EAST AFRICAN STANDARD

Tomato products — Specification — Part 4: Canned tomato paste

EAST AFRICAN COMMUNITY

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# Table of contents

1 Scope ....................................................................................................................... 1
2 Normative references ................................................................................................. 1
3 Description and definitions ......................................................................................... 1
  3.1 Product description ............................................................................................... 1
  3.2 Product designation .............................................................................................. 2
  3.3 Concentration ....................................................................................................... 2
  3.4 Definitions .......................................................................................................... 2
4 Essential composition and quality factors .................................................................... 3
  4.1 Composition ......................................................................................................... 3
  4.2 Quality criteria ..................................................................................................... 3
  4.3 Classification of “Defectives” ............................................................................... 5
4.4 Lot acceptance ...................................................................................................... 5
5 Food additives ........................................................................................................... 5
  5.1 Acidity regulators ................................................................................................. 5
6 Contaminants ............................................................................................................. 6
  6.1 Pesticide residues ................................................................................................. 6
  6.2 Other contaminants ............................................................................................. 6
7 Hygiene ..................................................................................................................... 6
8 Weights and measures ............................................................................................... 7
  8.1 Fill of container ..................................................................................................... 7
9 Packaging and labelling ............................................................................................. 7
  9.1 Packaging ............................................................................................................. 7
  9.2 General ................................................................................................................. 7
  9.3 Name of the product ............................................................................................ 7
  9.4 Declaration of the percentage of natural total soluble solids ......................... 7
  9.5 Labelling of non-retail containers ....................................................................... 8
  9.6 Other labelling details ......................................................................................... 8
10 Methods of analysis and sampling .......................................................................... 8
Annex A (normative) Determination of water capacity of containers ............................. 12
Annex B (normative) Sampling and compliance ............................................................. 13
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
Web: www.each.org

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Introduction

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

*United States Standards for Grades of Canned Tomato Paste*, Effective date September 19, 1977

CODEX STAN 228:2001 (Rev.1:2004), *General methods of analysis for contaminants*

CODEX STAN 230:2001 (Rev.1:2003), *Maximum levels for lead*


Codex Alimentarius website: http://www.codexalimentarius.net/mrls/pestdes/jsp/pest_q-e.jsp

USDA Foreign Agricultural Service website: http://www.mrldatabase.com

USDA Agricultural Marketing Service website: http://www.ams.usda.gov/AMSv1.0/Standards


European Union: http://ec.europa.eu/sanco_pesticides/public

Assistance derived from these sources and others inadvertently not mentioned is hereby acknowledged.

This standard has been developed to take into account:

- the needs of the market for the product;
- the need to gain market access locally, regionally and internationally;
- the structure of the CODEX, UNECE, USA, ISO and other internationally recognized standards;
- the needs of the producers in gaining knowledge of market standards and conformity assessment; and
- the need to promote good manufacturing practices that will enhance wider market access, involvement of small-scale traders and hence making production of fruit and vegetable products a viable means of wealth creation.
Tomato products — Specification — Part 4: Canned tomato paste

1 Scope

This Part 4 of EAS 66 specifies the requirements for tomato paste as described in Clause 3.

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.

CAC/GL 21, Principles for the Establishment and Application of Microbiological Criteria for Foods
CAC/RCP 1, Recommended International Code of Practice — General Principles of Food Hygiene
CAC/RCP 53, Code of Hygienic Practice for Fresh Fruits and Vegetables
EAS 35, Edible salts — Specification
EAS 38, Labelling of prepackaged foods — Specification
EAS 41, Fresh fruit and vegetable products — Sampling and method of test
EAS 76, Methods of test for tomato products
EAS 217, Methods for microbiological examination of foods
CD/K/370:2010 [CAC/GL 21], Principles for the establishment and application of microbiological criteria for foods
CD/K/371:2010 [CAC/GL 30], Principles and guidelines for the conduct of microbiological risk
CD/K/344:2010 [CODEX STAN 234], Recommended methods of analysis and sampling
CD/K/372:2010 [CAC/GL 33], Sampling for pesticide residues for the determination of compliance with MRLs — Recommended methods
CD/K/375:2010 [CAC/GL 50], General guidelines on sampling

3 Description and definitions

3.1 Product description

Tomato paste is prepared by concentrating one or any combination of two or more of the following optional tomato ingredients:

(i) The liquid obtained from mature tomatoes of the red or reddish varieties (Lycopersicum esculentum P. Mill).

(ii) The liquid obtained from the residue from preparing such tomatoes for canning, consisting of peelings and cores with or without such tomatoes or pieces thereof.

(iii) The liquid obtained from the residue from partial extraction of juice from such tomatoes.

Such liquid is obtained by so straining the tomatoes, with or without heating, as to exclude skins (peel), seeds, and other coarse or hard substances in accordance with good manufacturing practice.
Prior to straining, food-grade hydrochloric acid may be added to the tomato material in an amount to obtain a pH no lower than 2.0. Such acid is then neutralized with food-grade sodium hydroxide so that the treated tomato material is restored to a pH of 4.2±0.2. Water may be added to adjust the final composition. The food contains not less than 8.0 % tomato soluble solids. The food is preserved by heat sterilization (canning), refrigeration, or freezing. When sealed in a container to be held at ambient temperatures, it is so processed by heat, before or after sealing, as to prevent spoilage.

3.2 Product designation

Tomato concentrate may be considered “Tomato Puree” or “Tomato Paste” when the concentrate meets these requirements:

3.2.1 “Tomato Puree” — Tomato concentrate that contains no less than 7% but less than 24% of natural total soluble solids.

3.2.2 “Tomato Paste” — Tomato concentrate that contains at least 24% of natural total soluble solids.

3.3 Concentration

The following designations of concentration may be used in connection with this standard for the applicable natural tomato soluble solids group:

<table>
<thead>
<tr>
<th>Natural tomato soluble solids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra heavy concentration.</td>
</tr>
<tr>
<td>Heavy concentration.</td>
</tr>
<tr>
<td>Medium concentration.</td>
</tr>
<tr>
<td>Light concentration.</td>
</tr>
</tbody>
</table>

3.4 Definitions

For the purpose of this standard the following definitions shall apply:

3.4.1 tomato concentrates
products prepared by concentrating the liquid obtained from sound, ripe tomatoes (Lycopersicum esculentum P. Mill).

3.4.2 tomato puree
tomato concentrate containing no less than 8.5 % of natural tomato soluble solids and not more than 25 % total solids by weight.

3.4.3 tomato paste
tomato concentrate containing 25 % or more by weight of natural tomato soluble solids.

3.4.4 texture
Texture is the degree of fineness or coarseness of the product. Texture is classified when the product is diluted with water to between 8 percent and 9 percent, inclusive, of natural tomato soluble solids.

3.4.5 kind of texture
(1) Fine texture means smooth, uniform finish.
(2) Coarse texture means a coarse, slightly granular finish.
4 Essential composition and quality factors

4.1 Composition

4.1.1 Basic ingredients

Tomato paste as defined in 3.1.

4.1.2 Other permitted ingredients

One or any combination of two or more of the following safe and suitable ingredients may be used in the foods:

(a) Salt in accordance with EAS 35 (sodium chloride formed during acid neutralization shall be considered added salt);

(b) spices and aromatic herbs (such as basil leaf, etc.) and their natural extracts;

(c) Lemon juice (single strength or concentrated) used as an acidulant or organic acids; and

(d) water complying with EAS 12;

(e) Sodium bicarbonate.

(f) Flavouring.

4.2 Quality criteria

4.2.1 Colour

4.2.1.1 The product shall have a characteristic reddish colour of tomato paste derived from ripe and sound tomatoes. No artificial colouring material shall be added to the product.

4.2.1.2 The amount of red in tomato paste is determined by comparing the color of the product, diluted with water to 8.5 percent (+0.1 percent) of natural tomato soluble solids (N.T.S.S.), with that produced by spinning a combination of the following Munsell color discs:

Disc 1 - Red (5R2 6/13) (glossy finish)
Disc 2 - Yellow (2.5YR5/12) (glossy finish)
Disc 3 - Black (N1) (glossy finish)
Disc 4 - Grey (N4) (mat finish)

4.2.1.3 Such comparison is made under a diffused light source of approximately 250 footcandle (candela) intensity and having a spectral quality approximating that of daylight under a moderately overcast sky, and a color temperature of 7,500 degrees Kelvin + 200 degrees. With the light source directly over the disc and diluted product, observation is made at an angle of 45 degrees and at a distance of 12 or more inches from the product.

4.2.1.4 Use of electric color meters

Values that may be used for conversion to a numerical score point color evaluation of the product, diluted to 8.5 percent (+0.1 percent) natural tomato soluble solids, may be determined by an approved electronic color meter system.

The values derived with the approved electronic color meter system shall be resolvable into a calculated numerical score point by use of any appropriate conversion formula.
4.2.2 Flavour and odour

4.2.2.1 Tomato paste shall have a good flavour and odour. The flavor and odor of the product is determined on undiluted samples and also after dilution with water to between 8 percent and 9 percent, inclusive, of natural tomato soluble solids.

4.2.2.2 Good flavor and odor means a distinct tomato paste flavor characteristics of ripe, good quality tomatoes and inclusive of any optional ingredient which may have been added. Such flavor and odor may be no more than slightly affected by any one or combination of the following: stems, sepals, leaves, crushed seeds, cores; by immature, soured, or overripe tomatoes; from the effects of unsatisfactory preparation, processing, or storage; or from any other factor not specifically mentioned.

4.2.2.3 Fairly good flavor and odor means a characteristic tomato paste flavor and inclusive of any optional ingredient which may have been added. Such flavor and odor may be affected, but not to a serious degree, by any one or combination of the following: stems, sepals, leaves, or crushed seeds, cores; by immature, soured or overripe tomatoes; from the effects of unsatisfactory preparation, processing, or storage; or from any other factor not specifically mentioned.

4.2.2.4 Off flavor and odor means tomato paste flavor that fails to meet the requirements of fairly good flavor and odor or which has a flavor and/or odor which is seriously objectionable.

4.2.3 Texture

Tomato paste shall have a homogeneous evenly divided texture indicative of food manufacturing practice.

4.2.4 Definition of defects

Tomato paste shall be prepared in accordance with good manufacturing practices (GMP), from such materials and under such practices that the product is substantially free defects such as dark specks or scale-like particles, seeds or objectionable tomato particles of seeds, objectionable tomato peel, harmless extraneous material, or any other similar substances.

Consistent with its intended use, these conditions are fulfilled when:

(a) the product is practically free of objectionable tomato peel;
(b) the product is practically free of seeds or particles of seeds;
(c) the presence of any extraneous plant material other than seed and peel and other than those used as seasonings cannot be detected by the naked eye, and can only be seen under microscope; and
(d) the product is practically free of dark specks or scale-like particles.

4.2.5 Defects and allowances

4.2.5.1 Mineral impurities

The mineral impurity content does not exceed 0.1% of the natural total soluble solids content.

4.2.5.2 Lactic acid

The content of lactic acid (total) does not exceed 1% of the natural total soluble solids content.

4.2.5.3 Mould count

Mould count for tomato paste to be set according to the legislation of the country of retail sale.

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1 Sand, soil and any other impurities insoluble in hydrochloric acid.
4.2.5.4 pH

The pH must be below 4.6.

4.2.6 Benzoic acid shall be the only preservation that will be added to tomato concentrates.

### Table 1 — Compositional requirements for tomato paste

<table>
<thead>
<tr>
<th>S/N</th>
<th>Characteristic</th>
<th>Requirement</th>
<th>Method of test</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Natural tomato soluble solids content per cent by mass, min.</td>
<td>8.5</td>
<td>EAS 76*</td>
</tr>
<tr>
<td></td>
<td>Puree</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paste</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>ii</td>
<td>Edible salt content per cent by mass, max.</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>pH</td>
<td>Not higher than 4.3</td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>Benzoic acid content, max.</td>
<td>750 ppm</td>
<td></td>
</tr>
</tbody>
</table>

4.3 Classification of “Defectives”

4.3.1 A container that fails to meet the natural total soluble solids requirements, as set out in 3.2, and/or one or more of the applicable quality requirements, as set out in 4.2, should be considered as a “defective”.

4.3.2 Tomato paste shall be free from the following defects:

i) Dark specks or scale-like particles of seeds.

ii) Seeds or other objectionable particles of seeds.

iii) Tomato peels.

iv) Extraneous plant material.

4.4 Lot acceptance

A lot should be considered as meeting the applicable quality requirements referred to in 4.2 when:

(a) the number of “defectives”, as defined in 4.3, does not exceed the acceptance number (c) of the appropriate sampling plan with an AQL of 6.5 established in Annex B; and

(b) the maximum allowance for mould count is not exceeded (see 7.3.2).

These acceptance criteria do not apply to non-retail containers.

5 Food additives

5.1 Acidity regulators

<table>
<thead>
<tr>
<th>INS No.</th>
<th>Name of the Food Additive</th>
<th>Maximum Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>330</td>
<td>Citric Acid</td>
<td>GMP</td>
</tr>
<tr>
<td>331(i)</td>
<td>Sodium dihydrogen citrate</td>
<td></td>
</tr>
<tr>
<td>331(ii)</td>
<td>Trisodium citrate</td>
<td></td>
</tr>
<tr>
<td>332(i)</td>
<td>Potassium dihydrogen citrate</td>
<td></td>
</tr>
<tr>
<td>332(ii)</td>
<td>Tripotassium citrate</td>
<td></td>
</tr>
<tr>
<td>333</td>
<td>Calcium citrates</td>
<td></td>
</tr>
</tbody>
</table>
6 Contaminants

6.1 Pesticide residues

6.1.1 The product covered by the provisions of this Standard shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this product.

6.1.2 In order to consider the concentration of the product, the determination of the maximum pesticide residue limits shall take into account the natural total soluble solids, the reference value being 4.5 for fresh fruit. Table 2 gives the current Codex MRLs.

Table 2 — Maximum pesticide residue limits and extraneous maximum residue limits in tomato paste (current as at 2009-06-09)

<table>
<thead>
<tr>
<th>Type</th>
<th>Unit symbol</th>
<th>Limit</th>
<th>Method of test</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARBARYL</td>
<td>MRL (mg/kg )</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.2 Other contaminants

6.2.1 The product covered by the provisions of this Standard shall comply with those maximum levels for contaminants established by the Codex Alimentarius Commission for this product. The current limits for contaminants are given in Table 3.

6.2.2 In order to consider the concentration of the product, the determination of the maximum levels for contaminants shall take into account the natural total soluble solids, the reference value being 4.5 for fresh fruit.

Table 3 — Limits for mineral impurities in tomato paste

<table>
<thead>
<tr>
<th>Type of impurity, max</th>
<th>Limits, ppm</th>
<th>Method of test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic (as As)</td>
<td>0.5</td>
<td>EAS 41*</td>
</tr>
<tr>
<td>Lead (as Pb)</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Copper (as Cu)</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Zinc (as Zn)</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Tin (as Sn)</td>
<td>250</td>
<td></td>
</tr>
</tbody>
</table>

7 Hygiene

7.1 Tomato paste shall be prepared and handled in accordance with the appropriate provisions of EAS 39, and relevant Codex texts such as codes of hygienic practice and codes of practice.

7.2 The products should comply with any microbiological criteria established in accordance CAC/GL 21.

7.3 Microbiological limits

7.3.1 Tomato paste shall be free from pathogenic organisms and shall comply with the microbiological limits indicated in Table 3.

Table 3 — Microbiological limits for tomato paste

<table>
<thead>
<tr>
<th>Type of micro-organism</th>
<th>Limits (number of counts), max</th>
<th>Method of test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total viable counts</td>
<td>10 per g</td>
<td>EAS 217*</td>
</tr>
<tr>
<td>Yeast and moulds</td>
<td>shall be absent</td>
<td></td>
</tr>
<tr>
<td>Escherichia Coli</td>
<td>shall be absent</td>
<td></td>
</tr>
<tr>
<td>Salmonella</td>
<td>shall be absent</td>
<td></td>
</tr>
</tbody>
</table>
7.3.2 Howard count

The product shall not contain any mould filaments in a quantity indicative of unsuitable raw materials or unsanitary processing lines. A guide for determining compliance with these requirements would be a mould count, as determined by the Howard method see AOAC (1970) 40.085 = moulds (25): official final action and 40.002 (m), not in excess of 30% positive fields.

8 Weights and measures

8.1 Fill of container

8.1.1 Minimum fill

The container should be well filled with the product 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 20°C which the sealed container will hold when completely filled. Determination of fill of container shall be in accordance with Annex A.

8.1.2 Classification of “Defectives”

A container that fails to meet the requirement for minimum fill of 8.1.1 should be considered as a “defective”.

8.1.3 Lot acceptance

A lot should be considered as meeting the requirement of 8.1.1 when the number of “defectives”, as defined in 8.1.2, does not exceed the acceptance number \( c \) of the appropriate sampling plan with an AQL of 6.5.

9 Packaging and labelling

9.1 Packaging

Tomato paste shall be packaged in appropriate containers made up of glass, plastic, and cans with food grade acid-resistant lacquering materials that shall not affect the quality of the product. The interior of the can shall not show any black discolouration, rusting or pitting.

9.2 General

The product covered by the provisions of this Standard shall be labelled in accordance with EAS 38. In addition, the following specific provisions apply:

9.3 Name of the product

The name of the product shall be:

(a) “Tomato Paste” if the food contains not less than 24% natural total soluble solids;

(b) Another denomination usually employed in the country accompanied by the declaration of the percentage of the natural total soluble solids; or

(c) If an added ingredient, as defined in 4.1.2, 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.

9.4 Declaration of the percentage of natural total soluble solids

The percentage solids may be included on the label in either of the following manners:
(a) The minimum percentage of natural total soluble solids (example: “Minimum Solids - 20%”).
(b) A range within 2% of the natural total soluble solids (example: “Solids - 20% to 22%”).

9.5 Labelling of non-retail containers

Information for non-retail containers 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 manufacturer, packer, distributor or importer, as well as storage instructions, shall appear on the container. 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.

9.6 Other labelling details

i) Name and address of the manufacturer;
ii) List of ingredients;
iii) Net weight in grams or minimum volume in millilitres or litres;
iv) Date of manufacture;
v) ‘Sell by ……………….’ date.

10 Methods of analysis and sampling

10.1 General

10.1.1 The factors of quality and analysis may be determined based on the following sample unit sizes:
(a) The entire contents of a container;
(b) A representative portion of the contents of a container;
(c) A combination of the contents of two or more containers; or
(d) A representative portion of processed product stored or held in bulk containers.

10.1.2 The methods of analysis referred to hereunder apply, as appropriate, to the East African Standards for Fruit Juices, Concentrated Fruit Juices and Fruit Nectars preserved exclusively by Physical Means.

10.2 Test of mineral impurities

According ISO 762:2003, Fruit and vegetable products — Determination of mineral impurities content

10.3 Determination of cadmium

According to the following standards:
10.4 Determination of benzoic acid

According to ISO 6560:1983, *Fruit and vegetable products — Determination of benzoic acid content (benzoic acid contents greater than 200 mg per litre or per kilogram) — Molecular absorption spectrometric method*

10.5 Determination of moulds and yeasts

According to ISO 7954:1987, *Microbiology — General guidance for enumeration of yeasts and moulds — Colony count technique at 25 degrees C*

10.6 Determination of lactic acid

According to EN 2631:1999, *Lactic acid — Enzymatic determination*

10.7 Determination of ethanol


10.8 Determination of added salt

According to ISO 3634:1979, *Vegetable products — Determination of chloride content. The determination of sodium is not necessary. Results are expressed as % m/m NaCl.*

10.9 Determination of soluble solids and sugars

According to the following standards:

- ISO 2172:1983, *Fruit juice — Determination of soluble solids content — Pycnometric method*
- EAS 41-10 [ISO 2173:2003], *Fruit and vegetable products — Determination of soluble solids — Refractometric method*

10.10 Determination of pH

According to ISO 1842:1991, *Fruit and vegetable products — Determination of pH*

10.11 Determination of total titratable acidity

According to EAS 41-2 [ISO 750:1998], *Fruit and vegetable products — Determination of titratable acidity*

10.12 Determination of volatile acidity


10.13 Determination of insoluble content

According:

- ISO 763:2003, *Fruit and vegetable products — Determination of ash insoluble in hydrochloric acid*

10.14 Determination of arsenic

According to following standards:
10.15 Determination of copper

According to ISO 7952:1994, Fruits, vegetables and derived products — Determination of copper content — Method using flame atomic absorption spectrometry. Results are expressed as mg copper/kg.

10.16 Determination of iron

According to following standards:

- EAS 41-7 [ISO 5517:1978], Fruits, vegetables and derived products — Determination of iron content — 1,10-Phenanthroline photometric method
- ISO 9526:1990, Fruits, vegetables and derived products — Determination of iron content by flame atomic absorption spectrometry. Results are expressed as mg iron/kg.

10.17 Determination of lead

According to ISO 6633:1984, Fruits, vegetables and derived products — Determination of lead content — Flameless atomic absorption spectrometric method. Results are expressed as mg lead/kg.

10.18 Determination of sulphur dioxide

According to EAS 41-11 [ISO 5523:1981], Liquid fruit and vegetable products — Determination of sulphur dioxide content (Routine method). Results are expressed as mg SO₂/kg.

10.19 Determination of tin

According to EAS 41-6 [ISO 2447:1998], Fruit and vegetable products — Determination of tin content.

10.20 Determination of zinc

According to the following standards:

Annex A  
(normative)

Determination of water capacity of containers

A.1 Scope

This method applies to glass containers.²

A.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.

A.3 Procedure

A.3.1 Select a container which is undamaged in all respects.

A.3.2 Wash, dry and weigh the empty container.

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

A.4 Calculation and expression of results

Subtract the weight found in A.3.2 from the weight found in A.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.

² For determination of water capacity in metal containers the reference method is ISO 90.1:1986.
Annex B  
(normative)  

Sampling and compliance  

B.1  Compliance  

Unless otherwise provided in a standard, a lot of canned vegetables shall be deemed in compliance for the following factors, to be determined by the sampling and acceptance procedure as provided in B.2, namely:  

B.1.1  Quality  

The quality of a lot shall be considered acceptable when the number of defectives does not exceed the acceptance number \( c \) in the sampling plans.  

B.1.2  Fill of container  

A lot shall be deemed to be in compliance for fill of container (packing medium and vegetable ingredient) when the number of defectives does not exceed the acceptance number \( c \) in the sampling plans.  

B.1.3  Drained weight  

A lot shall be deemed to be in compliance for drained weight based on the average value of all samples analyzed according to the sampling plans.  

B.2  Sampling and acceptance procedure  

B.2.1  Definitions  

(i) Lot  
A collection of primary containers or units of the same size, type, and style manufactured or packed under similar conditions and handled as a single unit of trade.  

(ii) Lot size  
The number of primary containers or units in the lot.  

(iii) Sample size  
The total number of sample units drawn for examination from a lot.  

(iv) Sample unit  
A container, a portion of the contents of a container, or a composite mixture of product from small containers that is sufficient for the examination or testing as a single unit. For fill of container, the sample unit shall be the entire contents of the container.  

(v) Defective  
Any sample unit shall be regarded as defective when the sample unit does not meet the criteria set forth in the standards.  

(vi) Acceptance number \( c \)  
The maximum number of defective sample units permitted in the sample in order to consider the lot as meeting the specified requirements.  

(vii) Acceptable quality level (AQL)  
The maximum percent of defective sample units permitted in a lot that will be accepted approximately 95 percent of the time.
### B.2.2 Sampling plans

<table>
<thead>
<tr>
<th>Lot size (primary containers)</th>
<th>Size of container</th>
<th>$n$</th>
<th>$c$</th>
</tr>
</thead>
<tbody>
<tr>
<td>net weight equal to or less than 1 kg (2.2 lb)</td>
<td>4,800 or less</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>4,801 to 24,000</td>
<td>21</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>24,001 to 48,000</td>
<td>29</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>48,001 to 84,000</td>
<td>48</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>84,001 to 144,000</td>
<td>84</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>144,001 to 240,000</td>
<td>126</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Over 240,000</td>
<td>200</td>
<td>19</td>
</tr>
<tr>
<td>net weight greater than 1 kg (2.2 lb) but not more than 4.5 kg (10 lb)</td>
<td>2,400 or less</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2,401 to 15,000</td>
<td>21</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>15,001 to 24,000</td>
<td>29</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>24,001 to 42,000</td>
<td>48</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>42,001 to 72,000</td>
<td>84</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>72,001 to 120,000</td>
<td>126</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Over 120,000</td>
<td>200</td>
<td>19</td>
</tr>
<tr>
<td>net weight greater than 4.5 kg (10 lb)</td>
<td>600 or less</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>601 to 2,000</td>
<td>21</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2,001 to 7,200</td>
<td>29</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>7,201 to 15,000</td>
<td>48</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>15,001 to 24,000</td>
<td>84</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>24,001 to 42,000</td>
<td>126</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Over 42,000</td>
<td>200</td>
<td>19</td>
</tr>
</tbody>
</table>

1. $n$ = number of primary containers in sample.
2. $c$ = acceptance number.