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OF THE PEOPLE'S REPUBLIC OF CHINA

GB 5749-2006

Supersedes GB 5749-1985

Standards for Drinking Water Quality

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Standardization Administration of China

Foreword

All the technical contents of this national standard are compulsive.

This national standard will replace GB 5749-1985 Standards for Drinking Water Quality from the implementation date of this standard.

There have been some significant changes in this national standard over its previous edition in the following technical aspects:

-----The water-quality index increase to 106 items from 35 items of GB 5749-1985, up 71 items. 8 of the previous items have been revised as follows:

a) Microorganism index increases to 6 items from 2 initially, newly covering escherichia coli, heat-resisting coliform group, giardia and cryptosporidium; total coliform group is revised;

b) The drinking water disinfectant increases to 4 items from 1 item initially, newly covering monochloro amine, ozone and chlorine dioxide;

c) Inorganic compound of toxicological index increases to 21 items from 10 items initially, newly covering bromate, chlorite, chlorate, stibium, barium, beryllium, borium, molybdenum, nickel, thallium, cyanogen chloride; and arsenium, cadmium, lead and nitrate are revised;

The organic compound of toxicological index increases to 53 items from 5 items initially, newly covering formaldehyde, trihalomethane, dichloromethane, 1,2-dichloroethane, 1,1,1-trichloroethane, bromoform, chlorodibromomethane, monobromo-dichloro-methane, epoxy chloropropane, vinyl chloride, 1,1- dichloroethylene, vinylene chloride, trichloroethylene, tetrachloroethylene, hexachlorobutadiene, dichloroacetic acid, trichloroacetic acid, trichloroacetaldehyde, benzene, toluene, xylene, ethylbenzene, styrene, 2,4,6- trichlorophenol, chlorobenzene, 1,2- dichlorobenzene, 1,4- dichlorobenzene, trichlorobenzene, dinbutyl phthalate (2-ethylhexyl) ester, acrylamide, microcystin-LR, bentazone, chlorothalonil, deltamethrin, dimethoate, 2,4-dichlorophenoxyacetic acid, heptachlor, hexachlorobenzene, lindane, malathion, parathion, methyl parathion, pentachlorophenol, atrazine, furadan, chlorpyrifos, equigard and glyphosate; carbon tetrachloride is revised;

d) Sensitive character and general chemical index increases to 20 items from 15 items initially, newly covering oxygen consumption, ammonia nitrogen, sulfide, sodium and aluminium;

turbidness is revised;

e) About radioactive index, total alpha radioactivity is revised.

-----Two parts, selection of water source and sanitary protection of water source, have been deleted.

-----Simplify the provisions of water quality detection of water supply department and part of the contents is included into Health Specifications for Central Drinking Water Supply Institutions.

-----Add Annex A.

-----Add references.

This Annex A of this national standard is for reference only.

The implementation items and dates specified in Table 3: Water Quality Unconventional Indexes and Their Limitation shall be determined by the province-level governments according to the local practical situations and shall be filed in the Standardization Administration of China, the Ministry of Construction and the Ministry of Health. From 2008, these three authorities will announce implementation conditions of the unconventional indexes; and all the indexes shall be implemented by July 1, 2012 at latest.

This national standard was proposed by the Ministry of Health, the Ministry of Construction, the Ministry of Water Resources, the Ministry of Land Resources and the State Environmental Protection Administration, etc.

This national standard is under the jurisdiction of Ministry of Health of the People's Republic of China.

This national standard was drafted by Environment and Health-related Product Safety Institute, Chinese Center for Disease Control and Prevention.

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This national standard was firstly issued in August, 1985 and this version is the first revision.

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Standards for Drinking Water Quality

1. Scope

This national standard specifies the sanitary requirements for drinking water quality, drinking water source quality, central water supply organization, secondary water supply and health- and safety-related products, together with the water quality monitoring methods and water examination methods.

This national standard is applicable to all kinds of central drinking water supply and non-central drinking water supply in both urban and rural regions.

2. Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. For dated label, subsequent amendments (excluding amending error in the text) to, or revisions of, any of these publications do not apply. However, the parties whose enter into agreement according to these specifications are encouraged to research whether the latest editions of these labels are applied or not. For undated references, the latest edition of the normative document is applicable to these specifications.

GB 3838 Environmental Quality Standards for Surface Water

GB/T 5750 (whole) Standard Inspection Methods for Drinking Waters

GB/T 14848 Standards for Groundwater Quality

GB 17051 Health Specifications for Secondary Water Supply Facilities

GB/T 17218 Assessment of Health Safety for Treatment Chemicals of Drinking Water

GB/T 17219 Safety Evaluation Criteria for Drinking Water Distribution Equipment and Protective Material

CJ/T 206 Standards for Water Quality of Municipal Water Supply

SL 308 Standards for Aptitude of Rural Water Supply Organizations

Health Specifications for Central Drinking Water Supply Organizations (Ministry of Health)

3. Terms and Definitions

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

3.1 Drinking water

Used as drinking water and domestic water in daily life.

3.2 Type of water supply

3.2.1 Central water supply

Water catchment is concentrated in the water source and the water is delivered to the users or the public watering points through water distribution network, including self-built water supply facilities. Water distributing station supplying drinking water for users daily and the dual water supply served for public area and residential areas are also included in central water supply.

3.2.2 Secondary water supply

Before entering into the families, the central water supply passes through re-storage, pressurization and sterilization or advanced treatment, and then deliver to the users through pipeline or vessels.

3.2.3 Small central water supply

In the rural areas, the daily water supply is less than 1,000m³ (or the water-covered population is less than 10,000).

3.2.4 Non-central water supply

Decentralized users directly fetch water from the water source, without any facilities or just with simple facilities.

3.3 Regular indices

The water-quality indices that can reflect the basic water quality of drinking water

3.4 Non-regular indices

The water-quality indices of drinking water in special regions, times and cases

4. Sanitary requirements of the drinking water quality

4.1 The drinking water quality shall satisfy the following basic requirements so as to ensure the drinking safety for users.

- 4.1.1** The drinking water shall be free of pathogenic microorganism.
- 4.1.2** Drinking water shall contain no human health-endangered chemicals.
- 4.1.3** Drinking water shall contain no human health-endangered radioactive substances.
- 4.1.4** The sensitive property of drinking water shall be acceptable.
- 4.1.5** The drinking water shall be sterilized.
- 4.1.6** The drinking water quality shall conform to the sanitary requirements stated in Table 1 and Table 3. The ex-works in-water disinfectant limitation of central water supply and the in-water disinfectant surplus of the pipeline terminal shall conform to the requirements of Table 2.
- 4.1.7** Due to the limitation of conditions, the water quality of small central water supply and non-central water supply can be executed according to the requirements of Table 4 and the rest indices can be executed according to the provisions of Table 1, 2 and 3.
- 4.1.8** When any public accident event affects the water quality, the sensitive property and general chemical index can be loosened upon the approval from the city-above government.
- 4.1.9** When the drinking water contains the indices listed in Table A1, the assessment can make reference from the limitation of this table.

Table 1: Regular indices of water quality and their limitations

Index	Limitation
1. Microorganism indices ^a	
Total coliform group/ (MPN/100mL or CFU/100mL)	Not detected
Heat resisting coliform group/ (MPN/100mL or CFU/100mL)	Not detected
Escherichia coli/ (MPN/100mL or CFU/100mL)	Not detected
Aerobic bacteria count/ (CFU/mL)	100
2. Toxicological indices	
As/ (mg/L)	0.01
Cd/ (mg/L)	0.005
Cr (sexavalence)/ (mg/L)	0.05
Pb/ (mg/L)	0.01
Hg/ (mg/L)	0.001
Se/ (mg/L)	0.01
Cyanidum/ (mg/L)	0.05
Fluoride/ (mg/L)	1.0
Nitrate (counted "N")/ (mg/L)	10 If the groundwater source is confined, then 20
Chloroform/ (mg/L)	0.06
Carbon tetrachloride/ (mg/L)	0.002
Bromate (when using ozone)/ (mg/L)	0.01
Formaldehyde (when using ozone)/ (mg/L)	0.9
Chlorite (when using chlorine dioxide for sterilization)/ (mg/L)	0.7
Chlorate (when using composite chlorine dioxide for sterilization)/ (mg/L)	0.7
3. Sensitive property and general chemical index	
Chroma (platinum/cobalt chroma unit)	15

Index	Limitation
Turbidness (scattered turbidness unit)/NTU	1 If confined by water source and water purification conditions, then 3
Odor and sapor	Free from any odor and sapor
Visible matters (unaided eye)	No
pH	Not less than 6.5 and not larger than 8.5
Al/ (mg/L)	0.2
Fe/ (mg/L)	0.3
Mn/ (mg/L)	0.1
Cu/ (mg/L)	1.0
Zn/ (mg/L)	1.0
Chloride/ (mg/L)	250
Sulfate/ (mg/L)	250
Total soluble solid/ (mg/L)	1000
Total hardness (CaCO ₃)/ (mg/L)	450
Oxygen consumption (COD _{Mn} method, counted as O ₂)/ (mg/L)	3 Restrict in the water source, if untreated water oxygen consumption > 6mg/L, then 5
Volatile phenol/ (mg/L)	0.002
Anion synthetic detergent/ (mg/L)	0.3
4、Radioactive indices ^b	Guidance value
Total α radioactivity/ (Bq/L)	0.5
Total β radioactivity/ (Bq/L)	1
<p>a. MPN means most probable number; CFU means colony forming unit. If total coliform group is detected in the water sample, escherichia coli or heat resisting coliform group shall be examined further; if total coliform group is not detected, then it's not necessary to examine escherichia coli or heat resisting coliform group.</p> <p>b. If the radioactive index exceed the guidance value, then it's necessary to analyze and evaluate the nuclide and to judge whether it's drinkable or not.</p>	

Table 2: Regular indices and requirements on disinfectant of drinking water

Disinfectant	Time exposed to water	Ex-works in-water limitation/ (mg/L)	Ex-works in-water surplus/ (mg/L)	Pipeline terminal in-water surplus/ (mg/L)
Chlorine gas and free chlorine preparation (free chlorine)	≥30min	4	≥0.3	≥0.05
Monochloro amine (total chlorine)	≥120min	3	≥0.5	≥0.05
Ozone (O ₃)	≥12min	0.3	-----	≥0.02 If add chlorine, then the total chlorine ≥0.05
Chlorine dioxide (ClO ₂)	≥30min	0.8	≥0.1	≥0.02

Table 3: Non-regular indices and limitations of water quality

Index	Limitation
1. Microorganism indices	
Giardia/ (pcs/10L)	<1
Cryptosporidium/ (pcs/10L)	<1
2. Toxicological indices	
Sb/ (mg/L)	0.005
Ba/ (mg/L)	0.7
Be/ (mg/L)	0.002
B/ (mg/L)	0.5
Mo/ (mg/L)	0.07
Ni/ (mg/L)	0.02
Ag/ (mg/L)	0.05
Tl/ (mg/L)	0.0001
Cyanogen chloride (counted as CN-)/ (mg/L)	0.07
Chlorodibromomethane/ (mg/L)	0.1
monobromo-dichloro-methane/ (mg/L)	0.06
Dichloroacetic acid/ (mg/L)	0.05
1,2-dichloroethane/ (mg/L)	0.03
Dichloromethane/ (mg/L)	0.02
Trihalomethane(summation of chloroform, chlorodibromomethane, monobromo-dichloro-methane and bromoform)	The ratio of the measured concentration of all kinds of compounds to their limitations shall not exceed 1
1,1,1-Trichloroethane/ (mg/L)	2
Trichloroacetic acid/ (mg/L)	0.1
Trichloroacetaldehyde/ (mg/L)	0.01
2,4,6-Trichlorophenol/ (mg/L)	0.2
Bromoform/ (mg/L)	0.1
Heptachlor/ (mg/L)	0.0004
Malathion/ (mg/L)	0.25
Pentachlorophenol/ (mg/L)	0.009
Benzene hexachloride (total)/ (mg/L)	0.005
Hexachlorobenzene/ (mg/L)	0.001
Dimethoate/ (mg/L)	0.08
Parathion/ (mg/L)	0.003
Bentazone/ (mg/L)	0.3
Methyl parathion/ (mg/L)	0.02
Chlorothalonil/ (mg/L)	0.01
Furadan/ (mg/L)	0.007
Lindane/ (mg/L)	0.002
Chlorpyrifos/ (mg/L)	0.03
Glyphosate/ (mg/L)	0.7

Index	Limitation
Equigard/ (mg/L)	0.001
Atrazine/ (mg/L)	0.002
Deltamethrin/ (mg/L)	0.02
2,4-Dichlorophenoxyacetic acid/ (mg/L)	0.03
Dicophane (DDT)/ (mg/L)	0.001
Ethylbenzene (mg/L)	0.3
Xylene (total)/ (mg/L)	0.5
1,1-Dichloroethylene/ (mg/L)	0.03
1,2-Dichloroethylene (mg/L)	0.05
1,2-Dichlorobenzene/ (mg/L)	1
1,4-Dichlorobenzene/ (mg/L)	0.3
Trichloroethylene/ (mg/L)	0.07
Trichlorobenzene (total)/ (mg/L)	0.02
Hexachlorobutadiene/ (mg/L)	0.0006
Acrylamide/ (mg/L)	0.0005
Tetrachloroethylene/ (mg/L)	0.04
Toluene/ (mg/L)	0.7
Dinbutyl phthalate(2-ethylhexyl) ester/ (mg/L)	0.008
Epoxy chloropropane/ (mg/L)	0.0004
Benzene/ (mg/L)	0.01
Styrene/ (mg/L)	0.02
Benzo(a)-pyrene/ (mg/L)	0.00001
Vinyl chloride/ (mg/L)	0.005
Chlorobenzene/ (mg/L)	0.3
Microcystin-LR/ (mg/L)	0.001
3.Sensitive property and general chemical index	
Ammonia nitrogen (counted as N)/ (mg/L)	0.5
Sulfide/ (mg/L)	0.02
Na/ (mg/L)	200

Table 4: Partial water-quality indices and limitations of small central water supply and non-central water supply

Index	Limitation
1. Microorganism indices	
Aerobic bacteria count/ (CFU/mL)	500
2. Toxicological indices	
As/ (mg/L)	0.05
Fluoride/ (mg/L)	1.2
Nitrate (counted as N)/ (mg/L)	20
3. Sensitive property and general chemical index	
Chroma (platinum/cobalt chroma unit)	20
Turbidness (scattered turbidness unit)/ (NTU)	3 If confined by the technical conditions of water source and pure water, then 5
pH	Not less than 6.5, and not larger than 9.5
Total soluble solid/ (mg/L)	1500
Total hardness (counted as CaCO ₃)/ (mg/L)	550
Oxygen consumption (COD _{Mn} method. counted as O ₂)/ (mg/L)	5
Fe/ (mg/L)	0.5
Mn/ (mg/L)	0.3
Chloride/ (mg/L)	300
Sulfate/ (mg/L)	300

5. Sanitary requirements of the drinking water source quality

5.1 The surface water adopted as drinking water source shall conform to the requirements of GB 3838.

5.2 The groundwater adopted as drinking water source shall conform to the requirements of GB/T 14848.

6. Sanitary requirements on central water supply organizations

The sanitary requirements on central water supply organizations shall conform to the Health Specifications for Central Drinking Water Supply Organizations issued by the Ministry of Health.

7. Sanitary requirements on secondary water supply

The facilities and treatment of secondary water supply shall conform to the requirements of GB 17051.

8. Sanitary requirements on health- and safety-related products of drinking water

8.1 Treatment chemicals for flocculation, flocculation acceleration, sterilization, oxygenation, absorption, pH adjustment, antirust and antiprecipitation of drinking water shall not pollute the drinking water and shall conform to the requirements of GB/T 17218.

8.2 The distribution equipment, protective material and water treatment material of drinking water shall not pollute the drinking water and shall conform to the requirements of GB/T 17219.

9. Water quality monitoring

9.1 Water quality detection of water supply organizations

9.1.1 The selection of non-regular indices shall be ascertained by county-above water supply authority and health authority.

9.1.2 The sampling point selection, inspection item/frequency and qualification rate calculation of urban central water supply organizations shall conform to CJ/T 206.

9.1.3 The sampling point selection, inspection item/frequency and qualification rate calculation of rural central water supply organizations shall conform to SL 308.

9.1.4 The water quality detection results of water supply organizations shall regularly submitted to the local health authority and the content and submitting method herein shall be

ascertained by local water supply authority and health authority.

9.1.5 When the water quality of drinking water occur exceptional conditions, such conditions shall be timely reported to the local water supply authority and health authority.

9.2 Water quality monitoring for health supervision

9.2.1 At all levels, the health authority shall carry out health supervision and monitoring for the water quality of the water supplied by all kinds of water supply organizations regularly according to the actual demands.

9.2.2 When any public accident event affects the water quality, the drinking water supervision and monitoring proposals shall be ascertained by county-above health authority as required.

9.2.3 The scope, item and frequency of water quality monitoring shall be ascertained by city-above health authority.

10. Water examination methods

The water examination of respond shall be carried out according to all the provisions of GB/T 5750.

Annex A (Reference Annex) Reference indices and limitations of drinking water quality

Table A.1 Reference indices and limitations of drinking water quality

Index	Limitation
Enterococcus/ (CFU/100mL)	0
Aerogenesis capsule clostridium/ (CFU/100mL)	0
2(2-ethylhexyl) adipic acid ester/ (mg/L)	0.4
Ethylene dibromide/ (mg /L)	0.000 05
Dioxin (2,3,7,8-TCDD)/ (mg/L)	0.000 000 03
Geosmin (dimethylnaphthalene alkanol)/ (mg) /L)	0.000 01
Pentachloro-propane/ (mg/L)	0.03
Bisphenol a/ (mg/L)	0.01
Acrylonitrile / (mg/L)	0.1
Acroleic acid/ (mg/L)	0.5
Acrolein/ (mg/L)	0.1
Lead tetraethyl/ (mg /L)	0.0001
Glutaric dialdehyde/ (mg/L)	0.07
2-methylisoborneol (mg /L)	0.00001
Petroleum type (total)/ (mg/L)	0.3
Asbestos (> 10µm)/ (10,000 units/L)	700
Nitrite/ (mg/L)	1
Polycyclic aromatic hydrocarbon (total)/ (mg /L)	0.002
Polychlorinated biphenyl (total)/ (mg /L)	0.0005
Diethyl phthalate/ (mg/L)	0.3
Dibutyl phthalate/ (mg/L)	0.003
Naphthenic acid/ (mg/L)	1.0
Anisole/ (mg/L)	0.05
Total organic carbon/ (mg/L)	5
β-Naphthol/ (mg/L)	0.4
Butyle xanthogen/ (mg /L)	0.001
Ethyl mercuric chloride/ (mg /L)	0.0001
Nitrobenzene/ (mg/L)	0.017

References

- [1] World Health Organization. Guidelines for Drinking-water Quality, third edition. Vol. 1, 2004, Geneva
- [2] EU's Drinking Water Standards. Council Directive 98/83/EC on the quality of water intended for human consumption. Adopted by the Council, on 3 November 1998
- [3] US EPA. Drinking Water Standards and Health Advisories, Winter 2004
- [4] National Drinking Water Quality Standards, Russia, implemented from January 2002
- [5] Drinking Water Quality Criteria, Japan, implemented from April 2004