



**United States  
Department of  
Agriculture**

Agricultural  
Marketing  
Service

Fruit and  
Vegetable  
Division

Processed  
Products  
Branch

# **United States Standards for Grades of Canned Tomato Puree (Tomato Pulp)**

Effective May 1, 1978

This is the Sixth issue of the United States Standards for Grades of Canned Tomato Puree (Tomato Pulp) published in the **FEDERAL REGISTER** of April 14, 1978, (43 FR 15610) to become effective May 1, 1978. This issue supersedes the fifth issue, which have been in effect since February 25, 1970.

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 processed fruits and vegetables, 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 standards also serve as a basis for the inspection and grading of commodities by the Federal inspection service, the only activity authorized to approve the designation of U.S. grades as referenced in the standards, as provided under the Agricultural Marketing Act of 1946. This service, available as on-line (in-plant) or lot inspection and grading of all processed fruit and vegetable products, is offered to interested parties, upon application, on a fee-for-service basis. The verification of some specific recommendations, requirements, or tolerances contained in the standards can be accomplished only by the use of on-line inspection procedures. In all instances, a grade can be assigned based on final product factors or characteristics.

In addition to the U.S. grade standards, grading manuals or instructions for inspection of several processed fruits and vegetables are available upon request for a nominal fee. These manuals or instructions contain detailed interpretations of the grade standards and provide step-by-step procedures for grading the product.

Grade standards are issues by the Department after careful consideration of all data and views submitted, and the Department welcomes suggestions which might aid in improving the standards in future revisions. Comments may be submitted to, and copies of standards and grading manuals obtained from:

Chief, Processed Products Branch  
Fruit and Vegetable Division, AMS  
U.S. Department of Agriculture  
P.O. Box 96456, Rm. 0709, So. Bldg.  
Washington, D.C. 20090-6456

UNITED STATES STANDARDS FOR GRADES OF  
TOMATO PUREE (TOMATO PULP)  
EFFECTIVE MAY 1, 1978

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Authority: Agricultural Marketing Act of 1946, Secs. 203, 205, 60 Stat. 1087, as amended, 1090, as amended (7 U.S.C. 1622, 1624).

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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.

**§52.5081 Product description.**

- (a) **Tomato Puree (or Tomato Pulp)**, hereinafter referred to as **Tomato Puree**, is the clean sound, wholesome product as defined in the Standard of Identity for Tomato Puree (Tomato Pulp) (21 CFR 155.192), issued pursuant to the Federal Food, Drug, and Cosmetic Act.

**§52.5082 Concentration.**

- (a) The degree of concentration is not considered a factor of quality for the purposes of these standards, but tomato puree contains not less than 8 percent, but less than 24 percent of natural tomato soluble solids.
- (b) The following designations of concentration may be used in connection with these standards for the applicable natural tomato soluble solids group:

**NATURAL TOMATO SOLUBLE SOLIDS**

Extra heavy concentration.	15.0 percent or more, but less than 24.0 percent.
Heavy concentration.	11.3 percent or more, but less than 15.0 percent.
Medium concentration.	10.2 percent or more, but less than 11.3 percent.
Light concentration.	8 percent or more, but less than 10.2 percent.

**§52.5083 Texture.**

- (a) **General.** Texture is the degree of fineness or coarseness of the product. Texture is classified when the product is diluted with water, when necessary, to between 8 percent and 9 percent, inclusive, of natural tomato soluble solids.
- (b) **Kind of texture.**
  - (1) **Fine** texture means smooth uniform finish.
  - (2) **Coarse** texture means a coarse, slightly granular finish.

**§52.5084        Grades.**

**(a)    U.S. Grade A** is the quality of tomato puree that:

- (1)**    has a good flavor and odor;
- (2)**    has a good color;
- (3)**    is practically free from defects; and
- (4)**    scores not less than 90 points when scored in accordance with the scoring system outlined in this subpart.

**(b)    U.S. Grade C** is the quality of tomato puree that:

- (1)**    has at least a fairly good flavor and odor;
- (2)**    has at least a fairly good color;
- (3)**    is at least fairly free from defects; and
- (4)**    scores not less than 80 points when scores in accordance with the scoring system outlined in this subpart.

**(c)    Substandard** is the grade of tomato puree that fails to meet the requirements of **U. S. Grade C**.

**§52.5085        Recommended fill of container.**

It is recommended that container of tomato puree be filled as full as practicable without impairment of quality.

**§52.5086        Determining the grade of a sample unit.**

**(a)    General.** The grade of a sample unit of tomato puree is determined by considering the factor of flavor and odor which is not scored, the ratings for the factors of color and defects which are scored, the total score, and the limiting rules which apply.

**(b)    Factors not rated by score points.**

- (1)**    **Flavor and odor.**

- (i) The flavor and odor of the product is determined on undiluted samples and also after dilution with water to between 8 percent and 9 percent, inclusive, of natural tomato soluble solids.
  - (ii) **Good flavor and odor** means a distinct tomato puree flavor characteristics of ripe, good quality tomatoes and inclusive of salt which may be added. Such flavor and odor may be no more than slightly affected by any one or combination of the following: stems, sepals, leaves, crushed seeds, cores; by immature, soured, or overripe tomatoes; from the effects of unsatisfactory preparation, processing, or storage; or from any other factor not specifically mentioned.
  - (iii) **Fairly good flavor and odor** means a characteristic tomato puree flavor and inclusive of salt which may be added. Such flavor and odor may be affected, but not to a serious degree, by any one or combination of the following: stems, sepals, leaves, or crushed seeds, cores; by immature, soured or overripe tomatoes; from the effects of unsatisfactory preparation, processing, or storage; or from any other factor not specifically mentioned.
  - (iv) **Off flavor and odor** means tomato puree flavor that fails to meet the requirements of **fairly good flavor and odor** or which has a flavor and/or odor which is seriously objectionable.
- (c) **Factors rated by score points.** The relative importance of each scoring factor is expressed numerically on the scale of 100. The maximum number of points that may be given each factor is:

<b>Factors</b>	<b>Points</b>
Color	50
Defects	<u>50</u>
	Total score 100
<b>§52.5087</b>	<b>Determining the rating for the factors which are scored.</b>

The essential variations within each factor which is scored are so described that the value may be determined numerically. The numerical range within each factor is inclusive. (For example, **45 to 50 points** means 45, 46, 47, 48, 49, or 50 points.)

**§52.5088 Color.**

- (a) **General.** The amount of red in tomato puree is determined by comparing the color of the product, diluted, if necessary, with water to between 8.0 percent and 8.6 percent, inclusive, of natural tomato soluble solids (N.T.S.S.), with that produced by spinning a combination of the following Munsell color discs:

Disc 1 - Red (5R 2.6/13) (glossy finish).

Disc 2 - Yellow (2.5YR 5/12) (glossy finish).

Disc 3 - Black (N1) (glossy finish).

Disc 4 - Grey (N4) (mat finish).

Such comparison is made under a diffused light source of approximately 250 foot-candle (candela) intensity and having a spectral quality approximating that of daylight under a moderately overcast sky, and a color temperature of 7,500 degrees Kelvin  $\pm$  200 degrees. With the light source directly over the disc and product, observation is made at an angle of 45 degrees and at a distance of 12 or more inches from the product.

- (b) **Availability of color reference.** The colors referred to in this section are available from the approved supplier under license from the U.S. Department of Agriculture:

Munsell Color Company  
2441 North Calvert Street  
Baltimore, Maryland 21218

**(c) Use of electric color meters.**

- (1)** Values that may be used for conversion to a numerical score point color evaluation of the product, may be determined by any electronic color meter system approved by the United States Department of Agriculture. Such values may be determined by electronic color meters only on tomato puree that has a concentration of, or may be diluted with water to, 8.5 percent ( $\pm$  0.1 percent) natural tomato soluble solids (N. T. S. S.).
- (2)** The values derived with the approved electronic color meter system shall be resolvable into a calculated numerical score point by use of any appropriate conversion formula that has been approved by the USDA.

**(d) Grade "A" classification.**

- (1)** Tomato puree that has a good color may be given a score of 45 to 50 points. **Good color** means a bright, typical, red tomato puree color. Such color when the product of the proper concentration and observed as specified in this section, is as red as, or more red than, that produced by spinning the Munsell color discs in the following combinations or an equivalent of such composite color:
  - 65 percent of the area of Disc 1;
  - 21 percent of the area of Disc 2; and
  - 14 percent of the area of either Disc 3 or Disc 4; or
  - 7 percent of the area of Disc 3 and 7 percent of the area of Disc 4, whichever most nearly matches the appearance of the sample.
- (2)** Any calculated numerical score of 45 points, for a product shall be equivalent to a visually evaluated color score of 45 points produced under the conditions specified in paragraph (d) (1) of this section. Proportionately higher calculated numerical scores or visually assigned score points may be assigned to products of proper concentration which show more redness.



**(e) Grade "C" classification.**

- (1)** Tomato puree that has at least a fairly good color may be given a score of 40 to 44 points. Tomato puree that falls into this classification shall not be graded above U.S. Grade C, regardless of the total score for the product ( this is a limiting rule). **Fairly good color** means a typical red tomato puree color which may be slightly dull or may have a slight yellow, yellow-orange, or brownish cast. Such color, when the product is of proper concentration and observed as specified in this section, is as red as, or more red than, that produced by spinning the Munsell color discs in the following combinations or an equivalent of such composite color:

53 percent of the area of Disc 1;

28 percent of the area of Disc 2;

19 percent of the area of either Disc 3 or Disc 4; or

9-1/2 percent of the area of Disc 3 and 9-1/2 percent of the area of Disc 4, whichever most nearly matches the appearance of the sample.

- (2)** Any calculated numerical score of 40 points for a product of the proper concentration, shall be equivalent to a visually evaluated color score of 40 points produced under the conditions specified in paragraph (e) (1) of this section. Proportionately higher calculated numerical scores or visually assigned score points may be assigned to products of proper concentration which show more redness.

- (f) "Substandard" classification.** Tomato puree that fails to meet the requirements of paragraph (e) of this section may be given a score of 0 to 39 points and shall not be graded above Substandard regardless of the total score for the product ( this is a limiting rule).

**§52.5089 Defects.**

- (a) General.** This factor is concerned with the degree of freedom from defects such as dark specks or scale-like particles, seeds or objectionable tomato particles of seeds, objectionable tomato peel, harmless extraneous material, or any other similar substances.

- (b) **Grade "A" classification.** Tomato puree that is practically free from defects may be given a score of 45 to 50 points. **Practically free from defects** means that any defects present do not more than slightly affect the appearance or usability of the product.
- (c) **Grade "C" classification.** Tomato puree that is fairly free from defects may be given a score of 40 to 44 points. Tomato puree that falls into this classification shall not be graded above U.S. Grade C, regardless of the total score for the product (this is a limiting rule). **Fairly free from defects** means that any defect present may be noticeable but are not so large, so numerous, nor of such contrasting color or nature as to seriously affect the appearance or usability of the product.
- (d) **"Substandard" classification.** Tomato puree that fails to meet the requirements of paragraph (c) of this section may be given a score of 0 to 39 points and shall not be graded above Substandard regardless of the total score for the product (this is a limiting rule).

**§52.5090            Determining the grade of a lot.**

The grade of a lot of tomato puree covered by these standards is determined by the procedures set forth in the **Regulations Governing Inspection and Certification of Processed Fruits and Vegetables, Processed Products Thereof, and Certain Other Processed Food Products** (Sections §§ 52.1 to 52.83).

Size of container .....		
Label .....		
Container mark or identification .....		
Net weight .....		
Vacuum (inches) .....		
Texture (fine or course) .....		
Natural tomato soluble solids (percent) .....		
Factors		Score points
Color .....	50	(A) 45 - 50 (C) 40 - 44 <sup>1/</sup> (SStd) 0 - 39 <sup>1/</sup>
Defects .....	50	(A) 45 - 50 (C) 40 - 44 <sup>1/</sup> (SStd) 0 - 39 <sup>1/</sup>
Total score	100	
Flavor and odor .....		Good Fairly Good Off
Grade .....		

<sup>1/</sup> Limiting rule.

**Effective date:** The U. S. Standards for Grades as hereby amended shall become effective May 1, 1978, and thereupon will supersede U. S. Standards for Grades of Canned Tomato Puree which have been in effect since February 25, 1970.

**Note:** The Food Safety and Quality Service has determined that this document does not contain a major proposal requiring preparation of an Inflation Impact Statement under Executive Order 11821 and OMB Circular A-107.

**Dated:** April 10, 1978

/s/  
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 Joseph A. Powers  
 Acting Administrator  
 Food and Safety and Quality Service