
Carbonated and non-carbonated soft drinks — Specification



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PUBLIC REVIEW DRAFT

Foreword

Uganda National Bureau of Standards (UNBS) is a parastatal under the Ministry of Trade, Industry and Cooperatives established under Cap 327, of the Laws of Uganda, as amended. UNBS is mandated to co-ordinate the elaboration of standards and is

- (a) a member of International Organisation for Standardisation (ISO);
- (b) a contact point for the WHO/FAO Codex Alimentarius Commission on Food Standards; and
- (c) the National Enquiry Point on TBT Agreement of the World Trade Organisation (WTO).

The work of preparing Uganda Standards is carried out through Technical Committees. A Technical Committee is established to deliberate on standards in a given field or area and consists of key stakeholders including government, academia, consumer groups, private sector and other interested parties.

Draft Uganda Standards adopted by the Technical Committee are widely circulated to stakeholders and the general public for comments. The committee reviews the comments before recommending the draft standards for approval and declaration as Uganda Standards by the National Standards Council.

The committee responsible for this document is Technical Committee UNBS/TC 218, *Drinking water and soft drinks*.

This fourth edition cancels and replaces the third edition (US 47:2020), which has been technically revised.

Introduction

Non-alcoholic ("soft") drinks include:

- a) waters (natural mineral waters and source waters, table waters and soda waters);
- b) fruit and vegetable juices (fruit juice, vegetable juice, concentrates for fruit juice, concentrates for vegetable juice);
- c) fruit and vegetable nectars (fruit nectar, vegetable nectar, concentrates for fruit nectar, concentrates for vegetable nectar);
- d) water based flavoured drinks (carbonated water based flavoured drinks, non-carbonated water based flavoured drinks) and concentrates (liquid or solid) for water based flavoured drinks);
- e) coffee, coffee substitutes, tea, herbal infusions; and
- f) other cereal and grain beverages.

Due to the nature of these products, it is not easy for the consumer to tell the category of one product from another.

Carbonated and non-carbonated soft drinks are prepared with water and one or more of the following ingredients:

- a) fruit juice;
- b) fruit pulp;
- c) vegetable, herbal or other plant extracts;
- d) natural identical or artificial flavouring materials;
- e) permitted colourings;
- f) sweetening agents;
- g) acidulants;
- h) clouding matter and preservatives;
- i) carbon dioxide; and
- j) other ingredients such as caffeine, taurine and carnitine.

Carbonated and non-carbonated soft drinks are easily mistaken for either fruit or vegetable juices, fruit or vegetable nectars or fruit or vegetable juice drinks, which contain substantial amount of fruit or vegetable juice. While this can be very deceptive to the consumer who may be interested in the inherent nutritional value of fruit or vegetable products, it introduces an unfair competition to the genuine fruit and vegetable products.

In Uganda, carbonated and non-carbonated drinks, including "sport," "energy," or "electrolyte" drinks and particulate drinks, includes all carbonated and non-carbonated varieties and concentrates, products based on fruit and vegetable juices, sugar free products containing less than 0.5 g of sugar per serving size indicated on the label and no sugar added drinks with no sugar added in the processing of the product, and also, includes coffee-, tea- and herbal-based drinks are marketed under the following categories:

- a) Carbonated soft drinks:
- b) Non-carbonated soft drinks:

c) Concentrates (liquid or solid) for carbonated and non-carbonated drinks:

The standard stipulates the compositional, safety and quality attributes for carbonated and non-carbonated soft drinks. Labelling requirements have been incorporated in this standard to clearly distinguish carbonated and non-carbonated soft drinks from other types of drinks.

This standard clarifies the difference between the carbonated and non-carbonated soft drinks and other drinks with a view of facilitating communication between consumers and traders while encouraging fair trade practices. For clarity purposes to industry and standard enforcers, it is important to distinctively mention that diet/light/lite are low calorie drinks, normally with virtually no calories.

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Carbonated and non-carbonated soft drink — Specification

1 Scope

This Draft Uganda Standard specifies requirements, sampling and test methods for carbonated and non-carbonated soft drinks which may be concentrated (solid or liquid) or ready to drink.

This standard does not apply to products for which other standards apply such as:

- a) waters (including packaged water, flavoured drinking water and packaged natural mineral waters);
- b) fruit juice drinks;
- c) fruit juices and nectars;
- d) vegetable juices and nectars;
- e) herbal juices (ready to drink and concentrates); and
- f) cereal based beverages.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

US CAC/GL 50, *General guidelines on sampling*

US CAC/GL 66, *Guidelines for the use of flavourings*

US EAS 12, *Potable water — Specification*

US 28 EAS 39, *Code of practice for hygiene in the food and drink manufacturing industry*

US EAS 35, *Fortified food grade salt — Specification*

US EAS 38, *Labelling of pre-packaged foods — General requirements*

US EAS 104, *Alcoholic beverages — Methods of sampling and test*

US EAS 803, *Nutrition labelling — Requirements*

US EAS 804, *Claims on food — Requirements*

US EAS 805, *Use of nutrition and health claims — Requirements*

US ISO 2173, *Fruit and vegetable products — Determination of soluble solids — Refractometric method*

US ISO 2448, *Fruit and vegetable products — Determination of ethanol content*

US ISO 4831, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of coliforms — Most probable number technique*

US ISO 4833-1, *Microbiology of the food chain — Horizontal method for the enumeration of microorganisms — Part 1: Colony count at 30 °C by the pour plate technique*

US ISO 4833-2, *Microbiology of the food chain — Horizontal method for the enumeration of microorganisms — Part 2: Colony count at 30 °C by the surface plating technique*

US ISO 6561-2, *Fruits, vegetables and derived products — Determination of cadmium content — Part 2: Method using flame atomic absorption spectrometry*

US ISO 6633, *Fruit and vegetables products — Determination of lead content — Flameless atomic absorption spectrometric method*

US ISO 6634, *Fruit, vegetables and derived products — Determination of arsenic content — Silver diethyldithiocarbamate spectrophotometric method*

US ISO 6637, *Fruits, vegetables and derived products — Determination of mercury content — Flameless atomic absorption method*

US ISO 6888-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 1: Technique using Baird-Parker agar medium*

US ISO 7251, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive Escherichia coli — Most probable number technique*

US 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*

US 45, *General standard for food additives*

US 738, *General standard for contaminants and toxins in food and feed*

US 1659, *Materials in contact with food — Requirements for packaging materials*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

one gas (carbonation) volume

amount of carbon dioxide the water volume absorbs at the standard atmospheric pressure at 15.6 °C

3.2

carbonation

process of addition of carbon dioxide to soft drinks to achieve the characteristics of the product at the specified temperature and pressure

3.3**soft drink**

non-alcoholic beverage typically containing water and a flavouring agent. Such drinks may be diet/light/lite with low calorie/intense sweeteners added.

3.4**energy drink**

soft drink that typically contains high levels of nutrients and other ingredients such as caffeine, taurine, and carnitine and are marketed as boosting energy

3.5**sports drink**

soft drink typically containing electrolytes such as sodium, potassium, calcium, magnesium, chloride and bicarbonate

3.6**diet/light/lite soft drink**

soft drink sweetened with low or no sugars with or without non-nutritive and/or intense sweeteners and intended for use in very low energy diets

3.7**carbonated and non-carbonated soft drink**

water-based flavoured drink, including “sport,” “energy,” or “electrolyte” drinks and particulated drinks. Includes all water based flavoured drinks varieties and concentrates, products based on fruit and vegetable juices, and also includes coffee-, tea- and herbal-based drinks.

3.8**potable water**

water fit for human consumption

3.9**hermetically sealed containers**

containers which are designed and intended to protect the contents against the entry of viable microorganisms after closing

3.10**food grade packaging**

packaging which will safeguard the hygienic, nutritional, technological and organoleptic qualities of the product and shall not impart any toxic substance or undesirable odour or flavour to the product

4 Product description**4.1 General description**

Carbonated and non-carbonated soft drinks are the non-alcoholic beverages that may or may not contain dissolved carbon dioxide (packed in hermetically sealed containers and food grade packaging to ensure freedom from spoilage), prepared from potable water with or without one or more of the following ingredients: fruit juice, fruit pulp, vegetable extracts, herbal extracts or extracts from other plant parts, natural identical or artificial flavouring materials, permitted colourings, sweetening agents, acidulants, clouding matter and preservatives. These soft drinks may be concentrated (solid or liquid) or ready to drink.

NOTE The fruit juice, fruit pulp, vegetable extracts or herbal extracts and other plant extracts used to make the soft drinks are not as substantive as to qualify the drink as fruit, vegetable or herbal juice or juice drink.

4.2 Category description

4.2.1 Carbonated soft drinks:

Includes water based flavoured drinks with added carbon dioxide with nutritive, non-nutritive and/or intense sweeteners and other permitted food additives. Soft drinks should include sodas (soft drinks with added carbon dioxide, sweetener, and flavour) such as colas, pepper-types, root beer, lemon-lime, citrus types, diet/light/lite and regular types. These beverages may be clear, cloudy, or may contain particulated matter (for example, fruit pieces). Includes so-called “energy” drinks that are carbonated and contain high levels of nutrients and other ingredients (for example, caffeine, taurine, and carnitine).

4.2.2 Non-carbonated soft drinks,

Includes punches and ades: Include water based flavoured drinks without added carbon dioxide, fruit and vegetable juice-based drinks (for example, almond, aniseed, coconut-based drinks, and ginseng drink), fruit flavoured ades (for example, lemonade, orangeade), squashes (citrus-based soft drinks), capile groselha, lactic acid beverage, ready-to-drink coffee and tea drinks with or without milk or milk solids, and herbal-based drinks (e.g. iced tea, fruit-flavoured iced tea, chilled canned cappuccino drinks) and “sports” drinks containing electrolytes. These beverages may be clear or contain particulated matter (for example, fruit pieces), and may be unsweetened or sweetened with sugar or a non-nutritive high-intensity sweetener. Includes so-called “energy” drinks that are non-carbonated and contain high levels of nutrients and other ingredients (for example, caffeine, taurine, and carnitine).

4.2.3 Concentrates (liquid or solid) for carbonated and non-carbonated soft drinks:

Include powder, syrup, liquid and frozen concentrates for the preparation of carbonated or non-carbonated water-based non-alcoholic beverages by addition of water or carbonated water. Examples include fountain syrups (e.g. cola syrup), fruit syrups, frozen or powdered concentrate for lemonade and iced tea mixes

5 Essential quality and composition requirements

5.1 General

5.1.1 Carbonated and non-carbonated soft drinks shall:

- a) possess a good body, uniform colour, a well-balanced flavour and be free from off-odours and off-flavours when assessed using the normal sensory tests;
- b) be free from insect and rodent contamination and practically free from other extraneous matter;
- c) show no turbidity (except turbidity arising from the ingredients or food additives used for flavouring or colouring); and
- d) show no sedimentation (except sedimentation arising from the ingredients or food additives used for flavouring or colouring).

NOTE Sedimentation may occur in particulate drinks that contain particles such as pieces of fruits or vegetables.

5.1.2 Clear carbonated soft drinks shall be of sparkling clarity and shall remain so when stored under normal storage conditions.

5.1.3 Clear non-carbonated soft drinks shall remain so when stored under normal storage conditions.

5.1.4 The cloudy carbonated and non-carbonated soft drinks shall be stable.

5.2 Ingredients

5.2.1 Sweeteners

Carbonated and non-carbonated soft drinks may contain one or more nutritive and/or non-nutritive sweeteners as regulated by relevant standards. The sweeteners shall conform to relevant standards.

5.2.2 Water

The water used for the manufacture of carbonated and non-carbonated soft drinks shall be potable water complying with the requirements of US EAS 12.

5.2.3 Quinine salts

Carbonated and non-carbonated soft drinks may contain no more than 100 mg/kg quinine, in the drink as consumed, calculated as quinine sulphate, when determined in accordance with Annex A.

5.2.4 Caffeine

5.2.4.1 Carbonated and non-carbonated soft drinks may contain caffeine as a flavouring agent. When caffeine is used as a flavouring agent, the amount of caffeine in the drink as consumed shall not exceed 200 mg/L caffeine in the drink when determined in accordance with Annex B.

5.2.4.2 Caffeine may be used in carbonated and non-carbonated soft drinks as a functional ingredient. When caffeine is used as a functional ingredient such as in energy drinks or caffeinated drinks, the amount of caffeine in the drink as consumed shall not exceed 320 mg/L.

5.2.5 Common salt

The salt used for the manufacture of carbonated and non-carbonated soft drinks shall comply with the requirements of US EAS 35.

5.2.6 Fruit juice

For carbonated and non-carbonated soft drinks, to which fruit juice has been added, it shall not exceed five percent.

5.2.7 Flavourings

Carbonated and non-carbonated soft drinks may contain approved food flavourings. The use of flavourings shall be in accordance with US CAC/GL 66.

5.2.8 Other ingredients

Other ingredients used manufacture of carbonated and non carbonated drinks shall be clean, pure, fit for human consumption and conform to relevant standards.

5.3 Composition requirements

5.3.1 Sugar content

5.3.1.1 Carbonated and non-carbonated soft drinks that may be sweetened with sugars shall record a Brix value of not less than five degrees at 20 °C when tested in accordance with US ISO 2173. Concentrated (liquid or solid) carbonated and non-carbonated soft drinks shall be tested for Brix only after reconstitution or diluting as per manufacturer's instructions.

5.3.1.2 The test for sugar content in carbonated soft drink should be conducted after de-gassing.

5.3.1.3 Diet/light/lite carbonated and non-carbonated soft drinks may be sweetened with low sugar with or without non-nutritive and/or intense sweeteners. For those drinks, the Brix shall be less than five.

5.3.2 Carbonation

Carbonated beverages shall be carbonated to a pressure in accordance with their character. Carbonated beverages shall however have a minimum one volume of carbon dioxide when determined in accordance with method for the measurement of gas volume given in Annex C.

5.3.3 Alcohol content

Carbonated and non-carbonated soft drinks shall contain not more than 0.5% vol/vol alcohol content when tested in accordance with US ISO 2448 or US EAS 104 respectively.

6 Food additives

Carbonated and non-carbonated soft drinks may contain food additives in accordance with US 45.

7 Contaminants

Carbonated and non-carbonated soft drinks shall comply with maximum levels for contaminants in accordance with US 738.

Carbonated and non-carbonated soft drinks shall not contain heavy metals or inorganic contaminants in excess of the limits given in Table 1 when tested in accordance with the test methods specified therein.

Table 1 — Limits for inorganic contaminants or heavy metals in carbonated and non-carbonated soft drinks

Inorganic contaminants	Maximum limit mg/L	Test method
Arsenic (As)	0.05	US ISO 6634
Lead (Pb)	0.05	US ISO 6633
Mercury (Hg)	0.001	US ISO 6637
Cadmium (Cd)	0.003	US ISO 6561-2

8 Hygiene

Carbonated and non-carbonated soft drinks shall be produced and handled in a hygienic manner in accordance with US 28 EAS 39.

9 Microbiological limits

Carbonated and non-carbonated soft drinks shall comply with microbiological limits given in Table 2 when tested in accordance with the test methods specified therein.

Table 2 — Microbiological limits for carbonated and non-carbonated soft drinks

Microorganisms	Maximum limit	Test method
Total aerobic count, cfu/mL	25	US ISO 4833-1
<i>Escherichia coli</i> , cfu/mL	Not detectable	US ISO 16649-2
Total Coliform, MPN/mL	Not detectable	US ISO 4831
Yeast and moulds, cfu/mL	5	US ISO 21527-1
<i>Staphylococcus aureus</i> , cfu/mL	Not detectable	US ISO 6888-1

10 Packaging

10.1 Carbonated and non-carbonated soft drinks shall be packaged in food grade packaging that will safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product.

10.2 The packaging materials used shall conform to the requirements of US 1659.

11 Weights and measures

Carbonated and non-carbonated soft drinks shall be packaged in accordance with the Weights and Measures legislation.

12 Labelling

12.1 General

In addition to the requirements of US EAS 38, the specific labelling requirements in 11.2 to 11.8 shall apply and shall be legibly and indelibly marked on the container.

12.2 Name of product

The name of the product to be declared on the label shall be:

- soft drink;
- X drink (for example, mango drink, pineapple drink) where X is the name of the fruit or vegetable juice used in the flavouring of the drink and amount used shall be declared on the label;
- X flavoured drink (for example, mango flavoured drink, pineapple flavoured drink, coffee flavoured drink) where X is the name of the flavour in the drink;
- carbonated drinks shall have the word “carbonated” declared before the name of the product;
- drinks containing more than 200 mg/L caffeine shall include the word “caffeinated” or “contains caffeine” before the name of the product;
- low calorie soft drinks shall include the word “diet/light/lite” adjacent to the name of the product in the principal display;
- for spiced carbonated and non-carbonated soft drinks, the word “spiced” shall be included before the name of the product unless the common name of the spice is part of the name of the product; and
- for carbonated and non-carbonated soft drinks with added vitamins and minerals the amount used shall be declared on the label.

- i) X flavoured powdered drink (for example, mango powdered flavoured drink, pineapple powdered flavoured drink, coffee powdered flavoured drink) where X is the name of the flavour in the drink;
- j) Form of the product (such as powdered or concentrate or ready to drink)
- k) In the case the drink is flavoured with two or more flavours, the product name shall include the names of the flavours, comprising the mixture in descending order of proportion by weight (m/m) or the words "flavoured drink blend", "a flavoured drink mixture", "mixed flavoured drink" or other similar wording.

12.3 List of the ingredients

Where quinine or caffeine are used as a flavouring in the production or preparation of a carbonated and non-carbonated soft drink, these substances shall always be mentioned by name in the list of ingredients, immediately after the term "flavouring". Where caffeine is used as a functional ingredient, this shall be clearly indicated on the label.

12.4 Quantitative declaration of ingredient

Drinks containing more than 200 mg/L caffeine shall indicate the amount of caffeine in the drink as consumed in mg/100 mL.

12.5 Instructions for use

The rate or instruction for dilution or reconstitution shall be declared on the label of concentrated carbonated and non-carbonated soft drinks.

12.6 Caution

12.6.1 Carbonated soft drinks shall indicate on the label the caution, "Product is under pressure".

12.6.2 Caffeinated soft drinks shall bear a warning, "Not for consumption by children and pregnant and lactating women".

12.7 Nutrition labelling and claims

12.7.1 For low calorie or light carbonated and non-carbonated soft drinks, the calories (Xcal/100 mL) shall be declared on the label.

12.7.2 Nutritional labelling may be made in accordance with US EAS 803. Where nutrition and health claims have been made, they shall be made in accordance with US EAS 804 and US EAS 805 respectively.

12.8 Labelling prohibitions

The following labelling prohibitions shall apply:

- a) presentation of the carbonated and non-carbonated soft drinks in a manner that is likely to create the impression that the drink contains fruits or vegetables or any nutritional value commonly associated with fruits and vegetables; and
- b) use of any statement or any pictorial device which may cause confusion in the mind of the public or in any way mislead the public about the nutrition and composition properties of the carbonated and non-carbonated soft drinks.

13 Sampling

Sampling of carbonated and non-carbonated soft drinks shall be done in accordance to US CAC/GL 50.

Annex A (normative)

Method for determination of quinine

A.1 Principle

A.1.1 Carbon dioxide is removed from the sample by passing dry air or dry nitrogen through it. An extraction with ether is performed on the de-carbonated sample.

A.1.2 By means of a graph of concentration of a series of standard quinine sulphate solutions against fluorescence, the content of quinine in the test solution is determined.

A.2 Reagents

During the analysis, unless otherwise stated, only reagents of recognised analytical grade and only distilled water or water of equivalent purity shall be used. Reagents should be free from fluorescing impurities.

A.2.1 Sulphuric acid, 0.05 M

A.2.2 Ammonia solution, concentrated

A.2.3 Diethyl ether

A.2.4 Quinine sulphate, standard stock solution. Dissolve 0.10 g of quinine sulphate in 0.05 M sulphuric acid and make up to one litre with 0.05 M sulphuric acid. This solution contains 100 µg quinine sulphate/mL.

A.2.5 Quinine sulphate, standard working solution. Dilute 10 ml of the quinine sulphate stock solution to 200 mL with 0.05 M sulphuric acid. This solution contains one microgram of quinine sulphate per millilitre.

A.3 Apparatus

An instrument capable of measuring fluorescence

Glassware should completely be free from stopcock lubricant as this usually contains fluorescence substances. No detergents shall be used in washing glassware.

A.4 Procedure

Transfer 100 g of the de-carbonated sample to a separating funnel. Make the sample distinctly alkaline with ammonia solution and extract with the same 10 mL of water contained in a second separating funnel, and finally extract the wash water once with 10 mL of diethyl ether. Combine the ether extracts and remove the ether by distillation. Dry the residue in an air oven at 100 °C for a few minutes. Dissolve it in 0.05 M sulphuric acid and make up to 100 mL in a volumetric flask with 0.05 M sulphuric acid. Dilute 10 mL of this solution to 200 mL with 0.05 M sulphuric acid. Measure the fluorescence of the solution by means of a suitable instrument. Prepare a series of standards containing 0.1, 2.5 and 10 µg quinine sulphate/mL and measure the fluorescence.

A.5 Expression of results

Plot the fluorescence results of the series of standards to obtain a curve from which the concentration of quinine in the test solution can be read. Calculate the concentration of quinine as mg/kg quinine sulphate in the original sample.

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Annex B (normative)

Method for determination of caffeine content

B.1 Principle

B.1.1 Carbon dioxide is removed from the sample by means of dry air or dry nitrogen. An extraction with chloroform is performed on the de-carbonated sample.

B.1.2 By means of a graph of absorbance against concentration of standards, the content of caffeine of the sample is determined.

B.2 Reagents

During analysis use only reagents of recognised analytical grade and only distilled water or water of equivalent purity.

B.2.1 Chloroform

B.2.2 Ammonia solution, concentrated

B.2.3 Hydrochloric acid, (approximately one molar); Take 100 mL of concentrated hydrochloric acid (sp. gr. 1.184) and dilute to a litre.

B.2.4 Standard caffeine solution. Prepare a solution containing 10 mL using molar hydrochloric acid as solvent.

B.3 Apparatus

Spectrophotometer or photoelectric colorimeter capable of measuring optical density at a wavelength of 227 nm

B.4 Procedure

Transfer 25 g of de-carbonated sample into a small separating funnel. Make distinctly alkaline with ammonia solution and chloroform, washing each extract with the same 10 mL of water contained in a second separating funnel, and finally with the extract once with 10 mL of chloroform. Filter into a small flask. Evaporate or distil the combined extracts and dry the residue in molar hydrochloric acid and make up to volume in a 50 mL volumetric flask with the same acid. Prepare a series of standards and read the absorption at 272 nm using approximately molar hydrochloric acid for setting the instrument. Set the instrument by means of a blank prepared from water treated in exactly the same manner with the test solution and read absorption of the test solution.

B.5 Expression of results

Plot a graph of concentrations of standard caffeine solutions against their absorbance. From this graph determine the concentration of the alkaloid (caffeine) in the original sample. Report the results as milligrams per kilogram of anhydrous caffeine in the original sample.

Annex C (normative)

Method for measuring gas volume

C.1 Principle

The apparatus consists of pressure gauge having a hollow spike with holes in its side. The bottle is inserted from the side into the slot provided in the neck of the carbon dioxide tester and is secured in place by tightening with a threaded system. The pressure gauge is inserted until the needlepoint touches the crown cork. There is a shift value on the gauge stem, which is kept closed until the needlepoint of the pressure gauge is forced through the crown cork. The reading is noted on the gauge.

C.2 Procedure

C.2.1 Clamp the bottle in the frame of the gas volume tester. Pierce the crown cork but do not shake the bottle. Sniff off the top gas quickly until the gauge reading drops to zero. Make certain to close the valve the instant the needle touches zero in the pressure gauge. Shake the bottle vigorously until the gauge gives the reading that additional shaking does not change. Record the pressure.

C.2.2 Measure and record the temperature. Read the corresponding volume of gas from Table C.1.

Table C.1 — Carbon dioxide chart — Volume of carbon dioxide gas dissolved by one volume of water at given temperature, °C

Temp °C	Gauge pressure (X10 ³) Pa															
	0	14	28	42	56	70	84	98	112	127	141	155	169	183	197	211
0	1.71	1.9	2.2	2.4	2.6	2.9	3.1	3.3	3.5	3.8	4.0	4.2	4.4	4.7	4.9	5.2
0.6	1.68	1.9	2.1	2.4	2.6	2.8	3.0	3.2	3.5	3.7	3.9	4.1	4.3	4.6	4.8	5.1
1.1	1.64	1.9	2.1	2.3	2.5	2.7	2.9	3.2	3.4	3.6	3.8	4.1	4.3	4.5	4.7	4.9
1.8	1.61	1.8	2.0	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.8	4.0	4.2	4.4	4.6	4.8
2.2	1.57	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7
2.8	1.54	1.7	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6
3.3	1.51	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5
3.9	1.47	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.0	4.3	4.5
4.4	1.45	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.3
5.0	1.42	1.6	1.8	2.0	2.2	2.4	2.6	2.8	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.2
5.6	1.40	1.6	1.8	2.0	2.1	2.3	2.5	2.8	2.9	3.1	3.3	3.5	3.6	3.8	4.0	4.2
6.1	1.37	1.6	1.7	1.9	2.1	2.3	2.5	2.7	2.8	3.0	3.2	3.4	3.6	3.8	3.9	4.1
6.7	1.35	1.5	1.7	1.9	2.1	2.2	2.4	2.6	2.8	3.0	3.1	3.3	3.5	3.7	3.9	4.0
7.2	1.32	1.5	1.7	1.8	2.0	2.2	2.4	2.5	2.7	2.8	3.1	3.3	3.4	3.6	3.8	4.0
7.8	1.29	1.5	1.6	1.8	2.0	2.2	2.3	2.5	2.7	2.8	3.0	3.2	3.4	3.5	3.7	3.9
8.3	1.26	1.4	1.6	1.8	1.9	2.1	2.3	2.4	2.6	2.7	2.9	3.1	3.3	3.5	3.6	3.8

8.9	1.24	1.4	1.6	1.7	1.9	2.1	2.2	2.4	2.6	2.7	2.9	3.1	3.2	3.4	3.6	3.7
9.4	1.21	1.4	1.5	1.7	1.9	2.0	2.2	2.4	2.5	2.6	2.8	3.0	3.2	3.3	3.5	3.7
10.0	1.19	1.4	1.5	1.7	1.8	2.0	2.2	2.3	2.5	2.6	2.8	2.9	3.1	3.3	3.4	3.6
10.6	1.17	1.3	1.5	1.6	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	3.1	3.2	3.4	3.5
11.1	1.15	1.3	1.5	1.6	1.8	1.9	2.1	2.2	2.4	2.5	2.7	2.8	3.0	3.2	3.3	3.5
11.7	1.13	1.3	1.4	1.6	1.7	1.9	2.0	2.2	2.3	2.5	2.6	2.8	2.9	3.1	3.3	3.4
12.2	1.11	1.3	1.4	1.6	1.7	1.9	2.0	2.2	2.3	2.4	2.6	2.7	2.9	3.0	3.2	3.3
12.8	1.10	1.2	1.4	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.8	3.0	3.1	3.3
13.3	1.08	1.2	1.4	1.5	1.6	1.8	1.9	2.1	2.2	2.4	2.5	2.6	2.8	2.9	3.1	3.2
13.9	1.06	1.2	1.3	1.5	1.6	1.8	1.9	2.0	2.2	2.3	2.5	2.6	2.7	2.9	3	3.2
14.4	1.04	1.2	1.3	1.5	1.6	1.7	1.9	2.0	2.1	2.3	2.4	2.6	2.7	2.8	3.0	3.1
15.0	1.02	1.2	1.3	1.4	1.6	1.7	1.8	2.0	2.1	2.2	2.4	2.5	2.7	2.8	2.9	3.1
15.6	1.00	1.1	1.3	1.4	1.5	1.7	1.8	1.9	2.1	2.2	2.3	2.5	2.6	2.7	2.9	3.0
16.1	0.98	1.1	1.2	1.4	1.5	1.6	1.8	1.9	2.0	2.2	2.3	2.4	2.6	2.7	2.8	3.0
16.7	0.97	1.1	1.2	1.4	1.5	1.6	1.7	1.9	2.0	2.1	2.3	2.4	2.5	2.6	2.8	2.9
17.2	0.95	1.1	1.2	1.3	1.5	1.6	1.7	1.8	2.0	2.1	2.2	2.4	2.5	2.6	2.7	2.9
17.8	0.93	1.1	1.2	1.3	1.4	1.6	1.7	1.8	1.9	2.1	2.2	2.3	2.4	2.6	2.7	2.8
18.3	0.92	1.1	1.2	1.3	1.4	1.5	1.7	1.8	1.9	2.0	2.2	2.3	2.4	2.5	2.6	2.8
18.9	0.9	1.0	1.2	1.3	1.4	1.5	1.6	1.8	1.9	2.0	2.1	2.2	2.4	2.5	2.6	2.7

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Annex D
(Informative)

Inspection of empty and filled containers

Transparent containers both before and after filling shall pass for inspection before a brightly illuminated background and/or electronic device and be viewed, if necessary, under magnification. Defective containers or products shall be rejected.

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Certification marking

Products that conform to Uganda standards may be marked with Uganda National Bureau of Standards (UNBS) Certification Mark shown in the figure below.

The use of the UNBS Certification Mark is governed by the Standards Act, and the Regulations made thereunder. This mark can be used only by those licensed under the certification mark scheme operated by the Uganda National Bureau of Standards and in conjunction with the relevant Uganda Standard. The presence of this mark on a product or in relation to a product is an assurance that the goods comply with the requirements of that standard under a system of supervision, control and testing in accordance with the certification mark scheme of the Uganda National Bureau of Standards. UNBS marked products are continually checked by UNBS for conformity to that standard.

Further particulars of the terms and conditions of licensing may be obtained from the Director, Uganda National Bureau of Standards.



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