

Carbonated and /or flavored drinking water – Specification

0 Foreword

This Draft Tanzania standard has been prepared in order to improve the quality of carbonated and flavored drinking water in the industries and to the users. The safety to the user and utility of the product need to be taken into consideration by laying down the requirements for the product.

For the purpose of deciding whether a particular requirement of this Tanzania 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 TZS 4.

In the preparation of this draft Tanzania Standard assistance was drawn from:

EAS 153:2013 Packaged drinking water – Specification published by East African Community.

SANS 1862:2003 Packaged water other than natural mineral water published by South African Bureau of Standards.

SWS 791:2015 Packaged drinking water other than natural mineral water – Specification published by Standards Association of Zimbabwe.

IS 2346:2009 Carbonated beverages – Specification published by Indian Bureau of Standards.

1 Scope

This draft standard specifies the requirements, sampling and methods of test for carbonated (sparkling), flavoured and carbonated flavoured drinking water

2 Normative references

The following referenced documents are indispensable for the application of this document.

2.1 ASTM D 5907, *Standard test methods for filterable matter (total dissolved solids) and non-filterable matter (total suspended solids) in water*

2.2 ISO 10523, *Water quality — Determination of pH*

2.3 ISO 11423, *Water quality -- Determination of benzene and some derivatives*

2.4 ISO 12020, *Water quality — Determination of aluminium — Atomic absorption spectrometric methods*

2.5 ISO 13877, *Soil quality -- Determination of polynuclear aromatic hydrocarbons -- Method using high - performance liquid chromatography*

2.6 ISO 14402, *Water quality -- Determination of phenol index by flow analysis (FIA and CFA)*

2.7 ISO 15089, *Water quality -- Guidelines for selective immunoassays for the determination of plant treatment and pesticide agents*

2.8 ISO 16265, *Water quality -- Determination of the methylene blue active substances (MBAS) index -- Method using continuous flow analysis (CFA)*

2.9 ISO 16266, *Water quality — Detection and enumeration of pseudomonas aeruginosa — Method by membrane filtration*

- 2.10 ISO 21567, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of Shigella spp*
- 2.11 ISO 22743, *Water quality -- Determination of sulfates -- Method by continuous flow analysis (CFA)*
- 2.12 ISO 4832, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coliforms — Colony-count technique*
- 2.13 ISO 6059, *Water quality — Determination of the sum of calcium and magnesium — EDTA titrimetric method*
- 2.14 ISO 6222, *Water quality — Enumeration of culturable microorganisms — Colony count by inoculation in nutrient agar culture media*
- 2.15 ISO 6332, *Water quality — Determination of iron-spectrometric method using 1, 10-phenanthroline*
- 2.16 ISO 6461-2, *Water quality — Detection and enumeration of the spores of sulphite reducing anaerobes (clostridia)*
- 2.17 ISO 6888-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species)*
- 2.18 ISO 7027, *Water quality — Determination of turbidity*
- 2.19 ISO 7393, *Water quality -- Determination of free chlorine and total chlorine*
- 2.20 ISO 7887, *Water quality — Examination and determination of colour*
- 2.21 ISO 7899-2, *Water quality — Detection and enumeration of intestinal enterococci*
- 2.22 ISO 7980, *Water quality -- Determination of calcium and magnesium -- Atomic absorption spectrometric method*
- 2.23 ISO 8165, *Water quality -- Determination of selected monovalent phenols*
- 2.24 ISO 8245, *Water quality — Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC)*
- 2.25 ISO 8288, *Water quality -- Determination of cobalt, nickel, copper, zinc, cadmium and lead -- Flame atomic absorption spectrometric methods*
- 2.26 ISO 9297, *Water quality — Determination of chloride — Silver nitrate titration with chromate indicator (Mohr's method)*
- 2.27 ISO 9308-1, *Water quality — Detection and enumeration of Escherichia coli and coliform bacteria*
- 2.28 ISO 9696, *Water quality -- Measurement of gross alpha activity in non-saline water -- Thick source method*
- 2.29 ISO 9697, *Water quality -- Measurement of gross beta activity in non-saline water -- Thick source method*
- 2.30 ISO 9964, *Water quality — Determination of sodium and potassium*

- 2.31 ISO 6703, *Water quality -- Determination of cyanide*
- 2.32 ISO 11885, *Water quality -- Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES)*
- 2.33 ISO 7890, *Water quality -- Determination of nitrate -- Part 3: Spectrometric method using sulfosalicylic acid*
- 2.34 ISO 9390, *Water quality -- Determination of borate -- Spectrometric method using azomethine-H*
- 2.35 ISO 10359, *Water quality -- Determination of fluoride*
- 2.36 ISO 15061, *Water quality -- Determination of dissolved bromate -- Method by liquid chromatography of ions*
- 2.37 ISO 6777, *Water quality -- Determination of nitrite -- Molecular absorption spectrometric method*
- 2.38 ISO 15681, *Water quality -- Determination of orthophosphate and total phosphorus contents by flow analysis (FIA and CFA)*
- 2.39 ISO 11969, *Water quality -- Determination of arsenic -- Atomic absorption spectrometric method (hydride technique)*
- 2.40 ISO 5961, *Water quality -- Determination of cadmium by atomic absorption spectrometry*
- 2.41 ISO 12846, *Water quality -- Determination of mercury -- Method using atomic absorption spectrometry (AAS) with and without enrichment*
- 2.42 ISO 6333, *Water quality -- Determination of manganese -- Formaldoxime spectrometric method*
- 2.43 ISO 9965, *Water quality -- Determination of selenium -- Atomic absorption spectrometric method (hydride technique)*
- 2.44 ISO 11732, *Water quality -- Determination of ammonium nitrogen -- Method by flow analysis (CFA and FIA) and spectrometric detection*
- 2.45 ISO 9174, *Water quality -- Determination of chromium -- Atomic absorption spectrometric methods*
- 2.46 ISO 6785, *Milk and milk products -- Detection of Salmonella spp.*
- 2.47 ISO 7888, *Water quality -- Determination of electrical conductivity*
- 2.48 TZS 390 Carbonated soft drinks – Specification published by Tanzania Bureau of Standards.

3 Terms and definitions

In addition to terms defined in TZS 574, the following terms and definitions shall apply,

3.1

acceptable

satisfactory to the authority administering this standard, or to the parties concluding the purchase contract, as relevant

3.2

batch

quantity of packaged water that is processed during a specified period of production in a single bottling plant.

3.3

bottle

container that is made of glass, plastics material, tin plate or other suitable material, and that (in each case) is capable of being sealed with a closure

3.4

carbonated water (sparkling water)

water that, after possible treatment in accordance with 6.1, has been made effervescent by the addition of carbon dioxide

3.5

defective

bottle or its contents that do not comply in one or more respects with the relevant requirements of the standard

3.6

flavoured water

product that has food grade flavouring added to the water to give a particular taste

3.7

lot

product of the same description and from the same batch, in packages of the same size and type, from the same manufacturer, and submitted at any one time for inspection and testing.

3.8

substances

food grade chemical additives such as colourants, flavourings, minerals, preservatives, sugars and sweeteners that have been added to the water and that are permitted by the regulations.

4 Requirements

4.1 General requirements

4.1.1 Permissible treatment

Safe and appropriate chemical, physical and antimicrobial treatments are permitted. These treatments can be used singly or in combination as multiple barriers.

4.1.2 Flavour and odour

The product shall have a well-balanced, pleasant, characteristic and palatable flavour for flavoured drinking water. Off-flavours and off-odours shall not be present. The flavour of the product shall be in accordance with any claim made or implied.

4.1.3 Freedom from defects

The product shall comply with the test for turbidity under normal conditions of storage. Dust, fibre particles, surface film or scum, sediment and other foreign matter shall not be present.

4.1.4 Carbonation If carbonated, the packaged water shall be carbonated in accordance with the claimed product type stipulated on the label. Carbondioxide shall be of acceptable food grade.

4.1.5 Types of container for the finished product

The product shall be packed in suitable containers; that will not contaminate or adulterate the product. In addition, the containers shall not impart foreign flavours or foreign odours to the product.

4.2 Specific requirements

4.2.1 If carbonated, the product shall be carbonated to a volume in accordance with its character. However, it shall have a minimum of one percent volume by volume of carbon dioxide. This shall be determined as per TZS 390.

4.2.2,The product shall comply with the requirements given in tables 1 to 6 below, with the exclusion of the requirements for dissolved organic carbon/matter in the case of a product that contains added sugar; and the exclusion of the requirements for pH value in the case of a carbonated product.

4.2.2.1 Carbonated and /or flavoured water shall conform to the physical requirements as indicated in Table 1.

Table 1 — Physical requirements

Sl. No.	Parameters	Limit	Method of test
i)	Colour (TCU max)	15	ISO 7887
ii)	Turbidity (NTU), max	1	ISO 7027
iii)	Taste	Not objectionable	-
iv)	Odour	Characteristics of the flavour	-
v)	Conductivity ($\mu\text{S/cm}$), max	2500	ISO 7888
vi)	pH	2.5 - 5.5	ISO 10523

4.2.2.2 Carbonated and flavoured water shall conform to the chemical characteristics affecting quality indicated in Table 2

Table 2 — Quality requirements for carbonated and flavoured water

Sl. No.	Substance or characteristic	Limit of concentration (mg/L max.)	Method of test
i)	Suspended matter	Not detectable	ASTM D 5907
ii)	Total dissolved solids	1500	ASTM D 5907
iii)	Total organic matter	0.003	ISO 8245
iv)	Total hardness, as CaCO_3 ,	300	ISO 6059

v)	Aluminium, as Al ⁺⁺⁺ ,	0.2	ISO 12020
vi)	Chloride, as Cl ⁻	250	ISO 9297
vii)	Iron, as Fe	0.3	ISO 6332
viii)	Sodium, as Na ⁺	200	ISO 9964-1
ix)	Sulphate	400	ISO 22743
x)	Zinc, as Zn ⁺⁺	5	ISO 8288
xi)	Magnesium, as Mg ⁺⁺	100	ISO 7980
xii)	Calcium, as Ca ⁺⁺	150	ISO 7980
xiii)	Residual free chlorine	Not detectable	ISO 7393

4.2.2.3 Inorganic contaminants

Carbonated and flavoured water shall conform to the limits of inorganic contaminants affecting safety indicated in Table 3.

Table 3 — Limits for inorganic contaminants in carbonated and flavoured water

Sl. No.	Substance	Limit of concentration mg/L, max.	Method of test
i)	Arsenic, as As	0.01	ISO 11969
ii)	Cadmium, as Cd	0.003	ISO 5961
iii)	Lead, as Pb	0.01	ISO 8288
iv)	Copper, as Cu	2.000	ISO 8288
v)	Mercury (as total Hg)	0.001	ISO 12846
vi)	Manganese, as Mn	0.1	ISO 6333
vii)	Selenium, as Se	0.01	ISO 9965
viii)	Ammonium nitrogen	0.5	ISO 11732
ix)	Chromium, as Cr	0.05	ISO 9174
x)	Nickel, as Ni	0.02	ISO 8288
xi)	Cyanide, as CN	0.01	ISO 6703
xii)	Barium, as Ba	0.7	ISO 11885
xiii)	Nitrate, as NO ₃	45	ISO 7890
xiv)	Boron	0.5	ISO 9390
xv)	Fluoride, as F	1.5 ^{a)}	ISO 10359
xvi)	Bromate, as BrO ₃	0.01	ISO 15061

xvii)	Nitrite	0.5	ISO 6777
xiii)	Phosphates, as PO ₄	2.2	ISO 15681
a) If the product contains more than 1.0 mg/L fluoride, the following term shall appear on the label as part of, or in close proximity to the name of the product on in any otherwise prominent position "water contains fluoride".			

4.2.2.4 Organic contaminants

Carbonated and flavoured water shall conform to the limits of organic contaminants affecting safety indicated in Table 4.

Table 4 — Limits for organic constituents in carbonated and flavoured water

Sl. No.	Substance	Limit µg/L max.	Method of test
i)	<u>Aromatics</u>		
	Benzene	10	ISO 11423
	Toluene	700	-
	Xylene	500	-
	Polynuclear aromatic hydrocarbon	0.7	ISO 13877
ii)	<u>Chlorinated Alkanes and Alkenes</u>		
	Carbon tetrachloride	2	-
	1,2-Dichloroethane	30	-
	1,1-Dichloroethylene	0.3	-
	1,1-Dichloroethene	30	-
	Tetrachloroethene	40	-
iii)	<u>Phenolic substances</u>		
	Phenols	2	ISO 8165
	2,4,6-Trichlorophenol	200	ISO 14402
iv)	<u>Trihalomethanes</u>		
	Chloroform	30	-
v)	<u>Pesticides</u>		
	Aldrin/Dieldrin	0.03	ISO 15089
	Chlordane (total)	0.3	
	2,4- Dichlorophenoxyacetic acid	30	
	DDT (total)	1	
	Heptachlor and Heptachlor Epoxide	0.03	
	Hexachlorobenzene	1	
	Lindane BHC	2	
Methoxychlor	20		
vi)	Surfactants (reacting with methylene Blue)	200	ISO 16265

vii)	Mineral oil	0.01	-
viii)	Organic matter	3	-

4.2.2.5 Microbiological contaminants

Carbonated and flavoured water shall conform to the limits indicated in Table 5.

Table 5 — Microbiological limits for carbonated and flavoured water

Sl. No.	Type of micro-organism	Limits	Method of test
i)	Total viable counts at 22 °C in mL, max. ^a	100	ISO 6222
	Total viable counts at 37 °C, in mL, max. ^a	50	
ii)	Total Coliforms in 100 mL	Absent	ISO 4832
iii)	<i>E. Coli</i> in 100 mL	Absent	ISO 9308-1
iv)	<i>Staphylococcus aureus</i> in 100 mL	Absent	ISO 6888-1
v)	Sulphite reducing anaerobes in 100 mL	Absent	ISO 6461-2
vi)	<i>Pseudomonas aeruginosa</i> fluorescence in 100 mL	Absent	ISO 16266
vii)	<i>Streptococcus faecalis</i> in 100mL	Absent	ISO 7899-2
viii)	<i>Shigella</i> in 100 mL	Absent	ISO 21567
ix)	<i>Salmonella</i> in 100 mL	Absent	ISO 6785
^a) This parameter is for monitoring the system at source. Total time before analysis should be not more than 6 h at 4 °C. Determination of total viable counts shall start within 12 h after collection of the packaged drinking water sample.			

4.2.2.6 Radioactive characteristics

Carbonated and flavoured water shall conform to the limits for radioactive materials stipulated in Table 6

Table 6 — Limits for radioactive materials in Carbonated and flavoured water

Sl. No.	Radioactive material	Limits in Bq/L	Method of test
i)	Gross alpha activity	0.5	ISO 9696

ii)	Gross beta activity	1	ISO 9697
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5 Packing and labelling

5.1 Packaging

The product shall be packed as required, and in sealed retail containers suitable for the prevention of the possible adulteration or contamination of water.

5.2 Labelling

5.2.1 General

5.2.1.1 Applied labels on containers shall be clean, neat and securely attached. They shall not be superimposed on other labels or on printed matter printed directly on the containers. They shall not be applied by any person other than the manufacturer or his authorized agent.

5.2.1.2 The packages shall be legibly and indelibly labeled in Kiswahili and English, and any other language as agreed between the manufacturer and supplier with the following information:

5.2.2 The name of the product

The name of the product shall be a true description of the product concerned.

5.2.3 Composition and carbonation of the product

5.2.3.1 Composition

The composition of the product can be declared in advertising and on the label, the concentration (in units of milligrams per litre (mg/L)) of the following constituents being included in the declaration and listed in the following order:

Calcium as Ca
Magnesium as Mg
Sodium as Na
Potassium as **K**
Chloride as Cl
Sulfate as SO₄,
Total alkalinity as CaCO₃,
Nitrate as **N**
Fluoride as **F**

In addition, the amount of total dissolved solids shall be declared in milligrams per litre, and the pH value shall be declared.

5.2.3.2 Carbonation

The label shall state whether the product is non-carbonated or carbonated ("sparkling"), and the level of carbonation may be described using words such as "lightly" or "low", or other words that have similar meaning.

5.2.4 Net contents

The net contents shall be declared by volume in the metric system (SI units).

5.2.5 Name and address

The name and physical address of the company that filled the container shall be clearly marked on the labelling of each container.

5.2.6 Lot identification

Each container shall be embossed or otherwise permanently marked, in code or otherwise, to identify the producing factory, the lot, country of origin, the date of manufacture and expiry date. The use of a code is permissible only if the key to the code is disclosed to the authority administering this standard.

5.2.7 Prescribed labelling

5.2.7.1 If the product contains more than 1 mg/L of fluoride, the expression "contains fluoride" shall be affixed in close proximity to the name of the product.

5.2.7.2 If the product contains more than 2 mg/L of fluoride, the expression "this product is not suitable for infants and children under seven years" shall be affixed in close proximity to the name of the product or in a prominent place on the label.

5.3 Labelling prohibitions

The use of any statement or of any pictorial device which might create confusion in the mind of the public or which might in any way mislead the public about the nature, origin, composition or properties of the product put on sale is prohibited.

6 Sampling

6.1 General

The following sampling procedure shall be applied to determine whether a lot, submitted for inspection and testing, complies with the requirements of this standard, and the samples so taken shall be deemed to represent the lot.

6.2 Sample for physical examination and for the inspection of containers

From the lot, take at random the number of containers shown in column 2 of table 7.

6.3 Sample for chemical analysis

From the lot, take at random the number of containers that will deliver the volume given in column 3 of table 7.

6.4 Sample for microbiological examination

From the lot, take at random one container at the beginning of the filling cycle, one container in the middle of the cycle and one container at the end of the cycle.

6.5 Compliance with the standard

The lot shall be deemed to comply with the relevant requirements of the standard if, after inspection and testing of the samples taken in accordance with 6.2 to 6.4 inclusive, no defective (see 3.5) is found.

Table 7 sampling procedure

1	2	3	4
Lot size, containers	Sample size for physical examination, containers	Sample volume for chemical analysis (L)	Sample size for microbiological examination^a, containers
0 - 5000	3	3	3
5001 - 12500	6	3	3
12 501 - 25 000	9	3	3
25001 - 50000	16	3	3
50 001 upwards	30	3	3
^a For examination for parasites, 10 L of product is required.			