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# **United States Standards for Grades of Frozen Onions**

**Effective September 21, 2017**

This is the first issue of the United States Standards for Grades of Frozen Onions (82 FR 39658).

Voluntary U.S. grade standards are issued under the authority of the Agricultural Marketing Act of 1946, which provides for the development of official U.S. grades to designate different levels of quality. These grade standards are available for use by producers, suppliers, buyers, and consumers. As in the case of other standards for grades of fresh and processed fruits, vegetables, and specialty crops these standards are designed to facilitate orderly marketing by providing a convenient basis for buying and selling, for establishing quality control programs, and for determining loan values.

The U.S. grade standards and inspection instructions for all fresh and processed fruits, vegetables, and specialty crops are available on the internet and upon request at the address below. These documents provide detailed interpretations of the grade standards and provide step-by-step procedures for grading the product.

Grade standards are issued by the U.S. Department of Agriculture (USDA) after careful consideration of all data and views submitted during rulemaking. The Department welcomes suggestions for improving the standards in future revisions. Comments may be submitted to, and copies of standards and inspection instructions obtained from:

Director, Specialty Crops Inspection Division  
Specialty Crops Program,  
USDA, Agricultural Marketing Service  
1400 Independence Avenue, SW, STOP 0240  
Washington, D.C. 20250

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**Authority:** 7 U.S.C. 1621-1627.

**Note:** Compliance with the provisions of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act, or with applicable State laws and regulations.

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## United States Standards for Grades of Frozen Onions

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**§52.4072 Product description.**

Frozen onions are the individually quick frozen product prepared from fresh, clean, sound, firm bulbs of the Grano, Sweet Spanish type, or other common commercial varieties of (*Allium cepa*) that have been properly prepared, washed, blanched or unblanched, and then frozen in accordance with good commercial practice and maintained at temperatures necessary to preserve the product.

**§52.4073 Styles.**

- (a) **Whole** means whole stemmed, peeled bulbs of the sizes listed below:
- (1) **Type I.** 7/8 inch (22mm) to 1-7/8 inches (48 mm) in diameter at the greatest dimension of the onion at right angles to a line running from stem to root.
  - (2) **Type II (Pearl).** 3/8 inch (10 mm) to 7/8 inch (22mm) in diameter in the greatest dimension of the onion at right angles to a line running from stem to root.
- (b) **Strips** means stemmed, peeled bulbs that have been cut lengthwise into narrow pieces ranging from 3/4 inch (19 mm) to 2 inches (51 mm) in length. The width may vary from 1/4 inch (6 mm) to 3/4 inch (19 mm).
- (c) **Diced** means peeled bulbs which have been cut into approximately square pieces with a designated width ranging from 1/4 inch (6 mm) to 1 inch (25 mm) in width as determined by the width of the unit in the greatest cut dimension.
- (d) **Other** means any style designated as other, by style, description of size, shape, or other characteristic that differentiates it from the styles listed above.

**§52.4074 Requirements for style.**

- (a) **Whole style.**
- (1) **Type I.** The units are well shaped. By count, approximately 10 percent of the units (lot average) may be less than 7/8 inch (22 mm); 5 percent may be greater than 1-7/8 inches (48 mm) at the widest portion of the unit.
  - (2) **Type II (Pearl).** The units are well shaped. By count, approximately 10 percent of the units (lot average) may be less than 3/8 inch (10 mm); 5 percent may be greater than 7/8 inch (22 mm) in the greatest portion of the unit.
- (b) **Strips style.** A maximum of 25 percent of units, by weight, may be less than the minimum style requirement of 3/4 inch (19 mm) in length.

- (c) **Diced style.** The units that are practically uniform in size. Less than 30 percent of the units, by weight, are noticeably smaller than one-half the area of an average sized unit (or the designated size). Less than 30 percent of all units are large or irregularly shaped units greater than 1-1/2 times the area of an average sized unit (or the designated size).
- (d) **Other.** Units do not fall into any of the styles listed above, are reasonably uniform in size and shape, and overall appearance is not materially affected by other shapes and sizes.

**§52.4075 Definitions of terms.**

- (a) **Acceptable quality level (AQL)** means the maximum percent of defective units or maximum number of defects per hundred units of product that, for the purpose of acceptance sampling, can be considered satisfactory as a process average.
- (b) **Appearance.**
  - (1) **Good appearance** means that the product is practically free flowing, bright, and with practically uniform units. Markedly variable units, small specks, or other factors, do not significantly affect the overall appearance or edibility of frozen onions.
  - (2) **Reasonably good appearance** means that the product is reasonably free flowing, reasonably bright, and has reasonably uniform units. The overall appearance or edibility of the frozen onions is slightly but not seriously affected by markedly variable units, small specks, or other factors.
  - (3) **Poor appearance** means that the product fails to meet the requirements of reasonably good appearance.
- (c) **Blemished.** A unit that is affected or damaged by pathological injury, insect injury, or any other injury that affects the overall appearance or eating quality of the unit.
  - (1) **Minor blemish.** A unit with tan to brown blemish(es) that, in the aggregate, are larger than the area of a circle 1/8 inch (3 mm) in diameter but smaller than 1/4 inch (6 mm) in diameter.
  - (2) **Major blemish.** A unit with tan to dark blemish(es) that, in the aggregate, are larger than the area of a circle 1/4 inch (6 mm) in diameter.
  - (3) **Total blemish.** The total of the major and minor blemishes.
- (d) **Character** refers to the firmness and texture of the individual onion unit and the lack of tough, soft, or mushy units.

- (1) **Good character.** The onions are uniformly firm and tender, and practically free of soft and spongy units.
  - (2) **Reasonably good character.** The onions are reasonably firm and tender, and are not soft or spongy.
  - (3) **Poor character.** The product fails to meet the requirements of reasonably good character.
- (e) **Color** refers to the predominant and characteristic color of the exterior surface of the frozen onions.
- (1) **Good color.** The frozen onions have a good characteristic bright color typical of the variety.
  - (2) **Reasonably good color.** The frozen onions have a reasonably good color typical of the variety. The units individually or collectively may vary slightly from bright to slightly dull.
  - (3) **Poor color.** The units fail to meet the requirements of reasonably good color.
- (f) **Core material** is the portion of the onion bulb that is part of the internal or external onion flesh. This material should not be discolored, excessively tough, fibrous, soft, or mushy. Core material may also include sprouts, seed stems, root crown, and root material.
- (1) **Whole style:**
    - (i) **Minor core material** is a unit that is 3/8 inch (10mm) or less in diameter or length, whichever is applicable. Each unit is the equivalent of one minor defect.
    - (ii) **Major core material** is a unit that is more than 3/8 inch (10mm) in diameter or length, whichever is applicable. Each unit is the equivalent of one major defect.
    - (iii) **Total core material** is total of the major and minor core material.
  - (2) **Strips, diced, and other styles:**
    - (i) **Minor core material** is 1/2 square inch (3.2 square centimeters) or less. Each unit is the equivalent of one minor defect.
    - (ii) **Major core material** exceeds 1/2 square inch (3.2 square centimeters). Each unit is the equivalent of one major defect.

- (iii) **Total core material** is total of the major and minor core material.
- (g) **Dark green units** are units with dark green stripes across 50 percent or more of the onion unit. One unit is equivalent to one defect.
- (h) **Defect** is the deviation of a unit(s) from a specified quality characteristic requirement.
- (i) **Extraneous vegetable material (EVM)** is any plant material of onions or other harmless plants including, but not limited to, the leaves or roots. Each equivalent of EVM of 1 inch in length is considered one defect.
- (j) **Grit or dirt** is any particle of earthy material.
- (k) **Mechanical damage** (in whole style only) means that the appearance of the unit is affected by gouging, or the unit is crushed or broken to the extent that the appearance is materially affected.
- (l) **Normal flavor and odor** means that the frozen onions, before and after cooking, have a flavor and odor that is normal and typical for the variety and is free from objectionable flavors and odors.
- (m) **Peel** is the thin outer skin of the bulb. Peel is usually creamy white to brown in color, tough, and tissue-like. Each equivalent of peel that is 1/2 square inch (3.2 square centimeters) is considered one defect.
- (n) **Root crown** is the tough fibrous material on the bottom portion of the onion where the roots attach to the bulb. Root crown is scored as core material.
- (o) **Sample size** is the amount of product specified for use in grading. For varietal characteristics, color, flavor and odor, and appearance, the sample size is the entire container. For blemishes, character, specified defects, and mechanical damage, the sample size is 50 units by count for whole style, and 450 grams by weight for strips, diced, and other styles.

The appropriate sample size may be:

- (1) The entire contents of a container;
  - (2) A portion of the contents of a container; or
  - (3) A combination of the contents of two or more containers.
- (p) **Sprouts and seed stems** are the internal material that protrudes from the top or neck of the onion. Scoreable sprouts and seed stems may be tough, fibrous, or leathery, and may be white, tan to brown, or green in color. Sprouts and seed stems are scored as core material.

- (q) **Tolerance (TOL)** is the percentage of defective units allowed for each quality factor for a specific sample size.
- (r) **Unit** is a whole peeled bulb, immature bulb, individual piece, or portion of frozen onions.

**§52.4076 Grades.**

- (a) **U.S. Grade A** is the quality of frozen onions that meet the following requirements:
  - (1) Similar varietal characteristics except color, when designated as specialty or mixed pack;
  - (2) Has a normal flavor and odor;
  - (3) Has good color;
  - (4) Has a good appearance;
  - (5) Has no grit or dirt present that affects the appearance or edibility of the product; and
  - (6) Is within the limits for defects as specified in Tables I and II of this subpart as applicable for the styles in §52.4078.
- (b) **U.S. Grade B** is the quality of frozen onions that meet the following requirements:
  - (1) Similar varietal characteristics except color, when designated as specialty or mixed pack;
  - (2) Has a normal flavor and odor;
  - (3) Has a reasonably good color;
  - (4) Has a reasonably good appearance;
  - (5) Has no grit or dirt present that affects the appearance or edibility of the product; and
  - (6) Is within the limits for defects as specified in Tables I and II of this subpart as applicable for the styles in §52.4078.
- (c) **Substandard** is the quality of frozen onions that fail to meet the requirements of U.S. Grade B.



**§52.4077 Factors of quality.**

The grade of frozen onions is based on requirements for the following factors:

**(a) Prerequisite quality factors.**

- (1) Varietal characteristics, except color when designated as specialty or mixed pack;
- (2) Color;
- (3) Flavor and odor;
- (4) Appearance; and
- (5) Absence of grit or dirt.

**(b) Classified quality factors.**

- (1) Dark green units;
- (2) Poor colored units;
- (3) Major blemishes;
- (4) Total blemishes (major + minor);
- (5) Mechanical Damage (in Whole style only);
- (6) Major Core Material
- (7) Total Core Material (major + minor);
- (8) Peel;
- (9) Character; and
- (10) EVM.

**§52.4078 Requirements for classified quality factors and defects.**

- (a) **Sample size** is defined in §52.4075 Definition of Terms.
- (b) **Acceptance criteria** for specified defects are listed in Tables I and II that follow.

**TABLE I**  
**Acceptance Numbers for Specified Defects, Whole Style Frozen Onion**  
**GRADE A (50 Plan)**

Sample Units X Sample Unit Size			1 x 50	6 x 50	13 x 50	21 x 50	29 x 50
Units of Product			50 <sup>1</sup>	300	650	1050	1450
DEFECTS	TOL	AQL <sup>2</sup>	ACCEPTANCE NUMBERS				
Dark Green Units	1	0.612	1	4	7	10	14
Poor Color Units	5	3.8	4	17	33	50	67
Major Blemish	2	1.3	2	7	13	20	26
Total Blemish (Major + Minor)	5	3.8	4	17	33	50	67
Mechanical Damage	2	1.3	2	7	13	20	26
Major Core Material	1	0.612	1	4	7	10	14
Total Core Material (Major + Minor)	2	1.3	2	7	13	20	26
Peel	2	1.3	2	7	13	20	26
Character "Reasonably Good"	2	1.3	2	7	13	20	26
Character "Poor"	1	0.612	1	4	7	10	14
EVM	1	0.612	1	4	7	10	14

**GRADE B (50 Plan)**

Sample Units X Sample Unit Size			1 x 50	6 x 50	13 x 50	21 x 50	29 x 50
Units of Product			50 <sup>1</sup>	300	650	1050	1450
DEFECTS	TOL	AQL <sup>2</sup>	ACCEPTANCE NUMBERS				
Dark Green Units	2	1.3	2	7	13	20	26
Poor Color Units	8	6.4	6	26	52	80	108
Major Blemish	3	2.9	3	13	26	39	53
Total Blemish (major + minor)	8	6.4	6	26	52	80	108
Mechanical Damage	3	2.9	3	13	26	39	53
Major Core Material	2	1.3	2	7	13	20	26
Total Core Material (major + minor)	3	2.9	3	13	26	39	53
Peel	3	2.9	3	13	26	39	53
Character "Poor"	2	1.3	2	7	13	20	26
EVM	2	1.3	2	7	13	20	26

<sup>1</sup> Unofficial Samples

<sup>2</sup> AQL calculated from tolerance (TOL) at 650 units

**TABLE II**  
**Acceptance Numbers for Specified Defects, Strips, Diced or Other Styles Frozen Onion**  
**GRADE A (450 Gram Plan)**

Sample Units X Sample Unit Size			1 x 450	6 x 450	13 x 450	21 x 450	29 x 450
Total Weight of Product (in grams)			450 <sup>1</sup>	2700	5850	9450	13050
DEFECTS	TOL	AQL <sup>2</sup>	ACCEPTANCE NUMBERS				
Dark Green Units	0.11	0.056	1	3	6	9	12
Poor Color Units	0.88	0.696	6	26	51	79	106
Major Blemish	0.22	0.144	2	7	13	19	26
Total Blemish (major + minor)	0.88	0.696	6	26	51	79	106
Major Core Material	0.11	0.056	1	3	6	9	12
Total Core Material (major + minor)	0.44	0.325	3	13	26	40	53
Peel	0.22	0.144	2	7	13	19	26
Character "Reasonably Good"	1.0	0.9	7	32	64	100	135
Character "Poor"	0.5	0.4	4	16	31	48	64
EVM	0.11	0.056	1	3	6	9	12

**GRADE B (450 Gram Plan)**

Sample Units X Sample Unit Size			1 x 450	6 x 450	13 x 450	21 x 450	29 x 450
Total Weight of Product ( in grams)			450 <sup>1</sup>	2700	5850	9450	13050
DEFECTS	TOL	AQL <sup>2</sup>	ACCEPTANCE NUMBERS				
Dark Green Units	0.22	0.144	2	7	13	19	26
Poor Color Units	2.0	1.72	12	57	117	183	249
Major Blemish	0.67	1.72	5	20	39	60	81
Total Blemish (major + minor)	2.0	1.72	12	57	117	183	249
Major Core Material	0.22	0.144	2	7	13	19	26
Total Core Material (major + minor)	0.88	0.696	6	26	51	79	106
Peel	0.22	0.144	2	7	13	19	26
Character "Poor"	4.0	3.6	23	113	234	370	506
EVM	0.22	0.144	2	7	13	19	26

<sup>1</sup> Unofficial Sample

<sup>2</sup> AQL calculated from tolerance (TOL) at 5850 units

**§52.4079 Sample size.**

The sample size used to determine whether the requirements of these standards are met is specified in the sampling plans and procedures in the Regulations Governing Inspection and Certification of Processed Fruits and Vegetables, Processed Products Thereof, and Certain Other Processed Products (7 CFR 52.1 through 52.83).

**§52.4080 Acceptance criteria.**

- (a) Style.** A lot of frozen onions is considered as meeting the requirements for style if the requirements in §52.4074, as applicable, are not exceeded.
- (b) Lot inspection.** A lot of frozen onions is considered as meeting the requirements for quality if:

  - (1)** The prerequisite requirements specified in §52.4077 are met; and
  - (2)** The Acceptable Quality Levels in Tables I or II of §52.4078 as applicable, are not exceeded.
- (c) Single sample unit.** Each unofficial sample unit submitted for quality evaluation will be treated individually and is considered as meeting the requirements for quality if:

  - (1)** The prerequisite requirements specified in §52.4077 are met; and
  - (2)** The Acceptable Quality Levels in Tables I or II of §52.4078 are not exceeded.