

Foreword

This Bangladesh Standard was adopted by the Bangladesh Standards and Testing Institution on, after the recommendation by the Sectional Committee for the Fruits, Vegetables and their Derived Products had been approved by the Agricultural and Food Products Divisional Committee.

Tomato ketchup is one of the most widely consumed processed tomato products in Bangladesh, prepared from sound, ripe tomatoes or tomato concentrates, blended with nutritive sweeteners, salt, spices, condiments, and other permitted ingredients to impart a characteristic flavor, color, and texture. Considering its growing popularity and wide consumption as a condiment and culinary ingredient, it was considered necessary to revise this standard to ensure that the product conforms to the required quality and safety specifications and to protect consumer health.

This standard BDS 530 Tomato Ketchup was first published in 1966, subsequently revised in 1988 and 2002. The present version represents the third revision of this standard. Major modifications introduced in this revision include the following:

- i) definition for 'tomato ketchup' has been updated;
- ii) the list of ingredients has been reviewed and modified;
- iii) clauses for 'normative references', 'ingredients', 'hygiene', 'pesticide residues', 'legal requirement' and 'compliance' have been incorporated;
- iv) limits for 'preservatives' and 'total soluble solids' have been revised;
- v) limit for 'acidity' parameter has been deleted and limit for 'pH' has been included;
- vi) limits for 'heavy metals' have been revised;
- vii) limits for microbiological parameters have been included; and
- viii) requirements for labeling has been modified according to the current practices;

The Sectional Committee responsible for the preparation of this standard has taken into consideration the views of the members of this committee, local producers, consumers and technologists and has related the standard to the manufacturing and trade practices followed in the country in this field.

In the formulation of this standard, considerable assistance has been derived from the following publications which is acknowledged with thanks:

- i. CXS 57:1981 Standard for Processed Tomato Concentrates, last amended in 2023
Codex Alimentarius Commission
- ii. CXS 306-2023 Standard for Chili Sauce
Codex Alimentarius Commission

This standard is subject to periodical reviews and amendments, if necessary, in order to keep pace with the latest industrial and technological innovations. Any suggestions for improvement will be recorded and placed before the committee in due course.

For the purpose of deciding, whether a particular requirement of this standard is complied with the final value observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with BDS 103. The number of significant places retained in the rounded off value should be the same as that of the specified value in the standard.

This standard BDS 530:YYYY Tomato Ketchup (3rd Rev.) cancels and replaces BDS 530:2002 Tomato Ketchup (2nd Rev.) that has been technically revised.

Bangladesh Standard Specification for Tomato Ketchup (Third Revision)

1. Scope

1.1 This standard specifies the requirements and the methods of test for tomato ketchup for edible purposes.

2. Normative References

2.1 The relevant standards listed in Annex-A are necessary adjuncts to this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

3. Terminology

3.1 For the purpose of this standard, the following definitions shall apply.

3.2 **Tomato Juice** – Expressed liquid derived from ripe tomatoes containing a minimum of 5 percent by mass of total soluble solids. The tomato juice may contain finely derived insoluble solids from tomato flesh. Common salt, sugar, dextrose, malic acid, ascorbic acid, citric acid and permitted colours may also be added.

3.3 **Tomato ketchup (sauce)** – Preparation from sound and ripe tomatoes with more than 25 percent by mass of total soluble solids. Common salt, spices, sugar, vinegar, onion, garlic and other permitted additives may be added to tomato ketchup. It is also known as catsup or catchup.

3.4 **Tomato Puree** – Concentrated tomato juice containing 9 to 25 percent by mass of total soluble solids. The puree may contain common salt permitted colours and additives.

3.5 **Tomato paste** – Concentrated tomato juice containing more than 25 percent by mass of total soluble solids. The paste may contain added common salt, permitted additives.

3.6 **Head space** – The distance between the top of the double seam and the level of the surface of the contents in the container.

3.7 **Defects** – Presence of seeds, skins, stems, core and other coarse and hard substances.

4. Ingredients

4.1 The following raw materials shall be used in the manufacture of tomato ketchup:

i) Tomato ketchup shall be derived from sound, fully ripe, wholesome tomatoes. The tomatoes shall be free from insect or fungal attack or any other blemish affecting the quality of the product. Tomatoes of the following varieties or any other suitable variety may be used for preparing tomato ketchup.

- | | | | | |
|-------------------|--------------|------------|--------------|----------|
| a) BARI Tomato 19 | b) Ponderosa | c) Roma | d) Marglobe | e) Sioux |
| f) World champion | g) Rutgers | h) Oxheart | i) Samarzano | |

ii) Sugars and/or other foodstuffs with sweetening properties such as, glucose syrup or high fructose corn syrup.

iii) Salt, spices, potable water, and vinegar or citric acid.

iv) Onion, garlic, ginger and any other permitted flavouring material.

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4.2 Food Colours – Only natural or nature-identical permitted colours such as Paprika Oleoresin (INS 160c), Lycopene (INS 160d), and Canthaxanthin (INS 161g) may be used as per GMP. The source and INS number of any food colour used shall be declared on the label, as applicable.

4.3 Food Additives – The product may contain any food additives as permitted under the food category 12.6.2 in the latest available version of Codex General Standard for Food additives (CODEX STAN 192)'.
to be created as BDS

4.4 Food Preservatives – The product may contain only the following preservatives when tested according to the given methods in the table 1.

Table 1 Limit for preservatives

Sl. No. (1)	Preservatives (2)	Limit (3)	Method of test (4)
i.	Benzoic acid and/or its salts (as Benzoic acid), mg/kg, Max	1000	BDS ISO 22855
ii.	Sorbic acid and/or its salts (as Sorbic acid), mg/kg, Max	1000	BDS ISO 22855
iii.	Sulphur dioxide, Sulphites and/or its salts (as Sulphur dioxide), mg/kg, Max.	300	BDS ISO 5523

NOTE – When more than one preservative is used, the amount of each shall be such that, when expressed as a percentage of the amount permitted singly, the sum of these percentages does not exceed one hundred percent.

4.5 Thickening agents - The product may contain thickening agents such as modified starches (as per GMP) and xanthan gum (maximum 0.5%), which must be declared on the product label.

5. Requirements

5.1 The finished product shall be free from pest, insects and their residues, rodent hair, adulterants, foreign matter, visible fungal infestation and other signs of spoilage.

5.2 Organoleptic Requirements – Tomato ketchup shall of two grades, namely, Grade-1 and Grade-2 as given below:

Grade-1: The tomato ketchup shall possess good body and consistency and uniform colour, be practically free from defects, shall have the normal characteristic taste and flavour. It shall score not less than 85 points.

Grade-2: The tomato ketchup shall possess good body, uniform colour, be reasonably free from defects and shall possess normal characteristic taste and flavour. It shall score not less than 75 points.

The maximum and minimum number of points to be scored through different factors shall be as follows:

Sl. No. (1)	Characteristics (2)	Maximum (3)	Minimum	
			Grade-1 (4)	Grade-2 (5)
i.	Colour	25	19	16
ii.	Consistency	25	19	16
iii.	Flavour	25	19	16
iv.	Absence of defects	25	18	17

5.2.1 Scoring shall be done according to the method prescribed in Annex-B.

5.3 **Specific Requirements** – Tomato ketchup shall comply with the specific requirements in Table 2, 3 and Table 4.

Table 2 Requirements for Tomato Ketchup

Sl. No.	Characteristics	Requirements	Method of test
(1)	(2)	(3)	(4)
i.	Total soluble solids, percent by mass, <i>Min.</i>	26	BDS ISO 2173
ii.	Specific Gravity (Brix), <i>Min.</i>	1.111 (26°)	Cl. 9 of BDS 1010
iii.	PH, <i>Max.</i>	4.5	BDS ISO 1842

Table 3 Maximum Limit for Heavy metals

Sl. No.	Characteristics	Limit	Method of test
(1)	(2)	(3)	(4)
i)	Arsenic (As), mg/kg, <i>Max.</i>	0.2	AOAC 986.15
ii)	Lead (Pb), mg/kg, <i>Max.</i>	0.3	AOAC 999.10
iii)	Copper (Cu), mg/kg, <i>Max.</i>	5.0	AOAC 990.10
iv)	Zinc (Zn), mg/kg, <i>Max.</i>	5.0	AOAC 986.15
v)	Tin (Sn), mg/kg, <i>Max.</i>	250.0	AOAC 980.19

Table 4 Maximum Limit for Microbiological Parameters

Sl. No.	Characteristics	Limit	Method of test
(1)	(2)	(3)	(4)
i)	Total Plate Count, cfu/g, <i>Max.</i>	50	BDS ISO 4833-1
ii)	Yeast and Mould count, cfu/g, <i>Max.</i>	<10	BDS ISO 21527-1
iii)	Total Coliform count, cfu/g, <i>Max.</i>	Nil	BDS ISO 4832
iv)	<i>Salmonella</i> /25g, <i>Max.</i>	Absent	BDS ISO 6579-1

5.4 **Hygiene** – During processing, handling, storage and transportation, effective measures must be taken to prevent cross contamination with chemicals, microbial or physical contaminants.

5.4.1 The product shall be processed and packed under strict hygienic conditions in premises maintained in accordance with BDS 822.

5.5 **Pesticide residues** – The product covered by this standard shall comply with the maximum residue limits for pesticide established by the Codex Alimentarius Commission.

5.6 **Legal Requirement** – The product shall in all other aspects comply with the requirements of the legislations enforced in the country.

6. Packing and Marking

6.1 **Packing** – The product shall be packaged in containers made from food grade packaging material and sealed in a manner that will safeguard the hygienic, nutritional and organoleptic properties of the product throughout the shelf life of the product.

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6.2 Marking – Each package shall be suitably labeled so as to give the following information:

- a) Name of the product;
- b) Name and address of the manufacturer/importer;
- c) List of the ingredients;
- c) Batch or code number;
- d) Net content in g;
- e) Date of manufacture and expiry;
- f) Storage condition;
- g) Maximum Retail Price (MRP); and
- h) Any other requirements as specified under the 'Packaged Commodities Rules, 2021 (Amendment-2025)' of BSTI.

6.2.1 Each package may also be marked with the BSTI Certification Mark.

NOTE – The use of BSTI Certification Mark is governed by the provisions of Bangladesh Standards and Testing Institution Act, 2018 and the Rules and Regulations made thereunder. Details of conditions, under which a license for the use of BSTI Certification Mark may be granted to manufacturers or processors, may be obtained from the Bangladesh Standards and Testing Institution.

7. Sampling

7.1 Representative samples shall be prepared as prescribed in col. 3 of BDS 1010.

8. Tests

8.1 Test shall be carried out as prescribed in the relevant column of Table 1, 2,3 and 4.

8.2 Quality of Reagents – Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (BDS 833) shall be used where the use of water as a reagent is intended.

NOTE – 'Pure chemicals' shall mean chemicals that do not contain impurities, which may affect the result of analysis.

9. Compliance

9.1 When on testing, each of the samples is found to conform to the requirements specified in this Bangladesh Standard Specification, the lot, batch or consignment from which the samples have been drawn shall be deemed to comply with standard specification.

Annex - A
[Clause 2.1]

List of Relevant Standards

BDS and ISO No.	Title
BDS 103	Methods of rounding off numerical value
BDS 822	Code of hygienic conditions for food processing units
BDS 833	Water for laboratory use
BDS 1010	Methods of sampling and test for processed fruits and vegetables in cans/containers
ISO 750:1998	Fruit and vegetable products — Determination of titratable acidity
BDS ISO 1842	Fruit and vegetable products - Determination of pH
BDS ISO 4832	Microbiology of food and animal feeding stuffs- Horizontal method for the enumeration of coliforms- colony count technique
BDS ISO 4833-1	Microbiology of food chain – Horizontal method for the enumeration of microorganism – Part 1: Colony count at 30°C by the pour plate technique
BDS ISO 5523	Liquid fruit and vegetable products – Determination of sulphur dioxide content (Routine method)
BDS ISO 6579-1	Microbiology of the food chain - Horizontal method for the detection, enumeration and serotyping of <i>Salmonella</i> – Part 1: Detection of <i>Salmonella</i> spp
BDS ISO 21527-1	Microbiology of food and animal feeding stuffs – Horizontal method for the enumeration of yeasts and moulds- Part 1: Colony count technique in products with water activity greater than 0.95
BDS ISO 22855	Fruit and vegetable products - Determination of benzoic acid and sorbic acid concentrations - High performance liquid chromatography method

Annex-B
[Clause 4.4.1]

Determination of the Grade of Tomato Ketchup

B-1 Apparatus

B-1.1 White porcelain Bowls-big enough to hold the contents of container under examination.

B-1.2 Stainless steel spoons

B-2 Procedure

B-2.1 Panel of Judges - Grades of the product shall be judged by a panel of 3 to 5 judges. All the judges constituting a panel shall be conversant with the factors governing the quality of the product. The containers shall be opened and the contents poured separately into white porcelain bowls. Each judge shall independently examine the contents from each of the containers and assign scores for different characteristics.

B-2.1.1 The judges shall consider the following characteristics, colour, consistency, flavour and absence of defects.

B-2.2 System of scoring - The variations within each factor are so described that the scores may be described for each factor and expressed numerically. The relative importance of each factor has been expressed numerically on a scale of 100. Each judge gives a score for the individual factors, by the method described in Table-5 and record his observations in the score sheet (P-8).

B-2.2.1 The scores as number of points given by the judges for the contents of each container for the four factors shall be recorded in tabular form in score card (P-9) and the average score calculated for each factor with overall average for each container entered in the appropriate column (see Table-5 and B-2.3.2).

B-2.3 Ascertaining the grade

B-2.3.1 Agreement among Judges – To ascertain of uniformity of judgment among the judges, the total assigned by each of them for the contents of the same container shall be calculated by adding up the scores for the various individual characteristics. If the difference between the maximum and the minimum of the total score so obtained does not exceed $(K + 5)$, where K is the number of judges, the scoring shall be deemed as uniform for the containers under consideration. If the difference exceeds $(K+5)$, the most outlying score, the is the one which is farthes form its immediate neighbour (the scores being arranged in one order) shall be discarded and the uniformity among the score cards of remaining judges examined.

B-2.3.2 When the consistency (see B-2.3.1) is thus established the overall average scores given by the judges whose scoring has been found to be consistent shall be calculated for each container. The average score for each of the individual characteristic shall also be calculated by taking into account the corresponding scores as given by the same judge for the contents of the same container.

B-2.3.3 Assignment of grade - In order to assign a grade for the contents of a container, the following procedure shall be adopted:

Grade-1 – The score for each factor individually shall be not less than 75 percent of the maximum score obtainable and the overall average score shall be not less than 85 points.

Grade-2 – The score for each factor individually shall be not less the 65 percent of the maximum score obtainable and the overall average score shall be not less than 75 points.

Table-5 Method for Giving Scores for Tomato Ketchup
(Clause B-2.2)

Characteristic (1)	Description (2)	Maximum Number of Points (3)
Colour	Good, practically uniform colour; Practically free from discolouration (such as blackening of the surface) due to oxidation or other causes, changes normally associated with processing shall not be considered as defects.	25
	Good, reasonably uniform colour; reasonably free from discolouration.	19
	Indication of developing black discolouration at the surface; colour not characteristic red, tending to be pink.	16
Consistency	Good fluid consistency; uniform smooth texture; no tendency for separation of insoluble solids and liquid portions.	25
	Reasonably good fluid consistency; reasonably uniform texture, little tendency to separate.	19
	Fairly good fluid consistency; some tendency to separate.	16
Flavour	Good characteristic flavour of tomato ketchup; free from scorched burnt or any objectionable flavour.	25
	Reasonably good, characteristic flavour of tomato ketchup, having a slightly scorched taste.	19
	Fair flavour; may have smell of being scorched or over burnt, but the product is acceptable.	16
Absence of defects	Practically free from defects, such as presence of particles of seeds, skins, dark specks or other hard and coarse extraneous material.	25
	Reasonably free from defects, some pieces of seeds or minute pieces of core may be present, not easily discernible to the eye.	19
	Some pieces of seeds or pieces of core material readily noticeable on casual examination.	17

Score Sheet for Individual Judge

Details of the Sample:

Sample No.....

Date of sampling.....

a) Product.....

b) Name of the manufacturer.....

c) Type

d) Batch No.....

e) Date of manufacture.....

Factors	Score points		Sample cans										
	Grade-1	Grade-2	1	2	3	4	5	6	7	8	9	10	
Colour	19-25	16-18											
Consistency	19-25	16-18											
Flavour	19-25	16-18											
Absence of defects	19-25	17-18											

Signature of the judge.....

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Score Card

Sample No.....

Date of Sampling.....

Details of Sample Can: a) Product b) Name of manufacturer.....

c) Batch No.....d) Date of Manufacture.....

FACTOR	Colour					Consistency					Flavour					Absence of defects					Total score					Average score for					Grade of the can
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	Colour	Consistency	Absence of defects	Flavour	Total	
Judge																															
Can number																															

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