



OS 8/2012

مياه الشرب غير المعبأة  
Un Bottled Drinking Water

المديرية العامة للمواصفات والمقاييس  
وزارة التجارة والصناعة

ICS: 13.060.20

مياه الشرب غير المعبأة  
Un Bottled Drinking Water

تاريخ الاعتماد : 16 شوال 1433هـ، الموافق 3 / 9 / 2012  
صفة الإصدار : مواصفة قياسية عمانية ملزمة

## FOREWORD

- The Directorate General for Specifications and Measurements (DGSM) is the National Standards body in Oman. The Royal Decree No. 39/1976 established it, and one of its duties and functions, which were defined by the Royal Decree No. 1 /1978, is the preparation of Omani Standards.
- (DGSM) has updated the Omani standard No. 8/2006 for Unbottled Drinking Water, and issues this standard based on the International Guidelines for Drinking – Water Quality vol.1.Recommendations – World Health Organization 2011. This Standard shall cancel and replace the Omani Standard No. 8/2006 “Un- Bottled Drinking Water”.

The technical amendments:

1. **Boron concentration:** The Public Authority for electricity and water suggested the concentration of Boron to be 2.4 mg/liter. Ministry of Health agreed upon this suggestion according to the International Guidelines for Drinking – Water Quality vol.1.Recommendations – World Health Organization 2011.
2. **Method of test for Coliform bacteria:** To decrease the time of the test from 72 hours to 24 hours according to the International Guidelines for Drinking – Water Quality vol.1.Recommendations – World Health Organization 2011.
3. **Fluoride concentration and pH:** Fluoride concentration to be (0.6-0.8 for desalinated water) and the pH to be (6.5-8 for natural water, 6.5-8.5 for desalinated water).

## UN BOTTLED DRINKING WATER

### 1- SCOPE

This Omani standard is concerned with un bottled drinking water obtained from different sources.

### 2- DEFINITIONS

#### 2.1 Drinking water

Water fit for human consumption obtained from any source which is supplied to the consumer through the public distribution system, or the limited water supply system and complying with all the specific properties mentioned in this standard.

#### 2.2 Treated drinking water

Water exposed to one or all of the following processes: decantation, filtration, disinfection, and amendment of ratio for dissolved solids (desalination) to be fit for human consumption.

#### 2.3 Public water distribution system

A system for supplying the consumer with water fit for human consumption, and includes collection, treatment, storage, and distribution of drinking water from the source to the consumer. No untreated water may be pumped into the distributions system.

#### 2.4 Limited water system

A system for supplying the consumer with water fit for human consumption and comprises less than 15 connections. No untreated water may be pumped into the distribution system.

#### 2.5 Well

A vertical hole cut into the ground to access underground water.

#### 2.6 Spring

A place where a natural outflow of water to the surface of the ground takes place.

#### 2.7 Surface water

Rains water collected in valleys or behind dams or in tanks and used for drinking.

**3- CHARACTERISTICS\*****3.1 Characteristics aesthetic quality**

- 3.1.1 The Drinking water shall not contain any substances that affect its colour odour or taste. It shall be completely free from foreign substances or impurities which can be seen with the naked eye whether such earth, sand, hair or other impurities.
- 3.1.2 The substances and characteristics aesthetic quality shall be according to Table No. 1.
- 3.1.3 Chemical constituents of health significance shall be according to tables Nos. 2, 3, 4.
- 3.1.4 Total residual chlorine.**
- 3.1.4.1 Total residual chlorine concentration in drinking water shall be sufficient to kill all microbes therein, provided that the chlorine concentration shall range between 0.2mg/L and 0.5mg/L.
- 3.1.4.2 Concentration of chlorine shall be increased in case of epidemics up to not exceed 5.0mg/L.
- 3.1.5 When water is treated with ozone, ultraviolet rays or any other means, this treatment shall be sufficient to kill all microbes and treated water shall conform with the microbiological characteristics of treated water mentioned in item 3.3.

**3.2 Biological characteristics**

Drinking water shall be completely free from algae, moulds, parasites, insects, and their eggs, larvae, vesicles, parts and free from protozoa.

**3.3 Microbiological characteristics**

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

**3.3.2 Treated water entering the distribution system:**

It shall be free from coli-form bacteria and E.coli bacteria in any 100ml examined sample.

**3.3.3 Treated water in the distribution system:**

- 3.3.3.1 It shall be free from E.coli bacteria in any 100ml examined sample.
- 3.3.3.2 It shall be free from coli-form in any 100ml of examined sample, in 95% of the samples examined throughout the year, in the case of large supplies when sufficient samples are examined.

**3.3.4 Untreated underground water**

- 3.3.4.1 It shall be free from E.coli bacteria in any 100ml examined sample.
- 3.3.4.2 Conliform shall be not exceed 10 colonies/ 100ml of examined sample provided that it does not occur repeatedly.

- 3.3.5 Water distributed by tanker vehicles (unpiped water supplies).
- 3.3.5.1 It shall be free from E.coli bacteria in any 100ml examined sample.
- 3.3.5.2 Coliform shall not exceed 3 colonies / 100ml of examined sample but not in two consecutive.
- 3.3.6 If it is necessary, to supplement the microbiological analysis for water used in Food Factories, the samples shall be also examined for the following:
- Detection of salmonella
  - Detection of staphylococci
  - Detection of bacteriophages
  - Detection of enteroviruses
  - Detection of vibrocholera

### 3.4 Radioactive Characteristics

If the total radioactivity of the sample is exceeded 10Bq/liter, it could be carried out examination for specific each radionuclide and it's activity according to table 4.

---

#### \*Mandatory item

#### 4- SAMPLING:

Sampling shall be carried out according to Omani Standard No. 189 "Methods of test for drinking water – Part 1: Sampling".

#### 5- METHODS OF TEST

Drinking water shall be tested according to the following Omani Standards:

- **O.S. 17** Methods of test for drinking and mineral water – part 6: Determination of nitrate, fluoride, and borate.
- **O.S. 18** Drinking water – Determination of Copper and iron contents.
- **O.S. 19** Methods of test for drinking and mineral water – Part 5: Determination of total hardness calcium and magnesium.
- **O.S. 20** Drinking water – Determination of manganese and Zinc contents.
- **O.S. 21** Drinking water – Determination of chloride and sulphate contents.
- **O.S. 22** Drinking water – Determination of phenolic compounds (as phenol) content.
- **O.S. 190** Methods of test for drinking and mineral water part 2: Determination of physical properties.

- **O.S. 199** Methods of test for drinking and mineral water – Part3: Determination of total dissolved solids, pH value, and residual chlorine.
- **O.S. 200** Methods of test for drinking and mineral water – Part 4: Methods for the determination of cadmium, lead, arsenic, selenium, and cyanide.
- **O.S. 250** Methods of test for drinking and mineral water – part 7: Determination of mercury, chromium, silver, and barium.
- **O.S. 357** Methods of test for drinking and mineral water – Part 10: Determination of mineral oils.
- **O.S. 453** Methods of test for drinking and mineral water – Part 13: Determination of radioactive and concentration of some radio element.
- **O.S. 478** Methods of test for drinking and mineral water: Routine microbiological tests.
- **O.S. 479** Methods of test for drinking and mineral water – Part 14: Determination of some of pollution indicating materials.
- **O.S. 691** Methods of test for drinking and mineral water – Part 15: None routine microbiological test.

Table (1)

Substances or characteristics	Quality level	Maximum level	Unit
a) Organoleptic parameter			
Colour	Non	<15	Truecolourunit
Turbidity	1	<5	Nephelometric turbidity unit
Taste & odour	Not offensive ac	Acceptable	
Temperature	Not offensive ac	Acceptable	
b) Inorganic constituents			
Ammonia*	-	1.5	
Chloride	≤ 250	600	
Sodium	≤ 200	400	
Sulphate	≤ 250	400	mg/L
Total hardness	≤ 200	500	mg/L
Total dissolved solids	120-600	1000	mg/L
Nitrate (as No3)		50	
Nitrate (as No2)		3 Short-term exposure	
		0.2 long-term exposure	
Hydrogen sulphide	≤ 0.05	0.1	mg/L
<b>pH</b>	<u>6.5-8 for natural water</u> <u>6.5 – 8.5 for desalinated water</u>	9	
<b>Flouride</b>	<u>Quality Level 0.6 – 0.8 as for desalinated water</u>	Maximum level is mentioned in Table (2)	<u>mg/L</u>
Magnesium		30 if sulphites ≥ 250	mg/l
		150 if sulphites < 250	mg/L

\* if present

All disination water used in dink, it shall be according to quality level

-maximum level = the level is used in case of no alternative source

**Table No. (2)**  
The maximum level for health – related  
inorganic constituents

Constituent	Maximum limit (mg/litre)
Aluminum	0.1 For large water treatment facilities 0.2 For small water treatment facilities*
Antimony	0.02
Arsenic	0.01
Barium	0.7
Boron	0.5 for natural water 2.4 desalinated water
Brom (as bromate)	0.01
Cadmium	0.003
Chromium	0.05
Copper	2
Cyanide	0.07
Fluoride	1.5
Iron	1
Lead	0.01
Manganese	0.4
Mercury	0.001
Molybdenum	0.07
Nickel	0.02
Selenium	0.01
Zinc	3

\*Fewer than 10000 people

**Table No. (3)**  
Maximum limits  
for chemicals that are of health significance

Chemical	Maximum limit (mg/litre)
Acrylamide	0.0005
Alcholor	0.02
Aldicarb	0.01
Aldrin and dieldrin	0.00003
Atrazine	0.002
Benzene	0.01
Benzo[a]pyrene	0.0007
Bromodichloromet hane	0.06
Bromoform	0.1
Carbofuran	0.007
Carbon tetrachloride	0.004
Chloral hydrate (trichloroacetaldehyde)	0.01
Chlorate	0.7
Chlordane	0.0002
Chlorine	5 For effective disinfection, there should be a residual concentration of free chlorine of $\geq 0.5$ mg/litre after at least 30 min. contact time at pH<8.0
Chlorite	0.7
Chloroform	0.2
Chlorotoluron	0.03
Chlorpyrifos	0.03

<b>Cyanazine</b>	<b>0.0006</b>
<b>Cyanogen chloride</b>	<b>0.07</b> <b>For cyanide as total cyanogenic compounds</b>
<b>2.4-D</b> <b>(2.4-dichlorophenoxyacetic acid)</b>	<b>0.03</b>

**Table No. (3)**  
**Maximum limits**

for chemicals that are of health significance in drinking-water

Chemical	Maximum limit (mg/litre)
2,4-DB	0.9
DDT and metabolites	0.001
Di (2-ethylhexyl) phthalate	0.008
Dibromoacetonitrile	0.07
Dibromochloromethane	0.1
1,2-Dibromo-3-chloropropane	0.001
1,2-Dibromoethane	0.0004
Dichloroacetate	0.05
Dichloroacetonitrile	0.02
Dichlorobenzene, 1,2-	1
Dichlorobenzene, 1,4-	0.3
Dichlorobenzene, 1,2-	0.03
Dichlorobenzene, 1,1-	0.03
Dichlorobenzene, 1,2-	0.05
Dichloromethane	0.02
1,2-Dichloropropane (1,2-DCP)	0.04
1,3-Dichloropropene	0.02
Dichloroprop	0.1
Dimethoate	0.006
Edetic acid (EDTA)	0.6 Applies to the free acid
Endrin	0.0006
Epichlorohydrin	0.0004
Ethylbenzene	0.3
Fenoprop	0.009
Formaldehyde	0.9
Hexachlorobutadiene	0.0006
Isoproturon	0.009
Lindane	0.002
MCPA	0.002
Mecoprop	0.01
Methoxychlor	0.02

**Table No. (3)**  
**Maximum limits**

for chemicals that are of health significance in drinking-water

Chemical	Maximum limit (mg/litre)
Metolachlor	0.01
Microcystin-LR	0.001
Molinate	0.006
Monochloramine	3
Monocloroacetate	0.02
Nitritotricetic acid (NTA)	0.2
Pendimethalin	0.02
Pentachlorophenol	0.009
Pyriproxyfen	0.3
Simazine	0.002
Styrene	0.02
2,4,5-T	0.009
Terbutylazine	0.007
Tetrachloroethene	0.04
Toluene	0.7
Trichloroacetate	0.2
Trichloroethene	0.07
Trichlorophenol, 2,4,6-	0.2
Triluralin	0.02
Trihalomethanes	The sum of the ratio of the concentration of each to its respective guideline value should not exceed 1
Uranium	0.015
Vinyl chloride	0.0003
Xylenes	0.5

**Table No. (4)**  
**Levels of radionuclides in drinking water**

<b>Radionuclides</b>	<b>Guidance Level (Bq/liter)</b>	<b>Radionuclides</b>	<b>Guidance Level (Bq/liter)</b>	<b>Radionuclides</b>	<b>Guidance Level (Bq/liter)</b>
3H	10 000	93Mo	100	140La	100
7Be	10 000	99Mo	100	139Ce	1000
14C	100	96Tc	100	141Ce	100
22Na	100	97Tc	1000	143Ce	100
32P	100	97mTc	100	144Ce	10
33P	1 000	99Tc	100	143Pr	100
35S	100	97Ru	1000	147Nd	100
36Cl	100	103Ru	100	147Pm	1000
45Ca	100	106Ru	10	149Pm	100
47Ca	100	105Rh	1000	151Sm	1000
46Sc	100	103Pd	1000	153Sm	100
47Sc	100	105Ag	100	152Eu	100
48Sc	100	110mAg	100	154Eu	100
48V	100	111Ag	100	155Eu	1000
51Cr	10 000	109Cd	100	153Gd	1000
52Mn	100	115Cd	100	160Tb	100
53Mn	10 000	115mCd	100	169Er	1000
54Mn	100	111In	1000	171Tm	1000
55Fe	1000	114mIn	100	175Yb	1000
59Fe	100	113Sn	100	182Ta	100
56Co	100	125Sn	100	181W	1000
57Co	1 000	122Sb	100	185W	1000
58Co	100	124Sb	100	186Re	100
60Co	100	125Sb	100	185Os	100
<b>Radionuclides</b>	<b>Guidance Level (Bq/liter)</b>	<b>Radionuclides</b>	<b>Guidance Level (Bq/liter)</b>	<b>Radionuclides</b>	<b>Guidance Level (Bq/liter)</b>

59Ni	1 000	123mTe	100	191Os	100
63Ni	1 000	127Te	1000	193Os	100
65Zn	100	127mTe	100	190Ir	100
71Ge	10 000	129Te	1000	192Ir	100
73As	1000	129mTe	100	191Pt	1000
74As	100	131Te	1000	193mPt	1000
76As	100	131mTe	100	198Au	100
77As	1 000	132Te	100	199Au	1000
75Se	100	125I	10	197Hg	1000
82Br	100	126I	10	203Hg	100
82Rb	100	129I	<u>1</u>	200TI	1000
85Sr	100	131I	10	201TI	1000
89Sr	100	129Cs	1000	202TI	1000
90Sr	10	131Cs	1000	204TI	100
90Y	100	132Cs	100	203Pb	1000
91Y	100	134Cs	10	206Bi	100
93Zr	100	135Cs	100	207Bi	100
95Zr	100	136Cs	100	210Bib	100
93mNb	1000	137Cs	10	210Pbb	0.1
94Nb	100	131Ba	1000	210Pob	0.1
95Nb	100	140Ba	100	223Rab	1
224Rab	1	235Ub	1	242Cn	10
<b>Radionuclides</b>	<b>Guidance Level (Bq/liter)</b>	<b>Radionuclides</b>	<b>Guidance Level (Bq/liter)</b>	<b>Radionuclides</b>	<b>Guidance Level (Bq/liter)</b>
225Ra	1	236Ub	1	243Cm	1

226Rab	1	237U	100	244Cm	1
228Rab	0.1	126Ub,c	10	245Cm	1
227Thb	10	237Np	1	246Cm	1
228Thb	1	239Np	100	247Cm	1
229Thb	0.1	236Pu	1	248Cm	0.1
230Thb	1	237Pu	1000	249Bk	100
231Thb	1 000	238Pu	1	246Cf	100
232Thb	1	239Pu	1	248Cf	10
234Thb	100	240Pu	1	249Cf	1
230Pa	100	241Pu	10	250Cf	1
231Pab	0.1	242Pu	1	251Cf	1
233Pa	100	244Pu	1	252Cf	1
230U	1	241Am	1	253Cf	100
231U	1000	242Am	1000	254Cf	1
232U	1	242mAm	1	253Es	10
233U	1	243Am	1	254Es	10
<u>234Ub</u>	<u>1</u>			254mEs	100