

# **Quick frozen vegetables — Specification**

PUBLIC REVIEW DRAFT

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## **Quick frozen vegetables — 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 quick frozen vegetables as defined in this standard.

This Kenya standard replaces the following standards:

Quick Frozen Carrots (CXS 140-1983),  
Quick Frozen Corn-on-the-Cob (CXS 133-1981),  
Quick Frozen Leeks (CXS 104-1981),  
Quick Frozen Whole Kernel Corn (CXS 132-1981)  
Quick Frozen Broccoli (CXS 10-1981)  
Quick Frozen Brussels Sprouts (CXS 112-1981)  
Quick Frozen Cauliflower (CXS 111-1981)  
Quick Frozen French Fried Potatoes (CXS 114-1981)  
Quick Frozen Green and Wax Beans (CXS 113-1981)  
Quick Frozen Peas (CXS 41-1981)  
Quick Frozen Spinach (CXS 77-1981)

During the preparation of this standard useful information was derived from following document:

**Codex standard for quick frozen vegetables (CODEX STAN 320-2015).**

Acknowledgement is hereby made for the assistance derived from these sources.

## Quick frozen vegetables — Specification

### 1 Scope

This Kenya Standard specifies requirements and methods sampling and test for quick frozen vegetables, as defined in clause 3. The products covered by this standard includes but not limited to quick frozen; carrot, whole kernel corn, leeks, corn-on-the-cob, Broccoli, Brussels Sprouts, Cauliflower, French Fried Potatoes , Green and Wax Beans , Peas , Frozen Spinach, and mixed vegetables.

These products are intended for direct consumption without further processing except for size-grading or re-packing if required.

The standard does not apply to the product when indicated as being intended for further processing or for other industrial purposes.

### 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.

KS 2752, Processed Fruits and Vegetables- Code of practice

KS CAC/RCP 8, *Recommended code of practice for the processing and handling of quick frozen foods*

KS CODEX STAN 193, *Codex general standard for the contaminants and toxins in foods*

KS CAC/GL 75, *Guidelines on substances used as processing aids*

KS EAS 38, *Labeling of prepackaged foods — Specification*

KS EAS 803, *Nutrition labelling — Requirements*

KS EAS 804, *Claims — General requirements*

KS EAS 805:2014, *Use of nutrition and health claims — Requirements*

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

KS 229, *edible salt* Specification

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*

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

KS ISO 6633; *Fruits, vegetables and derived products -- Determination of lead content -- Flameless atomic absorption spectrometric method*

KS ISO 17240; *Fruit and vegetable products -- Determination of tin content -- Method using flame atomic absorption spectrometric*

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

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 21528-1 *Microbiology of the food chain – Horizontal method for the detection and enumeration of Enterobacteriaceae – Part 1: Detection of Enterobacteriaceae*

KS ISO 11290\_2 *Microbiology of the food chain – Horizontal method for the detection and enumeration of Listeria monocytogenes and of Listeria spp. – Part 2: Enumeration method*

### 3 Description

#### 3.1 Product definition

##### 3.1.1 Quick frozen vegetables

These are products

- a) Prepared from substantially sound, fresh (barring mature processed peas) or frozen vegetables, as defined in the corresponding Annexes, having reached appropriate maturity for processing. None of their essential characteristic elements are removed from them but they shall be washed and prepared appropriately, depending on the product to be produced. They undergo operations such as washing, peeling, grading, cutting, blanching/deactivation of enzyme activity, etc., depending on the type of product.
- b) Made from vegetables which were subjected to a quick freezing process, and maintained at -18°C or colder at all points in the cold chain, subject to permitted temperature tolerances.

##### 3.1.2 Quick frozen carrots

Quick frozen carrots are the products prepared from freezing fresh, clean, sound, roots of carrot varieties (cultivars) conforming with the characteristics of the species *Daucus carota* L. from which the leaves, green tops, peel and secondary roots have been removed and which have been washed and may or may not be blanched.

##### 3.1.3 Quick frozen corn-on-the-cob

Quick frozen corn-on-the-cob is the product prepared from freezing fresh, clean, sound, properly matured whole or pieces of ears conforming to the characteristics of the sweet corn variety *Zea mays* L. *convar saccharata* Koern which are trimmed (except for the style “whole”), separated from husk and silk, sorted and washed and sufficiently blanched to ensure stability of colour and flavour during normal marketing cycles. Corn-on-the-cob can be of the following types:

- a) **Super sweet varieties** — Means kernels (or grains) of corn that provide higher naturally occurring sugar, and/or crisper texture (maybe yellow, white or combination of each) typical for the variety. These varieties may be slightly darker in colour, and some varieties have slightly tougher pericarp (kernel skin) than conventional sweet corn.
- b) **Sweet varieties** — Means kernels of sweet corn that convert sugars to starch by going through distinct stages of maturity - milk, cream, then dough stages.

##### 3.1.4 Quick frozen leek

Quick frozen leek is the product prepared from fresh, clean, sound, edible parts of the leek plant conforming to the characteristics of the species *Allium porrum* L., and which have been trimmed, washed, possibly blanched to ensure adequate stability of colour and flavour during normal marketing cycles

### **3.1.5 Quick frozen whole kernel corn**

Quick frozen whole kernel corn is the product prepared from fresh, clean whole sound, succulent kernels of sweet corn species *Zea mays* L. convar. *saccharata* Koern of either the white or yellow varieties by removing husk and silk; by sorting, trimming and washing; and by sufficiently blanching before or after removal from the cob to ensure adequate stability of colour and flavour during normal marketing cycles. Whole kernel corn can be of the following types:

- a) **Super sweet varieties** — Means kernels (or grains) of corn that provide higher naturally occurring sugar, and/or crisper texture (may be yellow, white or combination of each) typical for the variety. These varieties may be slightly darker in colour, and some varieties have slightly tougher pericarp (kernel skin) than conventional sweet corn.
- b) **Sweet varieties** — Means kernels of sweet corn that convert sugars to starch by going through distinct stages of maturity - milk, cream, then dough stages.

### **3.1.6 Quick frozen BROCCOLI**

Quick frozen broccoli is the product prepared from the fresh, clean, sound stalks or shoots of the broccoli plant conforming to the characteristics of the species *Brassica oleracea* L. var. *italica* Plenck (Sprouting Broccoli) which have been sorted, trimmed, washed and sufficiently blanched to ensure adequate stability of colour and flavour during normal marketing cycles.

### **3.1.7 Quick frozen Brussels sprouts**

Quick frozen Brussels sprouts are the products prepared from freezing fresh, clean, sound, whole auxiliary buds of the plant conforming to the characteristics of *Brassica oleracea* L. var. *gammier Gemmifera* (DC) Schulz – which buds are trimmed, sorted, washed and sufficiently blanched to ensure adequate stability of colour and flavour during normal marketing cycles.

### **3.1.8 Quick frozen cauliflower**

Quick frozen cauliflower is the product prepared from freezing fresh, clean, sound heads of the cauliflower plant conforming to the characteristics of the species *Brassica oleracea* L. var. *botrytis* L., which heads may be trimmed and separated into parts, and which are washed and sufficiently blanched to ensure stability of colour and flavour during normal marketing cycles.

### **3.1.9 Quick frozen French fried potatoes**

Quick frozen French fried potatoes are the products prepared from freezing clean, sufficiently developed, sound tubers of the potato plant conforming to the characteristics of the species *Solanum tuberosum* L, *Solanum Andigena* L and rhizomes of the sweet potato plant conforming to the characteristics of the species *Ipomoea batatas*. They shall have been sorted, washed, peeled or unpeeled, cut into various shapes and treated as necessary to achieve satisfactory colour and fried or pre-cooked in edible oil, fat, or water blanched. The treatment, precooking and frying operations shall be sufficient to ensure adequate stability of colour and flavour during normal marketing cycles. Following the frying or precooking operation the product is quickly cooled and quick frozen. Products that have not been fried or precooked are not covered by this standard.

### **3.1.10 Quick frozen peas**

Quick frozen peas are the products prepared from freezing fresh, clean, sound, whole, young and tender peas conforming to the characteristics of the species *Pisum sativum* L. which have been washed, sufficiently blanched to ensure adequate stability of colour and flavor during normal marketing cycles.

### **3.1.11 Quick frozen spinach**

Quick frozen spinach is the product prepared from freezing fresh, clean, sound edible parts of the spinach plant conforming to the characteristics of the species *Spinacia oleracea* L., and which have been sorted,

washed, sufficiently blanched to ensure adequate stability of colour and flavor during normal marketing cycles and properly drained.

### **3.1.13 Quick frozen mixed vegetables**

A product prepared from a mixture of two or more types of fresh or frozen or dry washed clean and sound vegetables, prepared via appropriate manufacturing processes and subjected to quick freezing process to reach a temperature of -18 °C.

### **3.1.2 Process definition**

Quick freezing is where the product is subjected to a freezing process in appropriate equipment and complying with the conditions laid down hereafter and in the corresponding Annexes. This freezing operation shall be carried out in such a way that the range of temperature of maximum crystallization is passed quickly. The quick freezing process shall not be regarded as complete unless and until the product temperature has reached -18 °C at the thermal Centre after thermal stabilization. The recognized practice of repacking quick frozen products under temperature controlled conditions is permitted.

## **3.2 Handling practice**

The product shall be handled under such conditions as will maintain the quality during transportation, storage and distribution up to and including the time of final sale. It is recommended that during storage, transportation, distribution and retail, the product be handled in accordance with the provisions of KS CAC/RCP 8

## **4 Styles and sizing**

In addition to the styles defined in the corresponding Annexes, any other styles shall be permitted as indicated in 4.1.

**NOTE** Quick frozen vegetables may be "free flowing" i.e. in which the individual units (Individual Quick Frozen- IQF) are not stuck to one another, stuck together or in blocks to an extent that they cannot easily be separated in a frozen state.

### **4.1 Other styles**

Any other style in addition to those described in the various Annexes shall be permitted provided that the product:

- a) is sufficiently distinctive from other forms of presentation laid down in the standard;
- b) meets all relevant requirements of the standard, including requirements relating to limitations on defects 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
- c) is adequately described on the label to avoid confusing or misleading the consumer.

## **5 Essential compositional and quality requirements**

### **5.1 Compositional requirements**

#### **5.1.1 Basic ingredients**

Vegetables as defined in clause 3.1.1 to 3.1.2



**5.1.2 Other permitted ingredients**

**5.1.2.1 For the quick frozen carrots:**

- a) Salt (sodium chloride) as defined in KS 229
- b) Sugars as defined in the relevant Kenya standards for sugars
- c) Aromatic herbs and spices as defined in the Codex standards for spices and culinary herbs; stock or juice of vegetables and aromatic herbs; garnishes composed of one or more vegetables (e.g. lettuce, onions; pieces of green or red peppers, or mixtures of both) up to a maximum of 10% m/m of the total drained vegetable ingredient.

**5.1.2.2 For quick frozen corn-on-the-cob:**

- a) Sugars as defined in the relevant Kenya standards
- b) Salt (sodium chloride) as defined in KS 229
- c) Spices, seasonings, butter, edible oils, named sauces, flavourings as defined in the relevant Kenya Standards; and
- d) Other appropriate vegetables.

**5.1.2.3 For quick frozen leeks**

- a) Salt (sodium chloride) as defined in KS 229
- b) Condiments such as spices and herbs as defined in the relevant Kenya standards for spices and culinary herbs.

**5.1.2.4 For quick frozen whole kernel corn**

Garnishes, such as pieces of green peppers or red peppers, or mixture of both, either of which may be sweet or hot or may be dried. Other vegetables may be used as garnishes. A garnish may not exceed 5% m/m of the finished food.

**5.1.2.4 For quick frozen Broccoli**

- (a) Sugars as defined in the relevant Kenya standards for sugars (KS);
- (b) Salt (sodium chloride) as defined in the Standard for edible Salt (KS 229);
- (c) Edible fats and oils as defined in the relevant Kenya Standards
- (d) Spices and culinary herbs as define in relevant Kenya standards for spices and culinary herbs.
- (e) Named sauces.

**5.1.2.4 For quick frozen Brussel sprouts**

- (a) Sugars as defined in the relevant Kenya standards for sugars (b) Salt (sodium chloride) as in the Standard for edible salt (KS 229);
- (c) Edible fats and oils as defined in the relevant Kenya Standards
- (d) Spices and culinary herbs in relevant Kenya standards for spices and culinary herbs.
- (e) Named sauces.

**5.1.2.4 For quick frozen cauliflower**

- (a) Sugars as defined in the relevant Kenya standards for sugars (b) Salt (sodium chloride) as defined in the Standard for edible salt (KS 229);

- (c) Edible fats and oils as defined in the relevant Kenya Standards
- (d) Spices and culinary herbs as defined in the relevant Kenya standards for spices and culinary herbs.
- (e) Named sauces.

#### **5.1.2.4 For quick frozen French fried potatoes**

- (a) Sugars as defined in the relevant Kenya standards for sugars (b) Salt (sodium chloride) as defined in the Standard for edible salt (KS 229);
  - (c) Spices and culinary herbs as defined in the relevant Kenya standards for spices and culinary herbs.  
;
  - (d) Batters.
- Edible fats and oils as defined in the relevant Kenya Standards may be used in French fried potatoes

#### **5.1.2.4 For quick frozen wax**

- (a) Sugars as defined in the relevant Kenya standards for sugars (b) Salt (sodium chloride) as defined in the Standard for edible salt (KS 229)
- (c) Edible fats and oils as defined in the relevant Kenya standards
- (d) Spices and culinary herbs as defined in the relevant Kenya standards for spices and culinary herbs.
- (e) Named sauces.

#### **5.1.2.4 For quick frozen Peas**

- (a) Sugars as defined in the relevant Kenya Standards for Sugars (b) Salt (sodium chloride) as defined in the Standard for edible salt (KS 229)
- (c) Edible fats and oils as defined in the relevant Kenya Standards
- (d) Spices and culinary herbs as defined in relevant Kenya standards for spices and culinary herbs.
- (e) Named sauces.

### **5.2 Quality Criteria (Factors)**

#### **5.2.1 General requirements**

In addition to the provisions provided for in the corresponding Annexes, quick frozen vegetables:

- a) Shall have a reasonably uniform colour characteristic of the variety.
- b) Shall be sound, clean, practically free from sand, grit and other foreign material.
- c) Shall be practically free from pests and damage caused by them.
- d) Shall have a normal taste, flavour and free from any foreign odour/smell, taking into consideration any added ingredients as indicated in 5.1.2.
- e) Shall be reasonably tender; uniform in texture and ripeness.
- f) Shall be free from impurities and foreign materials, and all the stages of insect life cycle.
- g) Shall be free from any added preservatives or artificial colors.

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- h) Raw materials used in the final product shall be complying with their relevant Kenya Standards.
- i) Each vegetable component shall retain its physical properties, be homogenous in size.
- j) The proportion of each single vegetable ingredient in the mixed vegetables shall not be less than 25 % of the total weight.

### 5.2.2 Analytical Requirements (French fried potatoes)

- a) Moisture - the maximum moisture content of the whole product in the styles shoestring, medium and thick cut shall be 76% m/m; and in extra-large and other styles 78% m/m.
- b) The fat or oil extracted from the product shall have a free fatty acid content of not more than 1.5% of oil m/m measured as oleic acid or an equivalent fatty acid value based on the predominant fatty acid in the fat or oil

### 5.2.3. Analytical Characteristics (peas)

The alcohol-insoluble solids content as determined by the method specified in CXS 234-1999 must not exceed:

- (a) for Peas /Garden Peas 23% m/m;
- (b) for Sweet Green Peas 19% m/m.

### 5.2.4 Analytical Characteristics for leeks

Mineral impurities - not more than 0.1% m/m, measured on the whole product basis.

### 5.2.5 Analytical Characteristics for quick frozen spinach

- (a) Mineral impurities such as sand, grit and silt shall be not more than 0.1% m/m, measured on the whole product basis;
- (b) Sodium chloride-free dry matter - not less than 5.5% m/m.

## 5.3 Sample size

See individual Annexes for sample size for each product.

## 5.4 Analytical characteristics

Analytical characteristics shall be in accordance with the provisions provided for in the corresponding Annexes.

## 5.5 Definition of defects

In accordance with the relevant provisions in the corresponding Annexes.

## 5.6 Defects and allowances

Quick frozen vegetables shall be substantially free from defects. Certain common defects shall not be present in amounts greater than the limitations fixed in the corresponding Annexes.

## 5.7 Classification of “defectives”

A container that fails to meet one or more of the applicable quality requirements, as set out in 5.6(except those based on sample averages), shall be considered as a “defective”.

## 5.8 Lot acceptance

A lot shall be considered as meeting the applicable quality requirements referred to in 5.7 when:

- a) For those requirements which are not based on averages, the number of “defectives”, as defined in clause 5.7, does not exceed the acceptance number (c) of the appropriate sampling plan with an AQL of 6.5; and

For factors evaluated on a sample average, a lot will be considered acceptable if the average meets the specified tolerance, and no individual sample is excessively out of tolerance.

## 6 Food additives

No permitted food additives.

Sequestrants used in accordance with Tables 1 and 2 of the General Standard for Food Additives (CXS 192-1995) in Food Category 0.4.2.2.1 Frozen Vegetables (including mushrooms and fungi, roots and tubers, pulses and legumes, and aloe vera), seaweeds, and nuts and seeds, are acceptable for use in fried French potatoes conforming to this Standard.

The flavourings used in quick frozen peas shall comply with the Guidelines for the Use of Flavourings (CXG 66-2008).

## 7 Processing aids

The processing aids used for products covered by this standard shall comply with CAC/GL 75.

## 8 Contaminants

The products covered by this standard shall comply with the maximum levels of KS CODEX STAN 193.

### 8.1 Pesticide residues

The products covered by this standard shall comply with the maximum residue limits for pesticides established by the Codex Alimentarius Commission (CAC).

### 8.2 Heavy metal contaminants

The products covered by the provisions of this standard shall conform to those maximum limits for heavy metal contaminants established by the Codex Alimentarius Commission for these products given in Table 1.

**Table 1 — Heavy metal contaminant limits for quick frozen vegetables**

S/N	Contaminant	Maximum level	Test method
ii)	Lead (Pb)	0.3 mg/kg	AOAC 972.25 / KS ISO/TS 6733
v)	Cadmium (cd)	0.05 mg/kg	AOAC 999.11/ KS ISO 6732

## 9 Hygiene

**9.1** 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 processed fruits and vegetables code of practice (KS 2752), Recommended code of practice for the processing and handling of quick frozen foods (KS CAC/RCP 8) and other relevant texts such as codes of hygienic practice and codes of practice.

**9.2** The products shall comply with the microbiological criteria established in accordance with CAC/GL 21.

The products shall conform to microbiological criteria given in Table 2 and other microorganisms of food safety concern.

**Table 2 — Microbiological limits for quick frozen vegetables**

S/N	Microorganism	Limit	Test method
i)	Total plate count, cfu/g, max.	10 <sup>4</sup>	ISO 4833-1
	Enterobacteriaceae, cfu/g, max	10	ISO 21528-1
ii)	<i>Escherichia coli</i> , (cfu/g), max	10	KS ISO 7251
v)	<i>Salmonella</i> , cfu/25 g	Absent	ISO 6579
	<i>L.monocytogenes</i> , cfu.25g	absent	ISO 11290-2

## **10 Weights and measures**

### **10.1 Net weight**

The weight of the products covered by the provisions of this standard shall be indicated in accordance with CODEX STAN 1.

When the vegetables are glazed, in conformity with a specific Annex, the declaration of net content of the foods shall be exclusive of the glaze.

### **10.2 Classification of “defectives”**

A container that fails to meet the requirement for minimum fill of 10.1 shall be considered as a “defective”.

### **10.3 Lot acceptance**

A lot shall be considered as meeting the requirement of 10.3 when the number of “defectives”, as defined in 10.2, does not exceed the acceptance number (c) of the appropriate sampling plan with an AQL of 6.5.

### **10.4 Minimum drained weight**

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

## **11 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.

Packaging used for quick frozen vegetables shall be in accordance with the relevant provisions of KS CAC/RCP 8.

The packages for the French fried potatoes shall bear clear directions for keeping from the time they are purchased from the retailer to the time of their use, as well as directions for cooking

## **12 Labelling**

In addition to the requirements of KS EAS 38, the following specific provisions apply:

## **12.1 Name of the product**

**12.1.1** The name of the product shall be as defined in clause 3.

**12.1.2** The name of the food shall include the designation "Corn".

**12.1.3** The name of the product shall include the designation "Broccoli" and the size or size designation when the broccoli is sized.

**12.1.4** The name of the product shall include the designation "Brussels sprouts".

**12.1.5** The name of the product shall include the designation "cauliflower".

**12.1.5** The name of the product shall be "French Fried Potatoes" or the equivalent designation used in the country in which the product is intended to be sold. Where the sweet potato variety is used, the name of the product shall be "French Fried Sweet Potatoes".

**12.1.6** The name of the product shall include the designations "green beans" or "wax beans" as applicable. A statement regarding type ("round" or "flat") may be made if customary in the country of retail sale.

**12.1.7** The name of the product shall include the designation "peas", except that where peas are presented in conformity with Section 1.1.1 of annex J. Types "Garden Peas", Sweet Green Peas, the designation shall be "garden peas" or the equivalent designation used in the country of retail sale. The name of the product shall include the designation "Spinach".

### **12.2.1 Size Designation shall be declared as per the annexes**

**12.2.2** In addition, for the cauliflower; there shall appear on the label a designation of the style as appropriate, for example "straight cut" or "crinkle cut" and there may also appear an indication of the approximate dimensions of the cross section or the appropriate designation, i.e. "Shoestring", "medium", "thick cut" or "extra-large".

**12.2.2** In addition, for the French fried potatoes there shall appear on the label a designation of the style as appropriate, for example "straight cut" or "crinkle cut" and there may also appear an indication of the approximate dimensions of the cross section or the appropriate designation, i.e. "Shoestring", "medium", "thick cut" or "extra-large".

**12.3** The words "quick frozen" shall also appear on the label, except that the term "frozen" may be applied in countries where this term is customarily used for describing the product processed in accordance with 3.1. The type of quick freezing process may be included on the label.

**12.4** When any ingredient, has been added which impart(s) a distinctive flavour to the food, the name of the product shall be accompanied by the term "with X", as appropriate.

**12.5** When the vegetables are sized, the size, as defined in the corresponding Annexes, may be declared in conjunction with, or in close proximity to the name of the product.

As regard sizing declaration, carrots meeting the size requirements for "small" may be designated "baby" within countries where this practice is permitted.

For the Corn-on-the-Cob, there shall for the styles "whole" and "trimmed whole" appear on the label, in conjunction with or in close proximity to the name a clear indication of the number of units included in the package.

**12.6** If a term designating the size of the Brussels sprouts is used:

- (a) it shall be supported by the sieve size in mm; and/or
- (b) the words "very small", "small", "medium" or "large" as appropriate; and/or
- (c) by a size representation on the label of the size range to which the Brussels sprouts predominantly conform; and/or
- (d) the customary method of declaring size in the country in which the product is sold.

If a term designating the size of the cauliflower florets is used:

- (a) the words “large florets”, “medium florets”, “small florets” or “cut florets” as appropriate; and/or
- (b) by a correct representation on the label of the size range to which the florets predominantly conform; and/or
- (c) the customary method of declaring size in the country of retail sale.

If a term designating the size of the beans is used:

- (a) it shall be supported by the size in mm as shown in Section 2.4.5.2; and/or
- (b) the words “extra small”, “very small”, “small”, “medium”, or “large” as appropriate; and/or
- (c) by a correct graphic representation on the label of the size range to which the beans predominantly conform; and/or
- (d) the customary method of declaring size in the country in which the product is sold.

**12.7** For the whole kernel cob; there shall appear on the label in conjunction with or in close proximity to the word “corn”:

- a) The words “whole kernel” except that the description “whole grain”, “cut”, “sweet” or “kernels” may be used if this is customary in the country of retail sale.
- b) The colour for example; “yellow” or “white” except that the colour “golden” may be used in lieu of “yellow” if this is customary in the country of retail sale.

**12.8** When other sizes and size designations not included in this standard are used, they shall be indicated on the sales package.

**12.9** Styles – There shall appear on the label in conjunction with, or in close proximity to the name of the product, the style (cut/description/presentation), as defined in the corresponding Annexes.

As regard styles declaration, “whole” and “finger” carrots may be simply designated as “carrots” in countries where this is a customary practice.

**12.10** Other styles – If the product is produced in accordance with the other styles provision (4.1), the label shall contain in conjunction with, or in close proximity to the name of the product, such additional words or phrases that will avoid misleading or confusing the consumer.

**12.11** Size designation – If a term designating the size of whole leek is used, it shall:

- a) Be supported by a statement of the predominant range of the maximum diameter of the leek in mm, or fractions of an inch in those countries where the English system is in general use; and/or
- b) Conform to the customary method of declaring size in the country of retail sale.

**12.12** If an added ingredient, as defined in 5.1.2, 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.

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

#### **12.14 Nutrition declaration**

Any added essential nutrients declaration shall be labelled in accordance with CAC/GL 2, CAC/GL 1 and KS EAS 804.

**12.215 Frozen vegetables containing spices and/or aromatic herbs**

Where the products contain spices and/or aromatic herbs in accordance with 5.1.2.1 c), the term “spiced” and/or the common name of the aromatic herb shall appear on the label near the name of the product.

**12.16 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.

**12.17 List of ingredients**

A complete list of ingredients including added syrup shall be declared on the label in descending order of proportion.

**12.18 Net contents**

The net contents shall be declared by weight in metric units (*Système Internationale*).

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

**12.20 Instructions for use shall be declared****12.21 Storage conditions or conditions for use****12.22 batch code/number or Lot identification**

Each container shall be embossed or otherwise permanently marked in code or in clear identity the producing factory and the lot.

**12.23 Place/country of origin****12.24 Date of expiry****12.25 Date of manufacture****12.26 Irradiation status, where applicable****13 Sampling and test methods**

The products covered by the provisions of this standard shall be sampled and 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.



**Annex A**  
(normative)

**Quick frozen carrots**

**A.1 Defects and allowances**

**A.1.1 Presentation**

**A.1.1.1 Styles**

**a) Whole:**

- 1) **Conical and cylindrical:** Consist of carrots which, after processing, retain the approximate conformation of a whole carrot. The largest diameter at the greatest circumference measured at right angles to the longitudinal axis shall not exceed 50 mm. The variation in diameter between the largest and smallest carrot shall not exceed 4:1.
- 2) **Spherical:** Consist of fully mature carrots of a roundish shape of which the largest diameter in any direction shall not exceed 45 mm.

b) **Finger:** Carrots of the cylindrical type, including sections obtained thereof by transverse cutting, being not less than 30 mm long (apart from arising end pieces).

c) **Halved:** Carrots cut longitudinally into two approximately equal halves.

d) **Quartered:** Carrots cut longitudinally into four approximately equal sections.

e) **Sliced length-wise:** Carrots sliced approximately longitudinally, either smooth or corrugated into four or more units of approximately equal size. Not less than 20 mm long and not less than 5 mm in width measured at the maximum width.

f) **Shoestring or Julienne:** Carrots cut longitudinally, either smooth or corrugated, into strips. The cross section shall not exceed 9.5 mm (measured at the longest side of the cross section).

g) **Sliced or ring cut or roundels:** Carrots cut, either smooth or corrugated at right angles to the longitudinal axis into rings, having a minimum thickness of 2 mm, a maximum thickness of 10 mm and a maximum diameter of 50 mm.

h) **Pieces:** Carrots cut cross-wise into sections having a thickness greater than 10 mm but less than 30 mm or whole carrots which are halved and then cut cross-wise into sections or sections of carrots that may be irregular in shape and size and which are larger than ring cut or double diced.

i) **Diced:** Carrots cut into cubes with edges not exceeding 12.5 mm.

j) **Double dice:** Carrots cut into uniformly shaped units having a cross section that is square and of which the longest dimension is approximately twice that of the shortest dimension - the shortest dimension not exceeding 12.5 mm.

**A.2 Sizing**

a) Quick frozen carrots of the styles whole and finger may be presented sized or unsized.

b) If presented as size-graded, the styles in A.1.1.1 shall conform to one of the three following systems of specification for the size names.

- c) The diameter shall be measured at the point of largest transverse cross-section of the unit in accordance with the following table. However, when other sizes and size designations are used they shall be indicated on the sales package.

**Table A.1 — Sizing for quick frozen vegetables**

Size designation	Diameter
<b>Specification for cylindrical carrots</b>	
a) Small	6 – 23 mm
b) Medium	23 – 27 mm
c) Large	Greater than 27 mm
<b>Specification for conical carrots</b>	
a) Small	10 – 30 mm
b) Medium	30 – 36 mm
c) Large	Greater than 36 mm
<b>Specification for spherical carrots</b>	
a) Very small	Less than 18 mm
b) Small	18 – 22 mm
c) Medium	22 – 27 mm
d) Large	27 – 35 mm
e) Extra large	Over 35 mm

### A.3 Quality factors

#### A.3.1 General requirements

Quick frozen carrots shall be free from objectionable tough parts; and with respect to visual defects subject to a tolerance shall be:

- a) not misshapen (this regards whole and finger carrot style only);
- b) reasonably free from blemishes;
- c) reasonably free from mechanical damage this regards whole and finger carrot style only);
- d) reasonably free from green top;
- e) reasonably free from extraneous vegetable materials(E.V.M.)<sup>1)</sup>; and
- f) reasonably free from unpeeled areas.

<sup>1</sup> Excluding those in A.2.1.

## A.3.2 Analytical characteristics

Mineral impurities measured on a whole product basis not more than 0.1% m/m.

## A.3.3 Definitions of visual defects

Table A.2 — Definitions of visual defects

S/N	Defect	Definition
a)	<b>Extraneous vegetable material</b>	- Harmless vegetable material which does not consist of mature carrot roots.
b)	<b>Misshapen</b>	- Units showing branching, twisting, or other forms of distortion which detract seriously from the appearance of the product (Styles: Whole and Finger). Units (other than small pieces) not possessing the configuration of the defined style.
c)	<b>Major blemishes</b>	- Units with one or more black, dark brown and other intensely discoloured areas due to disease, insect damage, inadequate topping or physiological factors covering an area or aggregate area greater than that of a circle 6 mm in diameter, which detract in a major way from the appearance of the product.
d)	<b>Blemishes</b>	- Units with one or more black, dark brown or other intensely discoloured areas due to disease, insect damage, inadequate topping or physiological factors covering an area or aggregate area greater than that of a circle 3 mm in diameter but less than 6 mm in diameter. - Other types of discolouration which detract noticeably but not in a major way from the appearance of the product.
e)	<b>Unpeeled</b>	- Units showing noticeable unpeeled areas larger than a circle of 6 mm diameter.
f)	<b>Damaged</b>	- Units which are crushed or broken.
g)	<b>Cracked</b>	- Cracks greater than 3 mm wide or other splits which detract materially from the appearance of the product (Styles: "whole", "finger" and "sliced").
h)	<b>Greening</b>	- Units showing green colouration extending down the shoulder or green ring at the top (whole and finger styles). - Units showing green colouration (other styles).
i)	<b>Small pieces</b>	- Units less than 25 mm long for the styles "whole, conical and cylindrical", "finger", "halved", "quartered" and "shoestring or julienne". - Units less than one third the volume of the standard product for the other styles.

j)	<b>Woody</b>	- The core of the carrot is not tender, but has tough, woody texture; it separates very easily from the outer flesh
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#### A.3.4 Minimum sample unit

The minimum sample unit for style, sizing and other visual defects shall be as follows:

**Table A.3 — Minimum sample unit for style, sizing and other visual defects**

a)	E.V.M. and small pieces	1,000 g
b)	Whole, finger, halved, quartered	25 units
c)	Diced, double dice, Shoestring or Julienne, sliced or ring cut, sliced lengthwise, pieces styles	400 g

#### A.3.5 Defects and allowances

A tolerance of 10% by weight of non-conforming units applies to the whole style and 20% for all other styles. If presented size graded the product shall contain not less than 80% by mass of carrots of the declared size.

When the product is presented as “free flowing” a tolerance of 10% (m/m) shall be allowed for pieces which are stuck together to such an extent that they cannot easily be separated in the frozen state.

For tolerances based on the minimum sample unit indicated in A.3.4, visual defects will be scored in accordance with the appropriate tables in this clause (see Figures A.4 and A.5).

**Table A.4 — Whole, finger, halved and quartered styles**

S/N	Defects	Percentage by number	Percentage by weight
a)	Misshapen	3	-
b)	Major blemishes and unpeeled areas	4	-
c)	Blemishes	10	-
d)	Damaged and cracked	4	-
e)	Small pieces	-	15
f)	Greening	12	-
g)	E.V.M.: Not to exceed 2 pieces or 1 g /	-	-
h)	Woody	1	-

S/N	Defects	Percentage by number	Percentage by weight
TOTAL maximum allowance: 22% by number.			

Table A.5 — Ring cut, sliced lengthwise, diced, double diced, shoestring and pieces

S/N	Defects	Percentage by weight	
		Ring cut, sliced lengthwise	Diced, double diced, Shoestring and pieces
a)	Misshapen	6	-
b)	Major blemishes and unpeeled areas	4	5
c)	Blemishes	10	12
d)	Damaged and cracked	4	10
e)	Small pieces	15	20
f)	Greening	12	-
g)	E.V.M.: Not to exceed 2 piece / 1,000 g	-	-
h)	Woody	1	1
Total maximum allowance: 20% by weight for diced, double diced, shoestring and pieces, and 25% by weight for ring cut, sliced lengthwise.			

## Annex B (normative)

### Quick frozen corn-on-the-cob

#### B.1 Presentation

##### B.1.1 Style

- a) **Whole** — The whole, intact ear of corn to which a small part of the stalk may be attached.
- b) **Trimmed whole** — The product obtainable from one whole ear after trimming of both ends.
- c) **Cut cob** — Portions of the whole trimmed ear cut transversely into pieces.

#### B.2 Quality factors

##### B.2.1 General requirements

With respect to visual defects subject to a tolerance, quick frozen corn-on-the-cob shall be:

- a) of reasonably uniform white, cream to yellow (golden) to darker yellow colour; except for mixed colour varieties;
- b) reasonably tender and sufficiently developed;
- c) reasonably uniform in size;
- d) reasonably free from blemished or mechanically damaged areas;
- e) reasonably free from poorly trimmed units (except for whole style); and
- f) reasonably free from extraneous vegetable matter (E.V.M.).

##### B.2.2 Definition of visual defects

- a) **Uniform white, cream yellow (golden) to darker yellow colour** — Means, that all kernels on one ear are of the same colour and that the different units in one sample unit are of the same colour.
  - 1) **Light variation** — Some difference in colour exists, only slightly affecting the appearance
  - 2) **Pronounced variation** — Difference in colour between the different kernels and/or ears are noticeable and affecting the appearance. Uniformity of colour is not applied to mixed coloured varieties
- b) **Uniform in size** — Means that the length of the longest ear in the sample unit does not exceed the length of the shortest ear by more than 50 mm for whole and trimmed whole styles or by more than 20 mm for cut style, and that the largest diameter of the largest unit does not exceed the largest diameter of the smallest unit by more than 15 mm.

- 1) **Minor** - Outside one of the limits (length or diameter) by maximum 5 mm = 1 defect;
  - 2) **Major** - Outside both limits by maximum 5 mm = 2 defects;
  - 3) **Major** - Outside one or both of the limits by more than 5 mm = 4 defects.
- c) **Well developed** — Means that the kernels shall be positioned in a symmetrical pattern in distinct lines or rows which are not seriously affected by missing or shrunken kernels. The whole style may have some shrunken or under-developed parts.
- 1) **Minor** — Appearance materially affected by irregular pattern of kernels = 1 defect;
  - 2) **Major** — More than 10% but less than 15% by count of the kernels missing or shrunken = 2 defects;
  - 3) **Serious** — 15% or more by count of the kernels missing or shrunken = 4 defects.
- d) **In “whole style”** — The length of the part of ear which is shrunken or underdeveloped shall be considered as follows:
- 1) **Minor** — More than 20 mm and up to 25 mm = 1 defect;
  - 2) **Major** — More than 25 mm and up to 30 mm = 2 defects; and
  - 3) **Serious** — More than 30 mm = 4 defects.
- e) **Blemished or mechanically damaged areas**
- 1) **Blemished** — A unit affected by pathological or insect injury with associated discolouration which affects the kernels.
  - 2) **Mechanically damaged** — A unit affected by cuts or by crushing of the kernels. Kernels at the ends of the units which are damaged by cutting shall not be considered as damaged by mechanical injury.
- 1) **Minor** — More than 5% but less than 10% by count of the kernels are slightly affected but not more than 0.5% by count of all kernels are seriously blemished or damaged = 1 defect;
  - 2) **Major** — 10% or more but less than 15% by count of the kernels are slightly affected but not more than 1% by count of all kernels are seriously blemished or damaged = 2 defects.
  - 3) **Serious** — More than 15% by count of the kernels are slightly affected or more than 1% by count of the kernels are seriously affected = 4 defects.
- f) **Poorly trimmed** means (i) ears or cut cobs where at the stem end a small part of stalk remains attached and also means (ii) that the top end of the ear or the cut cob is cut too high leaving under-developed kernels on the cob. For the style “whole” the top is untrimmed and a piece of the stalk of maximum 15 mm may remain attached, and not be considered a defect.
- 1) **Minor** — At one end of unit less than 6 mm left = 1 defect;
  - 2) **Major** — At one end of unit 6 – 12 mm left = 2 defects; and
  - 3) **Serious** — At one end of unit more than 12 mm left = 4 defects.
- g) **E.V.M. (Extraneous vegetable material)**
- 1) **Husk** — Means the membranous outer covering and one of the constituent parts of an ear of corn that is removed during processing.

- 2) **Silk** — Means the coarse thread-like filaments that are one of the constituent parts of an ear of corn. Such silk is found beneath the husk and in immediate contact with the corn kernels (on-the-cob). Corn silk is normally removed during processing. Silk to the total length twice of that of the unit in question are considered normal and not a defect.

- **Minor** — silk to a total length of 2-6 times the length of the units = 1 defect;
- **Minor** — husks not more than 2 squares cm in total surface = 1 defect; and
- **Major** — silk to a total length greater than 6 times the length of the units or husks larger than 2 cm<sup>2</sup> square cm in total surface = 2 defects.

### B.2.3 Minimum sample unit

The minimum sample unit for the respective styles shall be:

- a) Whole and trimmed whole      4 ears
- b) Cut cob      8 pieces of ears

### B.2.4 Defects and allowances

Based on the minimum sample unit defined in B.2.3, visual defects shall be assigned points in accordance with Table B.1 in this clause. The maximum number of defects permitted in the Total Allowable Points rating is indicated for the respective categories Minor, Major and Serious or the Combined Total of the foregoing categories.

**Table B.1 — Defects allowances for all styles**

S/N	Defect	Unit of Measurement	Defect categories			
			Minor	Major	Serious	Total
a)	Kernel colour variation for single colour varieties	One ear	1	2	-	-
i)	Light					
ii)	Pronounced					
b)	Colour variation (ears)	Minimum sample unit	1	2	-	-
i)	Light					
ii)	Pronounced					
c)	Difference in size outside given range (in minimum sample unit)		1	2 or 4	-	-
d)	Not well developed	Each ear	1	2	4	-
e)	Blemished or damaged	Each ear	1	2	4	-
f)	Poorly trimmed	Each ear	1	2	4	-



g)	Extraneous vegetable matter	Minimum sample unit	1	2	-	-
	<b>Total allowable points</b>		<b>21</b>	<b>6</b>	<b>4</b>	<b>21</b>

## Annex C

(normative)

### Quick frozen leeks

#### C.1 Presentation

##### C.1.1 Styles

- a) **Whole leek** — the leek plant with roots and non-tender leaves removed.
- b) **Leek** — parts of the whole leek with a length, corresponding to the longest dimension of the package, but not less than 70 mm.
- c) **Cut leek** — parts of the whole leek, cut perpendicularly to the longitudinal axis, minimum length 30 mm, maximum length 70 mm.
- d) **Leek rings** — parts of the whole leek, cut perpendicularly to the longitudinal axis into slices, not thinner than 10 mm and not thicker than 30 mm.
- e) **Chopped leek** — the whole leek chopped into pieces, such that the original structure is almost entirely lost, resulting in a “unit” generally smaller than 15 mm in size.

##### C.1.2 Colour

Leek may be presented as white; when not more 10% m/m shall be present of leaves or parts of leaves with a green colour.

#### C.2 Sizing

- a) Whole leek and leek, may be presented as sized or unsized;
- b) The minimum diameter of whole leek and leek, measured perpendicularly to the axis immediately above the swelling at the neck shall be not less than 10 mm; and
- c) When sized, the difference between the largest and smallest diameter of the leeks in the same package, measured perpendicularly to the axis immediately above the swelling at the neck, shall be not more than 10 mm.

#### C.3 Quality factors

##### C.3.1 General requirements

Quick frozen leek shall have similar varietal characteristics and be free from objectionable tough parts; and with respect to visual defects or other defects subject to a tolerance, shall be:

- a) free from yellow and/or yellowish leaves;
- b) reasonably free from damage such as staining, discolouration, or insect injury;
- c) reasonably free from extraneous vegetable material (E.V.M.);
- d) reasonably well trimmed;

- e) practically free from loose or detached leaves (in whole style only); and
- f) practically free from hard parts as “seed heads”.

### C.3.2 Analytical characteristics

Mineral impurities — Not more than 0.1% m/m, measured on the whole product basis.

### C.3.3 Definition of visual defects

**Table C.1 — Definition of visual defects**

S/N	Visual defect	Definition
a)	<b>Discolouration</b>	- Discolouration of any kind on the product and which materially detracts from the appearance of the product.
	i) Minor	- Discolouration which is light in colour. Each area or combined area of 4 cm <sup>2</sup> = 1 defect; or if the greatest dimension is less than 20 mm.
	ii) Major	- Discolouration which is dark in colour. Each area or combined area of 4 cm <sup>2</sup> = 1 defect, or the greatest dimension is over 20 mm.
b)	<b>Damaged</b>	- Each leaf or part of leaf that is affected by blemishes, staining or insect injury.
c)	<b>Extraneous Vegetable Material (E.V.M.)</b>	- Each cm <sup>2</sup> harmless vegetable material other than from the leek.
d)	<b>Roots</b>	- Each disk of roots attached to the leek or loose.
e)	<b>Parts of roots</b>	- Parts of roots attached to the leek or loose.
		- The white or pale green portion is less than one-third of the total product.
f)	<b>Poorly trimmed</b>	- For the presentation “white” (Section C 1.2) not more than 10% m/m of green leaves is permitted. - Parts of the seed head.
g)	<b>Loose leaves</b>	- Leaf or part of it, which is detached from the shaft (in whole style only).

### C.3.4 Minimum sample size

The minimum sample size for segregating and evaluating visual defects shall be as follows in Table A.2:

**Table C.2 — Minimum sample size**

S/N	Style	Minimum sample size
a)	Whole leek	20 pieces
b)	Leek, cut leek	500 g
c)	Leek rings	300 g
d)	Chopped leek	300 g

### C.3.5 Method of examination

For separation and enumeration of visual defects the standard sample (see minimum sample size) is placed in water in a deep tray, and the shafts or leaf portions separated one by one.

### C.3.6 Defects and allowances

If size graded, the product shall contain not less than 80% by number of whole leek of the declared size.

For tolerances based on the minimum sample unit indicated in C.3.4, visual defects shall be assigned points in accordance with the appropriate tables in this Section. The maximum number of defects permitted is the Total Allowable Points rating indicated for the respective defect categories Minor and Major or the Combined Total of the foregoing categories (see Tables C.3, C.4 and C.5).

**Table C.3 — Whole leek**

S/N	Defect	Defect categories		
		Minor	Major	Total
a)	Discolouration			
	i) Minor	2		
	ii) Major		2	
b)	Damaged		2	
c)	E.V.M.	1		
d)	Roots		2	
e)	Parts of roots	1		
f)	Poorly trimmed		2	
g)	Loose leaves	1		

	<b>Total Allowable Points</b>	<b>8</b>	<b>6</b>	<b>10</b>
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(Sample Size: 20 pieces)

**Table C.4 — Leek, cut leek, leek rings and chopped leek**

S/N	Defect	Defect categories		
		Minor	Major	Total
a)	Discolouration			
	i) Minor	2		
	ii) Major		2	
b)	Damaged		2	
c)	E.V.M.	1		
d)	Roots		2	
e)	Parts of roots	1		
f)	Poorly trimmed		2	

Minimum sample size 500 g (leek and cut leek) Minimum sample size 300 g (leek rings and chopped leek).

**Table C.5 — Total allowable points**

S/N	Total allowable points	Minor	Major	Total
a)	Leek and cut leek	1	10	12
b)	Leek rings and chopped leek	5	6	6

**Annex D**  
(normative)

**Quick frozen whole kernel corn**

**D.1 Presentation**

**D.1.1 Colour**

- a) Yellow;
- b) White; and
- c) “Other” - colour depends on characteristics of the variety.

**D.2 Quality factors**

**D.2.1 General requirements**

Quick frozen whole kernel corn shall be

- a) of similar varietal characteristics;
- b) of a reasonably uniform colour which may be slightly dull;
- c) before and after cooking, free from foreign flavour and odour, taking into consideration any added optional ingredients;
- d) reasonably tender and sufficiently developed;
- e) reasonably free from loose skins; and with respect to visual defects subject to tolerances shall be:
- f) reasonably free from ragged, crushed or broken kernels;
- g) reasonably free from damaged or blemished kernels;
- h) reasonably free from pieces of cob, husk or silk;
- i) practically free from harmless extraneous vegetable material; and
- j) reasonably free from pulled kernels.

**D.2.2 Definitions of visual defects**

- a) **Damage or blemish** — Means any kernel affected by insect injury or damaged by discolouration, pathological injury, mechanical injury, or by any other means to the extent that the appearance or eating quality is affected. This category of defect may be further classified as “minor”, “major” or “serious” depending upon the extent to which the appearance is affected.
  - i) **Minor** — Means damage or blemish that affects the kernel to only a slight degree.

- ii) **Major** — Means damage or blemish that is quite noticeable and materially affects the kernel.
- b) **Serious** — Means damage or blemish that is very noticeable and of such nature that it would customarily be discarded under normal culinary preparation.
- c) **Cob** — Means the very firm to hard cellulose-like material to which the kernels of corn are attached and from which the kernels are removed during processing.
- d) **Husk** — Means the membranous outer covering and one of the constituent parts of an ear of corn that is removed during processing.
- e) **Silk** — Means the coarse thread-like filaments that are one of the constituent parts of an ear of corn.  
  
Such silk is found beneath the husk and in immediate contact with the corn kernels. Corn silk is normally removed during processing.
- f) **Harmless extraneous vegetable material** — Means vegetable matter other than cob, husk, or silk which is harmless. Such material may include, but is not limited to, grass, weeds, leaves and portions of stalk. This category of defect may be further classified as “minor”, “major” or “serious”, depending upon the amount of severity of the material.
  - 1) **Minor** — Only slightly noticeable and affects the product to only a slight degree.
  - 2) **Major** — Readily noticeable and affects the product to a material degree.
  - 3) **Serious** — Very noticeable and objectionable and would customarily be discarded under normal culinary preparation.
- g) **Pulled kernels** — means kernels of corn that have been so cut or removed from the ear of corn that portions of cob or hard tissue remain. This category of defect may be further classified as “minor” or “major” depending upon the amount of adhering cob that is present.
  - 1) **Minor** — Slight amount of cob material or hard tissue remains around the base of the kernel.
  - 2) **Major** — Moderate to noticeable amount of adhering cob material. (If there is an excessive amount of cob material adhering, apply tolerance given in Table D.1).

### D.2.3 Minimum sample unit

The minimum sample unit shall be 250 g.

### D.2.4 Defects and allowances

For tolerances based on the minimum sample unit indicated in D.2.3, visual defects shall be scored in accordance with Table D.1 in this Section. The maximum percentage of defects permitted in the Total Allowable Percentages rating is indicated for the respective categories “minor”, “major”, “serious” and “pulled kernels” or the Combined Total of the foregoing categories.

a)	Pieces of cob - maximum tolerance	0.6 cm <sup>3</sup>
b)	Husk - maximum tolerance	4.4 cm <sup>2</sup>
c)	Silk - maximum tolerance	160 cm
d)	Ragged, crushed or broken kernels	60 pieces

Table D.1 — Visual defects scoring

Defects	% m/m
Damage or blemish (minor)	5
Damage or blemish (major)	3
Damage or blemish (serious)	1
Harmless E.V.M.	0.2
Pulled Kernels	7
- Minor	2
<b>Total Allowable Percentage</b>	<b>9</b>

Total Defects without (4); 25%

## Annex E (normative)

### QUICK FROZEN BROCCOLI

In addition to the general provisions applicable to quick frozen vegetables, the following specific provisions apply:

#### 1.2 Presentation

##### 1.2.1 Styles

(a) **Spears** - The head and adjoining portion of the stem, with or without small tender attached leaves, ranging in length from more than 7 cm to 16 cm. The spears may be split longitudinally. Within each sample unit not more than 20% by count fall outside the designated length.

(b) **Florets** - The head and adjoining portion of the stem, with or without small tender attached leaves ranging in length from 15 mm to 80 mm with sufficient attached stem to maintain a compact head. The florets may be split longitudinally. Within each sample unit not more than 20% by count fall outside the designated length.

(c) **Cut spears** – Spears, which have been cut into portions and which may be irregular in shape. Pieces from 1.5 cm to 5 cm in the longest dimension. Leaf material may be present but shall not exceed 35% m/m and head material shall not be less than 15% m/m.

(d) **Chopped** - Broccoli finely cut into pieces less than 1.5 cm in the longest dimension. Leaf material may be present but shall not exceed 35% m/m and head material shall not be less than 15% m/m.

### 1.2.2 Sizing

Quick frozen broccoli florets may be presented sized or un-sized.

When sized, a size name designation and size parameter in mm should be indicated on the package. The package shall contain no less than 80.0% by weight of the declared size.

**Table 1: Sizing**

Size Designation	Diameter size range of the head of the florets (mm)
(a) Small florets	12 – 40 mm
(b) Florets	> 40 – 80 mm

## 2.2 Quality Factors

### 2.2.1 General Requirements

Quick frozen broccoli shall be of reasonably uniform dark green to light green depending on the varieties.

The inflorescences shall be firm, compact of fine/ close grained with floral buttons completely closed.

With respect to visual or other defects with a tolerance, quick frozen broccoli shall be reasonably free from:

- (a) an excessive amount of leaf material, particularly large coarse leaves;
- (b) detached fragments and loose leaves (only for spears and florets);
- (c) extraneous vegetable material;
- (d) yellow or brown coloured florets;
- (e) damage due to mechanical, pathological, or insect injury;
- (f) poorly trimmed units (spears and florets);
- (g) flowered or poorly developed units;
- (h) fibrous or woody units.

### 2.2.2 Definition of Visual Defects

(a) **Extraneous vegetable material (E.V.M.)** - means leaf, stem, or similar harmless vegetable material other than from the broccoli plant.

(b) **Detached leaves** (for spears and florets) - mean broccoli leaves and pieces thereof not attached to a unit.

(c) **Fragments** (for spears and florets) - means pieces less than 20 mm in length for spears and weighing less than 5 g for florets.

(d) **Blemished** - A unit or product, which is stained, spotted, affected by discolouration or disease or insect injury.

(i) **Minor** - Slightly affecting the appearance or eating quality.

(ii) **Major** - Materially affecting the appearance or eating quality.

(iii) **Serious** - Seriously affecting the appearance or objectionably affecting the eating quality to such an extent that customarily it would be discarded under normal culinary preparation.

(e) **Mechanical damage** (for spears and florets) - means a unit bearing the general configuration of a spear or floret, but from which more than 50% of the buds have become detached, or otherwise mechanically damaged so as to materially affect the appearance of the product.

(f) **Poorly trimmed** (for spears and florets) - means units in which the appearance is seriously affected by attached coarse leaves or pieces thereof, or ragged removal of leaves, or small side shoots, or poor cutting of the stem.

(g) **Over mature or poorly developed** - means individual buds are in the flowered stage and with respect to spears and florets branching bud clusters which comprise the head are spread so as to seriously affect the



appearance of the unit, or the bud clusters are of such advanced maturity that individual buds and supporting stems from loosely structured clusters.

(h) **Fibrous** - means tough fibre that is normally developed near the outside portion of the broccoli stem; such units are tough but still edible.

(i) **Woody** - means tough fibre that is normally developed near the outside portion of the broccoli stem, such units are extremely tough and highly objectionable.

### 2.2.3 Standard Sample Size

The standard sample size for presentation (styles) shall be 300 g.

### 2.2.4 Defects and Allowances

In addition, the following sample size applies for visual defects

**Table 2: Sample Size**

Styles	Sample Size for Visual Defects
(a) Spears, florets	300 g for detached fragments, loose leaves, and E.V.M.; for other defects 25 units
(b) Cut spears and other styles	300 g
(c) Chopped	100 g

**Table 3: Classification of Defects by Count for Spears and Florets**

Visual Defects	Unit of Measurement	Defect Categories			
		Minor	Major	Serious	Total
(a) E.V.M.	Each piece		2		
(b) Detached leaves	Each 5 g	1			
(c) Fragments					
(i) Spears	Each 20 mm	1			
(ii) Florets	Each 5 g	1			
(d) Blemished	Each unit				
(i) Minor		1			
(ii) Major			2		
(iii) Serious				4	
(e) Mechanical damage	Each unit		1		
(f) Poorly trimmed	Each unit	1			
(g) Over-mature/poorly	Each unit				
(h) Fibrous	Each unit		2		
(i) Woody	Each unit		2		
Total Allowable Points		25	12	4	25

For tolerance based on the standard sample sizes indicated in Section 2.2.3, visual defects shall be assigned points in accordance with the appropriate Table in this Section. The maximum number of defects permitted is the "Total Allowable Points" rating indicated for the respective categories "Minor", "Major" and "Serious" or the "Combined Total" of the foregoing categories.

**Table 4 – Chopped**

Visual Defects	Unit of Measurement	Defect Categories			
		Minor	Major	Serious	Total
(a) E.V.M.	Each piece		2		

(d) Blemished	Each unit				
(i) Minor	Each piece	1			
(ii) Major			2		
(iii) Serious				4	
(c) Over-mature / poorly developed	Each 10 g for cut		2		
	Each 2 g for chopped		2		
(h) Fibrous	Each 2 g		2		
(i) Woody	Each unit 2 g t			4	
Total Allowable Points		25	12	4	25

### 2.3 Definition of “Defectives”

Any standard sample unit, which fails to comply with the quality requirements, as set out in Sections 1.2.1, 2.2.1 and 2.2.4 shall be regarded as a “defective”.

#### 2.4 Lot Acceptance

A lot will be considered acceptable when the number of “defectives” as defined in Section 2.2 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

In applying the acceptance procedure each “defective”, as indicated in Sections 2.2.1 and 2.2.4, is treated individually for the respective categories.

## Annex F (normative)

### QUICK FROZEN BRUSSELS SPROUTS

In addition to the general provisions applicable to quick frozen vegetables, the following specific provisions apply:

#### 1.2 Presentation

##### 1.2.1 Sizing

(a) Quick frozen Brussels sprouts may be presented sized or unsized.

(b) Whether sized or unsized, the amount of frozen sprouts passing a square holed sieve of 12 mm, shall not exceed 5% by number.

(c) If quick frozen Brussels sprouts are presented as size graded, they shall conform to a, size name designation and size parameter in mm should be indicated on the package when measured in the frozen condition. The following system of size designations and diameters is a guide. Other designations including mixtures of sizes are allowed.

Table 1: Size Designation

Size Designation	Diameter of sprouts in mm using a square hole sieve or caliper
(a) Very small	12 – 22 mm
(b) Small	> 22 – 26 mm
(c) Medium	> 26 – 36 mm
(d) Large	over 36 mm

### 2.2 Quality Factors

#### 2.2.1 General Requirements

With respect to visual defects or other defects subject to a tolerance, quick frozen Brussels sprouts shall be reasonably free from

- (a) extraneous vegetable material (E.V.M.);
- (b) loosely structured buds;
- (c) poorly trimmed or mechanically damaged units;
- (d) damage by insects or disease;
- (e) loose leaves.

### 2.2.2 Definition of Visual Defects

- (a) **Extraneous vegetable material (E.V.M.)** - Extraneous material from the Brussels sprouts plant including stem and leaf, but excluding bud leaves and fragments thereof; harmless vegetable material from other plants.
- (b) **Yellow colour** - More than 50% of the outer surface of a sprout yellow in colour due to loss of outer leaves resulting either from over trimming or mechanical damage.
- (c) **Loosely structured** - Sprout not compact, having loosely packed or open leaves. A sprout in which the leaves form a rosette appearance.
- (d) **Perforated leaves** (by insects) - A sprout with one or more surface perforations larger than 6 mm in diameter, showing scar tissue at the edge of the perforation(s).
- (e) **Decayed** - A sprout which shows significant internal or external decomposition.
- (f) **Seriously blemished** - A sprout which is stained, spotted, discoloured or otherwise blemished, covering an aggregate area greater than that of a circle 15 mm in diameter, in such a way as to detract seriously from its appearance/eating quality, and to such an extent that it would be discarded under normal culinary preparation.
- (g) **Blemished** - A sprout which is stained, spotted, discoloured, or otherwise blemished to the extent that the aggregate area affected is greater than the area of a circle 6 mm in diameter, or in such a way as to detract materially but not seriously from its appearance. Sprouts with slight blemishes may be ignored.
- (h) **Poorly trimmed or mechanically damaged unit** - A unit in which: the stem end is very ragged leaving a heel extending more than 10 mm beyond the point of attachment of the lowest outer leaves;
- (i) 4 or more outer leaves have been damaged such that only the petioles remain attached to the stem;
- (ii) the stem extends more than 10 mm below the point of attachment of the lowest outer leaves;
- (iii) the appearance is damaged to an extent that the sprout is lacerated, can be separated easily into two pieces, or more than 25% of its volume has been removed.
- (i) **Loose leaf**: Leaf or leaf fragments detached from the bud.

### 2.2.3 Standard Sample Size

#### 2.2.3.1 Presentation (styles and sizing)

The standard sample size shall be 1 kg.

#### 2.2.3.2 Visual Defects

The standard sample size shall be 1 kg for the assessment of E.V.M. and loose leaf, and 100 sprouts for the assessment of other visual defects.

### 2.2.4 Defects and Allowances

#### 2.2.4.1 Styles – “Free Flowing”

When the product is presented as “free flowing” a tolerance of 10% m/m shall be allowed for pieces which are stuck together to such an extent that they cannot easily be separated in the frozen state.

#### 2.2.4.2 Sizing

If represented as size graded, of the sprouts 12 mm or larger, a minimum of 80% by number shall be of the declared size and a maximum of the following percentages by number of other sizes:

Table 2: Sizing

Size Designation	Very Small	Small	Medium	Large
(a) Max% 12 – 22 mm	-	20	20	5
(b) Max% 22 26 mm	20	-	20	-
(c) Max% 26– 36 mm	5	20	-	20
(d) Max% over 36 mm	0		20	-
Total Max%	20	20	20	20

**2.2.4.3 Visual Defects**

For tolerance based on the standard sample sizes indicated in Section 2.2.3.2, visual defects shall be assigned points in accordance with the Table in this Section. The maximum number of defects permitted is the "Total Allowable Points" rating indicated for the respective categories 1, 2 and 3 or the "Combined Total" of the foregoing categories.

**Table 3: Defects Allowances**

Defect	Unit of Measurement	Defect Categories			Total
		1	2	3	
(a) E.V.M.	Each piece	2			
(b) Loosely structured	Each sprout		2		
(c) Perforated leaves	Each sprout		1		
(d) Decayed	Each sprout			4	
(e) Seriously blemished	Each sprout			2	
(f) Blemished	Each sprout		2		
(g) Poorly trimmed or mechanically damaged	Each sprout		1		
(h) Loose leaf	Each 1% m/m	1			
<b>Maximum Total Allowable Points</b>		<b>10</b>	<b>45</b>	<b>10</b>	<b>55</b>

Maximum percentage by count of (b) Yellow sprouts: 25

**2.3 Classification of "Defectives"**

Any standard sample unit, which fails to comply with the quality requirements, as set out in Sections 2.2.1 and 2.2.4 shall be regarded as a "defective".

**2.4 Lot Acceptance**

A lot will be considered acceptable when the number of "defectives" as defined in Section 2.3 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

In applying the acceptance procedure each "defective", as indicated in Sections 2.2.1 and 2.2.4.3, is treated individually for the respective characteristics.

**Annex G****(normative)****QUICK FROZEN CAULIFLOWER**

**In addition to the general provisions applicable to quick frozen vegetables, the following specific provisions apply:**

**1.2 Presentation****1.2.1 Style**

(a) **Whole** - The whole, intact head, which is trimmed at the base. Small tender modified leaves may be present or attached to the unit;

(b) **Split** - The whole head, cut vertically into two or more sections which may have attached small, tender, modified leaves;

(c) **Florets**<sup>1</sup> - Segments of the head, which may have a portion of the attached, measuring at least 12 mm across the top in the greatest dimension. A maximum tolerance of 20% m/m is permitted for units in which the greatest dimension across the floret is more than 5 mm and less than 12 mm. Small, tender modified leaves may be present or attached to the units.

### 1.2.2 Sizing

**1.2.2.1** Quick frozen cauliflower florets may be presented sized or un-sized. When sized, Size is determined by the maximum diameter of the equatorial section.

**1.2.2.2** If presented as size graded they shall conform to the following specifications.

(a) **Large florets** - Segments of head measuring at least 30 mm across the top in the greatest dimension and of which a portion of secondary stem may be attached. Small tender modified leaves may be present or attached to the unit.

(b) **Small florets** - Segments of head measuring at least 12 mm but less than 30 mm across the top in the greatest dimension and to which a small portion of secondary stem may be attached. Small tender modified leaves may be present or attached to the unit.

## 2.2 Quality Factors

### 2.2.1 General Requirements

Quick frozen cauliflower shall be of reasonably uniform white to dark cream colour over the tops of the units which may be slightly dull and have a tinge of green, yellow or pink. The inflorescences shall be firm, compact, of fine / close grained.

The stem or branch portions may be light green or have a tinge of blue, and with respect to visual defects or other defects subject to a tolerance shall be reasonably:

(a) free from discoloured areas confined essentially to the surface;

(b) free from damaged or blemished areas;

(c) free from fibrous stems;

(d) free from poorly trimmed units;

(e) free from fragments;

(f) compact and reasonably well-developed;

(g) free from coarse green leaves;

(h) free from loose stems (for floret styles).

### 2.2.2 Definition of Visual Defects

Table 1 – Definition of Visual Defects

(a) Discolouration	(i) Light - The discolouration disappears almost entirely upon cooking.
	(ii) Dark - The discolouration does not disappear upon cooking.
(b) Blemished	(i) <b>Minor</b> - The appearance of the unit is only slightly affected.
	(ii) <b>Major</b> - The appearance of the unit is materially affected.
	(iii) <b>Serious</b> - The appearance of the unit is objectionably affected to such an extent that it would customarily be discarded under normal culinary preparation.
(c) Mechanically damaged	(i) <b>Major</b> - A unit in which more than 50% of the curd has been mechanically damaged or is missing (for split and floret styles).

	(ii) <b>Major</b> - A unit in which more than 25% of the curd has been mechanically damaged or is missing (for whole style).
(d) Fibrous	(i) <b>Major</b> - A unit which possesses tough fibres that are quite noticeable and materially affect the eating quality. (ii) <b>Serious</b> - A unit which possesses tough fibres that are objectionable and of such nature that it would be customarily discarded
<b>(e) Poorly trimmed</b> - A unit which has deep-knife gouges or a ragged appearance.	
<b>(f) Leaves</b> - Coarse green leaves or parts thereof whether or not attached to the unit.	
<b>(g) Fragments</b> - Portions of the floret 5 mm or less across the greatest dimension.	
<b>(h) Not compact</b> - A unit in which the florets are spreading, or the flowerhead has a "ricey" appearance or the flowerhead is very soft or mushy.	
<b>(i) Loose stem</b> - Each piece of stem exceeding 2.5 cm in length detached from a cauliflower unit.	

### 2.2.3 Standard Sample Size

The standard sample size for presentation 3 shall be 500 g having a minimum of 50 florets.

### 2.2.4 Defects and Allowances

When cauliflower is presented as sized, a tolerance of 20% by weight is permitted as not conforming to the size indicated on the package.

For tolerances based on the standard sample size indicated in Section 2.2.3, visual defects shall be assigned points in accordance with the Tables 2 and 3. The maximum number of defects permitted is the "Total Allowable Points" rating indicated for the respective categories Minor, Major and Serious or the "Combined Total" of the foregoing categories

**Table 2 – Whole Style**

Defect		Unit of Measurement	Defect Categories			
			Minor	Major	Serious	Total
(a) Discolouration	(i) Light	Each area or combined area of 8 cm <sup>2</sup>	1			
	(ii) Dark	Each area or combined area of 4 cm <sup>2</sup>		2		
(b) Blemished	(i) <b>Minor</b>	Each head	1			
	(ii) <b>Major</b>			2		
	(iii) <b>Serious</b>				4	
(c) Mechanically damaged	(i) <b>Major</b>	Each head		2		
(d) Fibrous	(i) <b>Major</b>	Each head		2		

	(ii) Serious				4	
(e) Poorly trimmed leaves		Each head		2		
		Each 2 cm <sup>2</sup>		2		
(f) Not compact		Each area or combined area of 12 cm <sup>2</sup>		2		
<b>Total Allowable Points</b>			<b>10</b>	<b>6</b>	<b>4</b>	<b>10</b>

Table 3 Split, Florets and Other Styles

Defect		Unit of Measurement	Defect Categories			
			Minor	Major	Serious	Total
(a) Discolouration	(i) Light	Each area or combined area of 8 cm <sup>2</sup>	1			
	(ii) Dark	Each area or combined area of 4 cm <sup>2</sup>		2		
(b) Blemished	(i) Minor.	Each unit	1			
	(ii) Major			2		
	(iii) Serious				4	
(c) Mechanically damaged	(i) Major	Each unit		2		
(d) Fibrous	(i) Major	Each unit		2		
	(ii) Serious				4	
(e) Poorly trimmed leaves		Each unit	1			
		Each 2 cm <sup>2</sup>		2		
(f) Fragments		Each 3% m/m		2		
(g) Not compact		Each area or combined area of 12 cm <sup>2</sup>		2		
(h) Loose stem		Each piece				
<b>Total Allowable Points</b>			<b>25</b>	<b>16</b>	<b>4</b>	<b>25</b>

### 2.3 Classification of “Defectives”

Any standard sample unit which fails to comply with the quality requirements, as set out in Sections 2.2.1 and 2.2.4 shall be regarded as a “defective”.

### 2.4 Lot Acceptance

A lot will be considered acceptable when the number of “defectives” as defined in Section 2.2 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

## Annex H (normative)

**QUICK FROZEN FRENCH FRIED POTATOES**

In addition to the general provisions applicable to quick frozen vegetables, the following specific provisions apply:

**1.2 Presentation****1.2.1 Styles**

The styles of the product shall be determined by the nature of the surface and the nature of the cross section.

**1.2.1.1 Nature of the Surface**

The product may be presented in any one of the following styles including:

- (a) **Straight cut** - Strips of potato with practically parallel sides and with smooth surfaces;
- (b) **Crinkle cut** - Strips of potato with practically parallel sides and in which two or more sides have a corrugated surface.

**1.2.1.2 Dimensions of the cross section**

The cross sectional dimensions of strips of quick frozen French fried potatoes that have been cut on all four sides (Styles (a) and (b) above) shall not be less than 4 mm when measured in the frozen condition. The quick frozen French fried potatoes within each pack shall be of similar cross sectional dimensions.

The product may be identified:

- (a) by the approximate dimensions of the cross sections or by reference to the following system for designations:

**Table 1. Size designations**

<b>Designation</b>	<b>Dimension in mm across the largest cut surface</b>
(a) Shoestring	4 - 8
(b) Medium	> 8 - 12
(c) Thick cut	> 12 - 16
(d) Extra large	> 16

**Uniformity**

Uniformity may be expressed as a tolerance of 10% by length of non-conforming styles units applies, when specific lengths are not indicated.

**2.2 Quality Factors****2.2.1 General Requirements**

Quick frozen French fried potatoes shall:

- (a) be free from any foreign flavours and odours;
- (b) be clean, sound and practically free from foreign matter;
- (c) have a reasonably uniform colour.

and with respect to visual defects subject to a tolerance shall be:

- (a) without excessive external defects such as blemishes, eyes and discolouration;
- (b) without excessive sorting effects, such as slivers, small pieces and scrap;
- (c) reasonably free from frying defects, such as burnt parts.

When prepared in accordance with the manufacturer's instructions quick frozen French fried potatoes shall:

- (a) have a reasonably uniform desired colour;
- (b) have a texture characteristic of the product and be neither excessively hard nor excessively soft or soggy.

**2.2.2.3 Definition of Visual Defects**



<b>External defects:</b> are blemishes or discolouration (either internally or on the surface) due to exposure to light, mechanical, pathological or pest agents, eye material or peeling remnants.
(a) <b>Minor defect</b> - A unit affected by disease, dark or intense discolouration, eye material, or dark peel covering an area or a circle greater than 3 mm but less than 7 mm in diameter; pale brown peel or light discolouration of any area greater than 3 mm in diameter.
(b) <b>Major defect</b> - A unit affected by disease, dark or intense discolouration, eye material, or dark peeling covering an area or a circle greater than 7 mm but less than 12 mm in diameter.
(c) <b>Serious defect</b> - A unit affected by disease, dark or intense discolouration, eye material, or dark peel covering an area or a circle of 12 mm in diameter or more.
<b>Note:</b> "Slight" external defects which in either area or intensity fall below the definition shown for minor defects shall be ignored.
<b>Sorting Defects</b>
(a) <b>Sliver</b> - A very thin unit (generally an edge piece) which will pass through a slot the width of which is 50% of the minimum dimension of the nominal or normal size.
(b) <b>Small piece</b> - Any unit less than 25 mm in length.
(c) <b>Scrap</b> - Potato material of irregular form not conforming to the general conformation of French fried potatoes.
<b>Frying Defects</b>
Burnt pieces - Any unit which is dark brown to black and hard due to gross over frying.

### 2.2.3 Standard Sample Size

The standard sample size shall be 1 kg.

### 2.2.4 Tolerances for Visual Defects

For tolerances based on the standard sample size as specified in Section 2.2.4 the visual external defects are classified as "minor" or "major" or "serious". The tolerances in respect of external defects are dependent on the cross section of the French fried potatoes.

To be acceptable, the standard samples shall not contain units in excess of the numbers shown for the respective categories, including total, in Table 2.

**Table 2: Tolerances for External Defects**

Defect category	Number of units affected cross section of strips	
	4 - 16 mm	over 16 mm
(a) Serious	7	3
(b) Serious + major	21	9
Total (serious + major + minor)	60	27

The tolerances for the other defects (not depending on cross section) (depending on the style) are:

**Table 3. Sorting defects (Grades)**

Slivers	maximum 12% m/m
Small Pieces and Scraps	maximum 6% m/m
Total Sorting Defects	maximum 12% m/m
Frying Defects	maximum 0.5% m/m

### 2.3 Classification of "Defectives"

Any sample unit taken shall be regarded as a "defective" for the respective characteristics when it:

(a) fails to meet any of the requirements given in Section 2.1;

(b) fails to meet any of the general requirements given in Section 2.2.1;

(c) exceeds the tolerances for visual defects in any one or more respective defect categories in Section 2.2.5.

#### 2.4 Lot Acceptance for composition and quality factors

A lot will be considered acceptable with respect to composition and quality factors when the number of “defectives” as defined in Section 2.2 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

In applying the acceptance procedure each “defective”, as indicated in Section 2.3(a) to (c), is treated individually for the respective characteristics.

### Annex I (normative)

#### QUICK FROZEN GREEN BEANS AND WAX BEANS

In addition to the general provisions applicable to quick frozen vegetables, the following specific provisions apply:

#### 1.2 Presentation

##### 1.2.1 Type

Green beans or wax beans having distinct varietal differences with regard to shape may be designated as:

(a) **Round** - Pods having a width not greater than  $1\frac{1}{2}$  times the thickness.

(b) **Flat** - Pods having a width greater than  $1\frac{1}{2}$  times the thickness.

##### 1.2.2 Styles

Quick frozen green beans and quick frozen wax beans shall be presented in the following styles:

(a) **Whole**: Whole pods of any length.

(b) **Cut**: Transversely cut pods in which 70% or more by count of the units are at least 20 mm long but not longer than 65 mm.

(c) **Short cut**: Transversely cut pods in which 70% or more by count of the units are more than 10 mm but less than 20 mm long.

(d) **Diagonal cut**: pods cut approximately 45° to the longitudinal axis in which 70% by count of the units are more than 6 mm long.

(e) **Sliced/French Cut**: pods sliced lengthwise or at an angle up to approximately 45° to the longitudinal axis, with a maximum thickness of 7 mm.

##### 1.2.3 Colour (for wax beans only)

The predominant colour of the pods of wax beans excluding the seeds and immediate surrounding tissue shall be yellow, or yellow with a green tinge.

##### 1.2.4 Sizing

(a) Quick frozen whole and cut green beans and wax beans may be presented sized or unsized.

(b) If round type beans are presented as size graded on diameter, they shall conform when measured in the thawed conditions, to the following size designation for the size names. However, other size designations may be used, and should be labelled accordingly.

Table 1: Size designation

Designations	Bean pod diameter in mm measured by passing through parallel bars
(a) Extra small	up to 6.5

(b) Very small	up to 8
(c) Small	up to 9.5
(d) Medium	up to 11
(e) Large	over 11

## 2.2 Quality Factors

### 2.2.1 General Requirements

With regard to visual defects subject to a tolerance, quick frozen beans shall be:

- (a) without excessive small pieces;
- (b) normally developed (for whole beans);
- (c) reasonably free from extraneous vegetable material (E.V.M.);
- (d) reasonably free from stem ends;
- (e) reasonably free from damage by insects or disease;
- (f) reasonably free from mechanically damaged units;
- (g) reasonably free from tough strings and fibrous units.

### 2.2.2 Definition of Visual Defects

(a) **Extraneous Vegetable Material:** Vegetable material from the bean plant, other than pod, such as leaf or vine, but excluding stem ends; other harmless vegetable material, not purposely included as an ingredient. For the purpose of assessment, E.V.M. comprising bean leaf material will be differentiated from other E.V.M.

(b) **Stem end:** A piece of the immediate stem which attaches the pod to the vine stem whether still attached to the unit or loose in the product.

(c) **Major blemish:** Each piece blemished due to insect or pathological damage affecting an area greater than a 6 mm diameter circle, 2 mm to 4 mm for the “extra small” size or blemished by other means to a degree which seriously detracts from its appearance.

(d) **Minor blemish:** Each piece blemished due to insect or pathological damage affecting an area greater than a 3 mm diameter circle, 2 mm to 4 mm for the “extra small” size or blemished by other means to a degree which seriously detracts from its appearance.

(e) **Mechanical damage** (whole and cut styles): a unit that is broken or split into two parts, crushed, or has very ragged edges to an extent that the appearance is seriously affected.

(f) **Undeveloped** (whole style only): Each unit which measures less than 3 mm at its widest point.

(g) **Tough strings:** Tough fibre which will support a weight of 250 g for 5 seconds or more when tested in accordance with the procedure as given in CAC/RM 39-1970.

(h) **Fibrous unit:** Each piece having parchment - like material formed during the ripening of the pod, to the extent that the eating quality is seriously affected.

(i) **Edible fibre** means fibre developed in the wall of the bean pod that, after cooking, is noticeable upon chewing, but can be consumed with the rest of the bean material without objection.

(ii) **Inedible fibre** means fibre developed in the wall of the bean pod that, after cooking, is objectionable upon chewing and tends to separate from the rest of the bean material.

(iii) **Small pieces** (cut and sliced styles): bean pieces less than 10 mm in length including loose seeds and pieces of seeds; - (whole style) bean pieces less than 20 mm in length including loose seeds and pieces of seeds.

### 2.2.3 Standard Sample Size

#### 2.2.3.1 Presentation

The standard sample size for sizing shall be 1 kg.

#### 2.2.3.2 Visual Defects

The standard sample size is 1 kg for E.V.M. and stem ends, and 300 g for other defect categories.

### 2.2.4 Defects and Allowances

#### 2.2.4.1 Presentation

(a) When the product is presented as “free-flowing” a tolerance of 10% (m/m) shall be allowed for pieces which are stuck together to such an extent that they cannot easily be separated in the frozen state. When assessing this factor, the sample unit shall be the entire contents of the pack or 1 kg.

(b) If presented as size graded, the product shall contain not less than 80% by number of bean pods of the declared size or smaller sizes. Of the 20% by number which may be of larger sizes, not more than a quarter may be of the second size larger and none may be larger than the second size larger.

#### 2.2.4.2 Visual Defects

For tolerance based on the standard sample size indicated in Section 2.2.3, visual defects shall be assigned points in accordance with Table 2. The maximum number of defects permitted is the “Total Allowable Points” rating indicated for the respective categories 1, 2 and 3 or the “Combined Total” of the foregoing categories.

**Table 2. Defect Tolerances by Count**

Defect	Defect Categories			Total
	1	2	3	
(a) E.V.M.				
(i) Bean leaf (each piece)	1			
(ii) Other E.V.M. (each piece)	2			
(b) Stem end	1			
(c) Major blemish		3		
(d) Minor blemish		1		
(e) Mechanical damage (whole and cut styles)		1		
(f) Undeveloped (whole style)		2		
(g) Tough strings			3	
(h) Fibrous unit			1	
(A) All but whole style	15	50	10	60
(B) Whole style only	15	30	6	40
(i) Small pieces (whole, cut and sliced styles) - maximum 20% m/m				

#### 2.3 Definition of “Defectives”

Any standard sample unit, which fails to comply with the quality requirements, as set out in Sections 2.2.1 and 2.2.4 shall be regarded as a “defective”.

## 2.4 Lot Acceptance

A lot will be considered acceptable when the number of “defectives” as defined in Section 2.3 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

In applying the acceptance procedure each “defective”, as indicated in Sections 2.2.1 and 2.2.4.2, is treated individually for the respective characteristics.

## Annex J (normative)

### QUICK FROZEN PEAS

In addition to the general provisions applicable to quick frozen vegetables, the following specific provisions apply:

#### 1.1.1 Types

(a) Any suitable variety of peas conforming to species *Pisum sativum* L may be used.

(b) The product shall be presented as “peas” or may be presented as “garden peas” provided they meet the organoleptic and analytical characteristics.

(c) Sweet green wrinkled varieties or hybrids having similar characteristics included.

#### 1.2 Presentation

##### 1.2.1 Sizing

1.2.1.1 Quick frozen peas of either type may be presented sized or un-sized.

1.2.1.2 If peas are size graded they shall conform to one of the two following systems of specifications for the size names. Other size ranges and designations may be used and should be labelled accordingly.

Table 1 – Specifications for Sizing

Size Designation	Round Hole Sieve Size In mm
<b>Specification A</b>	
1) Small	up to 8.75
2) Medium	up to 10.2
3) Large	over 10.2
<b>Specification B</b>	
1) Extra small up to 7.5	1) Extra small up to 7.5
2) Very small up to 8.2	2) Very small up to 8.2
3) Small	3) Small

##### 1.2.1.3 Tolerances for Sizes

If size graded, the product shall have a minimum of 80% either by number or weight of peas of the declared size, or of smaller sizes. It shall contain no more than 20% either by number or weight of peas of the next two larger adjoining sizes when applicable.

#### 2.2 Quality Factors

##### 2.2.1 Organoleptic and other characteristics

2.2.1.1 The product shall be of a reasonably uniform green colour according to type, whole, clean, practically free from foreign matter, free from any foreign taste or smell and practically free from damage by insects or diseases.

2.2.1.2 The product shall have a normal flavour, taking into consideration any seasonings or ingredients added.

##### 2.2.3 Definition of Defects

(a) **Blond Peas** means peas which are yellow or white but which are edible (that is, not sour or rotted).

(b) **Blemished Peas** means peas which are slightly stained or spotted.

(c) **Seriously Blemished Peas** means peas which are either hard, shrivelled, spotted, discoloured, worm-eaten or otherwise blemished to an extent that the appearance or eating quality is seriously affected.

(d) **Pea fragments** means portions of peas, separated or individual cotyledons, that are crushed, partially broken, broken or loose skins, excluding entire intact peas with skins detached.

(e) **Extraneous Vegetable Material (E.V.M.)** means any vine, leaf or pod material from the pea plant, or other harmless vegetable material.

#### 2.2.4 Standard Sample Size

The standard sample size for presentation shall be 500 g.

#### 2.2.5 Tolerances for Visual Defects

Based on a sample unit of 500 g the end product shall have not more than the following:

**Table 2. Tolerances for Visual Defects**

Blond Peas	2% m/m
Blemished Peas	5% m/m
Seriously Blemished Peas	1% m/m
Pea Fragments	12% m/m
E.V.M.	0.5% m/m but not more than 12 cm <sup>2</sup> in area

### 2.3 Classification of “Defectives”

Any standard sample unit, which fails to comply with the quality requirements, as set out in Sections 2.2.1 and 2.2.2 shall be regarded as a “defective”.

In addition, any standard sample unit which fails to comply with the quality requirements shall be regarded as a “defective” when any of the defects listed under Section 2.2.3 is present in more than twice the amount of the specified tolerance for the individual defect as listed under Section 2.2.4 or if the total of Section 2.2.4 from (a) to (d) inclusive exceeds 15% m/m.

### 2.4 Lot Acceptance

A lot will be considered acceptable when the number of “defectives” as defined in Section 2.3 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

## Annex K (normative)

### QUICK FROZEN SPINACH

**In addition to the general provisions applicable to quick frozen vegetables, the following specific provisions apply:**

#### 1.2 Presentation

##### 1.2.1 Styles

(a) **Whole spinach** - The complete tender/young spinach plant with root removed;

(b) **Leaf spinach** - Substantially whole leaves most of which are separated from the root crown with a maximum length of the stem of 10 cm;

- (c) **Cut-leaf spinach** - Parts of leaves of spinach generally larger than 20 mm in the smallest dimension;
- (d) **Chopped spinach** - Spinach leaves cut into small pieces ranging from 3 to 10 mm in the largest dimension, but not comminuted to a pulp or puree;
- (e) **Pureed spinach** (spinach puree) - Spinach finely chopped which passes through a sieve such that the leaf particles are less than 3 mm dimension.

## **2.2 Quality Factors**

### **2.2.1 Uniformity**

A tolerance of 10% by weight of non-conforming styles applies.

### **2.2.2 General Requirements**

Quick frozen spinach shall be practically free from tough fibrous material and for the styles of “whole leaf” and “cut leaf” not materially disintegrated due to mechanical damage; and, with respect to visual defects or other defects subject to a tolerance, shall be:

- (a) well drained and containing no excess water;
- (b) practically free from sand and grit;
- (c) practically free from loose or detached leaves in “whole” style only;
- (d) practically free from root material;
- (e) reasonably free from discoloured leaves or portions thereof;
- (f) reasonably free from flower stems (seed heads);
- (g) reasonably free from flower buds;
- (h) reasonably free from crown and portion thereof, except for “whole” spinach;
- (i) reasonably free from extraneous vegetable material (E.V.M.).

### **2.2.4 Definition of Visual Defects**

- (a) **Loose leaves (“whole” style only)** - Leaves which are detached from the crown.
- (b) **Discolouration** - Discolouration of any kind on the leaves or stem portions and which materially detracts from the appearance of the product.
  - (i) **Minor** - Discolouration which is light in colour;
  - (ii) **Major** - Discolouration which is dark brown or black in colour.
- (c) **Extraneous Vegetable Matter** - Harmless vegetable material such as grass, (E.V.M) weeds, straw, etc.
  - (iii) **Minor** - E.V.M. which is green and tender;
  - (iv) **Major** - E.V.M. which is other than green or is coarse.
- (d) **Seed heads (flower stems)** - The flower bearing portion of the spinach plant, which is longer than 25 mm;
- (e) **Flower buds** - The separate flower buds detached from the seed head;
- (f) **Crowns (exclusive of “whole” style)** - The solid area of the spinach plant between the root and the attached leaf clusters;
- (g) **Root material** - Any portion of the root, either loose or attached to leaves.

### **2.2.5 Standard Sample Size**

The standard sample size for segregating and evaluating visual defects shall be as indicated in Table 1.

**Table 1. Sample Size**

<b>Style</b>	<b>Standard Sample Size (g)</b>
(a) Whole and leaf	300
(b) Cut leaf	300
(c) Chopped	100
(d) Pureed	100

### **2.2.6 Method of Examination**

For separation and enumeration of visual defects the test sample (standard sample size) is placed in water in a deep tray, and the leaves or leaf portion separated one by one.

### 2.2.7 Defects and Allowances

For tolerances based on the standard sample sizes indicated in Section 2.2.4, visual defects shall be assigned points in accordance with the appropriate Table in this Section. The maximum number of defects permitted is the "Total Allowable Points" rating indicated for the respective categories Minor, Major and Serious or the "Combined Total" of the foregoing categories.

Defect	Unit of Measurement	Defect Categories			
		Minor	Major	Serious	Total
(a) Loose Leaves (whole style only)	Each Leaf	1			
(b) Discolouration	Each 4 cm <sup>2</sup>				
(i) Minor		1			
(ii) Major			2		
(c) E.V.M.	Each 5 cm				
(i) Minor		1			
(ii) Major			2		
(d) Seed heads	Each whole head		2		
	Each portion	1			
(e) Crown (exclusive of "whole" style)	Each whole crown		2		
	Each Part				
(f) Root material				4	
Total Allowable Points		20	10	4	20

Table 3 - Chopped Style

Defect	Unit of Measurement	Defect Categories		
		Minor	Major	Total
(b) Discolouration	Each cm <sup>2</sup>			
(i) Minor		1		
(ii) Major			2	
(c) E.V.M.	Each 1 cm			
(i) Minor		1		
(ii) Major			2	
(c) Flower buds	Each 50 pieces	1		
(d) Crown material	Each piece		2	
(e) Root material	Each piece		2	
Total Allowable Points		20	10	20



Table 4 - Pureed Style

Defect	Allowance
Any dark particle or flower bud	Shall not affect the overall appearance of the product

**2.3 Classification of “Defectives”**

Any standard sample unit, which fails to comply with the quality requirements, as set out in Sections 2.1.1, 2.1.6 and 2.2.1 shall be regarded as a “defective”.

**2.4 Lot Acceptance**

A lot will be considered acceptable when the number of “defectives” as defined in Section 2.2 does not exceed the acceptance number (c) for the appropriate sample plan with an AQL of 6.5.

In applying the acceptance procedure each “defective”, as indicated in Section 2.2, is treated individually for the respective characteristics.

## Annex L (normative)

### Determination of water capacity of containers (CAC/RM 46-1972)

**E.1 Scope**

This method applies to glass containers.

**E.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.

**E.3 Procedure**

**E.3.1** Select a container which is undamaged in all respects.

**E.3.2** Wash, dry and weigh the empty container.

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

**E.4 Calculation and expression of results**

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

## Annex M (normative)

### Sampling plans

The appropriate inspection level is selected as follows:

**Inspection level I**  
**Inspection level II**

**Normal sampling**  
**Disputes, (Codex referee purposes sample size),**  
**enforcement or need for better lot estimate**  
**Sampling plan 1 (Inspection level I, AQL = 6.5)**

Net weight is equal to or less than 1 kg (2.2 LB)		
Lot size (N)	Sample size (n)	Acceptance number (c)
4,800 or less	6	1
4,801 - 24,000	13	2
24,001 - 48,000	21	3
48,001 - 84,000	29	4
84,001 - 144,000	38	5
144,001 - 240,000	48	6
More than 240,000	60	7
Net weight is greater than 1 kg (2.2 LB) but not more than 4.5 kg (10 LB)		
Lot size (N)	Sample size (n)	Acceptance number (c)
2,400 or less	6	1
2,401 - 15,000	13	2
15,001 - 24,000	21	3
24,001 - 42,000	29	4

42,001 - 72,000	38	5
72,001 - 120,000	48	6
More than 120,000	60	7
<b>Net weight greater than 4.5 kg (10 LB)</b>		
<b>Lot size (N)</b>	<b>Sample size (n)</b>	<b>Acceptance number (c)</b>
600 or less	6	1
601 - 2,000	13	2
2,001 - 7,200	21	3
7,201 - 15,000	29	4
15,001 - 24,000	38	5
24,001 - 42,000	48	6
more than 42,000	60	7

**Sampling plan (Inspection level II, AQL = 6.5)**

<b>Net weight is equal to or less than 1 kg (2.2 LB)</b>		
<b>Lot size (N)</b>	<b>Sample size (n)</b>	<b>Acceptance number (c)</b>
4,800 or less	13	2
4,801 - 24,000	21	3
24,001 - 48,000	29	4
48,001 - 84,000	38	5
84,001 - 144,000	48	6
144,001 - 240,000	60	7
More than 240,000	72	8
<b>Net weight is greater than 1 kg (2.2 LB) but not more than 4.5 kg (10 LB)</b>		
<b>Lot size (N)</b>	<b>Sample size (n)</b>	<b>Acceptance number (c)</b>
2,400 or less	13	2
2,401 - 15,000	21	3
15,001 - 24,000	29	4
24,001 - 42,000	38	5
42,001 - 72,000	48	6
72,001 - 120,000	60	7
More than 120,000	72	8
<b>Net weight greater than 4.5 kg (10 LB)</b>		

Lot size (N)	Sample size (n)	Acceptance number (c)
600 or less	13	2
601 - 2,000	21	3
2,001 - 7,200	29	4
7,201 - 15,000	38	5
15,001 - 24,000	48	6
24,001 - 42,000	60	7
More than 42,000	72	8