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Inspection
Division

United States Standards for Grades of Apples

Effective October 31, 2019

This issue of the United States Standards for Grades of Apples (84 FR 51939) supersedes the previous issue which has been in effect since December 19, 2002.

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

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 Apples

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Grades**§51.300 U.S. Extra Fancy.**

“U.S. Extra Fancy” consists of apples of one variety (except when more than one variety is printed on the container) which are mature but not overripe, clean, fairly well formed, free from decay, internal browning, internal breakdown, soft scald, scab, freezing injury, visible water core, and broken skins. The apples are also free from injury caused by bruises, brown surface discoloration, smooth net-like russeting, sunburn or sprayburn, limb rubs, hail, drought spots, scars, disease, insects, or other means. The apples are free from damage caused by bitter pit or Jonathan spot and by smooth solid, slightly rough or rough russeting, or stem or calyx cracks, as well as damage by invisible water core after January 31st of the year following the year of production except for the Fuji variety of apples. Invisible water core and smooth net-like russeting shall not be scored against the Fuji variety of apples under any circumstances. For the apple varieties listed in table 1 of §51.305, each apple of this grade has the amount of color specified for the variety. (See §§51.305 and 51.306.)

§51.301 U.S. Fancy.

“U.S. Fancy” consists of apples of one variety (except when more than one variety is printed on the container) which are mature but not overripe, clean, fairly well formed, and free from decay, internal browning, internal breakdown, soft scald, freezing injury, visible water core, and broken skins. The apples are also free from damage caused by bruises, brown surface discoloration, russeting, sunburn or sprayburn, limb rubs, hail, drought spots, scars, stem or calyx cracks, disease, insects, bitter pit, Jonathan spot, or damage by other means, or invisible water core after January 31st of the year following the year of production, except for the Fuji variety of apples. Invisible water core and smooth net-like russeting shall not be scored against the Fuji variety of apples under any circumstances. For the apple varieties listed in table 1 of §51.305, each apple of this grade has the amount of color specified for the variety. (See §§51.305 and 51.306.)

§51.302 U.S. No. 1.

“U.S. No. 1” consists of apples which meet the requirements of U.S. Fancy grade except for color, russeting, and invisible water core. In this grade, less color is required for all varieties listed in table 1 of §51.305. Apples of this grade are free from excessive damage caused by russeting which means that apples meet the russeting requirements for U.S. Fancy as defined under the definitions of “damage by russeting,” except the aggregate area of an apple which may be covered by smooth net-like russeting shall not exceed 25 percent; and the aggregate area of an apple which may be covered by smooth solid russeting shall not exceed 10 percent: *Provided*, That, in the case of the Yellow Newtown or similar varieties, the aggregate area of an apple which may be covered with smooth solid russeting shall not exceed 20 percent; and that smooth net-like russeting shall not be scored against the Fuji variety under any circumstances. Each apple of this grade has the amount of color specified in §51.305 for the variety. Invisible water core shall not be scored in this grade. (See §§51.305 and 51.306.)

(a) U.S. No. 1 Hail: "U.S. No. 1 Hail" consists of apples which meet the requirements of U.S. No. 1 grade except that hail marks where the skin has not been broken and well healed hail marks where the skin has been broken, are permitted, provided the apples are fairly well formed. (See §§51.305 and 51.306.)

(b) [Reserved]

§51.303 U.S. Utility.

"U.S. Utility" consists of apples of one variety (except when more than one variety is printed on the container) which are mature but not overripe, not seriously deformed and free from decay, internal browning, internal breakdown, soft scald, and freezing injury. The apples are also free from serious damage caused by dirt or other foreign matter, broken skins, bruises, brown surface discoloration, russeting, sunburn or sprayburn, limb rubs, hail, drought spots, scars, stem or calyx cracks, visible water core, bitter pit or Jonathan spot, disease, insects, or other means. (See §51.306.)

§51.304 Combination grades.

(a) Combinations of the above grades may be used as follows:

(1) Combination U.S. Extra Fancy and U.S. Fancy;

(2) Combination U.S. Fancy and U.S. No. 1; and

(3) Combination U.S. No. 1 and U.S. Utility.

(b) Combinations other than these are not permitted in connection with the U.S. apple grades. When Combination grades are packed, at least 50 percent of the apples in any lot shall meet the requirements of the higher grade in the combination. (See §51.306.)

Color Requirements

§51.305 Color requirements.

(a) In addition to the requirements specified for the grades set forth in §§51.300 through 51.304, apples of these grades shall have the percentage of color specified for the variety in table 1 in this section. All apple varieties other than those appearing in table 1 shall have no color requirements pertaining to these grades. For the solid red varieties, the percentage stated refers to the area of the surface which must be covered with a good shade of solid red characteristic of the variety: *Provided*, That an apple having color of a lighter shade of solid red or striped red than that considered as a good shade of red characteristic of the variety may be admitted to a grade, provided it has sufficient additional area covered so that the apple has as good an appearance as one with the minimum percentage of good red characteristic of the variety required for the grade. For

the striped red varieties, the percentage stated refers to the area of the surface in which the stripes of a good shade of red characteristic of the variety shall predominate over stripes of lighter red, green, or yellow. However, an apple having color of a lighter shade than that considered as a good shade of red characteristic of the variety may be admitted to a grade, provided it has sufficient additional area covered so that the apple has as good an appearance as one with the minimum percentage of stripes of a good red characteristic of the variety required for the grade. Faded brown stripes shall not be considered as color.

- (b) Color standards USDA Visual Aid APL-CC-1 (Plates a - e) consists of a folder containing the color requirements for apples set forth in paragraph (a) of this section and five plates illustrating minimum good shade of solid red or striped red color, minimum compensating color and shade not considered color, for the following 12 varieties: Red Delicious, Red Rome, Empire, Idared, Winesap, Jonathan, Stayman, McIntosh, Cortland, Rome Beauty, Delicious, and York. The color standards are available for purchase at <http://www.ams.usda.gov>.

Table 1¹

(Only the varieties listed below shall be required to meet a minimum color requirement)

| Variety | U.S. Extra Fancy (Percent) | U.S. Fancy (Percent) | U.S. No. 1 (Percent) |
|---------------|-------------------------------|-------------------------|-------------------------|
| Red Delicious | 66 | 40 | 25 |
| Red Rome | 66 | 40 | 25 |
| Empire | 66 | 40 | 25 |
| Idared | 66 | 40 | 25 |
| Winesap | 66 | 40 | 25 |
| Jonathan | 66 | 40 | 25 |
| Stayman | 50 | 33 | 25 |
| McIntosh | 50 | 33 | 25 |
| Cortland | 50 | 33 | 25 |
| Rome Beauty | 50 | 33 | 25 |
| Delicious | 50 | 33 | 25 |
| York | 50 | 33 | 25 |

¹ Variations on varietal designations listed above must meet or exceed those color requirements listed.

Tolerances

§51.306 Tolerances.

In order to allow for variations incident to proper grading and handling in each of the grades in 51.300, 51.301, 51.302, 51.303, and 51.304 the following tolerances are provided as specified:

(a) Defects:

- (1)** U.S. Extra Fancy, U.S. Fancy, U.S. No. 1, and U.S. No. 1 Hail grades: 10 percent of the apples in any lot may fail to meet the requirements of the grade, but not more than one-half of this amount, or 5 percent, shall be allowed for apples which are seriously damaged, including therein not more than 1 percent for apples affected by decay or internal breakdown.
- (2)** U.S. Utility grade: 10 percent of the apples in any lot may fail to meet the requirements of the grade, but not more than one-half of this amount, or 5 percent, shall be allowed for apples which are seriously damaged by insects, and including in the total tolerance not more than 1 percent for apples affected by decay or internal breakdown.

(b) When applying the foregoing tolerances to Combination grades, no part of any tolerance shall be allowed to reduce, for the lot as a whole, the 50 percent of apples of the higher grade required in the combination, but individual containers shall have not less than 40 percent of the higher grade.

(c) Size: When size is designated by the numerical count for a container, not more than 10 percent of packages in the lot may fail to be fairly uniform.¹ When size is designated by minimum or maximum diameter, not more than 5 percent of the apples in any lot may be smaller than the designated minimum, and not more than 10 percent may be larger than the designated maximum. For Red Delicious or Golden Delicious varieties only, a combination of minimum diameter and/or weight may be used. When this designation is used, an individual apple will be considered to have met the minimum size requirement even if the apple is smaller than the minimum diameter, provided it is equal to or greater than the weight provided in table II of this section. However, not more than 5 percent of the apples in any lot may fail to meet either the minimum diameter or minimum weight when so designated. In addition, when Red Delicious or Golden Delicious apples are designated with diameter/weight combinations, they may only be designated according to the following table:

¹ "Fairly uniform" means the size of the fruit within the container does not vary more than ½ inch diameter from the smallest to largest fruit.

Table II

| Red Delicious | Golden Delicious |
|---------------------------|-------------------------|
| 2-1/8 inches or 65 grams | 63 grams |
| 2-1/4 inches or 75 grams | 70 grams |
| 2-3/8 inches or 84 grams | 82 grams |
| 2-1/2 inches or 100 grams | 95 grams |
| 2-5/8 inches or 115 grams | 109 grams |
| 2-3/4 inches or 139 grams | 134 grams |

Application of Tolerances

§51.307 Application of tolerances.

The contents of individual packages in the lot, are subject to the following limitations: *Provided*, That the averages for the entire lot are within the tolerances specified for the grade:

- (a) Packages which contain more than 10 pounds:
 - (1) Shall have not more than one and one-half times a specified tolerance of 10 percent or more and not more than double a tolerance of less than 10 percent, except that at least one apple which is seriously damaged by insects or affected by decay or internal breakdown may be permitted in any package.
 - (2) [Reserved]
- (b) Packages which contain 10 pounds or less:
 - (1) No package may have more than 3 times the tolerance specified, except that at least three defective apples may be permitted in any package: *Provided*, That not more than three apples or more than 18 percent (whichever is the larger amount) may be seriously damaged by insects or affected by decay or internal breakdown.
 - (2) [Reserved]

Methods of Sampling and Calculation of Percentages

§51.308 Methods of sampling and calculation of percentages.

- (a) When the numerical count is marked on the container, containers are packed to weigh ten pounds or less, or in any container where the minimum diameter of the smallest apple does not vary more than 1/2 inch from the minimum diameter of the largest apple, percentages shall be calculated on the basis of count.

- (b) In all other cases except those listed in paragraph (a) of this section, they shall be calculated on the basis of weight.

Condition After Storage or Transit

§51.309 Condition after storage or transit.

Decay, scald, or any other deterioration which may have developed on apples after they have been in storage or transit shall be considered as affecting condition and not the grade.

Packing Requirements

§51.310 Packing requirements.

- (a) Apples tray packed or cell packed in cartons shall be arranged according to approved and recognized methods. Packs shall be at least fairly tight² or fairly well filled.³
- (b) Closed cartons containing apples not tray or cell packed shall be fairly well filled or the pack shall be sufficiently tight to prevent any appreciable movement of the apples.
- (c) Packs in wooden boxes or baskets shall be sufficiently tight to prevent any appreciable movement of apples within containers when the packages are closed. Each wrapped apple shall be completely enclosed by its individual wrapper.
- (d) Apples on the shown face of any container shall be reasonably representative in size, color and quality of the contents.
- (e) Tolerances: In order to allow for variations incident to proper packing, not more than 10 percent of the containers in any lot may fail to meet these requirements.

Marking Requirements

§51.311 Marking requirements.

Variety (or varieties if more than one is packed in the container), grade, and the numerical count or minimum diameter of apples packed in a closed container shall be indicated on the container. For apple lots utilizing the combined diameter/weight designations for Red Delicious and Golden Delicious varieties, the minimum diameter and minimum weight of apples packed in a closed container shall be indicated on the container.

² "Fairly tight" means that apples are of the proper size for molds or cell compartments in which they are packed, and that molds or cells are filled in such a way that no more than slight movement of apples within molds or cells is possible.

³ "Fairly well filled" means that the net weight of apples in containers ranging from 2,100 to 2,900 cubic inch capacity is not less than 37 pounds for Cortland, Gravenstein, Jonathan, McIntosh and Golden Delicious varieties and not less than 40 pounds for all other varieties.

- (a) When the numerical count is not shown, the minimum diameter or, in the case of Red Delicious or Golden Delicious lots where minimum diameter/weight designations have been chosen, the minimum diameter and weight as designated in table II, shall be plainly stamped, stenciled or otherwise marked on the container in terms of whole inches, or whole inches and not less than eighth inch fractions thereof in the following manner: “A” inches or “B” grams, where “A” corresponds to one of the diameter measurements in terms of inches listed in table II and “B” corresponds to the weight measurement in grams as indicated in table II. Both diameter and weight must be shown using the word “or” between the given measurements.
- (b) The word “minimum,” or its abbreviation, when following a diameter size marking, means that the apples are of the size marked or larger. (See §§51.306 and 51.307.)

Definitions

§51.312 Mature.

“**Mature**” means that the apples have reached the stage of development which will insure the proper completion of the ripening process. Before a mature apple becomes overripe it will show varying degrees of firmness, depending upon the stage of the ripening process. The following terms are used for describing different stages of firmness of apples:

- (a) “**Hard**” means apples with a tenacious flesh and starchy flavor.
- (b) “**Firm**” means apples with a tenacious flesh but which are becoming crisp with a slightly starchy flavor, except the Delicious variety.
- (c) “**Firm ripe**” means apples with crisp flesh except that the flesh of the Gano, Ben Davis, and Rome Beauty varieties may be slightly mealy.
- (d) “**Ripe**” means apples with mealy flesh and soon to become soft for the variety.

§51.313 Overripe.

“**Overripe**” means apples which have progressed beyond the stage of ripe, with flesh very mealy or soft, and past commercial utility.

§51.314 Clean.

“**Clean**” means that the apples are free from excessive dirt, dust, spray residue, and other foreign material.

§51.315 Fairly well formed.

“**Fairly well formed**” means that the apple may be slightly abnormal in shape but not to an extent which detracts materially from its appearance.

§51.316 Injury.

“**Injury**” means any specific defect defined in this section or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects, which more than slightly detract from the appearance or the edible or shipping quality of the apple. In addition, specific defect measurements are based on an apple three inches in diameter. Corresponding smaller or larger areas would be allowed on smaller or larger fruit. Any reference to “*inch*” or “*inches in diameter*” refers to that of a circle of the specified diameter. Any reference to “*aggregate area*,” “*total area*,” or “*aggregate affected area*” means the gathering together of separate areas into one mass for the purpose of comparison to determine the extent affected. The following specific defects shall be considered as injury:

- (a) Russeting in the stem cavity or calyx basin which cannot be seen when the apple is placed stem end or calyx end down on a flat surface shall not be considered in determining whether an apple is injured by russeting. Smooth net-like russeting outside of the stem cavity or calyx basin shall be considered as injury when an aggregate area of more than 10 percent of the surface is covered, and the color of the russeting shows no very pronounced contrast with the background color of the apple, or lesser amounts of more conspicuous net-like russeting when the appearance is affected to a greater extent than the amount permitted above.
- (b) Sunburn or sprayburn, when the discolored area does not blend into the normal color of the fruit.
- (c) Dark brown or black limb rubs which affect a total area of more than one-fourth inch in diameter, except that light brown limb rubs of a russet character shall be considered under the definition of injury by russeting.
- (d) Hail marks, drought spots, other similar depressions or scars:
 - (1) When the skin is broken, whether healed or unhealed;
 - (2) When there is appreciable discoloration of the surface;
 - (3) When any surface indentation exceeds one-sixteenth inch in depth;
 - (4) When any surface indentation exceeds one-eighth inch in diameter; or
 - (5) When the aggregate affected area of such spots exceeds one-half inch in diameter.

- (e) Bruises which are not slight and incident to proper handling and packing, and which are greater than:
 - (1) 1/8 inch in depth;
 - (2) 5/8 inch in diameter;
 - (3) Any combination of lesser bruises which detract from the appearance or edible quality of the apple to an extent greater than any one bruise described in paragraphs (e)(1) or (2) of this section.
- (f) Brown surface discoloration when caused by delayed sunburn, surface scald, or any other means and affects an area greater than 1/4 inch in diameter.
- (g) Disease:
 - (1) Cedar rust infection which affects a total area of more than three-sixteenths inch in diameter.
 - (2) Sooty blotch or fly speck which is thinly scattered over more than 5 percent of the surface, or dark, heavily concentrated spots which affect an area of more than one-fourth inch in diameter.
 - (3) Red skin spots which are thinly scattered over more than one-tenth of the surface, or dark, heavily concentrated spots which affect an area of more than one-fourth inch in diameter.
- (h) Insects:
 - (1) Any healed sting or healed stings which affect a total area of more than one-eighth inch in diameter including any encircling discolored rings.
 - (2) Worm holes.

§51.317 Damage.

“**Damage**” means any specific defect defined in this section or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects, which materially detract from the appearance, or the edible or shipping quality of the apple. In addition, specific defect measurements are based on an apple three inches in diameter. Corresponding smaller or larger areas would be allowed on smaller or larger fruit. Any reference to “*inch*” or “*inches in diameter*” refers to that of a circle of the specified diameter. Any reference to “*aggregate area*,” “*total area*,” or “*aggregate affected area*” means the gathering together of separate areas into one mass for the purpose of comparison to determine the extent affected. The following specific defects shall be considered as damage:

- (a)** Russeting in the stem cavity or calyx basin which cannot be seen when the apple is placed stem end or calyx end down on a flat surface shall not be considered in determining whether an apple is damaged by russeting, except that excessively rough or bark-like russeting in the stem cavity or calyx basin shall be considered as damage when the appearance of the apple is materially affected. The following types and amounts of russeting outside of the stem cavity or calyx basin shall be considered as damage:
- (1)** Russeting which is excessively rough on Roxbury Russet and other similar varieties.
 - (2)** Smooth net-like russeting, when an aggregate area of more than 15 percent of the surface is covered, and the color of the russeting shows no very pronounced contrast with the background color of the apple, or lesser amounts of more conspicuous net-like russeting when the appearance is affected to a greater extent than the amount permitted above.
 - (3)** Smooth solid russeting, when an aggregate area of more than 5 percent of the surface is covered, and the pattern and color of the russeting shows no very pronounced contrast with the background color of the apple, or lesser amounts of more conspicuous solid russeting when the appearance is affected to a greater extent than the above amount permitted.
 - (4)** Slightly rough russeting which covers an aggregate area of more than one-half inch in diameter.
 - (5)** Rough russeting which covers an aggregate area of more than one-fourth inch in diameter.
- (b)** Sunburn or sprayburn which has caused blistering or cracking of the skin, or when the discolored area does not blend into the normal color of the fruit unless the injury can be classed as russeting.
- (c)** Limb rubs which affect a total area of more than one-half inch in diameter, except that light brown limb rubs of a russet character shall be considered under the definition of damage by russeting.
- (d)** Hail marks, drought spots, other similar depressions, or scars:
- (1)** When any unhealed mark is present;
 - (2)** When any surface indentation exceeds one-eighth inch in depth;
 - (3)** When the skin has not been broken and the aggregate affected area exceeds one-half inch in diameter; or

- (4) When the skin has been broken and well healed, and the aggregate affected area exceeds one-fourth inch in diameter.
- (e) Stem or calyx cracks which are not well healed, or well healed stem or calyx cracks which exceed an aggregate length of one-fourth inch.
- (f) Invisible water core existing around the core and extending to water core in the vascular bundles, or surrounding the vascular bundles when the affected areas surrounding three or more vascular bundles meet or coalesce, or existing in more than a slight degree outside the circular area formed by the vascular bundles. *Provided*, That invisible water core shall not be scored as damage against the Fuji variety of apples under any circumstances.
- (g) Bruises which are not slight and incident to proper handling and packing, and which are greater than:
 - (1) 3/16 inch in depth;
 - (2) 7/8 inch in diameter;
 - (3) Any combination of lesser bruises which detract from the appearance or edible quality of the apple to an extent greater than any one bruise described in paragraphs (g)(1) or (2) of this section.
- (h) Brown surface discoloration when caused by delayed sunburn, surface scald, or any other means and affects an area greater than 1/2 inch in diameter.
- (i) Disease:
 - (1) Scab spots which affect a total area of more than one-fourth inch in diameter.
 - (2) Cedar rust infection which affects a total area of more than one-fourth inch in diameter.
 - (3) Sooty blotch or fly speck which is thinly scattered over more than one-tenth of the surface, or dark, heavily concentrated spots which affect an area of more than one-half inch in diameter.
 - (4) Red skin spots which are thinly scattered over more than one-tenth of the surface, or dark, heavily concentrated spots which affect an area of more than one-half inch in diameter.
 - (5) Bitter pit or Jonathan spot when one or more spots affects the surface of the apple.

- (j) Insects:
 - (1) Any healed sting or healed stings which affect a total area of more than three-sixteenths inch in diameter including any encircling discolored rings.
 - (2) Worm holes.

§51.318 Serious damage.

“**Serious damage**” means any specific defect defined in this section; or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects which seriously detract from the appearance, or the edible or shipping quality of the apple. In addition, specific defect measurements are based on an apple three inches in diameter. Corresponding smaller or larger areas would be allowed on smaller or larger fruit. Any reference to “*inch*” or “*inches in diameter*” refers to that of a circle of the specified diameter. Any reference to “*aggregate area*,” “*total area*,” or “*aggregate affected area*” means the gathering together of separate areas into one mass for the purpose of comparison to determine the extent affected. The following specific defects shall be considered as serious damage:

- (a) The following types and amounts of russetting shall be considered as serious damage:
 - (1) Smooth solid russetting, when more than one-half of the surface in the aggregate is covered, including any russetting in the stem cavity or calyx basin, or slightly rough, or excessively rough or bark-like russetting, which detracts from the appearance of the fruit to a greater extent than the amount of smooth solid russetting permitted: *Provided*, That any amount of russetting shall be permitted on Roxbury Russet and other similar varieties.
 - (2) [Reserved]
- (b) Sunburn or sprayburn which seriously detracts from the appearance of the fruit.
- (c) Limb rubs which affect more than one-tenth of the surface in the aggregate.
- (d) Hail marks, drought spots, or scars, if they materially deform or disfigure the fruit, or if such defects affect more than one-tenth of the surface in the aggregate: *Provided*, That no hail marks which are unhealed shall be permitted and not more than an aggregate area of one-half inch shall be allowed for well healed hail marks where the skin has been broken.
- (e) Stem or calyx cracks which are not well healed, or well healed stem or calyx cracks which exceed an aggregate length of one-half inch.

- (f) Visible water core which affects an area of more than one-half inch in diameter.
- (g) Disease:
 - (1) Scab spots which affect a total area of more than three-fourths inch in diameter.
 - (2) Cedar rust infection which affects a total area of more than three-fourths inch in diameter.
 - (3) Sooty blotch or fly speck which affects more than one-third of the surface.
 - (4) Red skin spots which affect more than one-third of the surface.
 - (5) Bitter pit or Jonathan spot which is thinly scattered over more than one-tenth of the surface.
- (h) Insects:
 - (1) Healed stings which affect a total area of more than one-fourth inch in diameter including any encircling discolored rings.
 - (2) Worm holes.
- (i) Bruises which are not slight and incident to proper handling and packing, and which are greater than:
 - (1) 3/8 inch in depth;
 - (2) 1 1/8 inches in diameter;
 - (3) Any combination of lesser bruises which detract from the appearance or edible quality of the apple to an extent greater than any one bruise described in paragraph (i)(1) or (2) of this section.
- (j) Brown surface discoloration when caused by delayed sunburn, surface scald, or any other means and affects an area greater than 3/4 inch in diameter.

§51.319 Seriously deformed.

“**Seriously deformed**” means that the apple is so badly misshapen that its appearance is seriously affected.

§51.320 Diameter.

When measuring for minimum size, “diameter” means the greatest dimension of the apple measured at right angles to a line from stem to blossom end. When measuring for maximum size, “diameter” means the smallest dimension of the apple determined by passing the apple through a round opening in any position.

U.S. Condition Standards for Export

§51.321 U.S. Condition Standards for Export.⁴

- (a) Not more than 5 percent of the apples in any lot shall be further advanced in maturity than firm ripe.
- (b) Not more than 5 percent of the apples in any lot shall be damaged by storage scab.
- (c) Not more than a total of 5 percent of the apples in any lot shall be affected by scald, internal breakdown, freezing injury, or decay; or damaged by bitter pit, Jonathan spot, water core⁵ except that invisible water core shall not be scored as damage when these condition standards are applied to the Fuji variety of apples, or other condition factors: *Provided, That:*
 - (1) Not more than a total of 2 percent shall be allowed for apples affected by decay and soft scald;
 - (2) Not more than 2 percent shall be allowed for apples affected by internal breakdown;
- (d) Container packs shall comply with packing requirements specified in §51.310 of the United States Standards for Grades of Apples.
- (e) Any lot of apples shall be considered as meeting the U.S. Condition Standards for Export if the entire lot averages within the requirements specified: *Provided, That* no package in any lot shall have more than double the percentages specified, except that for packages which contain 10 pounds or less, individual packages in any lot may have not more than three times the tolerance or three apples (whichever is the greater amount).

⁴ These standards may be applied to domestic shipments of apples as well as export lots, and may be referred to as “U.S. Condition Standards.”

⁵ “Damage by water core” means externally invisible water core existing around the core and extending to water core in the vascular bundles, or surrounding the vascular bundles when the affected areas surrounding three or more vascular bundles meet or coalesce, or existing in more than slight degree outside the circular area formed by the vascular bundles, or any externally visible water core.

Metric Conversion Table
§51.322 Metric conversion table.

| Inches | Millimeters (mm) |
|---------------------|-------------------------------|
| 1/16 equals | 1.6 |
| 1/8 equals | 3.2 |
| 3/16 equals | 4.8 |
| 1/4 equals | 6.4 |
| 3/8 equals | 9.5 |
| 1/2 equals | 12.7 |
| 5/8 equals | 15.9 |
| 3/4 equals | 19.1 |
| 7/8 equals | 22.2 |
| 1-1/8 equals | 28.6 |
| 2-1/8 equals | 54.0 |
| 2-1/4 equals | 57.2 |
| 2-3/8 equals | 60.3 |
| 2-1/2 equals | 63.5 |
| 2-3/4 equals | 69.9 |
| Cubic Inches | Cubic Centimeters (cc) |
| 2100 equals | 34,412.7 |
| 2900 equals | 47,522.3 |
| Pounds | Grams (g) |
| 10 equals | 4,536.0 |
| 37 equals | 16,783.2 |
| 40 equals | 18,144.0 |