

# C O D E X   A L I M E N T A R I U S

INTERNATIONAL FOOD STANDARDS



Food and Agriculture  
Organization of  
the United Nations



World Health  
Organization

E-mail: [codex@fao.org](mailto:codex@fao.org) - [www.codexalimentarius.org](http://www.codexalimentarius.org)

---

## STANDARD FOR PROCESSED TOMATO CONCENTRATES

CXS 57-1981\*

Adopted in 1981. Revised in 2007, 2017. Amended in 2013.

\* Formerly CAC/RS 57-1972.

## 1. SCOPE

This Standard applies to the product as defined in Section 2 below, and offered for direct consumption, including for catering purposes or for repacking if required. This Standard also applies to the product when indicated as being intended for further processing. The Standard does not include products that contain seeds and skins such as “pizza toppings” and other “homestyle” products as well as products commonly known as tomato sauce, chilli sauce, and ketchup, or similar products which are highly seasoned products of varying concentrations containing characterising ingredients such as pepper, onions, vinegar, etc., in quantity that materially alter the flavour, aroma and taste of the tomato component.

## 2. DESCRIPTION

### 2.1 Product definition:

Processed tomato concentrate is the product:

- (a) prepared by concentrating the juice<sup>1</sup> or pulp obtained from substantially sound, mature red tomatoes (*Lycopersicon/Lycopersicum esculentum* P. Mill) strained or otherwise prepared to exclude the majority of skins, seeds and other coarse or hard substances in the finished product; and
- (b) preserved by physical means.

The tomato concentration shall be 7% or more of natural total soluble solids<sup>2</sup>, but not dehydrated to a dry powder or flake form.

### 2.2 Product designation:

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

- 2.2.1 “**Tomato Puree**” – Tomato concentrate that contains no less than 7% but less than 24% of natural total soluble solids.
- 2.2.2 “**Tomato Paste**” – Tomato concentrate that contains at least 24% of natural total soluble solids.

## 3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

### 3.1 Composition

#### 3.1.1 Basic Ingredients

Processed tomato concentrate as defined in Section 2.1.

#### 3.1.2 Other Permitted Ingredients

- (a) salt (sodium chloride) in accordance with the *Standard for Food Grade Salt* (CXS 150-1985);
- (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; and
- (d) water.

### 3.2 Quality criteria

---

<sup>1</sup> In this Standard, “juice” must not be intended as the fruit juice (including tomato juice) as defined in the *General Standard for Fruit Juices and Nectars* (CXS 247-2005).

<sup>2</sup> The concentrations are measured on the product without added salt.

Processed tomato concentrates shall have good flavour and odour, fairly good red colour, and shall possess a homogeneous (evenly divided) texture, characteristic of the product.

### 3.2.1 *Definition of Defects*

Processed tomato concentrates shall be prepared in accordance with good manufacturing practices (GMP), from such materials and under such practices that the product is substantially free of extraneous plant materials, this including other objectionable material and shall be practically free of mineral impurities.

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.

### 3.2.2 *Defects and Allowances*

#### 3.2.2.1 *Mineral impurities*<sup>3</sup>

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

#### 3.2.2.2 *Lactic Acid*

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

#### 3.2.2.3 *Mould Count*

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

#### 3.2.2.4 *pH*

The pH must be below 4.6.

### 3.3 *Classification of “defectives”*

A container that fails to meet the natural total soluble solids requirements, as set out in Section 2.2, and/or one or more of the applicable quality requirements, as set out in Section 3.2, should be considered as a “defective”.

### 3.4 *Lot acceptance*

A lot should be considered as meeting the applicable quality requirements referred to in Section 3.2 when:

- (a) the number of “defectives”, as defined in Section 3.3, does not exceed the acceptance number (c) of the appropriate sampling plan with an AQL of 6.5; and
- (b) the maximum allowance for mould count is not exceeded (see Section 3.2.2.3).

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

## 4. *FOOD ADDITIVES*

Only certain acidity regulators as indicated in Table 3 of the *General Standard for Food Additives* (CXS 192-1995) are acceptable for use in foods conforming to this Standard.

---

<sup>3</sup> Sand, soil and any other impurities insoluble in hydrochloric acid.

## 5. CONTAMINANTS

- 5.1 The products covered by this Standard shall comply with the maximum levels of the *General Standard for Contaminants and Toxins in Food and Feed* (CXS 193-1995).
- 5.2 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.
- 5.3 The products covered by this Standard shall comply with the maximum residue limits for pesticides established by the Codex Alimentarius Commission.
- 5.4 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.

## 6. HYGIENE

- 6.1 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* (CXC 1-1969), and other relevant Codex texts such as codes of hygienic practice and codes of practice.
- 6.2 The products should comply with any microbiological criteria established in accordance with the *Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods* (CXG 21-1997).

## 7. WEIGHTS AND MEASURES<sup>4</sup>

### 7.1 Fill of container

#### 7.1.1 *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.

#### 7.1.2 *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".

#### 7.1.3 *Lot Acceptance*

A lot should be considered as meeting the requirement of Section 7.1.1 when the number of "defectives", as defined in Section 7.1.2, does not exceed the acceptance number (c) of the appropriate sampling plan with an AQL of 6.5.

## 8. LABELLING

- 8.1 The product covered by the provisions of this Standard shall be labelled in accordance with the *General Standard for the Labelling of Prepackaged Foods* (CXS 1-1985). In addition, the following specific provisions apply:

---

<sup>4</sup> The provisions in this Section do not apply to non-retail containers.

**8.2 Name of the product**

The name of the product shall be:

- (a) "Tomato Puree" if the food contains not less than 7% but less than 24% natural total soluble solids;
- (b) "Tomato Paste" if the food contains not less than 24% natural total soluble solids;
- (c) Another denomination usually employed in the country accompanied by the declaration of the percentage of the natural total soluble solids; or
- (d) If an added ingredient, as defined in Section 3.1.2, 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.

**8.3 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%").

**8.4 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. METHODS OF ANALYSIS AND SAMPLING

Provision	Method	Principle	Type
Fill of containers	CAC/RM 46-1972 (for glass containers) (Codex general method for processed fruit and vegetables) and ISO 90.1:1999 (for metal containers) (Codex general method for processed fruit and vegetables)	Weighing	I
Lactic acid	EN 2631:1999	Enzymatic determination	II
Mineral impurities (sand)	AOAC 971.33 (Codex General Method for processed fruits and vegetables)	Gravimetry	I
Mould count	AOAC 965.41	Howard mould count	I
pH	NMKL 179:2005	Potentiometry	II
	AOAC 981.12		III
Sodium Chloride	ISO 3634:1979 expressed as sodium chloride (Codex General Method)	Potentiometry	III
Tomato soluble solids	AOAC 970.59	Refractometry	I

**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.