

Canned citrus fruits - Specification

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PUBLIC REVIEW DRAFT

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KENYA STANDARD

DKS 2688:2016
ICS 67.160

Canned citrus fruits - Specification

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FOREWORD

This Kenya Standard was developed by the Technical Committee on Processed Fruits and Vegetables under the guidance of the Standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards.

The standard stipulates the essential compositional, quality, microbiological, contaminants and labelling requirements for fruit juices, fruit nectars, concentrated fruit juices and all other products relating and similar to fruit juice as defined in this standard.

In the preparation of this standard useful information was derived from members of the technical committee, Codex I standard for canned citrus fruits (CODEX STAN 254-2007) and local manufacturers.

This standard replaces the following standards:

Canned grapefruit (KS CODEX STAN 15-1981); and
Canned mandarin oranges (KS CODEX STAN 68-1981)

PUBLIC REVIEW DRAFT

KENYA STANDARD

Canned Citrus Fruits– Specification

1. SCOPE

This Kenya Standard specifies requirements for canned citrus fruits, as defined in Clause 3 below, intended for direct human consumption, including for catering purposes or for repacking if required. The products covered by this Standard include Canned Pummelo, Canned Sweet orange and Canned Grapefruit. It does not apply to the product when indicated as being intended for further processing.

2. 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.

KS EAS 38, *labeling of prepackaged foods*

KS EAS 39, *Code of practice for hygiene in the food and drink manufacturing industry*

KS EAS 12, *Drinking (Potable) water- Specification*

KS EAS 803: 2013, *Nutrition labeling – Requirements*

KS EAS 804:2013 *Claims on foods – Requirements*

KS EAS 805: 2013 *Use of Nutrition and health claims*

KS CAC RCP 3; recommended international code of hygienic practice for dried fruits

Codex Stan 195, General Standard for Food Additives

Codex Stan 193, General Standard for contaminants

KS 38, *Plantation (mill) white sugar — Specification*

KS 05-344, *Specification for honey.*

KS EAS 5, *Refined white sugar — Specification*

KS EAS 217-2, *Methods for the microbiological examination of foods - Part 2: General Guidance for the Enumeration of Micro-Organisms-Colony Count Technique at 30°C*

KS EAS 217-8, *Methods for microbiological examination of foods -Part 8: Enumeration of yeasts and moulds*

KS ISO 7251, *Microbiology of food and animal feeding stuffs - Horizontal method for the detection and enumeration of presumptive Escherichia coli - Most probable number technique*

KS ISO 763, *Fruits and vegetable products - Determination of ash insoluble in hydrochloric acid*

KS ISO 2448, *Fruit and vegetable products - Determination of ethanol content*

KS ISO 2172, *Eruit juice - Determination of soluble solids content - Pyknometric method*

KS ISO 2173, *Fruit and vegetable products - Determination of soluble solids - Refractometric method*

KS ISO 5522, *Fruits, vegetables and derived products - Determination of total sulphur dioxide content*

3. Descriptions

3.1. Product definition

3.1.1 Canned citrus fruit is the product:

- (a) prepared from washed, sound and mature ripe grapefruit (*Citrus paradise* Macfadyen), mandarin oranges (*Citrus reticulata* Blanco, including all the suitable commercial varieties for canning), sweet orange varieties (*Citrus sinensis* (L.), Osbeck, including all the suitable commercial varieties for canning) or pummelo (*Citrus Maxima* Merr. or *Citrus grandis* (L.)).
- (b) Packed with water or other suitable liquid packing medium, sugars as defined in the *Standard for Sugars* (CODEX STAN 212-1999), honey as defined in the *Standard for Honey* (KS 344), suitable spices or flavouring ingredients appropriate to the product.
- (c) Processed by heat, in an appropriate manner, before or after being hermetically sealed in a container, so as to prevent spoilage. Before processing, the fruit shall have been properly washed and peeled and the membrane, seeds and core and fibre strands originating from albedo or core, shall have been substantially removed from the sections.

3.1.2 COLOUR TYPES (canned grapefruit or canned pummelo only)

3.1.2.1 White - produced from white-fleshed grapefruit or pummelo.

3.1.2.2 Pink - produced from pink or red-fleshed grapefruit or pummelo.

3.1.2.3 Pale yellow - produced from pale yellow fleshed pummelo.

3.1.3.1 Definitions of Styles

Product	Whole ¹	Broken	Twin	Pieces
Canned Grapefruit	Not less than 75% of original segment	Less than 75% of original segment		
Canned Sweet Orange				
Canned Pummelo	Not less than 50% of original segment	Less than 50% of original segment		Large enough to remain on a screen having 8 mm ² openings formed by a wire of 2 mm diameter
Canned Mandarin Orange	Not less than 75% of original segment	Not less than 50% of original segment but large enough to remain on a screen having 8 mm ² openings formed by wire of 2 mm diameter.	See definition for whole except two or three segments joined together, which have not been separated during processing.	

3.1.3.2 Other Styles (Canned grapefruit, mandarin oranges, sweet orange varieties and pummelos)

Any other presentation of the product should be permitted provided that the product:

- (1) is sufficiently distinctive from other forms of presentation laid down in the Standard;
- (2) meets all relevant requirements of the Standard, including requirements relating to limitations on defects, drained weight, and any other requirements which are applicable to that style which most closely resembles the style or styles intended to be provided for under this provision; and
- (3) is adequately described on the label to avoid confusing or misleading the consumer.

3.1.4. SIZES IN WHOLE SEGMENT STYLE (Canned mandarin oranges only)

3.1.4.1 Designation in accordance with size

Canned mandarin oranges in whole segment style may be designated according to size in the following manner:

(a) **Uniform Single Size**

- (i) "Large" - 20 or less whole segments per 100 g of drained fruit.
- (ii) "Medium" - 21 to 35 whole segments per 100 g of drained fruit.
- (iii) "Small" - 36 or more whole segments per 100 g of drained fruit.
- (iv) Single sizes shall also meet the uniformity requirements of Section 3.1.4. 1

(b) **Mixed Sizes** - A mixture of two or more single sizes.

3.2.2 Varietal Type

Any commercially cultivated variety or type suitable for canning may be used.

5. Essential composition and quality factors

5.1. Composition

5.1.1. Basic Ingredients

Citrus fruit as defined in Section 3 and liquid packing media appropriate to the product.

5.1.1.1. Other Permitted Ingredients (Canned grapefruit only)

- Spices

5.1.2.1 Packing Media

In accordance with the *Guidelines for Packing Media for Canned Fruits* (CAC/GL 51-2003)

The cut-out strength for any syrup packing medium shall be determined on average, but no container may have a soluble solids (^oBrix) value beyond the next category of the medium ^oBrix.

5.2 Quality Criteria

5.2.1 Colour, Flavour and Texture

Canned Citrus fruits shall have normal colour, flavour, odour and texture characteristics of the product of

5.2.1.1 Colour

The colour shall be typical of fruit which has been properly prepared and properly processed. The liquid

5.2.1.2 Flavour

Canned grapefruit, canned mandarin oranges, canned sweet orange varieties and canned pummelo shall have a normal flavour and odour free from flavours or odours foreign to the product. Canned grapefruit with special ingredients shall have a flavour characteristic of that imparted by the grapefruit and the other substances used.

5.2.1.3 Texture

The texture shall be reasonably firm and characteristic for the canned product and reasonably free from dry cells or fibrous portions affecting the appearance or edibility of the product. Whole Segments shall be practically free from signs of disintegration

5.2.1.3 Wholeness

For canned grapefruit, canned pummelo or canned sweet orange varieties only - In the style of Whole Sections or Segments, not less than 50% by weight of drained fruit shall be in whole segments

5.2.2 Uniformity of size

For canned mandarin oranges (whole segment style - single sizes only) - In the 95%, by count, of units (excluding broken segments) that are most uniform in size, the weight of the largest unit shall be no more than twice the weight of the smallest unit

5.2.3 Defects and Allowances

(a) For canned grapefruit, canned sweet orange varieties and canned pummelo:

The finished product shall be prepared from such materials and under such practices that it shall be reasonably free from extraneous fruit matter such as peel or core or albedo and shall not contain excessive defects whether specifically mentioned in this Standard or not. Certain common defects should not be present in amounts greater than the following limitations:

- (i) The total surface covered by membrane shall not exceed 20 cm² per 500 g of total contents.
- (ii) Developed seeds shall not exceed 4 per each 500 g of total contents. A developed seed is defined as a seed which measures more than 9 mm in any dimension.
- (iii) Not more than 15% by weight of the drained fruit may be blemished units. A blemished unit is a fruit section or any portion thereof which is damaged by lye peeling, by discolouration, or by any other visible injury.

(b) For canned mandarin oranges:

The product shall be substantially free from defects within the limits set forth as follows:

Defect	Maximum Limit in the Drained Fruit
- Broken segments (as defined in 2.3.1) (Whole segment style)	10% m/m
- Broken segments (as defined in 2.3.1) (Twin segment style)	15% m/m
- Membrane (aggregate area)	7 cm ² /100 g (based on sample average)
- Fibre strands (aggregate length)	5 cm/100 g (based on sample average)
- Seeds (that measure more than 4 mm in any dimension)	1/100 g (based on sample average)

5.2.3.1 Classification of “Defectives”

For canned grapefruit, canned mandarin oranges, canned sweet orange varieties and canned pummelo - A container that fails to meet one or more of the applicable quality requirements, as set out in Sections 3.1.4 and 5.2 (except those based on sample averages), should be considered as a “defective”.

5.2.3.2 Lot Acceptance

(a) For canned grapefruit, canned mandarin oranges, canned sweet orange varieties and canned pummelo:

A lot should be considered as meeting the applicable quality requirements referred to in Sections 3.1.4 and 5.2 when the number of “defectives”, as defined in Section 5.2.3, does not exceed the acceptance number (c) of the appropriate sampling plan with an AQL of 6.5.

(b) For canned mandarin oranges:

The lot must comply with requirements of Section 5.2.3(b) which are based on sample average.

5.2.4.2 Other permitted ingredients

5.2.4.2.1 Nutrients

For the purpose of product fortification, essential nutrients such as vitamins and minerals may be added to products. Such additions shall comply with national legislation established for this purpose.

NOTE: any optional ingredients added are subject to ingredient labelling requirements (see Clause 10)

6. FOOD ADDITIVES

Acidity regulators and firming agents used in accordance with Tables 1 and 2 of the *General Standard of Food Additives* (CODEX STAN 192-1995) in food category 04.1.2.4 (Canned or bottled (pasteurized) fruit) or listed in Table 3 of the *General Standard for Food Additives* are acceptable for use in foods conforming to this Standard.

7. Contaminants

The products covered by this Standard shall comply with the maximum levels of the General Standard for Contaminants and Toxins in Food and Feed (CODEX STAN 193-1995).

7.1 Pesticide residues

The products covered by this Standard shall comply with the maximum residue limits for pesticides established by the Codex Alimentarius Commission.

7.2 Heavy Metal Contaminants

The products covered by the provisions of this standard shall conform to those maximum limits for Heavy metals contaminants established by the Codex Alimentarius Commission for these products in table 5 below

TABLE 5- Contaminants

CONTAMINANTS	MAXIMUM LEVEL	Method of Test
Arsenic (As)	0.2 mg/kg	AOAC 942.17
Lead (Pb)	0.3 mg/kg	AOAC 972.25 / KS ISO 6733
Copper (Cu)	5.0 mg/kg	AOAC 999.10
Zinc (Zn)	5.0 mg/kg	AOAC972.25 / KS ISO 5738
Iron (Fe)	15 mg/kg	AOAC 999.10
Tin (Sn)	250 mg/kg	AOAC 999.10
Mercury (Hg)	0.01	AOAC 999.10
Cadmium (cd)	0.05 mg/kg	AOAC 999.11/ KS ISO 6732

7.3 Other contaminants

The products covered by the provisions of this standard shall conform to those maximum levels for contaminants established by the Codex Alimentarius Commission for these products

8. Hygiene

8.1

It is recommended that the products covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *General Principles of Food Hygiene* (CAC/RCP 1-1969), *Code of Hygienic Practice for Low and Acidified Low-Acid Canned Foods* (CAC/RCP 23-1979) and other relevant Codex texts such as codes of hygienic practice and codes of practice.

8.2 The products shall conform to microbiological criteria in Table 6 and those provided in KS 2455; Food Safety - general standard

Table 6 - Microbiological limits for canned citrus fruits

SL No.	Microorganism	Limit	Method of Test
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	Total plate count, cfu/g, max	50	KS ISO 4833
i.	<u>Escherichia coli, (cfu/g), max</u>	<u>Absent</u>	<u>KS ISO 7251</u>
ii.	<u>Staphylococcus aureas, (cfu/25g)</u>	<u>Absent</u>	<u>KS ISO 6888-1</u>
iii.	<u>Shigella, cfu/25g</u>	<u>Absent</u>	<u>KS ISO4833</u>
iv.	<u>Salmonella. CfU/25g</u>	<u>Absent</u>	<u>KS ISO 6579</u>
v.	<u>Colostridium botulinum, cfu/25g</u>	<u>Absent</u>	<u>KS ISO 4833</u>
vi.	<u>Vibrio cholera, cfu/25g</u>	<u>Absent</u>	<u>KS ISO 4833</u>
vii.	<u>Moulds (cfu/25g), max</u>	<u>Absent</u>	<u>KS ISO 7954</u>

9.3 WEIGHTS AND MEASURES

9.1 Fill of Container

9.1.1 Minimum Fill

The container should be well filled with the product (including packing medium) which should occupy not less than 90% (minus any necessary head space according to good manufacturing practices) of the water capacity of the container. The water capacity of the container is the volume of distilled water at 20oC which the sealed container will hold when completely filled. This provision does not apply to vacuum packaged vegetables. This shall be carried out in accordance to CAC/RM 46-1972 (Codex General Method for processed fruits and vegetables) and ISO 90.1:1999

9.1.2 Classification of “Defectives”

A container that fails to meet the requirement for minimum fill of Section 7.1.1 should be considered as a “defective”.

9.1.3 Lot Acceptance

The requirements for minimum drained weight should be deemed to be complied with when the average drained weight of all containers examined is not less than the minimum required, provided that there is no unreasonable shortage in individual containers.

9.1.4 Minimum Drained Weight

7.1.4.1 The drained weight of the product should be not less than the percentages indicated in the corresponding Annexes, calculated on the basis of the weight of distilled water at 20oC which the sealed container will hold when completely filled.

(a) For - The drained weight of the product shall be not less than 50%, calculated on the basis of the weight of distilled water which the sealed container will hold when completely filled.

(b) The drained weight of the product shall be not less than 40%, calculated on the basis of the weight of distilled water at 20oC which the sealed container will hold when completely filled.

(c) The drained weight of the product shall be not less than 56%, calculated on the basis of the weight of distilled water at 20oC which the sealed container will hold when completely filled.

Table 7 – Drained weight requirements for Canned Asparagus

Product	Minimum Drained Weight (%) at 20°C	Method of test
canned grapefruit, canned sweet orange varieties and and pummelos	50%	AOAC 968.30
For canned pummelo	40%	

For canned mandarin oranges	56%	

9.1.5 Packaging

The products covered by the provisions of this standard shall be packaged in clean food grade packaging material to protect the product from contamination. The packaging materials and process shall not contaminate the product or otherwise affect its technological, nutritional or sensory quality.

10. Labelling

In addition to the Standard for the Labelling of Pre-packaged Foods (KS EAS 38), the following specific provisions apply:

10.1 Name of the product

10.1.1 The name of the product shall be “grapefruit”, “mandarin oranges”, “pummelo” or “oranges”, as defined in Section 3.1.

10.1.2

For Canned Grapefruit, Sweet Orange Varieties, and Canned Pummelo:

- (a) The style shall be included as part of the name or in close proximity to the name of the product as in Section 2.3.1.
- (b) The packing medium shall be included as part of the name or in close proximity to the name of the product as in Section 3.1.2.
- (c) The colour for grapefruit or pummelo if “pink”, the colour type “pink” shall be included as part of the name or in close proximity to the name of the product.

10.1.3 If an added ingredient, as defined in Section 3.1.3, alters the flavour characteristic of the product, the name of the food shall be accompanied by the term “flavoured with X” or “X flavoured” as appropriate.

10.1.4 for Canned Mandarin Oranges:

- (a) The style, as appropriate, shall be declared as a part of the name or in close proximity to the name of the product, as follows:
 - (i) **Whole segments** - A size classification for Whole segments style may be stated on the label if the pack complies with the appropriate requirements of Section 2.4.1 of this Standard. In addition, the number of units present in the container may be shown by a range of count, e.g., “(number) to (number) whole segments”.
 - (ii) **Broken segments.**
- (b) In the case of sizes, size designation may be declared in close proximity to the style designation, e.g., “mixed sized whole segments”.
- (c) The packing medium shall be declared as part of the name or in close proximity to the name as in Section 3.1.2.

10.1.5 Other styles - If the product is produced in accordance with the other styles provision (Section 2.3.2), the label should contain in close proximity to the name of the product such additional words or phrases that will avoid misleading or confusing the consumer

10.1.8 In the case of mixed fruits; List of the names of the various vegetables species used in the mix shall be listed in descending order of the proportions

10.2 Additional Requirements

10.2.1 Drain weight declaration content-

Canned fruits must be labelled with a declaration of “Drained weight content ___%.

10.1.2.6 Ingredient declaration

10.2.2 Nutrition declaration - Any added essential nutrients declaration should be labelled in accordance with the Guidelines on Nutrition Labelling (CAC/GL 2-1985), General Guidelines on Claims (CAC/GL 1-1979) and the CAC/GL 23-1997; Guidelines for Use of Nutrition and Health Claims

10.2.3 Fruits containing spices and/or aromatic herbs

Where tomato juice contains spices and/or aromatic herbs in accordance with Section 3.1.2(f), the term “spiced” and/or the common name of the aromatic herb shall appear on the label near the name of the juice.

10.2 Non-retail containers

Information for non-retail containers not destined to final consumers shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, net contents and the name and address of the manufacturer, packer, distributor or importer, as well as storage instructions, shall appear on the container, except that for tankers the information may appear exclusively in the accompanying documents.

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

10.3 List of Ingredients — a complete list of ingredients including added syrup shall be declared on the label in descending order of proportion.

10.4 Net Contents — the net contents shall be declared by volume in metric units (*Systeme Internationale*).

10.5 Name or business name and Address of the manufacturer, packager, distributor, importer, exporter or vendor of the product, whichever may apply, shall be declared.

10.6 Instructions for use shall be declared

10.7 Storage conditions or conditions for use

10.8 Lot Identification — each container shall be embossed or otherwise permanently marked in code or in clear identity the producing factory and the lot.

10.9 Place/country of origin

10.8 Date of expiry

10.9 irradiation status, where applicable

11. Methods of sampling and test

The products covered by the provisions of this standard shall be tested using appropriate standard methods declared in this standard. Other test may be performed as per the methods given in the latest AOAC/ Codex/ ISO and other internationally recognized methods. Sampling shall be as described in the Standard.

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**DETERMINATION OF WATER CAPACITY OF CONTAINERS
(CAC/RM 46-1972)**

1. SCOPE

This method applies to glass containers.

2. DEFINITION

The water capacity of a container is the volume of distilled water at 20°C which the sealed container will hold when completely filled.

3. PROCEDURE

3.1 Select a container which is undamaged in all respects.

3.2 Wash, dry and weigh the empty container.

3.3 Fill the container with distilled water at 20°C to the level of the top thereof, and weigh the container thus filled.

4. CALCULATION AND EXPRESSION OF RESULTS

Subtract the weight found in 3.2 from the weight found in 3.3. The difference shall be considered to be the weight of water required to fill the container. Results are expressed as ml of water.

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