

**ICS 67.80.20**

**DMS 27:2018**

**Second edition**

**DRAFT MALAWI STANDARD**

**Tomato sauce and ketchup –  
Specification**

# **Tomato sauce and ketchup – Specification**

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## FOREWORD

This Draft Malawi standard has been prepared by *MBS/TC 10*, Technical committee on *Processed foods*, to provide requirements for tomato sauce and ketchup. It is the first revision of MS 27:1984.

The draft standard is based on the following standards:

Indian Standard IS 3882:1966 Reaffirmed 2001, *Tomato ketchup - Specification*

East African Standard EAS 66 – 2:2017, *Tomato products – Specification, Part 2: Tomato sauce and ketchup*

Acknowledgement is made for the use of the information.

## TECHNICAL COMMITTEE

This draft Malawi standard 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.*

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**DRAFT MALAWI STANDARD**

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**Tomato sauce and ketchup - Specification**

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**1 SCOPE**

This draft Malawi standard prescribes the requirements and the methods of test for tomato sauce and ketchup.

**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 11: *Vinegar – Specification;*

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

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

MS 25: *Tomato concentrates (tomato puree and paste) – Specification;*

MS 96: *Chillies and capsicums, whole of ground (powdered) – Specification;*

MS 188: *Edible salt – Specification;*

MS 226: *Garlic – Specification;*

MS 230: *Tomatoes – 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 1112: *Code of hygienic practices for fresh fruits and vegetables;*

AOAC 920.15:1 *Solids (total) in fruits and fruit products;*

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

ISO 1842: *Fruit and vegetable products -- Determination of pH;*

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** Tomato sauce and ketchup are products prepared from substantially sound ripe red or reddish tomatoes (*Lycopersicon/Lycopersicum esculentum P. Mill*), tomato paste or puree highly seasoned with characteristic ingredients such as pepper, onions, vinegar and sugar in quantities that materially alter the flavour, aroma and taste of the tomato component.

**3.1.2** Tomato sauce and ketchup shall practically be free from insect or fragments, fungal or any other blemishes affecting the quality and safety of the product

#### 3.2 Product designation

**3.2.1** The product shall be considered **Tomato sauce**, when it contains no less than 18 % but less than 25 % of natural total soluble solids.

**3.2.2** The product shall be considered **Tomato ketchup**, when it contains at least 26 % 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:

**Table 1 – Compositional requirements for tomato sauce/ ketchup**

1	2		3
Characteristic	Requirement		Test method
Total soluble solids content, % by m/m,	Tomato sauce	18 - 25	AOAC 920.151
	Tomato ketchup, min.	26	
Sodium chloride, % by m/m.	6		AOAC 971.27
pH	Not higher than 4.5		ISO 1842
Specific gravity at 20 °c	1.050 - 1.111		Annex A

#### **4.1.1 Basic ingredients**

Ripe red tomatoes (*Lycopersicon/Lycopersicum esculentum P. Mill*) complying with MS 230, tomato paste or puree complying with MS 25.

#### **4.1.2 Other permitted ingredients**

The following may be added to tomato sauce and ketchup and shall comply with the relevant applicable standards:

**4.1.2.1** Salt complying with MS 188;

**4.1.2.2** Vinegar complying with MS 11;

**4.1.2.3** Chillies complying with MS 96;

**4.1.2.4** Sugar (sucrose, dextrose, dried glucose syrup, glucose syrup);

**4.1.2.5** Spices;

**4.1.2.6** Flavouring;

**4.1.2.7** Onions; and

**4.1.2.8** Garlic complying with MS 226.

#### **4.2 Quality criteria**

##### **4.2.1 Colour**

The product shall have a natural red colour, (i.e. free from abnormal colours of the product).

##### **4.2.2 Texture**

The product shall have a homogeneous consistent texture indicative of good manufacturing practices.

##### **4.2.3 Flavour**

The product shall have a good flavour characteristic of properly processed tomato sauce and ketchup without any objectionable flavour foreign to the product.

##### **4.2.4 Defects**

Tomato sauce and ketchup shall be practically free from the following defects:

**4.2.4.1** Dark specks or scale-like particles;

**4.2.4.2** Seeds or particles of seeds;

**4.2.4.3** Tomato peel;

**4.2.4.4** Extraneous plant material; and

**4.2.4.5** Traces of insecticides and mineral impurities.

##### **4.2.5 Classification of defectives**

A container that fails to meet the applicable quality requirements from clause **4.2.1** to **4.2.3** and clause **4.2.6** shall be considered as defective.

##### **4.2.6 Organoleptic properties**

The finished products shall have the characteristic taste and flavour of tomato sauce and ketchup and shall be free from burnt or any other objectionable flavours. It shall be of good keeping quality and shall show no sign of fermentation.

## 5 FOOD ADDITIVES

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

### 5.2 Fillers and stabilizers

The products may contain artificial fillers such as cereal products or other permitted stabilizers.

## 6 CONTAMINANTS

6.1 The products covered by this standard shall comply with the maximum levels as stated in MS 302.

6.2 The products covered by this standard shall comply with the maximum pesticides residue limits established by the Codex Alimentarius Commission.

## 7 HYGIENE

7.1 Products covered by this draft standard shall be prepared and handled in accordance with the appropriate clauses of MS 21 and MS 1112.

7.2 The product shall be free from pathogenic organisms and shall comply with microbiological limits in table 2.

**Table 2 – Microbiological limits for tomato sauce and ketchup**

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	AOAC 965.41

## 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.

#### **8.1.4 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**

Name of product including the type shall be "**Tomato sauce**" or "**Tomato ketchup**". If an added ingredient, as defined in clause **4.1.2**, alters the flavour characteristic of the product, the name of the food shall be accompanied by the term "flavoured with X" or "X flavoured" as appropriate.

**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 in descending order of proportion;

**8.2.7** Net content declared by mass in grams or kilograms;

**8.2.8** Storage conditions; 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 C.

**9.2** Test methods for tomato sauce and ketchup have been outlined in Annex A and B.



## ANNEX A

(Normative)

### DETERMINATION OF SPECIFIC GRAVITY

#### A1 PRINCIPLE

The method involves use of specific gravity bottle which enables a liquid's density to be measured accurately by reference to an appropriate working fluid which is water. The specific gravity bottle is weighed empty, full of water, and full of a liquid whose specific gravity is desired. The ratio of the mass of a unit volume of a substance to the mass of a unit volume of water is then calculated as the specific gravity.

#### A2 APPARATUS

##### A2.1 Specific gravity bottle/ pycnometer.

#### A3 PROCEDURE

**A3.1** Clean and thoroughly dry the specific gravity bottle and weigh it.

**A3.2** Fill it up to the mark with freshly boiled and cooled water, which has been maintained at a temperature of  $20\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$  and weigh.

**A3.3** Remove the water, dry the bottle again and fill it with the material maintained at the same temperature.

**A3.4** Weight the bottle again.

#### A4 CALCULATION

**A4.1** Specify the temperature of testing

**A4.1.1** Calculate as follows:

$$\text{Specific gravity at } 20\text{ }^{\circ}\text{C} / 20\text{ }^{\circ}\text{C} = \frac{C-A}{B-A}$$

Where  $C$  = mass in gram of the specific gravity bottle with the material;

$A$  = mass in grams of the empty specific gravity bottle, and;

$B$  = mass in grams of the specific gravity bottle with water.

**A4.1.2** To find out the degree Brix, the table **A4.1.2** shall be used.

**Table A4.1.2 - Degrees brix. Specific gravity and degrees baume of sugar solutions**

<b>Degrees brix of Per cent by</b>	<b>Specific gravity A 25°/20°</b>	<b>Specific gravity at 25°/4°</b>	<b>Degrees Baume (Modulus 145)</b>
0.0	1.000 000	0.998 234	0.00
0.2	1.000 78	0.999 010	0.11
0.4	1.001 55	0.999 786	0.22
0.6	1.002 33	1.000 563	0.34
0.8	1.003 11	1.001 342	0.45
1.0	1.003 89	1.002 120	0.56
1.2	1.004 67	1.002 897	0.67
1.4	1.005 45	1.003 675	0.79
1.6	1.006 23	1.004 453	0.90
1.8	1.007 01	1.005 234	1.01
2.0	1.007 79	1.006 015	1.12
2.2	1.008 58	1.006 796	1.23
2.4	1.009 36	1.007 580	1.34
2.6	1.010 15	1.008 363	1.46
2.8	1.010 93	1.009 148	1.57
3.0	1.011 72	1.009 934	1.68
3.2	1.012 51	1.010 721	1.79
3.4	1.013 30	1.011 510	1.90
3.6	1.014 09	1.012 298	2.02
3.8	1.014 88	1.013 089	2.13
4.0	1.015 57	1.013 881	2.24
4.2	1.016 47	1.014 673	2.35
4.4	1.017 26	1.015 467	2.46
4.6	1.018 06	1.016 261	2.57
4.8	1.018 86	1.017 058	2.68
5.0	1.019 65	1.017 854	2.79
5.2	1.101 45	1.018 652	2.91
5.4	1.021 25	1.019 451	3.02
5.6	1.022 06	1.020 251	3.13
5.8	1.022 86	1.021 054	3.24
6.0	1.023 66	1.021 855	3.35
6.2	1.024 47	1.022 659	3.46
6.4	1.025 27	1.023 463	3.57
6.6	1.026 08	1.024 270	3.69
6.8	1.026 89	1.025 077	3.80
7.0	1.027 70	1.025 885	3.91
7.2	1.028 51	1.026 694	4.02
7.4	1.029 32	1.027 504	4.13
7.6	1.030 13	1.028 316	4.24
7.8	1.030 95	1.029 128	4.35
8.0	1.031 76	1.029 942	4.46
8.2	1.032 58	1.030 757	4.58
8.4	1.033 40	1.031 573	4.69
8.6	1.034 22	1.032 391	4.80
8.8	1.035 04	1.033 209	4.91
9.0	1.035 86	1.034 029	5.02
9.2	1.036 68	1.034 850	5.13
9.4	1.037 50	1.035 671	5.24
9.6	1.038 33	1.036 494	5.35
9.8	1.039 15	1.037 318	5.46
10.0	1.039 98	1.038 143	5.57
10.2	1.040 81	1.038 970	5.68
10.4	1.041 64	1.039 797	5.80
10.6	1.042 64	1.040 626	5.91
10.8	1.043 00	1.041 456	6.02

Degrees brix of Per cent by	Specific gravity A 25°/20°	Specific gravity at 25°/4°	Degrees Baume (Modulus 145)
11.0	1.044 13	1.042 298	6.13
11.2	1.044 97	1.043 121	6.24
11.4	1.045 80	1.043 954	6.35
11.6	1.046.64	1.044 788	6.46
11.8	1.047 47	1.045 625	6.57
12.0	1.048 31	1.046 462	6.68
12.2	1.049 15	1.047 300	6.79
12.4	1.049 99	1.048 140	6.90
12.6	1.050 84	1.048 980	7.02
12.8	1.051 68	1.049 822	7.13
13.0	1.052 52	1.050 665	7.24
13.2	1.053 37	1.051 510	7.35
13.4	1.054 22	1.052 356	7.46
13.6	1.055 06	1.053 202	7.57
13.8	1.055 91	1.054 050	7.68
14.0	1.056 77	1.059 165	8.34
14.2	1.057 62	1.060 022	8.45
14.4	1.058 47	1.050 880	8.56
14.6	1.059 33	1.061 733	8.67
14.8	1.050 18	1.062 598	8.78
16.0	1.065 34	1.063 460	8.89
16.2	1.066 21	1.064 324	9.00
16.4	1.067 07	1.065 188	9.11
16.6	1.067 94	1.066 054	9.22
16.8	1.068 81	1.066 921	9.33
17.0	1.069 68	1.067 799	9.45
17.2	1.070 55	1.066 658	9.56
17.4	1.071 42	1.069 529	9.67
17.6	1.072 29	1.070 400	9.78
17.8	1.073 17	1.071 273	9.89
18.0	1.074 04	1.072 147	10.00
18.2	1.074 92	1.073 023	11.00
18.4	1.075 80	1.073 900	10.11
18.6	1.076 68	1.074 777	10.33
18.8	1.077 56	1.075 657	10.44
19.0	1.078 44	1.076 537	10.55
19.2	1.079 32	1.077 449	10.66
19.4	1.080 21	1.078 320	10.77
19.6	1.081 10	1.079 187	10.88
19.8	1.081 98	1.080 071	10.99
20.0	1.082 87	1.080 959	11.10
20.2	1.083 76	1.081 848	11.21
20.4	1.084 65	1.082 737	11.32
20.6	1.085 54	1.083 628	11.43
20.8	1.086 44	1.084 520	11.54
21.0	1.087 23	1.084 414	11.65
21.2	1.088 23	1.086 309	11.76
21.4	1.089 13	1.087 205	11.87
21.6	1.090 03	1.088 101	11.98
21.8	1.090 93	1.089 000	12.09
22.0	1.091 83	1.089 900	12.20
22.2	1.091 73	1.090 802	12.31
22.4	1.093 64	1.091 704	12.42
22.6	1.094 54	1.092 607	12.52
22.8	1.095 54	1.093 513	12.63.
	1.095 45		
23.0	1.096 36	1.094 420	12.74
23.2	1.097 27	1.095 328	12.85
23.4	1.098 18	1.096 236	12.96

Degrees brix of Per cent by	Specific gravity A 25°/20°	Specific gravity at 25°/4°	Degrees Baume (Modulus 145)
23.6	1.099 09	1.097 147	13.07
23.8	1.000 00	1.098 058	13.18
24.0	1.100 92	1.098 971	13.29
24.2	1.101 83	1 099 886	13.40
24.4	1.102 75	1.100 802	13.51
24.6	1.103 67	1.101 718	13.62
24.8	1.104 59	1.102 637	13.73
25.0	1.105 51	1.103 557	13.84
25.2	1.106 43	1.105 400	13.95
25.4	1.107 36	1.106 324	14.06
25.6	1.108 28	1.107 248	14.17
25.8	1.109 21	1.108 175	14.28
26.0	1.110 14	1.109 103	14.39
26.2	1.111 06	1.110 033	14.49
26.4	1.112 00	1.110 963	14.60
26.6	1.112 93	1.111 895	14.71
26.8	1.113 86	1.112 828	14.82
27.0	1.114 80	1.113 763	14.93
27.2	1.115 73	1.114 697	15.04
27.4	1.116 67	1.115 635	15.15
27.6	1.117 61	1.116 572	15.26
27.8	1.118 55		15.37
28.0	1.119 49	1.117 512	
28.2	1.120 43	1.120 453	15.48
28.4	1.121 38	1.119 395	15.59
28.6	1.122 32	1.120 339	15.69
28.8	1.123 27	1. 121 284	15.80
29.0	1.124 22	1.122 231	15.91
29.2	1.125 17	1.123 179	16.02
29.4	1.126 12	1.124 128	16.13
29.6	1.127 07	1.125 128	16.24
29.8	1.128 02	1.226 030	16.35
30.0	1.129 98	1.126 984	16.46
30.2	1.130 93	1.127 939	16.57
30.4		1.128 896	
30.6	1.130. 89	1,129 853	16.67
30.8	1.131 85		16.78
31.0	1.132 81	1.130 812	16.89
31.2	1.133 78	1.131 773	17.00
31.4	1.134 74	1.132 735	17.11
31.6	1.135 70	1.133 698	17.22
31.8	1.136 67	1.134 663	17.33
32.0	1.137 64	1.135 628	17.43
32.2	1.138 61	1.136 596	17.54
32.4	1.139 58	1.137 565	17.65
32.6	1.140 55	1.138 534	17.76
32.8	1.141 52	1.139 506	17.87
33.0	1.142 50	1.140 479	17.96
33.2	1.143 47	1.141 453	18.08
33.4	1.144 45	1.142 420	18.19
33.6	1.145 43	1.143 405	18.30
33.8	1.146 41	1.144 384	18.41
34.0	1.147 39	1.145 363	18.52
34.2	1.148 37	1.146 345	18.63
34.4	1.149 36	1.147 328	18.73
34.6	1.150 34	1.148 313	18.84
			18.95

Degrees brix of Per cent by	Specific gravity A 25°/20°	Specific gravity at 25°/4°	Degrees Baume (Modulus 145)
34.8		1.149 298	19.06
35.0	1.151 33	1.150 286	19.17
35.2	1.152 32	1.151 275	19.28
35.4	1.533 1	1.152 265	19.38
35.6		1.153 256	19.40
35.8	1.154 30	1.154 249	19.60
36.0	1.155 30		19.71
36.2	1.56 29	1.55 242	19.81
36.4	1.157 29	1.155 238	19.92
36.6	1.158 28	1.156 235	20.03
36.8	1.159 28	1.157 233	20.14
37.0	1.160 28	1.158 233	20.25
37.2	1.161 28	1.159 233	20.35
37.4	1.162 28	1.160 236	20.46
37.6	1.163 29	1.161 236	20.57
37.8	1.164 30	1.162 240	20.68
38.0	1.165 30	1.163 245	20.78
38.2	1.166 31	1.164 252	20.89
38.4	1.167 32	1.165 259	21.00
38.6	1.168 33	1.166 269	21.11
38.8	1.169 34	1.167 281	21.21
39.0	1.170 36	1.168 293	21.32
39.2	1.171 38	1.169 307	21.43
39.4	1.172 39	1.170 322	21.54
39.6	1.173 41	1.171 340	21.64
39.8	1.174 43	1.172 359	21.75
40.0	1.175 45	1.173 379	21.86
40.2	1.176 48	1.174 400	21.97
40.4	1.177 50	1.175 423	22.07
40.6	1.178 53	1.176 447	22.18
40.8	1.179 56	1.177 473	22.29
41.0	1.180 58	1.178 501	22.39
41.2	1.181 62	1.179 527	22.50
41.4	1.182 65	1.180 560	22.61
41.6	1.183 68	1.181 592	22.72
41.8	1.184 72	1.182 625	22.82
42.0	1.185 75	1.183 660	22.93
42.2	1.186 79	1.184 696	23.04
42.4	1.187 83	1.185 734	23.14
42.6	1.188 87	1.186 773	23.25
42.8	1.189 92	1.187 814	23.36
43.0	1.190 96	1.188 856	23.46
43.2	1.192 01	1.189 901	23.57
43.4	1.193 05	1.190 946	23.68
43.6	1.194 10	1.191 993	23.78
43.8	1.195 15		23.89
44.0	1.196 20	1.193.041	24.00
44.2	1.197 26	1.194.090	24.10
44.4	1.198 31	1.195 141	24.21
44.6	1.199 36	1.196 193	24.32
44.8	1.200 42	1.197 247	24.42
45.0	1.201 48	1.198 303	24.53
45.2	1.202 54	1.199 360	24.63
45.4	1.203 60	1.200 420	24.74
45.6	1.204 67	1.201 480	24.85
45.8	1.205 73	1.202 540	24.95
	1.206 80	1.203 603	25.06
	1.207 87	1.204 668	
	1.208 94	1.205 733	

Degrees brix of Per cent by	Specific gravity A 25°/20°	Specific gravity at 25°/4°	Degrees Baume (Modulus 145)
46.0	1.210 01	1.206 801	25.17
46.2	1.211 08	1.207 870	25.27
		1.208 940	
46.4	1.212 15	1.210 013	25.38
46.6	1.213 23	1.211 086	25.48
46.8	1.214 31	1.212 162	25.59
47.0	1.215 38	1.213 238	25.70
47.2	1.216 46	1.214 317	25.80
47.4	1.217 55	1.215 395	25.91
47.6	1.218 63	1.216 476	26.01
47.8	1.219 71	1.217 559	26.12
48.0	1.220 80	1.218 643	26.23
48.2	1.221 89	1.219 729	26.33
48.4	1.222 98	1.220 815	26.44
48.6	1.224 06	1.221 904	26.54
48.8	1.225 16	1.222 995	26.65
49.0	1.226 25	1.224 086	26.75
49.2	1.227 35	1.225 180	26.86
49.4	1.228 44	1.226 274	26.96
49.6	1.229 54	1.227 371	27.07
49.9	1.230 64	1.228 469	27.18
50.0	1.213 74	1.229 567	27.80
50.2	1.232 84	1.230 668	27.39
50.4	1.233 95	1.231 770	27.49
50.6	1.235 06	1.232 874	27.60
50.8	1.236 16	1.233 979	27.70

**ANNEX B  
(Normative)**

**DETERMINATION OF THE FILL OF THE CONTAINER**

**B1 SCOPE**

This method applies to glass containers.

**B2 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.

**B3 PROCEDURE**

**B3.1** Select a container which is undamaged in all respects.

**B3.2** Weigh the filled container, ( $W_1$ )

**B3.3** Empty, Wash, dry and weigh the empty container ( $W_2$ ).

**B3.4** Fill the container with distilled water at 20 °C to the level of the top thereof, and weigh the container thus filled ( $W_3$ ).

**B3.5** Calculate the water capacity of a container

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

**B4 CALCULATION AND EXPRESSION OF RESULTS**

**B4.1** 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.

**B4.2** The results are expressed as ml of water.

**ANNEX C  
(Normative)**

**METHOD OF SAMPLING**

**C1 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 **C.2.2**.

**C1.2 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 **C.2.2**.

**C1.3 Drained weight**

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

**C2 SAMPLING AND ACCEPTANCE PROCEDURE**

**C2.1 Definitions**

**C2.1.1 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.

**C2.1.2 Lot size:** The number of primary containers or units in the lot.

**C2.1.3 Sample size:** The total number of sample units drawn for examination from a lot.

**C2.1.4 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.

**C2.1.5 Defective:** Any sample unit shall be regarded as defective when the sample unit does not meet the criteria set forth in the standards.

**C2.1.6 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.

**C2.1.7 Acceptable quality level (AQL):** The maximum percent of defective sample units permitted in a lot that will be accepted approximately 95 % of the time.

**C2.2 Sampling plans**

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



**Table C.2.2 – Sampling plans**

<b>Net weight is equal to or less than 1 kg</b>		
<b>Lot size (N)</b>	<b>Sample size (n)</b>	<b>Acceptance number (c)</b>
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
<b>Net weight is greater than 1 kg but not more than 4.5 kg</b>		
<b>Lot size (N)</b>	<b>Sample Size (n)</b>	<b>Acceptance number (c)</b>
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
<b>Net weight greater than 4.5 kg</b>		
<b>Lot size (N)</b>	<b>Sample size (n)</b>	<b>Acceptance number (c)</b>
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

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