هيئة التقييس لدول مجلس التعاون لدول الخليج العربية
GCC STANDARDIZATION ORGANIZATION (GSO)

مشروع رقم :

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مياه الشرب غير المعبأة
Unbottled drinking water

إعداد
اللجنة الفنية الخليجية لقطاع المنتجات الغذائية والزراعية

هذه الوثيقة مشروع لمواصفة قياسية خليجية تم توزيعها لإبداء الرأي والملحوظات بشأنها، لذلك فإنها عرضة للتغير والتبديل، ولا يجوز الرجوع إليها كمواصفة قياسية خليجية إلا بعد اعتمادها من مجلس إدارة الهيئة.

ICS: 67.13.06

تقديم

هيئة التقييس لدول مجلس التعاون لدول الخليج العربية هيئة إقليمية تضم في عضويتها الأجهزة الوطنية للمواصفات والمقاييس في دول الخليج العربية ، ومن مهام الهيئة إعداد المواصفات القياسية الخليجية بواسطة لجان فنية متخصصة .

وقد قامت هيئة التقييس لدول مجلس التعاون لدول الخليج العربية ضمن برنامج عمل اللجنة الفنية رقم (٥) " اللجنة الفنية الخليجية لمواصفات قطاع المنتجات الغذائية والزراعية " بتحديث المواصفة القياسية الخليجية رقم ٢٠٠٩/١٤٩ " مياه الشرب غير المعبأة " وقامت المملكة العربية السعودية بإعداد مشروع هذه المواصفة .

وقد اعتمدت هذه المواصفة كلائحة فنية خليجية في اجتماع مجلس إدارة الهيئة رقم ( ) الذي عُقد بتاريخ / / هـ ، الموافق / / م .

على أن تلغي المواصفة رقم (١٤٩ /٢٠٠٩) وتحل محلها .

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. 149/2009" **Unbottled 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 .(149/2009)

Unbottled drinking water

1. Scope and field of application:

This GSO standard is concerned with Unbottled drinking water fit for human consumption

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2. Complementary references:

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

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

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

2.4 GSO 818: "Methods of test for drinking and mineral water – part 15: Non-routine microbiological tests".

2.5 GSO standards approved concerning methods of test for drinking and mineral Water – Chemical tests .

3. Definitions:

3.1 Unbottled drinking water

Water fit for human consumption which is supplied to the public through public distribution system, or the limited water supply system, or from wells, springs or any other water source from surface water sources, used for drinking and complying with all the specific properties mentioned in this standard.

3.2 Public distribution system

A system comprising more than 15 connections for supplying the public with water suitable for human consumption, and includes collection, treatment, storage and distribution of drinking water from the source to the consumer.

3.3 Limited water system

A system for supplying the public with water suitable for human consumption and comprises less than 15 connections.

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 Surface water

Collection rain water in valleys, dams, reservoirs or open tanks which is collected for drinking purposes.

3.8 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.

3.9 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 Be a source of water approved by the relevant official bodies, after work and analytical surveys to make sure it is fit for use.

4.2 treatment method whether chemical, physical or heating, singly or in combination, shall be sufficient to destroy the microbes. The treated Unbottled drinking water shall comply with biological and microbiological characteristics according to items (5.4),(5.5).

4.3 Residual free chlorine concentration in treated unbottled drinking water shall be sufficient to kill all microbes therein, provided that the residual concentration free chlorine shall be 0.5 ppm after at least 30 minutes contact time at pH < 8.0.

4.4 Concentration of chlorine shall be increased in case of epidemic or special circumstances according to instructions of the Ministries of Health or the concerned authorities.

5. Characteristics:

The following shall be met in Unbottled drinking water:

5.1 parameters related to quality:

5.1.1 Unbottled drinking water should not contain any substances which would affect its color, taste, odour or appearance. It should be free from foreign bodies such as soil, sand, hair and other substances and impurities which are visible to the naked eye.

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 (100-1000) ppm.

5.2 Chemical constituents of health significance in unbottled drinking water shall be according to Tables No. 1, 2, 3, 4 , 5

Table No.(1)
Chemical substances naturally occurring in water

Chemical substance	Guideline value		Notes
Inorganic	**µg/l**	**mg/l**	
Arsenic	10	0.01	
Barium	700	0.7	
Boron	2400	2.4	
chromium	50	0.05	Total chromium
1Fluoride	1500	1.5	
Manganese	400	0.4	Affect the appearance, taste or a dour of the water
Molybdenum	70	0.07	
Selenium	40	0.04	
Uranium	30	0.03	
Organic	**µg/l**	**mg/l**	
Microcystin-LR	1	0.001	

1- Determine the fluoride concentration in unbottled drinking water according to daily atmospheric temperature as follows:

$$\text{Fluoride concentrate} = \frac{0.34}{D}$$

Where:

$D = 0.038 + [0.0062 \text{ X } (\text{daily atmospheric temperature in } {}^{o}C \text{ X } \frac{9}{5} + 32)]$

Table No.(2)
Chemical present in water from industrial sources and human dwellings

Chemical substance	Guideline value		Notes
Inorganic substances:	**µg/l**	**mg/l**	
- Cadmium	3	0.003	
- Cyanide	70	0.07	
- Mercury	6	0.006	For inorganic mercury
Organic substances:	**µg/l**	**mg/l**	
- Benzene	10	0.01	
- Carbon tetrachloride	4	0.004	
-1,2- Dichlorobenzene	1000	1	
-1,4- Dichlorobenzene	300	0.3	
-1,2- Dichloroethane	30	0.03	
-1,2- Dichloroethene	50	0.05	
- Dichloromethane	20	0.02	

-Di(2- ethylhexyl) phthalate	8	0.008	
-1,4-Dioxane	50	0.05	
- Edetic acid (EDTA)	600	0.6	Applies to the free acid
- Ethyl benzene	300	0.3	
- Hexachlorobutadiene	0.6	0.0006	
- Nitrilotriacetic acid	200	0.2	
- Pentachlorophenol	9	0.009	
- Styrene	20	0.02	
- Tetracholoroethene	40	0.04	
-Toluene	700	0.7	
- Trichloroethane	20	0.02	
- Xylenes	500	0.5	

Table No.(3)
Chemicals present in water from agricultural activities

Chemical substance	Guideline value		Notes
Non pesticide substance:	**µg/l**	**mg/l**	
- Nitrate (asNo_3^-)	50000	50	Short-term exposure
- Nitrite (asNo_2^-)	3000	3	Short-term exposure
Pesticides used in agriculture:	**µg/l**	**mg/l**	
- Alachlor	20	0.02	
- Aldicarb	10	0.01	Applies to aldicarb sulfoxide and aldicarb sulfone
- Aldrine and dieldrin	0.03	0.00003	For combined aldrin plus dieldrin
- Atrazine and its chloro-s-triazine metabolites	100	0.1	
- Carbofuran	7	0.007	
- Chlordane	0.2	0.0002	

- Chlorotoluron	30	0.03	
-chlorpyrifos	30	0.03	
- Cyanazine	0.6	0.0006	
- 2,4 – dichlorophenoxy acetic acid	30	0.03	Applies to free acid
2,4Dichlorophenoxybutyric acid.	90	0.09	
- 1,2 - Dibromo- 3 chloropropane	1	0.001	
- 1,2 – Dibromoethane	0.4	0.0004	
- 1,2 - Dichloropropane	40	0.04	
- 1,3 – Dichloropropene	20	0.02	
- Dichloroprop	100	0.1	
- Dimethoate	6	0.006	
- Endrin	0.6	0.0006	
-Fenoprop	9	0.009	
-Hydroxyatrazine	200	0.2	Atrazine metabolite
-Isoproturon	9	0.009	
-Lindane	2	0.002	
-MCPAd	2	0.002	
-Mecoprop	10	0.01	
-Methoxychlor	20	0.02	
-Metolachlor	10	0.01	
-Molinate	6	0.006	
-Pendimethalin	20	0.02	
-Simazine	2	0.002	
-2,4,5-Te	9	0.009	
-Terbuthylazine	7	0.007	
-Trifluralin	20	0.02	

Table No.(4)
Chemicals used in water treatment or materials in contact with water

Chemical substance	Guideline value		Notes
Disinfectants:	**µg/l**	**mg/l**	
Chlorine	50000	5	For effective disinfection, there should be a residual concentration of free chlorine of ≥ 0.5 mg/l after at least 30 min contact time at pH< 8.0. A chlorine residual should be maintained throughout the distribution system. At the point of delivery, the minimum residual concentration of free chlorine should be 0.2 mg/l.
Monochloramine	3000	3	
dichloroisocyanurate Sodium	50000	50	As sodium dichloroisocyanurate
	40000	40	As cyanuric acid
Disinfection by products:	**µg/l**	**mg/l**	
- Bromate	10	0.01	
- Bromodichloroethane	60	0.06	
- Bromoform	100	0.1	
- Chlorate	700	0.7	
- Chlorite	700	0.7	
- Chloroform	300	0.3	
- Cyanogen chloride	70	0.07	
- Di bromoacetonitrile	70	0.07	
- Di bromochloromethan	100	0.1	
- Di chloroacetate	50	0.05	Applies to free acid
- Di chloroacetonitrile	20	0.02	
- Monochloroacetate	20	0.02	
-N-Nitrosodimethylamine	0.1	0.0001	
- Tricholoroacetate	200	0.2	
-2,4,6- Tricholorophenol	200	0.2	
- Trihalomethanes			The sum of the ratio of the concentration of each to its respective guideline value should not exceed 1

Contaminants from treatment chemicals:	µg/l	mg/l	
- Acrylamide	0.5	0.0005	
- Epichlorohydrin	0.4	0.0004	
Contaminants from pipes and fittings:	**µg/l**	**mg/l**	
- Antimony	20	0.02	Atrazine metabolite
- Benzo (a) pyrene	0.7	0.0007	
- Copper	2000	2	Staining of laundry and sanitary Ware may occur below guideline valu.
- Lead	10	0.01	
- Nickel	70	0.07	
- Vinylchloride	03	0.0003	

Table No.(5)
pesticide residues for public health purposes

Chemical substance	Guideline value		
Pesticides used for public health purposes:	**µg/l**	**mg/l**	**Notes**
DDT and metabolites	1	0.001	

5.3 RADIOLOGICAL ASPECTS

5.3.1 Must not exceed the concentration of radioactivity of any of the isotopes (natural or industrial) alone in drinking water, the values in Table (7).

Table No (7)
Radionuclide

[4] Guidance level (Bq/l)	Dose coefficient (Sv/Bq)	[1]Radionuclide	Category
			[2]Naturally occurring radioactive isotope that starts the uranium decay seriesc
3	4500	Uranium-238	
2.8	4900	Uranium-234	
0.7	21000	Thorium-230	
0.5	28000	Radium-226	
0.2	69000	Lead-210	
0.1	120000	Polonium-210	
			[2]Naturally occurring radioactive isotope that starts the thorium decay series

0.6	23000	Thorium-232	
0.2	69000	Radium-228	
1.9	7200	Thorium-228	
			[3]Artificial radionuclides
7.2	1900	Caesium-134	
10.5	1300	Caesium-137	
4.9	2800	Strontium-90	
6.2	2200	Iodine-131	
			Another radionuclide
7610	0.002	Tritium	
236	0.058	Carbon-14	
0.5	25000	Plutonium-239	
0.7	20000	Americium-241	
22	0.620	potassium-40	

1 These isotopes of interest in drinking water.

2 Chains of radioactive isotopes is the most natural presence in groundwater, especially isotopes of radium .

3 Nuclear fission products resulting from human activities (leakage of nuclear power stations or nuclear explosions).

4 This maximum, which applies if found alone or should be the total value of any radioactive isotope divided by the maximum (in the last column of the table above) does not exceed one, as shown in the equation below :

$$\sum \frac{Ci}{GLi} \leq 1$$

where:
Ci = the measured activity concentration of radionuclide *i*, and
GLi = the guidance level (see Tables 5) of radionuclide *i* that, at an intake of 2 litres/day1 for 1 year, will result in an effective dose of 0.1 mSv/year.

If the total radiation dose ≤ 0.1 mSv per year Vtkon drinking water unfit for consumption, and if the total radiation dose <0.1 mSv per year to consider the matter and take corrective action to reduce the dose .

Chemical toxicity of uranium 15 times more radioactive toxicity, so the element of dissolved uranium should not exceed 30 parts per billion or micrograms per liter of drinking water .

5.3.2 Must not exceed the radioactivity concentration of radon at 150 Bq / l in drinking water.

5.4 Biological characteristics

Unbottled drinking water shall be completely free from algae, moulds, parasites and insects, their eggs, larvae, vesicles protozoa (including amoeba) and insect parts.

5.5 Microbiological characteristics

5.5.1 Unbottled drinking water shall be completely free from pathogenic and faecal microbes and viruses which may be hazardous to public health.

5.5.2 Treated water entering the distribution system:
It shall be free from total coliform bacteria and E. Coli or thermotolerant coliform bacteria in any 100 ml examined sample.

5.5.3 Treated water in the distribution system:

5.5.3.1 It shall be free from E. Coli or thermotolerant coliform bacteria in any 100 ml examined sample.

5.5.3.2 It shall be free from total coliform bacteria in any 100 ml of examined sample, in 95% of the samples examined throughout the year, in the case of large supplies when sufficient samples are examined.

6. Sampling:

Samples shall be taken according to GSO standard in item (2.1).

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 GSO mentioned in items (2.3, 2.4).

7.2 Tests of physical properties shall be carried out according to GSO in item (2.2).

7.3 Chemical test shall be carried out according to GSO mentioned in item (2.5).

References

Guiding for drinking water quality
fourth Ed. Vol. 1
Recommendations
World Health Organization 2011