

CODEX STANDARD FOR QUICK FROZEN CARROTS**CODEX STAN 140-1983****1. SCOPE**

This standard shall apply to quick frozen carrots of the species *Daucus carota* L. as defined below and offered for direct consumption without further processing, except for repacking, if required. It does not apply to the product when indicated as intended for further processing or for other industrial purposes.

2. DESCRIPTION**2.1 Product Definition**

Quick frozen carrots are the product prepared from 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.

2.2 Process Definition

Quick frozen carrots are the product subjected to a freezing process in appropriate equipment and complying with the definitions laid down hereafter. 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 has reached -18°C (0°F) at the thermal centre after thermal stabilization.

The recognized practice of repacking quick frozen products under controlled conditions is permitted.

2.3 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 will be handled in accordance with the provisions in the Recommended International Code of Practice for the Handling of Quick Frozen Foods (CAC/RCP 8-1976).

2.4 Presentation**2.4.1 Types** only for the styles Whole:

- (a) *Long* - any suitable variety of conical (e.g. Chantenay) or cylindrical (e.g. Amsterdam) cultivars of carrot.
- (b) *Round* - any suitable variety which has the appearance of spherical cultivar (e.g. Paris Carrot).

2.4.2 Styles:

- (a) **Whole**

- (i) *Conical and cylindrical cultivars* (e.g. Chantenay and Amsterdam types)
 - consist of carrots which, after processing, retain the approximate conformation of a whole carrot. The shortest 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.
- (ii) *Spherical cultivars* (e.g. Paris type)
 - 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 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.

2.4.3 Other Styles

Any other presentation of the product shall be permitted provided that it:

- (a) Is sufficiently distinctive from other forms of presentation laid down in this standard.

- (b) Meets all other requirements of this standard.
- (c) Is adequately described on the label to avoid confusing or misleading the consumer in accordance with Section 6.1.3.

2.4.4 Tolerances for Styles

A tolerance of 10 percent by weight of non-conforming units applies to the whole style and 20 percent for all other styles.

2.4.5 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 Section 2.4.5 (a), dependent on the cultivar used, 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.

Specification for Cylindrical Cultivars

Size Designation	Diameter
Small	6 - 23 mm
Medium	23 - 27 mm
Large	Greater than 27 mm

Specification for Conical Cultivars

Size Designation	Diameter
Small	10 - 30 mm
Medium	30 - 36 mm
Large	Greater than 36 mm

Specification for Spherical Cultivars

Size Designation	Diameter
Very small	Less than 18 mm
Small	Between 18 and 22 mm
Medium	Between 22 and 27 mm
Large	Between 27 and 35 mm
Extra large	Over 35 mm

2.4.6 Tolerances for Size

If presented size graded the product shall contain not less than 80 percent by mass of carrots of the declared size.

2.4.7 Standard Sample Unit for Presentation and Sizing

See Section 3.2.4(2) and 3.2.4(3).

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Optional Ingredients

3.1.1 Salt (sodium chloride), sucrose, invert sugar syrup, dextrose, glucose syrup, dried glucose syrup, fructose and fructose syrup.

3.1.2 Aromatic herbs and spices; 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 percent m/m of the total drained vegetable ingredient.

3.2 Quality Factors

3.2.1 General Requirements

Quick frozen carrots shall be:

- of a reasonable uniform colour, conforming to the colour characteristics of the variety;
- clean and sound;
- have a normal flavour and odour, free from foreign flavour and odour, taking into consideration added optional ingredients;
- free from objectionable tough parts;

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

- not misshapen; (this regards whole and finger carrot style only);
- reasonably free from blemishes;
- reasonably free from mechanical damage this regards whole and finger carrot style only);
- reasonably free from green tops;
- reasonably free from extraneous vegetable materials (EVM);
- reasonably free from unpeeled areas.

3.2.2 Analytical Characteristics

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

3.2.3 Definition of Visual Defects

Defect	Definition
of Extraneous Vegetable Material (EVM)	Harmless vegetable material which does not consist carrot roots

Misshapen	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
Major Blemishes	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
Blemishes	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
Unpeeled	Units showing noticeable unpeeled areas larger than a circle of 6 mm diameter
Damaged	Units which are crushed or broken
Cracked	Cracks greater than 2 mm wide or other splits which detract materially from the appearance of the product (Styles: Whole and Finger)
Greening	Units showing green colouration extending down the shoulder or green ring at the top (Whole and Finger Styles). units showing green colouration (other styles).
Small Pieces	- 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.

3.2.4 Standard Sample Unit

(i) EVM and small pieces

1 000 g

- (ii) Whole, Finger, Halved, Quartered 100 units
- (iii) Diced, Double Dice, Shoestring,
Julienne, Sliced or Ring Cut,
Sliced Lengthwise, Pieces Styles 400 g

3.2.5 Classification and Tolerances for Visual Defects

For tolerances based on the standard sample unit indicated in Section 3.2.4 visual defects shall be assigned points in accordance with Tables 1 and 2. The maximum number of points shall not exceed the Total Allowable Points rating given under Categories A or B or the Overall Total,.

Table 1

Whole, Finger, Halved and Quartered Styles

Defect	Classification	Defect A	Categories B	Overall Total	
Misshapen)	Each Unit	2			
Major Blemishes)			2		
Blemishes)				1	
Unpeeled Areas)				1	
Damaged)			2		
Cracked)			1		
Greening)				1	
Total Allowable Points:		25	30	40	
Small Pieces: Not to exceed 15% m/m					
EVM: Not to exceed 2 Pieces or 1 g/1000 g.					

Table 2

Ring Cut, Sliced Lengthwise, Diced, Double Diced, Shoestring and Pieces

Defect	Classification	Defect A	Categories B	Overall Total
Misshapen)	Each 4 grammes of affected material	1		
Major Blemishes)			2	
Blemishes)			1	
Unpeeled Areas)			1	
Greening)			1	
Total Allowable Points:	(a) Ring cut, Sliced lengthwise and Pieces;	26	8	26

(b) Diced and Double Dice;	13	4	13
(c) Shoestring/ Julienne	20	4	20
Damaged and Small Pieces: Not exceeding 25% m/m. Damaged not exceeding 10% m/m			
EVM: Not to exceed 2 Pieces or 1 g/1000 g.			

3.3 Definition of Defective for Presentation Quality Factors and Size

Any standard sample unit taken in accordance with the Joint FAO/WHO Codex Alimentarius Sampling Plans for Prepackaged Foods (AQL - 6.5) (CAC/RM 42-1969) (see Codex Alimentarius Volume 13) and which is adjusted to a standard sample size for applying the tolerances relating to "Visual Defects" shall be regarded as "defective" for the respective characteristics as follows:

- (a) When it fails to meet the general requirements given in Section 3.2.1.
- (b) When it fails to comply with the tolerances for style in Section 2.4.4.
- (c) When it exceeds the Total Allowable Points in any one of the defect categories A or B; or when it exceeds the Total Allowable Points for the Overall Total of the respective defect categories, in Tables 1 and 2.
- (d) When the tolerances for damaged and small pieces are exceeded; or
- (e) When it fails to comply with the size requirements in Section 2.4.6.

3.4 Lot Acceptance for Presentation Quality Factors and Size

A lot is considered acceptable with respect to Presentation Quality Factors and Size when the number of "defectives" as defined in Section 3.3 does not exceed the acceptance number (c) for the appropriate sample size as specified in the Joint FAO/WHO Codex Alimentarius Sampling Plans for Prepackaged Foods (CAC/RM 42-1969) (see Codex Alimentarius Volume 13). In applying the acceptance procedure each "defective" (sub-sections (a) or (b) or (c) or (d) or (e)) is treated individually for the respective characteristics.

4. FOOD ADDITIVES

4.1 Processing Aids	Maximum Levels
Citric Acid	Limited by GMP
Sodium Hydroxide	Limited by GMP

4.2 Carry-over Principle

Section 3 of the "Principle Relating to the Carry-over of Food Additives into Foods" as set forth in Codex Alimentarius Volume 1 shall apply.

5. HYGIENE

5.1 It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the Recommended International Code of Practice - General Principles of Food Hygiene (CAC/RCP 1-1969, Rev. 2 (1985) Codex Alimentarius Volume 1), and other Codes of Practice recommended by the Codex Alimentarius Commission which are relevant to this product.

5.2 To the extent possible in Good Manufacturing Practice, the product shall be free from objectionable matter.

5.3 When tested by appropriate methods of sampling and examination, the product:

- shall be free from microorganisms in amounts which may represent a hazard to health;
- shall be free from parasites which may represent a hazard to health; and
- shall not contain any substance originating from microorganisms in amounts which may represent a hazard to health.

6. LABELLING

In addition to the requirements of the Codex General Standard for the Labelling of Prepackaged Foods (CODEX STAN 1-1985 (Rev. 1-1991) Codex Alimentarius Volume 1) the following provisions apply:

6.1 The Name of the Food

6.1.1 The name of the food as declared on the label shall include the designation "carrots". The words "quick frozen" shall also appear on the label, except that the term "frozen"¹ may be applied in countries where this term is customarily used for describing the product processed in accordance with the sub-section 2.2 of the standard.

6.1.2 In addition, there shall appear on the label in conjunction with or in close proximity to the word "carrots":

- (a) the type Round if the carrots are of this type;
- (b) the style as appropriate: "Whole"², "Finger"², "Halved", "Quartered", "Sliced Lengthwise", "Shoestring" or "Julienne", "Sliced", "Ring Cut" or "Roundel", "Pieces", "Diced", or "Double Dice".

6.1.3 If the product is produced in accordance with sub-section 2.4.3 the label shall contain in close proximity to the word "carrots" such additional words or phrases that will avoid misleading or confusing the consumer.

6.1.4 When any ingredient, other than salt, has been added which imparts to the food the distinctive flavour of the ingredient, the name of the food shall be accompanied by the term "with X" or "X flavoured" as appropriate.

6.1.5 Where a statement of size is made, the words "very small", "small", "medium", "large", and "extra large", as appropriate shall be indicated. Carrots meeting the size requirements for "small" may be designated "baby" within countries where this practice is permitted.

6.2 Additional Requirements

The package 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.

¹ "Frozen": this term is used as an alternative to "quick frozen" in some English speaking countries.

² In countries where this is customary these styles may be simply designated as "carrots".

6.3 Bulk Packs

In the case of quick frozen¹ carrots in bulk the information required above shall either be placed on the container or be given in accompanying documents, except that the name of the food accompanied by the words "quick frozen" (the term "frozen" may be used in accordance with sub-section 6.1 of this standard) and the name and address of the manufacturer or packer shall appear on the container.

7. PACKAGING

Packaging used for quick frozen carrots shall:

- (a) protect the organoleptic and other quality characteristics of the product.
- (b) Protect the product against microbiological and other contamination.
- (c) protect the product from dehydration, and where appropriate, leakage as far as technologically practicable.
- (d) not pass on to the product any odour, taste, colour or other foreign characteristics, throughout the processing (where applicable) and distribution of the product up to the time of final sale.

8. METHODS OF ANALYSIS AND SAMPLING

See Codex Alimentarius Volume 13.

¹ "Frozen": this term is used as an alternative to "quick frozen" in some English speaking countries.