

ICS 67.80.20

DMS 25:2018

Second edition

DRAFT MALAWI STANDARD

**Tomato concentrates (tomato puree
and paste) – Specification**

Tomato concentrates (tomato puree and paste) – Specification

Obtainable from the
Malawi Bureau of Standards
Moirs Road
P O Box 946
BLANTYRE

Tel: +265 1 870 488
Fax: +265 1 870 756
E-mail: mbs@mbsmw.org
Website: www.mbsmw.org

Price based on 9 pages

© Copyright reserved

TABLE OF CONTENTS

Contents	Page
Foreword.....	i
Technical committee	i
Notice	i
Scope	1
Normative references.....	1
Description.....	2
Essential composition and quality factors.....	2
Food adittives.....	3
Contaminants.....	4
Hygiene.....	4
Packaging and labelling.....	4
Methods of sampling and test.....	5
Annex A: Method of sampling.....	6
Annex B: Estimation of mould count.....	8
Annex C: Determination of the fill of the container.....	9

FOREWORD

This draft proposal has been prepared by *MBS/TC 10*, Technical committee on *Processed foods*, to provide requirements for processed tomato concentrates. It is the first revision of MS 25:1984.

The draft standard is based on the following standards:

India Standard IS 3883:1993 Reaffirmed 2018, *Canned tomato concentrate - Specification*

CODEX STAN 57 – 1981, Rev 1 (2007), Amended (2013), Rev 2 (2017), *Standard for processed tomato concentrates*; and

East African Standard, EAS 66 – 4:2017, *Tomato products – Specification, Part 4: Tomato paste and puree*

Acknowledgement is made for the use of the information.

TECHNICAL COMMITTEE

This draft proposal was prepared by Technical Committee *MBS/TC 10 Processed foods*, and the following companies, organizations and institutions were represented:

NOTICE

This draft standard shall be reviewed every five years, or earlier when it is necessary, in order to keep abreast of progress. Comments are welcome and shall be considered when the draft standard is being reviewed

DRAFT MALAWI STANDARD

Tomato concentrates (tomato puree and paste) – Specification

1 SCOPE

1.1 This draft Malawi standard prescribes the requirements of processed tomato concentrates offered for direct consumption including for catering purposes or for repacking if required.

1.2 This draft proposal also applies to the product when indicated as being intended for further processing.

1.3 This draft Malawi standard does not include products that contain seeds and skins such as pizza toppings and other homestyle products. It also does not include products commonly known as tomato sauce, chilli sauce and ketchup, or similar product which are highly seasoned products of varying concentrations containing characterising ingredients such as pepper, onions, vinegar, etc., in quantities that alter the flavour, aroma and taste of the tomato component.

2 NORMATIVE REFERENCES

The following standards contain provisions, which through reference in this text, constitute provisions of this draft standard. All standards are subject to revision and since any reference to a standard is deemed to be a reference to the latest edition of that standard, parties to agreements based on this draft standard are encouraged to take steps to ensure the use of the most recent edition of the standard indicated below. Information on current valid national and international standards can be obtained from the Malawi Bureau of Standards.

MS 19: *Labelling of prepacked foods – General standard;*

MS 21: *Code of hygienic conditions for food and food processing units;*

MS 188: *Edible salt – Specification;*

MS 214: *Drinking water – Specification;*

MS 237: *Food additives – General standard;*

MS 302: *Contaminants and toxins in food;*

MS 624: *Nutrition labelling – Guidelines;*

MS 625: *Nutrition claims – Guidelines;*

MS 935: *Principles for the establishment and application of microbiological criteria for foods;*

MS 1112: *Code of hygienic practices for fresh fruits and vegetables;*

AOAC 971.27: *Sodium chloride in canned vegetables. Method I;*

ISO 762: *Fruit and vegetable products – Determination of mineral impurities content; and*

ISO 2173: *Fruit and vegetable products – Determination of soluble solids – Refractometric methods.*

ISO 4833: *Microbiology of the food chain - Horizontal methods for the enumeration of microorganisms;*

ISO 6579: *Microbiology of food and animal feeding stuffs – Horizontal methods for the detection of Salmonella spp.*;

ISO 7251: *Microbiology of food and animal feeding stuffs – Horizontal methods for the detection and enumeration of presumptive Escherichia coli – Most Probable Number technique*; and

ISO 21527-1: *Microbiology of food and animal feeding stuffs – Horizontal methods for the enumeration of yeasts and moulds.*

3 DESCRIPTION

3.1 Product definition

3.1.1 Processed tomato concentrate is the product prepared by concentrating the juice or pulp obtained from substantially sound, mature red tomatoes (*Lycopersicon/Lycopersicum esculentum P. Mill*) strained or otherwise prepared to exclude the majority of skins, seeds and other coarse or hard substances in the finished product; and preserved by physical means.

3.1.2 The tomato concentration shall be 7 % or more of the natural total soluble solids but not dehydrated to a dry powder or flake form.

NOTE: The concentration is measured on the product without added salt.

3.2 Product designation

Tomato concentrate may be considered “Tomato puree” or “Tomato paste” when the concentrate meets the following requirements:

3.2.1 Tomato puree, tomato concentrate that contains no less than 7 % but less than 24 % of natural total soluble solids.

3.2.2 Tomato paste, tomato concentrate that contains at least 24 % of natural total soluble solids.

4 ESSENTIAL COMPOSITION AND QUALITY FACTORS

4.1 Composition

The products shall comply with the compositional requirements in table 1 below:

Table 1 – Compositional requirements for tomato concentrates

1	2		3
Characteristic	Requirement		Test method
Total soluble solids content, % by m/m,	Tomato puree	7 - 24	ISO 2173
	Tomato paste, min.	24	
Sodium chloride, % by m/m.	2		AOAC 971.27
pH	Not higher than 4.5		ISO 1842

4.1.1 Basic ingredients

Processed tomato concentrates as defined in clause 3.1.

4.1.2 Other permitted ingredients

4.1.2.1 Salt (sodium chloride in complying with MS 188);

4.1.2.2 Spices and aromatic herbs (such as basil leaf, etc.) and their natural extracts;

4.1.2.3 Lemon juice (single strength or concentrated) used as an acidulant; and

4.1.2.4 Water complying with MS 214.

4.2 Quality criteria

Processed tomato concentrates shall be have good flavour and odour, fairly good red colour and shall possess a homogenous (evenly divided) texture, characteristic of the product.

4.2.1 Definition of defects

Processed tomato concentrates shall be prepared in accordance with good manufacturing practices (GMP), from such materials and under such practices that the product is substantially free of extraneous plant materials, this including other objectionable material, shall be practically free of mineral impurities.

4.2.2 Consistent with its intended use, these conditions are fulfilled when:

4.2.2.1 The product is practically free of objectionable tomato peel;

4.2.2.2 The product is practically free of seed or particles of seeds;

4.2.2.3 The presence of any extraneous plant material other than seed and peel and other than those used as seasonings cannot be detected by the naked eye and can only be seen under microscope; and

4.2.2.4 The product is practically free of dark specks of scale – particles.

4.2.3 Defects and allowances

4.2.3.1 Mineral impurities

The mineral impurity content shall not exceed 0.1 % of the natural total soluble solids content when tested according to ISO 762.

NOTE: impurities include sand, soil and any other impurities insoluble in hydrochloric acid

4.2.3.2 Lactic acid

The content of lactic acid (total) shall not exceed 1 % of the natural total soluble solids.

4.2.3.3 pH

The pH shall not exceed 4.6

4.3 Classification of defectives

A container that fails to meet the natural total soluble solids requirements as set out in clause 3. 2 and/or one or more of the applicable quality requirements as set out in clause 4. 2 shall be considered as defective.

5 FOOD ADDITIVES

Only those food additives listed under this product in MS 237 shall be used and only within the limits specified.

6 CONTAMINANTS

6.1 The products covered by this draft standard shall comply with the maximum levels as stated in MS 302. In order to consider the concentration of the product, the determination of the maximum levels for contaminants shall take into account the natural total soluble solids, the reference value being 4.5 for fresh fruits.

6.2 The products covered by this draft standard shall comply with the maximum pesticides residue limits established by the Codex Alimentarius Commission. In order to consider the concentration of the product, the determination of the maximum pesticides residue limits shall take into account the natural total soluble solids, the reference value being 4.5 for fresh fruit.

7 HYGIENE

7.1 Products covered by this draft standard shall be prepared and handled in conditions that comply with the appropriate provisions of MS 21 and MS 1112.

7.2 The products shall comply with microbiological criteria established in accordance with MS 935 and shall comply with the microbiological limits in table 2.

Table 2 – Microbiological limits for tomato concentrates (tomato puree and paste)

1	2	3
Type of micro-organism	Maximum limits	Test method
Total viable counts, cfu/g	10	ISO 4833 (all parts)
Yeast/moulds cfu/g	shall be absent	ISO 21527-1
Escherichia coli MPN/g	shall be absent	ISO 7251
Salmonella sp. per 25 g	shall be absent	ISO 6579
Mould filament, max.	50 % positive fields	Annex B

8 PACKAGING AND LABELLING

8.1 Packaging

8.1.1 The products shall be packed in suitable food grade containers having no action on the products. The containers shall be free from other products that may lead to contamination and alter the quality, composition, flavour, odour and taste of the products.

8.1.2 Containers shall be air tight and shall be provided with tamper- proof seals and closures. Containers shall preclude contamination with or proliferation of microorganisms in the products during storage and transportation.

8.1.3 Minimum fill

The products shall occupy a minimum fill of not less than 90 % of the water holding capacity of the container when determined in accordance with Annex C.

8.1.5 Classification of defectives

A container that fails to meet the requirement of minimum fill in clause **8.1.3** should be considered as a defective.

8.2 Labelling

In addition to the requirements of MS 19, the following specific provisions shall apply:-

8.2.1 Name of the product

The name of the product shall be:

- a) “**Tomato puree**” if the food contains not less than 7 % but less than 24 % natural total soluble solids;
- b) “**Tomato paste**” if the food contains not less than 24 % natural total soluble solid;
- c) If an added ingredient as defined in clause 4.1.2 alters the flavour of characteristic of the product, the name of the product shall be accompanied by the term “flavoured with X” or “X flavoured” as appropriate.

8.2.2 Declaration of the percentage of natural total soluble solids

The percentage solids shall be include on the label in the following manners:

- a) The minimum percentage of natural total soluble solids (example: minimum solids – 22 %);
- b) A range within 2 % of the natural total soluble solids (example: solids 20 % to 22 %).

8.2.3 Name and address of manufacturer/importer;

8.2.4 Country of origin;

8.2.5 Date of manufacture and expiry date in code or in clear;

8.2.6 List of ingredients;

8.2.7 Net content;

8.2.8 Storage condition; and

8.2.9 Batch number in code or in clear.

8.2.10 Nutrition labelling and nutrition claims

Nutritional labelling and nutrition claims shall be done according to the provisions prescribed in MS 624 and MS 625.

8.3 Labelling of non – retail containers

8.3.1 Information for non-retail containers shall be given either on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer, packer, distributor or importer, as well as storage instructions, shall appear on the container.

8.3.2 However, lot identification and the name and address of the manufacturer, packer, distributor or importer may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

9 METHODS OF SAMPLING AND TEST

9.1 Sampling shall be done in accordance with Annex A.

9.2 Test methods for tomato concentrates have been outlined in Annex B and C.

**ANNEX A
(Normative)**

METHOD OF SAMPLING

A1 QUALITY

The quality of a lot shall be considered acceptable when the number of defectives does not exceed the acceptance number (c) in the sampling plans in table **A.2.2**.

A1.2 Fill of container

A lot shall be deemed to be in compliance for fill of container (packing medium and vegetable ingredient) when the number of defectives does not exceed the acceptance number (c) in the sampling plans in table **A.2.2**.

A1.3 Drained weight

A lot shall be deemed to be in compliance for drained weight based on the average value of all samples analyzed according to the sampling plans in table **A.2.2**.

A2 SAMPLING AND ACCEPTANCE PROCEDURE

A2.1 Definitions

A2.1.1 Lot: A collection of primary containers or units of the same size, type, and style manufactured or packed under similar conditions and handled as a single unit of trade.

A2.1.2 Lot size: The number of primary containers or units in the lot.

A2.1.3 Sample size: The total number of sample units drawn for examination from a lot.

A2.1.4 Sample unit: A container, a portion of the contents of a container, or a composite mixture of product from small containers that is sufficient for the examination or testing as a single unit. For fill of container, the sample unit shall be the entire contents of the container.

A2.1.5 Defective: Any sample unit shall be regarded as defective when the sample unit does not meet the criteria set forth in the standards.

A2.1.6 Acceptance number (c): The maximum number of defective sample units permitted in the sample in order to consider the lot as meeting the specified requirements.

A2.1.7 Acceptable quality level (AQL): The maximum percent of defective sample units permitted in a lot that will be accepted approximately 95 % of the time.

A2.2 Sampling plans

Sampling plans shall be done in accordance with table **A.2.2**.

Table A.2.2 – Sampling plans

Net weight is equal to or less than 1 kg		
Lot size (N)	Sample size (n)	Acceptance number (c)
4,800 or less	6	1
4,801 - 24,000	13	2
24,001 - 48,000	21	3
48,001 - 84,000	29	4
84,001 - 144,000	38	5
144,001 - 240,000	48	6
more than 240,000	60	7
Net weight is greater than 1 kg but not more than 4.5 kg		
Lot size (N)	Sample Size (n)	Acceptance number (c)
2,400 or less	6	1
2,401 - 15,000	13	2
15,001 - 24,000	21	3
24,001 - 42,000	29	4
42,001 - 72,000	38	5
72,001 - 120,000	48	6
more than 120,000	60	7
Net weight greater than 4.5 kg		
Lot size (N)	Sample size (n)	Acceptance number (c)
600 or less	6	1
601 - 2,000	13	2
2,001 - 7,200	21	3
7,201 - 15,000	29	4
15,001 - 24,000	38	5
24,001 - 42,000	48	6
more than 42,000	60	7

**ANNEX B
(Normative)**

ESTIMATION OF MOULD COUNT

B1 APPARATUS

B1.1 Howard Mould - Counting apparatus

B1.1.1 Howard Mould- Counting slide

Glass slide of one-piece construction with flat plane circle, about 19 mm in diameter or rectangle 20 × 15 mm, surrounded by moat and flanked on each side by shoulders 0.1 mm higher than plane surface. Cover glass is supported on shoulders and leaves depth of 0.1 mm between underside of cover glass and plane surface. Central plane, shoulders and cover glass have optically worked surfaces. To facilitate calibration of microscope, new slides are engraved with circle 1.382 mm in diameter or with 2 fine parallel lines 1.382 mm apart.

B1.1.2 Accessory disc for mould-counting

Glass disc fitting into microscope eyepiece, ruled into squares each side of which is equal to one sixth of the diameter of field. Since limiting diaphragm is eyepiece field stop, rulings equal one-sixth of this diaphragm opening. Field viewed on slide with mould-counting microscope has diameter of 1.382 mm of magnification of 90 to 125 X.

B1.2 Compound microscope

With standardized field of view of 1.382 mm diameter at 90 to 125 X; and equipped with drop-in ocular disc ruled in squares, each of which is one-sixth of field diameter.

B2 PROCEDURE

B2.1 General

The tomato concentrate used shall be diluted with clean mould free water so as to make about 9 percent by mass of total solids (exclusive of salt) in the diluted product.

B2.2 Clean Howard cell so that Newton's rings are produced between slide and cover glass. Remove cover and with knife blade or scalpel, place portion of well-mixed sample upon central disc; with same instrument; spread it evenly and cover with glass so as to give uniform distribution. Use enough sample to bring material to edge of dish. (It is of utmost importance that portion be taken from thoroughly mixed sample and spread evenly over slide disc. Otherwise, when cover slip is put in place, insoluble material, and consequently moulds may be more abundant at centre of mount). Discard any mount showing uneven distribution or absence of Newton's rings, or liquid that has been drawn across moat and between cover glass and shoulder.

B2.3 Place slide under microscope and examine with such adjustment that each field of view covers 1.5 mm². (This area, which is essential, may frequently be obtained by so adjusting draw-tube that diameter of field becomes 1.382 mm). When such adjustment is not possible, make accessory drop-in ocular diaphragm with aperture accurately cut to necessary size. Diameter of area field of view can be determined by use of stage micrometer. When instrument is properly adjusted, quantity of liquid examined per field is 0.15 mm³. Use magnification of 90 to 125 X. In those instances where identifying characteristics of mould filaments are not clearly discernible in standard field, use magnification of approximately 200 X (8 mm objective) to confirm identity of mould filaments previously observed in standard field.

B2.4 From each of 2 or more mounts examine at least 25 fields shall be taken in such a manner as to be representative of all sections of mount. Observe each field, noting presence or absence of mould filaments and recording results as positive when aggregate length of not more than 3 filaments present exceeds one-sixth of diameter of field.

B3 CALCULATIONS

B3.1 Calculate portion of positive fields from results of examination of all observed fields and report as percent fields containing mould filaments.

**ANNEX C
(Normative)**

DETERMINATION OF THE FILL OF THE CONTAINER

C1 SCOPE

This method applies to glass containers.

C2 DEFINITION

The water capacity of a container is the volume of distilled water at 20 °C which the sealed container will hold when completely filled.

C3 PROCEDURE

C3.1 Select a container which is undamaged in all respects.

C3.2 Weigh the filled container, (W_1)

C3.3 Empty, Wash, dry and weigh the empty container (W_2).

C3.4 Fill the container with distilled water at 20 °C to the level of the top thereof, and weigh the container thus filled (W_3).

C3.5 Calculate the water capacity of a container

Where water capacity of the container (WCC) = $W_1 - W_2$

C4 CALCULATION AND EXPRESSION OF RESULTS

C4.1 Fill Percentage =
$$\frac{W_1 - W_2 \times 100}{W_3 - W_2}$$

Where ,

W_1 is the weight of the filled container;

W_2 is the weight of the empty container; and

W_3 is the weight of the container filled with distilled water.

C4.2 The results are expressed as ml of water.

THE MALAWI BUREAU OF STANDARDS

The Malawi Bureau of Standards is the standardizing body in Malawi under the aegis of the Ministry of Industry, Trade and Tourism. Set up in 1972 by the Malawi Bureau of Standards Act (Cap: 51:02), the Bureau is a parastatal body whose activities aim at formulating and promoting the general adoption of standards relating to structures, commodities, materials, practices, operations and from time to time revise, alter and amend the same to incorporate advanced technology.

CERTIFICATION MARK SCHEME

To bring the advantages of standardization within the reach of the common consumer, the Bureau operates a Certification Mark Scheme. Under this scheme, manufacturers who produce goods that conform to national standards are granted permits to use the Bureau's "Mark of Quality" depicted below on their products. This Mark gives confidence to the consumer of the commodity's reliability.



