

# CODEX ALIMENTARIUS

INTERNATIONAL FOOD STANDARDS



Food and Agriculture  
Organization of the  
United Nations



World Health  
Organization

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## STANDARD FOR APPLES

**CXS 299-2010**

**Adopted in 2010.**

## 1. DEFINITION OF PRODUCE

This Standard applies to fruits of commercial varieties (cultivars) of apples grown from *Malus domestica Borkh.*, of the *Rosaceae* family, to be supplied fresh to the consumer, after preparation and packaging. Apples for industrial processing are excluded.

## 2. PROVISIONS CONCERNING QUALITY

### 2.1 Minimum Requirements

In all classes, subject to the special provisions for each class and the tolerances allowed, the apples must be:

- whole, the stalk (stem) may be missing, provided the break is clean and the adjacent skin is not damaged;
- sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
- firm<sup>1</sup>;
- clean, practically free of any visible foreign matter;
- practically free of pests and damage caused by them affecting the general appearance of the produce;
- free of abnormal external moisture, excluding condensation following removal from cold storage;
- free of any foreign smell and/or taste;
- free of damage caused by low and/or high temperatures;
- practically free of signs of dehydration.

#### 2.1.1 The apples must have colour that is characteristic of the variety and the area in which they are grown.

The development and condition of the apples must be such as to enable them:

- to withstand transport and handling; and
- to arrive in satisfactory condition at the place of destination.

### 2.2 Maturity Requirements

Apples must be at a stage of development that enables them to continue the ripening process and to reach a stage of ripeness required in relation to the varietal characteristics.

In order to verify the minimum maturity requirements some parameters such as: morphological aspects, firmness and refractometric index can be considered.

### 2.3 Classification

In accordance with the defects allowed in the Annex - Maximum Allowance for Defects, apples are classified in three classes defined below:

#### 2.3.1 "Extra" Class

Apples in this class must be of superior quality. The flesh must be sound. They must be characteristic of the variety. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package<sup>2</sup>.

#### 2.3.2 Class I

Apples in this class must be of good quality. The flesh must be sound. They must be characteristic of the variety. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package<sup>2</sup>:

- a slight defect in shape and development;
- a slight defect in colouring;
- slight skin or other defects (see the Annex).

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<sup>1</sup> Firmness in this context is used to indicate an appropriate level of maturity of the fruit rather than a stage of ripening and it is acknowledged to vary according to apple varieties.

<sup>2</sup> Skin and other defects must not exceed the limits as defined in the Annex.

### 2.3.3 Class II

This class includes apples which do not qualify for inclusion in the higher classes, but satisfy the minimum requirements specified in Section 2.1 above. The following defects, however, may be allowed, provided the apples retain their essential characteristics as regards the quality, the keeping quality and presentation<sup>2</sup>:

- defects in shape and development;
- defects in colouring;
- skin or other defects (see the Annex).

### 2.4 Colouring

In all classes, in the absence of national legislation, the following colour codes may be applied except for green and yellow apple varieties:

Code	Percentage of colour
A	75% or more
B	50% or more
C	25% or more
D	Less than 25%

## 3. PROVISIONS CONCERNING SIZING

Size is determined by maximum diameter of the equatorial section or by weight of each apple.

For all varieties and all classes the minimum size is 60 mm if measured by diameter or 90 g if measured by weight. Fruit of smaller sizes may be accepted provided the Brix level of the produce meets or exceeds 10.5° Brix and the size is not smaller than 50 mm or 70 g.

## 4. PROVISIONS CONCERNING TOLERANCES

Tolerances in respect of quality and size shall be allowed in each lot for produce not satisfying the requirements of the class indicated.

### 4.1 Quality Tolerances

The application of the following tolerances should take into account that at stages following export; products may show in relation to the requirements of the standard:

- a slight lack of freshness and turgidity;
- for products graded in classes other than the "Extra" Class, a slight deterioration due to their development and their tendency to perish.

#### 4.1.1 "Extra" Class

Five percent by number or weight of apples not satisfying the requirements of the class, but meeting those of Class I or, exceptionally, coming within the tolerances of that class.

Included therein shall be allowed not more than 1.0% for apples affected by decay or internal breakdown

#### 4.1.2 Class I

Ten percent by number or weight of apples not satisfying the requirements of the class, but meeting those of Class II or, exceptionally, coming within the tolerances of that class.

Included therein shall be allowed not more than 1% for apples affected by decay or internal breakdown

#### 4.1.3 Class II

Ten percent by number or weight of apples satisfying neither the requirements of the class nor the minimum requirements, with the exception of apples affected by decay or internal breakdown that should not be more than 2%.

Included therein shall be allowed, a maximum of 2% by number or weight of fruit which may show the following defects:

- cork like blemishing (bitter pit);
- slight damage or unhealed broken skin/cracks;
- presence of internal feeding insects/pests or damage to the flesh caused by pests<sup>3</sup>.

## 4.2 Size Tolerances

For all classes of fruit subjected to rules of uniformity, 10% by number or weight of apples not meeting the size indicated on the package.

This tolerance may not be extended to include produce with a size below 50 mm or 70 g if the refractometric index is below 10.5°Brix

## 5. PROVISIONS CONCERNING PRESENTATION

### 5.1 Uniformity

The contents of each package must be uniform and contain only apples of the same origin, quality, size (if sized) and variety. For "Extra" Class, colour should be uniform. Sales packages (of a net weight not exceeding 5 kg) may contain mixtures of varieties and sizes provided they are uniform in quality, and for each variety concerned, its origin. The visible part of the contents of the package must be representative of the entire contents except for mixed sizes and varieties.

The uniformity of apples may be measured in accordance with one of the following options:

#### A. By diameter:

The maximum diameter difference of apples in the same package shall be limited to:

- 5 mm if the diameter of the smallest apples is less than 80 mm.
- 12 mm if the diameter of the smallest apple is equal to or over 80 mm.

Or

#### B. By weight:

The maximum difference by weight between apples in the same package shall be limited to:

- 15 g if the weight of the smallest apple is 90 g.
- 20 g if the weight of the smallest apple 90 g and over but under 135 g.
- 30 g if the weight of the smallest apple is 135 g and over but under 200 g.
- 40 g if the weight of the smallest apple is 200 g and over but under 300 g.
- 50 g if the weight of the smallest apple is over 300 g.

There is no size uniformity for apples packed loose in the package or sales package.

### 5.2 Packaging

Apples must be packed in such a way as to protect the produce properly. The materials used inside the package must be new<sup>4</sup>, clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labeling has been done with non-toxic ink or glue.

Apples shall be packed in each container in compliance with the *Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables* (CXC 44-1995).

#### 5.2.1 Description of Containers

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of the apples. Packages must be free of all foreign matter and smell.

## 6. MARKING OR LABELLING

### 6.1 Consumer Packages

In addition to the requirements of the *General Standard for the Labelling of Prepackaged Foods* (CXS 1-1985), the following specific provisions apply:

#### 6.1.1 Nature of Produce

If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety, class, colour code (if used) and size/weight or the number of pieces presented in rows and layers.

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<sup>4</sup> For the purposes of this Standard, this includes recycled material of food-grade quality.

## 6.2 Non-retail Containers

Each package must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside, or in the documents accompanying the shipment. For produce transported in bulk, these particulars must appear on a document accompanying the goods.

### 6.2.1 Identification

Name and address of exporter, packer and/or dispatcher. Identification code (optional)<sup>5</sup>.

### 6.2.2 Nature of Produce

Name of the produce if the contents are not visible from the outside. Name of the variety or varieties (where appropriate).

### 6.2.3 Origin of Produce

Country of origin and, optionally, district where grown or national, regional or local place name.

### 6.2.4 Commercial Identification

- Class;
- Size (if sized);
- Colour code (if used).

### 6.2.5 Official Inspection Mark (optional)<sup>5</sup>

## 7. CONTAMINANTS

7.1 The produce 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).

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

## 8. HYGIENE

8.1 It is recommended that the produce 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), *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CXC 53-2003), and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

8.2 The produce 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).

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<sup>5</sup> The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark.

**ANNEX****MAXIMUM ALLOWANCE FOR DEFECTS**

Defects Allowed		“Extra” Class	Class I	Class II
Russetting outside Calyx/stem cavity	• smooth net-like	3% of surface area	20% of surface area	50% of surface area
	• smooth solid	1% of surface area	5% of surface area	33% of surface area
accumulation for both types of russetting should not exceed the following		3% of surface area	20% of surface area	50% of surface area
Accumulated Blemishes & Bruising:		0.50 cm <sup>2</sup>	1.0 cm <sup>2</sup>	1.5 cm <sup>2</sup> <sup>6</sup>
- Bruises with slight discoloration;			0.25 cm <sup>2</sup>	1.0 cm <sup>2</sup>
- Scars caused by Scabs <sup>3</sup> ( <i>Venturia inaequalis</i> );			1.0 cm <sup>2</sup>	2.5 cm <sup>2</sup>
- other defects/blemish including healed hail marks				
Stem or Calyx cracks (healed or well cured)		----	0.5 cm	1 cm
Maximum length of elongated shaped defects		----	2 cm	4 cm

Russetting can be simply described as a “brownish roughened area or streaks on the skin of the apple”. In some apple varieties russetting is a characteristic of the variety and for others a quality defect. Allowances for russetting will be applied to apple varieties that russetting is not a characteristic of.

<sup>6</sup> Bruising with discoloration and dark blemishes not blending with skin color are accepted in this Class.