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مياه الشرب المعبأة
Bottled drinking water

Prepared by:
GSO Technical committee for sector standards
of food and agricultural products

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Foreword

Standardization Organization for GCC (GSO) is a regional Organization which consists of the National Standard Bodies of GCC member States.
One of GSO main functions is to issue Gulf Standard/ Technical regulation through specialized technical committees (TCs).
GSO through the technical program of committee TC No: (5) "Technical Gulf committee for food and agriculture product standards" has updated the GSO standard No. 1025/2000 " Bottled drinking water" The draft standard has been prepared by (State of Qatar).
This standard has been approved as Gulf Technical regulation by GSO Board of Directors in its meeting No…../……..held on / / H, / /
The approved standard will replace and supersede the standard No . 2000/1025

Bottled drinking water

1. Scope and field of application:

This Gulf standard is concerned with bottled drinking water fit for human consumption.

2. Complementary references:

2.1 GSO 9 : "Labelling of prepackaged foods".

2.2 GSO 21: "Hygienic regulations in food plants and their personnel".

2.3 GSO 111: "Methods of test for drinking and mineral water - part 1: Sampling"

2.4 GSO 112: "Methods of test for drinking and mineral water – part 2: determination of physical properties".

2.5 GSO 378: "Methods of test for drinking and mineral water - third part: Routine microbiological tests".

2.6 GSO 818: "Methods of test for drinking and mineral water – part 15:

Non-routine microbiological tests".

2.7 GSO 839: "Food packages – part 1: General requirements".

2.8 GSO 988: "Permissible radioactive levels in foodstuffs – Part 1".

2.9 GSO 1016: "Microbiological criteria for foodstuffs – Part 1".

2.10 Gulf standards approved concerning methods of test for drinking and mineral Water – Chemical tests .

3. Definitions:

3.1 Bottled drinking water**:** Treated drinking water intended for human consumption, bottled in suitable tightly sealed containers and complying with all the requirements mentioned in this standard

3.2 Treated drinking water **:** Water which has passed through treatment process, depending on the contamination degree of its resource, in order to protect the consumer from all detriments to health. Such processes include water gathering and initial purification, precipitation, filtration, final purification processes and desalination treatment.

3.3 Water source**:** A source of water supply whether it is an artesian well, drilled well, a spring, public or private water distribution system or any other source containing water suitable for human consumption.

3.4 Artesian water**:** Is water from a well tapping a confined aquifer in which the water level stands at some height above the top of the aquifer.

Artesian water may be collected with the assistance of external force to enhance the natural underground pressure so long as such measures do not alter the physical properties, composition, and quality of water.

3.5 Well water**:** Is water from a hole bored, drilled, or otherwise constructed in the ground which taps the water of an aquifer.

3.6 Spring water**:** The water derived from an underground formation from which water flows naturally to the surface of the earth. Spring water shall be collected only at the spring or through a bore hole tapping the underground formation feeding the spring. There shall be a natural force causing the water to flow to the surface through a natural orifice. The location of the spring shall be identifiable.

3.7 Water distribution system public or private**:** Means of public or private water systems providing consumers with tap water suitable for direct consumption.

4. Treatment requirements:

4.1 Water source shall be approved from a government agency after sampling and test to ensure suitability for consumption.

4.2 Transport process of water shall be carry out from place of source or collection to the packing places with equipment or transport lines prepared from suitable materials not lead to contaminant of the water.

4.3 treatment method whether chemical, physical or heating, singly or in combination, shall be sufficient to destroy the microbes. The treated bottled drinking water shall comply with biological and microbiological characteristics according to items (5.8),(5.9).

5. **Characteristics**:

The following shall be met in bottled drinking water:

5.1 **parameters related to quality**:

5.1.1 Bottled drinking water shall not contain any matter affecting colour, taste, smell or the appearance, and shall be completely free from extraneous matter or impurities such as dust, sand, thread or any other impurities.

5.1.2 PH for bottled drinking water shall be range between (6.5-8).

5.1.3 Total dissolved solids for bottled drinking water shall be between (100-600) ppm.

5.1.4 The substances and parameters of aesthetic quality shall be according to Table No.(1).

Table No. (1)
Substances and parameters related to quality of bottled drinking water

Chemical substance	Maximum permissible level
Aluminum	Less than 0.1 ppm
Ammonia	Less than 1.5 ppm
Total hardness	Not more than 200 ppm
Hydrogen sulfide	Not more than 0.05 ppm
Iron	Not more than 0.3 ppm
Sulphate	250 ppm
Magnesium	150 ppm
Toluene	700 microgram / Liter
Colour	Less than 15 true colour units
Turbidity	Less than 5 nephelometric turbidity units
Zinc	0.1 ppm

5.2 Chemical substance naturally according in water:

5.2.1 Chemical substance naturally according in water shall not exceed to what is mentioned in table No. (2).

Table No.(2)
Chemical substances naturally occurring in water

Chemical substance	Maximum permissible level (ppm)	Notes
Arsenic	0.01	
Barium	0.7	
Boron	0.5	
Chromium	0.05	Total chromium
Manganese	0.1	Affect the appearance, taste or a dour of the water
Molybdenum	0.07	
Selenium	0.01	
Uranium	0.015	

5.2.2 The fluoride content shall be between (0.8 – 1.5) ppm.

5.3 Residues for chemicals used in water treatment or materials in content with water: The content of residues for chemical used in water treatment or material in contact with water shall be according to table No. (3).

Table No.(3)
Chemicals used in water treatment or materials in contact with water

	Chemical substance	Maximum permissible level	Notes
5.3.1	Disinfectants:	ppm	For effective disinfection, there should be a residual concentration of free chlorine of ≥0.5 ppm after at least 3. minutes contact time at PH < 8.0
	Chlorine	0.6	
	Monochloramine	3	
5.3.2	Disinfection by products:	µg / liter	
	- Bromate	10	
	- Bromodichloroethane	60	
	- Bromoform	100	
	- Chloral hydrate (trihloroacetaldyde)	10	
	- Chlorate	700	
	- Chlorite	700	
	- Chloroform	200	
	- Cyanogen chloride	70	
	- Di bromoacetonitrile	70	
	- Di bromochloromethan	100	

	- Di chloroacetate	50	
	- Di chloroacetonitrile	20	
	- Formaldehyde	900	
	- Monochloroacetate	20	
	- Tricholoroacetate	200	
	- Tricholorophenol 2,4,6	200	
	- Trihalomethanes	1	
5.3.3	Contaminants from treatment chemicals:	µg/Liter	
	- Acrylamide	0.5	
	Epichohydrin	0.4	

Table No.(3)
Chemicals used in water treatment or materials in contact with water

	Chemical substance	Maximum permissible level	Notes
5.3.4	Contaminants from pipes and fittings:	µg/Liter	
	- Antimony	20	
	- Benzo (a) pyrene	0.7	
	- Copper	1000	
	- Lead	10	
	- Nickel	20	
	- Vinylchloride	0.3	

5.4 The maximum level for chemicals from industrial sources shall not exceed what is mentioned in table No. (4)

Table No.(4)
Chemical present in water from industrial sources

	Chemical substance	Maximum permissible level	Notes
5.4.1	Inorganic substances:	p p m	
	- Cadmium	0.0.3	For total mercury (organic and in organic)
	- Cyanide	0.07	
	- Mercury	0.001	
5.4.2	Organic substances:	µg / Liter	
	- Benzene	10	
	- Carbon tetrachloride	4	
	- Diethyl hexyl phthalate	8	
	- Dichlorobenzene 1,2-	1000	

- Dichlorobenzene 1,4-	300	
- Dichlorothane 1,2-	30	
- Dichlorothane 1,1-	30	
- Dichlorothene 1,2-	50	
- Dichloromethane	20	
- Edetic acid (EDTA)	600	Applied to the free acid
- Ethyl benzene	300	
- Hexachloro butadiene	0.6	
- Nitrilotriacetic acid	200	
- Pentachlorophenol	9	
- Styrene	20	
- Tetracholoroethene	40	
- Trichloro ethane	70	
- Xylenes	300	

5.5 The maximum level for agricultural pesticide residues and pesticides used in water for public health purposes shall not exceed to what is mentioned in table No. (5).

Table No.(5)
Agricultural pesticide residues and pesticide used in water for public health purposes

5.5.1	**Agricultural pesticide residues:**	**µg / Liter**	**Notes**
	- Fenoprop	9	
	- Isoproturon	9	
	- Lindane	2	
	- MCPA	2	
	- Mecoprop	10	
	- Methoxychlor	20	
	- Metolachlor	10	
	- Molinate	6	
	- Pendimethalin	20	
	- Simazine	2	
	- 2,4,5 - T	9	
	- Terbuthylazine	7	
	- Trifluralin	20	
5.5.2	**Pesticides used for public health purposes:**	**µg / Liter**	**Notes**
	- Chloropyrifos	30	
	- D D T and metabolites	1	
	- Pyriproxyfen	300	

5.6 The maximum levels for chemicals present in water from agricultural activities shall be according to table (6).

Table No.(6)
Chemicals present in water from agricultural activities

	Chemical substance	Maximum permissible level	Notes
5.6.1	Non pesticide substance	ppm	
	- Nitrate (No_3^-).	50	
	- Nitrite (No_2^-)	0.2	
5.6.2	Agricultural pesticide residues:	µg / Liter	
	- Alachlor	20	
	- Aldicarb	10	Applies to aldicarb sullfoxide and aldicarbsulfore
	- Aldrine and dieldrin	0.03	
	- Atrazine	2	
	- Carbofuran	7	
	- Chlordane	0.2	
	- Chlorotoluron	30	
	- Cyanazine	0.6	
	- 2,4 – dichlorophenoxy acetic acid	30	For free acid
	- 2,4 – dichlorophenoxy acetic acid	90	
	- 1,2 - Dibromo- 3 chloropropane	1	
	- 1,2 – Dibromoethane	0.4	
	- 1,2 - Dichloropropane	40	
	- 1,3 – Dichloropropene	20	
	- Dichloroprop	100	
	- Dimethoate	6	
	- Endrin	0.6	

5.7 Without prejudice to what is stated in Gulf standard mentioned in item (2.8), activity concentration of radionuclide in drinking water shall be according to table (7), and radioactivity constituents shall be according to table (8). If the total of radioactive exceed than 10 Bq/Liter, it can carry an examination to determine each radionuclide and its activity according to table No (7).

Table (7)
Levels of radionuclides

radionuclide	Bq / Liter	radionuclide	Bq / Liter	radionuclide	Bq / Liter
^{3}H	10000	^{56}Co	100	^{95}Zr	100
^{7}Be	10000	^{57}Co	1000	^{93}Nb	1000
^{14}C	100	^{58}Co	100	^{94}Nb	100
^{22}Na	100	^{60}Co	100	^{95}Nb	100
^{32}P	100	^{59}Ni	1000	^{224}Ra	1
^{33}P	1000	^{63}Ni	1000	^{225}Ra	1
^{35}S	100	^{65}Zn	100	^{226}Ra	1
^{36}CI	100	^{73}As	1000	^{228}Ra	0.1
^{54}Ca	100	^{74}As	100	^{93}Mo	100
^{47}Ca	100	^{76}As	100	^{99}Mo	100
^{46}Sc	100	^{77}As	1000	^{96}Tc	100
^{47}Sc	100	^{75}Se	100	^{97}Tc	1000
^{48}Sc	100	^{82}Br	100	^{99}Tc	100
^{48}V	100	^{86}Rb	100	^{97}Ru	1000
^{51}Cr	10000	^{85}Sr	100	^{103}Ru	100
^{52}Mn	100	^{89}Sr	100	^{106}Ru	10
^{53}Mn	10000	^{90}Sr	100	^{105}Rh	1000
^{54}Mn	100	^{90}Y	10	^{103}Pd	1000
^{55}Fe	1000	^{91}Y	100	^{105}Ag	100
^{59}Fe	100	^{93}Zr	100	^{110}Ag	100
^{111}Ag	100	^{131}Ba	1000	^{185}W	1000
^{109}Cd	100	^{140}Ba	100	^{186}Re	100
^{115}Cd	100	^{235}U	1	^{185}Os	100
^{111}In	1000	^{236}U	1	^{191}Os	100
^{114}In	100	^{237}U	100	^{193}Os	100
^{113}Sn	100	^{238}U	10	^{190}Ir	100
^{125}Sn	100	^{140}La	100	^{192}Ir	100
^{122}Sb	100	^{139}Ce	1000	^{191}Pt	1000
^{124}Sb	100	^{141}Ce	100	^{193}Pt	1000
^{125}Sb	100	^{143}Ce	100	^{198}Au	100
^{123}Te	100	^{144}Ce	10	^{199}Au	1000
^{127}Te	100	^{147}Nd	100	^{197}Hg	1000
^{129}Te	1000	^{147}Pm	1000	^{203}Hg	100
^{131}Te	100	^{147}Pm	100	^{200}Ti	1000
^{132}Te	100	^{151}Sm	1000	^{201}Ti	1000

radionuclide	Bq / Liter	radionuclide	Bq / Liter	radionuclide	Bq / Liter
^{129}I	1000	^{154}Eu	100	^{203}Pb	1000
^{131}I	10	^{155}Eu	1000	^{206}Bi	100
^{129}Cs	1000	^{153}Gd	1000	^{207}Bi	100
^{131}Cs	1000	^{160}Tb	100	^{210}Bi	100
^{132}Cs	100	^{169}Er	1000	^{210}Pb	0.1
^{134}Cs	10	^{171}Tm	1000	^{210}Po	0.1
^{135}Cs	100	^{175}Yb	1000	^{223}Ra	1
^{136}Cs	100	^{182}Ta	100	^{242}Cm	10
^{137}Cs	10	^{181}W	1000	^{243}Cm	1
^{244}Cm	1	^{234}U	10	^{248}Cm	0.1
^{245}Cm	1	^{237}Np	1	^{249}Bk	100
^{227}Th	10	^{239}Np	100	^{246}Cf	100
^{228}Th	1	^{236}Pu	1	^{248}Cf	10
^{229}Th	0.1	^{237}Pu	1000	^{249}Cf	1
^{230}Th	1	^{238}Pu	1	^{250}Cf	1
^{231}Th	1000	^{239}Pu	1	^{251}Cf	1
^{232}Th	1	^{240}Pu	1	^{252}Cf	1
^{234}Th	100	^{241}Pu	10	^{253}Cf	100
^{230}Pa	100	^{242}Pu	1	^{254}Cf	1
^{231}Pa	0.1	^{244}Pu	1	^{253}Es	10
^{233}Pa	100	^{241}Am	1	^{254}Es	10
^{230}U	1	^{242}Am	1000		
^{231}U	1000	^{243}Am	1		
^{232}U	1	^{246}Cm	1		
^{233}U	1	^{247}Cm	1		

Table (8)
Radioactive constituents of drinking water

Radioactive	Maximum level (Bq / Liter)
Gross alpha activity	0.5
Gross beta activity	1

5.8 Biological characteristics:
Bottled drinking water shall be completely free from algae, moulds, insects, their eggs, larvae, vesicles and insect parts and parasites including amoeba.

5.9 **Microbiological characteristics**:
Without prejudice to what is stated in the Gulf standard mentioned in (2.9),bottled drinking water during filling and marketing shall be free from:
5.9.1 Parasites and pathogenic microorganisms
5.9.2 Total coliforms including E:coli in any 250 ml sample examined.
5.9.3 Sulphite - reducing clostridia in any 250 ml sample examined
5.9.4 Pseudomonas aeruginosa in any 250 ml sample examined
5.9.5 Fecal streptococci in any 250 ml sample examined

6. Sampling:
Samples shall be taken according to Gulf standard in item (2.3).

7. Methods of examination and test:
All necessary tests shall be carried out on the representative sample taken according to item (6) to determine its compliance with all items of this standard
7.1 Microbiological, routine and non routine tests shall be carried out according to Gulf standards mentioned in items (2.5, 2.6).
7.2 Tests of physical properties shall be carried out according to Gulf standard mentioned in item (2.4).
7.3 Chemical test shall be carried out according to Gulf standard mentioned in item (2.10).

8. Packaging:
8.1 Without prejudice to what is stated in Gulf standard mentioned in item (2.7), bottled water shall be packed in hygienic suitable, clean and hermetically sealed containers that would prevent contamination of the water and preserve its physical and chemical properties.
8.2 Filling and sealing operations of containers shall be done in an aseptic atmosphere according to Gulf standard mentioned in item (2.2).

9. Labelling:
Without prejudice to what is mentioned in Gulf standard in item (2.1) the following information shall be declared on the label in case of bottled drinking water:
9.1 The name of the product shall be “bottled drinking water”. Any statement that would give wrong impression regarding the nature and properties of the product shall not be declared on the lable.
9.2 Water content of the different anions (chloride – sulphate – nitrate – carbonate – bicarbonate – fluoride) and cations (Calcium – magnesium – sodium – potassium _ , total hardness and total dissolved solids expressed in ppm.
9.3 PH.
9.4 The net volume in metric system, unit.
9.5 Packaged water containing added fluoride shall be labelled “Fluoridated water”.
9.6 Filling date and expiry date by day month and year in a non - codex manner.
9.7 The labelling information shall be written on the containers and shall not be written only on carton boxes or the like

10. Transportation, storage and handling:

10.1 **Transportation**:

Bottled drinking water shall be transported by any suitable means of transport that would protect it from damages and contamination under the same storage conditions.

10.2 **Storage and handling**:

10.2.1 Bottled drinking water shall be stored in room temperature away from any poisonous materials and as far as possible away from high temperature and contamination sources.

10.2.2 Bottled drinking water shall be stored in good and well ventilated stores free from distinctive odours.

10.2.3 Upon selling or marketing, bottled drinking water shall be protected from direct sunlight, high temperature, and other weather conditions