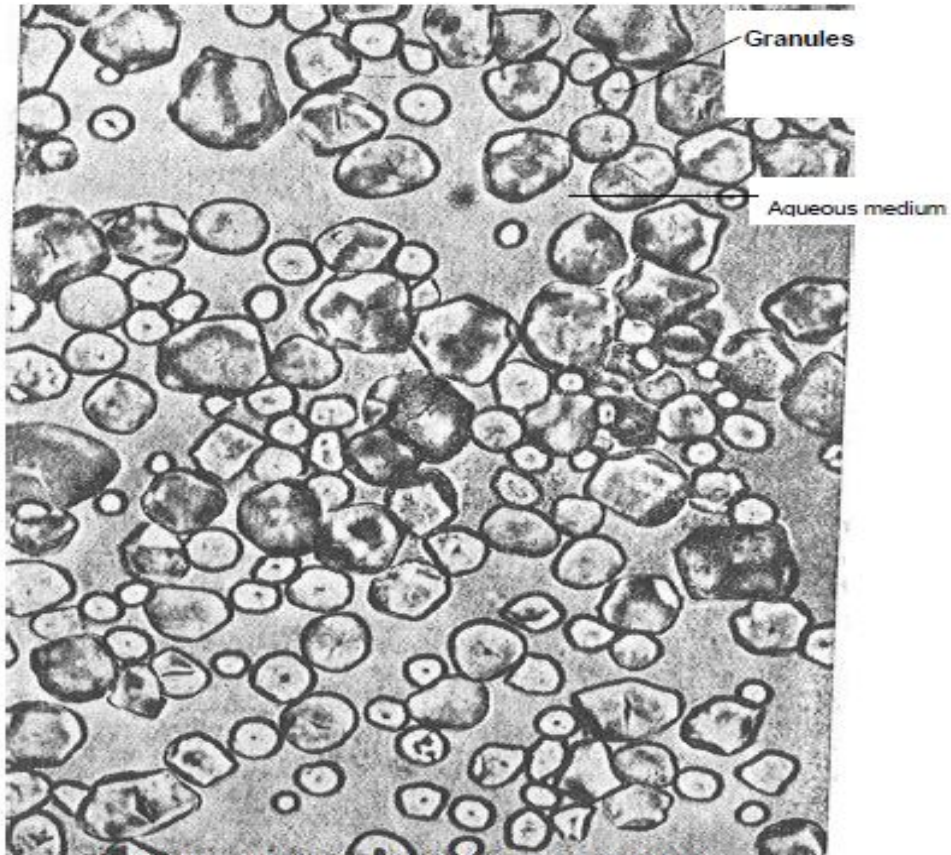


Figure A.1 — Photomicrograph of Maize Starch (X700)

## Bibliography

[1] RS 25: 2015, *Edible maize starch—Specification, Second edition*

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