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Edition 1.1

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SOUTH AFRICAN NATIONAL STANDARD

Packaged water other than natural mineral water

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Table of changes

Change No.	Date	Scope
Amdt 1	2003-05-09	Amended to align this standard with the requirements in the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act 54 of 1972), to delete reference to SANS 7937/ISO 7937 (SABS ISO 7937), to add SANS 6461-1/ISO 6461-1 and SANS 6461-2/ISO 6461-2 as normative references, and to delete references to Codex standards.

Foreword

This South African standard was approved by National Committee STANSA TC 5140.33, *Non-alcoholic beverages*, in accordance with procedures of Standards South Africa, in compliance with annex 3 of the WTO/TBT agreement.

This edition cancels and replaces the first edition (SABS 1862:2001).

A vertical line in the margin shows where the text has been modified by amendment No. 1.

Annexes B and C form an integral part of this standard. Annex A is for information only.

Contents

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Packaged water other than natural mineral water

1 Scope

This standard specifies the description, treatment, testing, packaging and labelling of water that is not natural mineral water. The water may be offered as packaged non-carbonated ("still") water or as packaged carbonated ("sparkling") water, with or without permitted substances.

2 Normative references

2.1 General

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

2.2 Standards

AOAC official method 991.07, Nitrogen- and phosphorus-containing pesticides in finished drinking water – Gas chromatographic method. In AOAC INTERNATIONAL. *Official methods of analysis.* 17th ed., vol. 1. edited by William Horwits. Gaithersburg: AOAC International, 2000.

APHA method 2320[1], *Alkalinity.*

APHA method 3500-K D[1)], *Potassium – Flame photometric method.*

APHA method 4500-CO_2 D[1)], *Carbon dioxide and forms of alkalinity by calculation.*

APHA method 4500-I[1)], *Iodine – Leuco crystal violet method.*

APHA method 6630 B[1)], *Organochlorine pesticides – Liquid- liquid extraction gas chromatographic method I.*

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1) In *Standard methods for the examination of water and wastewater*, prepared and published jointly by the American Public Health Association, the American Water Works Association and the Water Environment Federation. 19th ed. 1995.

SANS 163-1/ISO 10304-1 (SABS ISO 10304-1), *Water quality – Determination of dissolved fluoride, chloride, nitrite, orthophosphate, bromide, nitrite and sulfate ions, using liquid chromatography of ions – Part 1: Method for water with low contamination.*

SANS 241 (SABS 241), *Drinking water.*

SANS 5197 (SABS SM 197), *Turbidity in water.*

SANS 5198 (SABS SM 198), *Colour of water.*

SANS 5202 (SABS SM 202), *Chloride content of water.*

SANS 5207 (SABS SM 207), *Water – Iron content.*

SANS 5213 (SABS SM 213), *Water – Dissolved solids content.*

SANS 5221 (SABS SM 221), *Bacteriological quality of water.*

SANS 6050 (SABS SM 1050), *Water – Sodium content.*

SANS 6057 (SABS SM 1057), *Electrical conductivity of water.*

SANS 6265 (SABS SM 6265), *Water – Calcium and magnesium content – Atomic absorption spectrometric method.*

SANS 6461-1/ISO 6461-1, *Water quality – Detection and enumeration of the spores of sulfite-reducing anaerobes* (clostridia) *– Part 1: Method of enrichment in a liquid medium.* **Amdt 1**

SANS 6461-2/ISO 6461-2, *Water quality – Detection and enumeration of the spores of sulfite-reducing anaerobes* (clostridia) *– Part 2: Method of membrane filtration.* **Amdt 1**

~~SANS 7937/ISO 7937 (SABS ISO 7937)~~, Deleted by amendment No. 1.

2.3 Other publications

BORISH, Irvin N. *Clinical optometry.* 3rd ed. Chicago: Professional Press, 1970.

~~*Codex alimentarius*. Vol. 1, General requirements. 2nd ed. Rome: Food and Agriculture Organization of the United Nations, 1992. Section 4.~~ Deleted by amendment No. 1.

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1
acceptable
acceptable 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
bottling cycle
the period of bottling that produces a batch (see 3.2)

3.5
carbonated water
sparkling water
water that, after possible treatment in accordance with 6.1, has been made effervescent by the addition of carbon dioxide (see 6.3.4)

3.6
"clean worker"
worker who operates in an area that is required to be maintained in a completely hygienic condition

3.7
defective
bottle or its contents that do not comply in one or more respects with the relevant requirements of the standard

3.8
"dirty worker"
worker who operates in an area that cannot be maintained in a completely hygienic condition

3.9
flavoured water
product that has had flavouring added to the water to give a particular taste

3.10
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

3.11
non-carbonated water
still water
water that does not contain free carbon dioxide or other gases in excess of the amount necessary to keep dissolved the hydrogen bicarbonate salts that are present in the water

3.12
prepared water
water that has had its physical, chemical or microbiological composition altered from that of its source

3.13
product
water that complies with the requirements given in SANS 241

3.14
substances
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 under the current Foodstuffs, Cosmetics and Disinfectants Act

4 Requirements for transportation, factory, employees and equipment

4.1 Requirements for the transportation of water to be packaged

When water is to be transported from its source to a bottling or container filling facility, the transportation shall be conducted in a hygienic manner that will prevent any contamination.

4.2 Requirements for the factory, for employees, and for the filling area

4.2.1 General

All the statutory requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), and of the Health Act, 1977 (Act 63 of 1977), shall be complied with.

The factory, the equipment and the water used in the preparation of the product shall comply with the requirements given in 4.1 to 4.6 inclusive.

4.2.2 Factory construction, layout and conditions

4.2.2.1 Location, size, hygienic design and conditions

The location of the premises and the construction of the factory buildings shall be such that the premises and the buildings can be kept acceptably free from objectionable odours, smoke, dust and other contamination in order to comply with the relevant requirements for hygiene and sanitation. Adequate working space shall be provided to allow for satisfactory performance of all operations. The buildings and facilities shall be designed to provide:

a) separation by effective means between operations that could cause cross-contamination; and

b) a regular flow in the processing, from the arrival of the product at the premises to the finished product.

Provision shall be made for appropriate temperature conditions for the process and for the product. The factory buildings shall be of sound construction, in good repair and large enough to prevent crowding of equipment and employees, to permit adequate cleaning and the maintenance of hygiene and product quality and to allow proper supervision of operations. The factory grounds shall be graded to ensure proper drainage. The factory and grounds shall be maintained in a clean and hygienic state and shall be effectively fenced. Roadways and areas that serve the factory and that are within its boundaries or in its immediate vicinity shall have hard, paved surfaces suitable for wheeled traffic.

A system of control that does not contaminate the product shall be maintained to keep the factory free from birds, rodents, insects and other vermin.

4.2.2.2 Roofs, ceilings and overhead fittings

The roof shall be weatherproof. The roof and ceilings shall be at least 300 mm above any overhead equipment and shall in no case be less than 3 m from the floor. Ceilings and, where no ceilings are fitted, roofs shall be faced with a smooth, impervious material that is light in colour and capable of being easily cleaned without damage, and shall be so designed, constructed and finished as to be dustproof and to minimize condensation, mould development, flaking paint and the lodgement of dirt. A ceiling shall be provided where the unprotected product and packaging materials are handled. A ceiling is not required where a canopy covers the entire open product. In processing areas, all overhead structures and fittings shall be installed in such a way as to avoid direct or indirect contamination of product or raw materials by falling dust, dirt, condensation and drip, and in such a way as not to hamper cleaning operations. They should be insulated where appropriate.

4.2.2.3 Walls and doors

Outer walls shall be weatherproof and impermeable to water. Interior wall surfaces shall be faced with a smooth, crevice-free, impact-resistant, impervious, light-coloured, non-toxic material to a height of not less than 2 m from the floor. Where splashing might occur above this height, the facing shall be continued to this higher level. Above 2 m, the walls shall have a smooth, crevice-free, impervious, washable, light-coloured surface. All ledges that occur in the wall construction shall be sloped at an angle of at least 45°. The walls shall be free from unnecessary projections.

Wall-to-wall and wall-to-floor junctions in bottling areas shall be coved. The minimum radius of the coving shall be 25 mm and 40 mm respectively.

Doors shall be of adequate width and shall be tight-fitting. Doors and door frames shall be sheathed with, or made from, corrosion-resistant material that has high-impact resistance and, unless provided with effective air-screens, shall, as far as is practicable, be of a self-closing type. Doors and door frames shall have a smooth, seamless, impervious, light-coloured, readily cleanable surface.

4.2.2.4 Windows

Window-sills (sloped at an angle of at least 45°) shall be at least 1 m above floor level.

Windows and other openings shall be so constructed as to avoid accumulation of dirt.

Windows that open shall be fitted with screens that are easily removable for cleaning, and both shall be kept in good repair.

4.2.2.5 Floors of processing areas

Floors shall be constructed of concrete or other suitable smooth, impervious, non-slip and non-toxic material that is resistant to wear and corrosion and that is easy to clean. They shall be laid to an even surface that is free from cracks, crevices and open joints. Floors and drainage channels shall be graded to have a fall of at least 1 in 60 and shall be drained to internal drainage channels that are connected to external sewers via a suitable drain trap.

Floors and drainage channels shall be in good condition and repair, and shall have strainers in place. Internal drainage channels shall be of the open type with, where necessary, removable covers.

Where necessary, duckboards of easily cleaned impervious material shall be provided for workers.

Installations that obstruct flow and cleaning shall not be present in drainage channels. The capacity of drainage channels shall be sufficient to cope with peak loads. The factory shall have an efficient effluent and waste disposal system, so designed and constructed that it cannot contaminate or be detrimental to the product or the source of product.

4.2.2.6 Lift cages and staircases

Lift cages shall have a smooth, impervious, corrosion-resistant inside surface, and lift shafts shall be properly drained and shall be accessible for cleaning. Staircases in rooms where the product is processed or handled shall have solid risers, and shall be provided with impermeable balustrades to a height that prevents contamination of the product underneath. Stairs, lift cages and auxiliary structures such as platforms, ladders, chutes and catwalks shall be so constructed and situated as not to cause contamination of the product. Where necessary, chutes shall be constructed with inspection and cleaning hatches.

4.2.2.7 Pipes, cables, reservoirs and storage tanks

Piping for product lines shall be independent of piping for water used for other purposes and of piping for non-potable water. Product water and water for steam production or for refrigeration or for any other use, shall be carried in completely separate lines, with no cross-connection between them and without back-siphonage. Piping for the product shall be distinguished by colour from other water pipelines. In the pipeline for the product, there shall be no opening between the point of collection and the filling point. Cables and pipes shall be

a) fixed above ceilings, or

b) chased into walls, or

c) fixed to walls in such a way that the walls, cables and pipes can be easily cleaned and maintained in a hygienic condition, or

d) carried under floors.

Overhead pipes and cable connections to machines that cannot be fixed above the ceiling shall be carried a minimum of 40 mm apart on tubular brackets suspended at least 40 mm away from the ceiling.

Waste pipes and other pipes that cannot be chased into walls shall be fixed a minimum of 40 mm from the wall surfaces and 150 mm above the floor, and shall be spaced a minimum of 40 mm apart.

Pipes in which the product is conveyed shall have no dead ends.

Reservoirs and storage tanks shall be constructed from materials suitable for the product. Reservoirs and storage tanks shall be fitted with tight-fitting covers, manholes or hatches. Only water pipelines that carry the product may be connected to the reservoirs and storage tanks used for the product. Such reservoirs and storage tanks shall be distinctively marked.

4.2.2.8 Illumination

General illumination shall be such as to permit efficient operations during the manufacture, production, processing and treatment of the product. Artificial illumination, if used, shall be such that the colour of the product is not significantly altered. Light bulbs and fixtures suspended over the product at any stage of preparation, processing or packaging shall be of the safety type or shall be otherwise protected to prevent contamination of the product in the event of breakage.

4.2.2.9 Ventilation

The ventilation shall keep the air fresh, prevent excessive heat, remove excess steam or vapour, and prevent the formation of condensate and growth of mould. Natural ventilation shall be augmented, if necessary, by mechanical means. Air flow shall be from the more hygienic to the less hygienic areas of the factory. The air shall be free from noxious fumes, vapour, dust and contaminating aerosols.

4.2.2.10 Hand-washing facilities

The following shall be provided at the entrances to the preparation and processing areas of the factory used by the employees and at other convenient places in the preparation and processing areas of the factory within easy reach of the employees, and near the toilets in such a position that employees have to pass them when returning to the processing area:

a) an adequate number of handbasins, with an abundant supply of hot and cold running water (from taps operated by means other than the hands) or warm water in the temperature range 40 °C to 50 °C; and

b) abundant unscented liquid soap or suitable detergent, and disposable towels.

Access to hand-washing facilities shall at all times be unobstructed by equipment and operating activities.

4.2.2.11 Processing areas

Processing areas shall be so designed and equipped as to allow adequate working space, and shall be so staffed as to allow free movement of workers and to facilitate the free movement and cleaning of movable equipment.

Walls and floors shall have a smooth finish and shall be impervious to moisture, and measures shall be taken to prevent the flaking off of surface material from ceilings and walls. Brick walls shall be plastered. Processing areas shall be kept reasonably free from surplus water.

The filling (bottling) area shall be separate from the storage areas.

The cleaning and washing area for re-used bottles shall be separate from the filling (bottling) area.

4.2.2.12 Storage facilities for packaging materials

Containers, closures, cartons and labels for the packing and packaging of the product shall be stored in clean, dustproof, dry storerooms that are reserved for this purpose and are separate from production areas and other storage areas.

4.2.2.13 Storage facilities for pesticides, poisons and other hazardous materials

Pesticides, poisons and other hazardous materials, and the equipment for their application, shall be stored in a room separate from the processing area and the storage areas for ingredients or containers. The room shall be kept locked.

4.2.2.14 Storage facilities for cleaning materials, disinfectants and equipment

Cleaning materials, disinfectants and equipment shall be stored in a room separate from the processing area and shall at no time come into contact with containers, raw materials or the product.

4.2.2.15 Storage facilities for the product

Product awaiting dispatch shall be stacked, but not direct upon the floor, in well-ventilated, clean and dry rooms. The finished product shall be stored under conditions that will prevent contamination, microbiological spoilage and deterioration. Adequate measures shall be taken to protect the product against rough handling and damage. The product shall not be exposed to direct sunlight or to temperatures above 30 °C.

Product found not to comply with the in-house or other quality management systems or with the requirements of this standard shall be stacked apart from that which complies with the requirements.

4.2.2.16 Refuse

A separate refuse room or other equally adequate refuse facility shall be provided on the premises and shall be cleaned daily (see 4.5.4 and 4.5.5). The design and construction of the refuse facility shall be such as to prevent the harbouring of pests and the contamination of the product, equipment or building.

4.2.2.17 Comfort facilities

Adequate dining rooms, rest rooms, change-rooms, shower-baths, handbasins, and toilets (separate for each sex) shall be provided. Comfort facilities shall be separated from, and shall not open directly onto, processing areas.

Toilets shall be provided at an acceptable distance from the processing areas and shall be completely separate from change-rooms, the only permissible access being close-fitting, self-closing doors. The toilets shall be so designed and constructed as to ensure hygienic removal of waste. An abundant supply of toilet paper shall be provided at the toilet facilities. Hot and cold running water (from taps operated by means other than the hands), unscented liquid soap, nail brushes and paper towels (or hot-air driers) shall be available to employees at the facilities. Receptacles shall be provided for used disposable towels at each hand-washing facility. These receptacles shall be regularly emptied and cleaned.

The comfort facilities shall be kept neat and clean. Lockers shall be provided and the layout and equipment shall be such as to permit proper cleaning and maintenance. Alternatively, a system of controlled clothes baskets may be used instead of lockers.

There shall be adequate ventilation and illumination. The requirements of the said Occupational Health and Safety Act shall be complied with. Separate facilities shall be available for "clean" and "dirty" workers. When food is consumed on the premises by employees during rest periods, a room or rooms that has or have adequate dining facilities shall be provided. The change-rooms shall not be used for the preparation or consumption of food or as living quarters. Comfort facilities shall not be used as storage areas.

4.2.2.18 Facilities for cleaning and disinfecting portable equipment

A separate room or a partitioned-off area shall be equipped for the washing and disinfecting of work implements and of loose items of equipment, such as trays, trolleys, etc. Hot and cold water under adequate pressure shall be provided. If a separate room is not provided, the area to be used shall be such that there will be no possibility of contamination of the product. The floor of the room or area shall be smooth-surfaced and graded, to facilitate the disposal of waste liquids from the cleaning process.

4.2.2.19 Notices

Notices prohibiting eating, spitting, and the use of chewing gum and tobacco in any form shall be posted in each processing area and in each area for the storage of ingredients (see 4.6.3). Notices requesting employees to wash their hands on entering the processing areas and after using the toilets shall be posted at each entrance used by employees to gain access to the processing areas, and at exits from the toilet complex.

4.3 Equipment

4.3.1 General

Equipment, implements and utensils shall be suitable for their intended use. All plant equipment (including pipework, vessels, valves, taps, monitoring devices and probes), implements and utensils that come into contact with the product shall be made of a smooth-surfaced, corrosion-resistant and non-absorbent material that is free from pits and crevices, that does not transmit toxic substances, foreign odours or flavours to the product, that does not stain or soil the product or change the original qualities of the product, and that is preferably stainless steel. Acceptable alternatives to stainless steel are polyethylene and unplasticized polyvinyl chloride (uPVC). The use of different materials in such a way that contact corrosion can occur shall be avoided. The equipment, implements and utensils shall be capable of withstanding repeated cleaning and disinfection. They shall be of hygienic design and shall be so installed as to prevent hygiene hazards and to permit easy and effective cleaning and disinfection. Where necessary, as in the case of equipment that cannot be cleaned *in situ*, it shall be possible to dismantle equipment for cleaning and disinfection. Equipment, implements and utensils shall not be removed from the processing areas, except for repairs or for cleaning.

Equipment shall not be sunk into the floor unless provision is made for adequate drainage. All parts of stationary or not readily movable equipment shall be installed at such distances away from the walls and ceilings as are sufficient to provide access for cleaning and inspection. All permanently mounted equipment shall either be installed sufficiently above the floor to provide access for cleaning and inspection, or be completely sealed to the floor.

Lead and lead alloys, other than solder, and other metals that could alter the character of the product, shall not be used in the construction of equipment that comes into contact with the unprotected product at any stage of processing.

4.3.2 Tables

Table frames shall be made of smooth, corrosion-resistant metal, free from pits and crevices, or shall be treated against corrosion, and the tops shall be made of stainless steel or other smooth, corrosion-resistant, impervious material that has similar surface characteristics.

The table tops shall be constructed so as to be accessible for effective cleaning. Where metal tops are folded at the edge, the fold shall be effectively soldered or welded or sealed with an acceptable mastic sealant in such a way as to prevent the product from entering the folded section. The tops of tables shall allow rapid and effective drainage and shall be free from cracks and crevices. All joints shall be made watertight.

4.3.3 Cleaning and disinfection facilities

Cleaning materials and disinfectants, hot and cold running water that complies with 4.4, hosepipes, brushes and other materials necessary for the cleaning of the plant and utensils shall be available.

4.4 Water (other than the product)

Facilities for the storage, treatment and distribution of water shall be adequately protected against contamination. The factory shall use a supply of clean potable water under adequate pressure and free from suspended matter and substances that are deleterious to the product or injurious to health.

Potable water shall comply with the requirements of SANS 241.

4.5 Hygienic operating requirements

4.5.1 General

In the factory and on its grounds, no operation that is detrimental to the manufacture, processing or treatment of the product shall be permitted.

Effective measures shall be taken to inhibit mould growth and to prevent dust, dirt, flaking paint and other loose or extraneous material from being present in the processing areas or in the storage rooms. The factory and grounds shall be maintained in a clean and hygienic state.

All plant, equipment and utensils shall be maintained in a state of good repair and shall be cleaned as frequently as is necessary, and disinfected whenever required by circumstances. Provision shall be made for the cleaning-in-place of pipes and tanks used for the product. The entire processing and treatment system, including utensils, shall be cleaned at each change of operations. At the end of operations, filling nozzles and other parts exposed to bacterial contamination shall be thoroughly cleaned, rinsed and disinfected, and the rest of the system shall be cleaned and rinsed. Whenever necessary, but at least weekly, the entire system shall be cleaned, rinsed and disinfected. Immediately before the start of processing operations, plant and utensils shall be rinsed with potable water that complies with 4.4. Steam used in the cleaning of surfaces that come into contact with the product shall not contain substances that could contaminate the product.

4.5.2 Floors and drainage channels

During processing periods, the floor and the drainage channels shall be kept clean. Thorough cleaning of floors and drainage channels shall take place at the end of each day's operations and as often as is necessary during the working day to maintain hygienic conditions.

4.5.3 Walls

The inside surfaces of walls shall be thoroughly washed immediately after each day's operations and as often as is necessary during the working day to maintain hygienic conditions.

4.5.4 Removal of refuse

Litter, waste and overflow shall not be allowed to accumulate or give rise to unhygienic conditions, and shall be disposed of in an efficient and hygienic way (see 4.2.2.16).

4.5.5 Vermin and pest control

All refuse facilities (see 4.2.2.16) and all buildings in which packaging materials are stored or in which the product is processed or stored shall be rodentproof and be kept free of pests.

4.5.6 The use of pesticides

Pesticides shall not be used while processing is in operation. Equipment, utensils and work surfaces shall be kept free from pesticidal residues.

Pesticides shall at no time come into contact with containers or the product.

Pesticides shall only be dispensed and handled by authorized and properly trained personnel, or by persons under strict supervision of trained personnel.

Pesticides shall comply with the requirements of the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act 36 of 1947).

4.5.7 Animals

Animals, including birds, shall not be allowed in any part of the factory.

4.6 Requirements for employees engaged in the processing of the product

4.6.1 Health

4.6.1.1 Employees shall receive training in hygiene practices and records shall be kept of such training, and of the duties of a person in charge of food premises, since these duties relate to the training of employees.

4.6.1.2 The management shall ensure that no person who is suffering from, or who is a carrier of, any communicable disease (especially a carrier of *Salmonella* or *Shigella* organisms), or who shows symptoms of, or is suffering from, gastroenteritis or an enterobacterial infection or who is suffering from any condition causing discharge of pus or serum or loose skin from any part of the body shall be allowed to engage in the preparation, processing, handling or transportation of the product, or to work in any part of the factory where the product is prepared, processed, handled or transported.

4.6.1.3 The management shall ensure that no person who is known or suspected to be affected by a disease that can be transmitted through food, or who is known or suspected to be a carrier of such disease, or who is known or suspected to be afflicted with infected wounds, sores or any illness, is permitted to work in any part of the factory in a capacity in which there is a likelihood of that person's contaminating the product with pathogenic organisms.

4.6.1.4 The requirement of Government Notice No. R. 918, regulation 10 (o) (Government Gazette No. 20318 of 30 July 1999) under the Health Act, 1977 (Act 63 of 1977) is as follows:

> A person in charge of food premises shall ensure that (regulation 10): .....
> the reporting of diseases and conditions contemplated in regulation 11(2)(b) are properly recorded and kept for perusal by an inspector (10(o)).

The requirements of 11(2) are as follows:

> Food, a facility or a container shall not be handled by any person
> (a) .....;
> (b) who is or who is suspected of suffering from or being a carrier of a disease or condition in its contagious stage that can be transmitted by food, unless any such person immediately reports the disease or condition to the person in charge and a certificate by a medical practitioner stating that such person is fit to handle food is submitted;
> (c) .....

4.6.1.5 The records shall include the reporting of the diseases and conditions as well as the final certificate stating that the person is fit to handle food or water (or both).

4.6.1.6 The management shall ensure that no person who is suffering from any cut or injury is engaged in the factory in the preparation, processing, handling or transportation of the product unless and until the cut or injury has been so treated or dressed that the discharge of body fluids onto the product has been prevented, and the wound and its dressing have been so covered as to ensure that infection or contamination of the product is no longer possible. The dressing and its covering shall be conspicuous in colour.

4.6.2 Protective clothing

All employees engaged in the preparation and processing of the product, and also other factory workers and visitors who might enter the preparation and processing areas, shall wear clean protective clothing and clean, washable caps or acceptable alternative headgear to cover their hair. Employees engaged in the processing of the product shall wear light-coloured protective clothing. Waterproof protective clothing shall be made of a plastics material or rubber, or a similar acceptable material. Overalls shall cover the personal clothing of the employees. Sleeves shall not extend below the elbows, except when acceptably covered by plastics sleevelets. All protective clothing shall be of acceptable hygienic design, shall have no top pockets, shall be in good repair, and shall not constitute a source of contamination of the product.

Waterproof protective clothing shall be cleaned at each time of removal, and shall be hung on hooks or pegs at exits from preparation and processing areas during intervals between work and during visits to toilets. Overalls shall be left in the rest rooms when their wearers leave the factory building during breaks. Protective footwear shall be worn in preparation and processing areas.

4.6.3 Personal hygiene

Employees shall keep their fingernails short and clean, and shall wash their hands with unscented liquid soap and water before commencing work, after each absence from the factory processing area, at regular intervals during the day, and when they have been contaminated. Varnish or lacquer shall not be used on fingernails. Jewellery and wristwatches shall not be worn by employees who handle the unprotected product. Workers' personal effects and their food shall not be present in the preparation, processing, packing or storage areas of the factory.

Eating, spitting, and the use of chewing gum or tobacco in any form shall be prohibited within the preparation, processing, packing and storage areas of the factory. (See also 4.2.2.19.)

5 Requirements and tests for the untreated water that is used as the base for the product

5.1 The water that is used as the base for the product shall comply with all the chemical and biological requirements given in SANS 241 for class 1 drinking water.

5.2 The untreated water to be used in the final product water shall be tested for the constituents and parameters listed in column 1 of table 1, using the test methods given in column 3, at the frequencies given in column 4 of this table. Where the untreated water is received from a source of potable water (for example from a municipal supply), the manufacturer shall not be required to perform the tests provided the manufacturer is satisfied that its source can consistently deliver potable water. The manufacturer shall determine the appropriate water treatment required (if any) to achieve the limits given in SANS 241 (class 1) and in column 2 of table 1, based on these tests.

5.3 When the untreated water is tested in accordance with SANS 6461-2, viable *Clostridium* spores shall be absent in 100 mL. **Amdt 1**

Table 1 — Physical and macro constituents

1	2	3	4
Quality	**Limits (if applicable)**	**Test method**	**Frequency of testing**
Colour	20 mg Pt/L, max.	SANS 5198	As required
Turbidity	1 NTU, max.	SANS 5197	Daily
Electrical conductivity	150 mS/m, max.	SANS 6057	Daily
Total dissolved solids	1 000 mg/L, max.	SANS 5213	Initially and quarterly
Calcium as Ca	150 mg/L, max.	SANS 6265	Initially and quarterly
Magnesium as Mg	70 mg/L, max.	SANS 6265	Initially and quarterly
Sodium as Na	200 mg/L, max.	SANS 6050	Initially and quarterly
Potassium as K	50 mg/L, max.	APHA method 3500-K D	Initially and quarterly
Chloride as Cl	200 mg/L, max.	SANS 163-1	Initially and quarterly
Sulfate as SO_4	400 mg/L, max.	SABS 163-1	Initially and quarterly
Alkalinity	–	APHA method 2320	Initially and quarterly
Bicarbonate	–	Calculated using APHA method 4500-CO_2 D and the results obtained for pH value and alkalinity	Initially and quarterly
NOTE Where information on physical and macro constituents is labelled on the product, it is recommended that the values so given be clearly stated, for example "maximum values" or "typical values" or "average levels".			

5.4 Microbiological tests shall be carried out within 24 h of sampling, the samples having been kept at 4 °C ± 3 °C for the period prior to testing. When the untreated water is tested using the following method, parasites shall be absent in 10 L of the untreated product.

Filter 10 L of the water sample through a filter membrane that has apertures of 1,0 µm ± 0,2 µm. Remove the filter and place it in 100 mL sterile water for 10 min. Resuspend the filtered material or residue (or both), then concentrate it by centrifuging at 2 100 r/min for 6 min. Examine the pellet so collected at 400 times magnification under phase contrast microscopy for the presence of parasites.

NOTE Since algae can be confused with certain protozoan cysts such as *Cryptosporidium* and *Giardia*, it is advisable to use an immunofluorescent stain and a fluorescing microscope to distinguish between these organisms.

5.5 If an initial survey indicates that the possibility of contamination of the source water is high, the source water shall be tested for the suggested contaminant given in column 1 of table 2, using the corresponding test methods given in column 3, as additional tests to those given in SANS 241.

Table 2 — Contaminants

1	2	3
Contaminant	**Amount permissible**	**Test method**
Organochlorine pesticides and PCBs	Not detectable[a]	APHA method 6630 B
Organic phosphorous pesticides	Not detectable[a]	AOAC method 991.07
NOTE Test methods that deliver equal or better results may be substituted for those listed in column 3.		
[a] Not detectable by the method specified.		

6 Requirements and tests for the product

NOTE Annex A offers a method of quality verification.

6.1 Permissible treatment

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

6.2 Chemical and physical requirements and tests

6.2.1 Permissible concentrations of specific substances in a finished product that has been filled into the appropriate container (bottle or sachet)

When tested in accordance with the methods given in SANS 241, the product, in its packaged state, shall comply with the requirements for class 1 water given in table 1 of SANS 241, with the exclusion of the requirements for dissolved organic carbon 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.

6.2.2 Physical and macro constituents

The product shall be tested for the qualities given in table 1.

6.3 General requirements

6.3.1 Flavour and odour

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

6.3.2 Net volume of the product

The net volume of the product shall comply with the regulations framed under the Trade Metrology Act, 1973 (Act 77 of 1973).

6.3.3 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.

6.3.4 Carbonation (and the addition of other gases)

If carbonated, the packaged water shall be carbonated in accordance with the claimed product type stipulated on the label. Carbon dioxide and other gases shall be of acceptable food grade.

6.4 Microbiological requirements

When the treated product is tested in accordance with SANS 5221:

a) coliform bacteria shall not be detected in 100 mL;

b) faecal coliform bacteria shall not be detected in 100 mL; and

c) after bottling (or filling into sachets), the total viable colony count shall not exceed 100 per 1 mL. The total viable colony count shall be determined within 24 h of filling or of packing.

6.5 Sampling

Annex B gives sampling procedures.

7 Bottles and other containers

7.1 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. The containers shall be delivered to the filling plant in sealed packaging.

Annex C gives requirements to be specified in tender invitations and in each order or contract.

7.2 Condition of containers for the finished product

At the time of filling, all containers shall be clean and sound. Bottles shall be free from chips, cracks and other defects. Metal containers shall be free from corrosion and internal scratches and other lacquer imperfections. Closures shall be clean at the time of capping or sealing. Crown caps shall be fitted internally with a solid cork or composition cork disc or with an acceptable plastics disc. Containers to be used for the product shall not be used to store ingredients, raw materials or other products or preparations, and such containers shall not be used by workers for drinking purposes.

7.3 Washing of bottles

All returnable bottles (and, where necessary, new bottles) used for the product shall be cleaned by a suitable automatic process immediately before being filled. The process shall include:

a) a pre-soak or pre-rinse;

b) brushing, soaking, or jetting with an efficient cleaning solution for a sufficient time at a temperature high enough to ensure thorough cleaning; and

c) thorough rinsing with potable water to remove all traces of the cleaning solution from the bottles.

Test the rinsed bottles with an alcoholic solution of phenolphthalein to ensure that the rinsing has been effective. The indicator shall not turn red. New bottles that do not require the treatments in (a) to (c) above shall be rinsed with the treated product or with potable water that complies with class 1 of SANS 241.

7.4 Filling the product into containers and sealing them

Containers shall be filled under strictly hygienic conditions by means of manual or automatic equipment maintained in a hygienic state. The open ends of containers shall not be touched by hand. All containers shall be sealed immediately after they have been filled. Closing machines shall be kept clean, and contamination of the product from soiled equipment or detached particles of material shall be avoided.

7.5 Inspection of containers

Inspection of washed, unfilled and filled containers shall be performed on a continuous basis, either by means of electronic equipment maintained in perfect working order, or by means of personnel who operate as sighters. The sighters shall be relieved at intervals not exceeding 30 min., or at shorter intervals if deemed necessary. The rest periods shall not be shorter than the sighting periods. The eyes of each sighter shall be tested at least every 12 months.

When determined using the relevant methods in *Clinical optometry*, the visual acuity (Snellen test) of each sighter shall be at least 6/9 in each eye, or at least 6/12 in one eye provided that the other eye has an acuity of at least 6/6. Alternatively, the sighter's visual acuity shall have been corrected to be within the above-mentioned limits of refraction. The colour vision of each sighter shall be Ishihara Normal 1.

8 Packing and labelling of containers

8.1 Packing

The product shall be packed as required (see annex C), and in accordance with the requirements of the said Trade Metrology Act, in sealed retail containers suitable for the prevention of the possible adulteration or contamination of water.

~~NOTE The *Code of hygienic practice for packaged (bottled) drinking waters* is currently being developed by the Codex Committee on Food Hygiene.~~ **Amdt 1**

8.2 Labelling

8.2.1 General

The requirements of the said Trade Metrology Act, and of the current Foodstuffs, Cosmetics and Disinfectants Act, shall be complied with. ~~In addition, the Codex general standard for the labelling of prepackaged foods (in *Codex alimentarius*) shall apply.~~ **Amdt 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.

8.2.2 The name of the product

The name of the product (see annex C) shall be a true description of the product concerned.

8.2.3 Composition and carbonation of the product

8.2.3.1 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 SO_4

Total alkalinity ..... as $CaCO_3$

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 in pH units.

In addition, any fruit-flavoured water product or any product on the container of which there is any depiction of or reference to fruit, but that does not contain wine, shall comply with "Regulations relating to the classification, packing and marking of fruit juice and drink intended for sale in the Republic of South Africa", published by Government Notice No. R286 (Government Gazette No. 7290 of 7 November 1980), as amended under the Agricultural Product Standards Act, 1990 (Act No. 119 of 1990).

NOTE The Directorate: Plant Health and Quality of the National Department of Agriculture is responsible for administering this Act.

8.2.3.2 Carbonation

The label shall state whether the product is non-carbonated ("still") 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.

8.2.4 Net contents

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

8.2.5 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.

8.2.6 Lot identification

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

8.2.7 Optional labelling

The following are examples of optional labelling:

a) the term "Filled in the Republic of South Africa" (such a term may appear on the label only if the product is from a South African source and has been packaged in accordance with the requirements of this standard);

b) a trade name; and

c) the date of authorization by the South African Bureau of Standards to commence collection and production.

The terms given in table 3, descriptive of the particular properties of the product, may appear on the label as part of, or in close proximity to, the name of the product or in an otherwise prominent position, provided that the conditions specified are adhered to.

Table 3 — Optional labelling

1	2	3
Property	**Limits**	**Test method**
"Alkaline"	Where the product contains more than 500 mg/L of HCO_3 expressed as $CaCO_3$	APHA method 2320
"Acidulous"	Where the product contains more than 250 mg/L of free carbon dioxide	APHA method 4500-CO_2 D
"Saline"	Where the product contains more than 1 000 mg/L of NaCl	SANS 5202 and SANS 6050
"Contains iron"	Where the product contains more than 1 mg/L of Fe	SANS 5207
"Contains iodine"	Where the product contains more than 1 mg/L of I	APHA method 4500-I

8.2.8 Prescribed labelling

8.2.8.1 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.

8.2.8.2 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.

8.2.9 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.

9 Transportation of the finished product

The conditions of transportation shall be such that the finished product is protected against damage, contamination, deterioration and rough handling, and is shielded from direct sunlight and temperatures above 30 °C.

Annex A
(informative)

Quality verification of packaged water

A.1 When a purchaser requires ongoing verification of the quality of packaged water other than natural mineral water, it is suggested that, instead of concentrating solely on evaluation of the final product, he also direct his attention to the manufacturer's quality system. In this connection it should be noted that SANS 9001 covers the provision of an integrated quality system.

A.2 If the product does not bear the certification mark and no information about the implementation of quality control or testing during manufacture is available to help in assessing the quality of a lot, and a purchaser wishes to establish by inspection and testing of samples of the final product whether a lot of the product complies with this standard, the sampling plan given in B.1 can be applied.

Annex B
(normative)

Sampling and compliance with this standard

B.1 Sampling

B.1.1 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.

B.1.2 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 B.1.

B.1.3 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 B.1.

B.1.4 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.

B.2 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 B.1.2 to B.1.4 inclusive, no defective is found.

Table B.1 — Sampling procedure

1	2	3	4
Lot size, containers	**Sample size for physical examination, containers**	**Sample volume for chemical analysis L**	**Sample size for micro-biological examination[a], containers**
0 – 5 000	3	3	3
5 001 – 12 500	6	3	3
12 501 – 25 000	9	3	3
25 001 – 50 000	16	3	3
50 001 upwards	30	3	3
[a] For examination for parasites, 10 L of product is required.			

Annex C
(normative)

Notes to purchasers

The following requirements shall be specified in tender invitations and in each order or contract:

a) the type of container in which the product is to be packed (see 8.1); and

b) the name of the product concerned (see 8.2.2).

Bibliography

AMERICAN SOCIETY FOR TESTING AND MATERIALS. *Annual book of ASTM standards.* 2000. Section 11: Water and environmental technology. Vol. 11.01: Water (I). West Conshohocken: ASTM, 2000.

AMERICAN SOCIETY FOR TESTING AND MATERIALS. *Annual book of ASTM standards.* 2000. Section 11: Water and environmental technology. Vol. 11.02: Water (II). West Conshohocken: ASTM, 2000.

APHA method 3500-Ba B[2], *Barium – Atomic absorption spectrometric method.*

~~CODEX ALIMENTARIUS COMMISSION. CODEX COMMITTEE ON FOOD HYGIENE. *Code of hygienic practice for packaged (bottled) drinking waters (other than natural mineral waters).*~~ Deleted by amendment No. 1.

SANS 5011 (SABS SM 11), *Water – pH value.*

SANS 5200 (SABS SM 200), *Arsenic content of water.*

SANS 5201 (SABS SM 201), *Water – Cadmium content.*

SANS 5203 (SABS SM 203), *Water – Copper content.*

SANS 5205 (SABS SM 205), *Water – Fluoride content.*

SANS 5208 (SABS SM 208), *Water – Lead content.*

SANS 5209 (SABS SM 209), *Water – Manganese content.*

SANS 5214 (SABS SM 214), *Water – Zinc content.*

SANS 5220 (SABS SM 220), *Water – Oxygen absorption.*

SANS 6054 (SABS SM 1054), *Water – Chromium content.*

SANS 6056 (SABS SM 1056), *Sulphide content of water.*

SANS 6058 (SABS SM 1058), *Selenium content of water.*

SANS 6059 (SABS SM 1059), *Mercury content of water.*

SANS 6169 (SABS SM 1169), *Water – Aluminium content.*

SANS 9001/ISO 9001 (SABS ISO 9001), *Quality management systems – Requirements.*

2) In *Standard methods for the examination of water and wastewater*, prepared and published jointly by the American Public Health Association, the American Water Works Association and the Water Environment Federation. 19th ed. 1995.