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Replace GB 5749-1985

Hygienic Standards for Drinking Water Quality

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**Issued by Ministry of Health of the People's Republic of China and China National
Standardization Management Committee**

Foreword (Preface)

The entirety of the technical content in this standard is mandatory.

This standard will replace GB 5749-1985 Hygienic Standards for Drinking Water from its implementation date onwards.

As compared with GB 5749-1985, key changes are as follows:

- Number of water quality indexes had been increased from 35 items in GB 5749-1985 to 106 items in this standard; of which 71 items were newly added and 8 items were amended, including the following:
 - a) Microorganism indexes were increased from 2 items to 6 items, i.e. indexes for *Escherichia coli*, heat-resistant coliforms, giardia and cryptosporidium were added; while index for total coliform was amended;
 - b) Indexes for drinking water disinfectant were increased from 1 item to 4 items, i.e. indexes for monochloramine, ozone and chlorine dioxide were added;
 - c) Indexes for inorganic compounds under the toxicological index category were increased from 10 to 21 items, i.e. indexes for bromate, chlorite, chlorate, antimony, barium, beryllium, boron, molybdenum, nickel, thallium and cyanogen chloride were added; indexes for arsenic, cadmium, lead and nitrate were amended;

Indexes for organic compound under the toxicological index category were increased from 5 to 53 items, i.e. indexes for formaldehyde, trihalomethane, dichloromethane, 1,2-dichloroethane, 1,1,1-trichloroethane, bromoform, monochloride dibromomethane, dichloro monobromomethane, epoxy chloropropane, chloroethylene, 1,1-dichloroethylene, 1,2-dichloroethylene, trichloroethylene, tetrachloroethylene, hexachlorobutadiene, dichloroacetic acid, trichloroacetic acid, trichloroacetaldehyde, benzene, methylbenzene, xylene, ethylbenzene, styrene, 2,4,6-trichlorophenol, chlorobenzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene, trichlorobenzene, phthalate (2-ethylhexyl) ester, acrylamide, microcystin-LR, bentazone, chlorothalonil, deltamethrin, dimethoate, 2,4-dichlorophenoxyacetic acid, heptachlor, hexachlorobenzene, lindane, malathion, parathion, methyl parathion, pentachlorophenol, atrazine, carbofuran, chlorpyrifos, dichlorophos and glyphosate were added; index for carbon tetrachloride were amended;
 - d) Indexes for sensory properties and general chemicals were increased from 15 to 20 items, i.e. indexes for oxygen consumption, ammonia nitrogen, sulfide, sodium and aluminum were added; index for turbidity was amended;
 - e) Index for radioactive α under the radioactivity indexes was amended.
- Removed two sections of content previously included, i.e. water source selection and hygiene measures for water source.
- Simplify water quality inspection guidelines for water supply units, where part of the content was listed into the Hygiene Standards of Central Water Supply for Drinking Water.

- Added Appendix A.
- Added references for this standard.

Appendix A in this standard is an informative appendix.

Inspection items and date of implementation of the stipulated indexes listed in “Table 3 Unconventional Quality Indexes and Limits for Water” of this standard are determined by the provincial level government according to actual situation locally. Situation of implementation will be reported to the National Standardization Management Committee, Ministry of Construction and Ministry of Health for record purposes and the actual situation of implementation will be reported by these three authorities from 2008. The deadline for implementation of all of the required indexes will be July 1st, 2012.

This standard was proposed by the Ministry of Health, Ministry of Construction, Ministry of Water Resources, Ministry of Land and Resources and State Environmental Protection Administration of the People's Republic of China.

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

The organization responsible for the drafting of this standard: Bureau for Regulating Product Safety Pertaining to the Environment and Health of the China Center for Disease Control and Prevention.

The organizations involved in the drafting of this standard: Guangdong Province Health Supervision Bureau, Zhejiang Province Health Supervision Bureau, Jiangsu Province Center for Disease Control and Prevention, Beijing City Center for Disease Control and Prevention, Shanghai City Center for Disease Control and Prevention, Water Association for China Cities and Towns, China Research Institute of Water Resources and Hydropower and Environmental Standards Research Institute of the State Environmental Protection Administration.

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This standard was first issued in Aug1985 and this current version is the standard's first amendment version.

Hygienic Standards for Drinking Water Quality

1. Scope

This standard specifies the details on the hygiene requirements for quality of drinking water, quality of the source of drinking water, central water supply units, secondary water supply and products pertaining to hygiene & safety of drinking water as well as water quality monitoring and inspection methods.

This standard applies to drinking water supplied from various types of central water supplies in urban and rural areas. It is also applicable to drinking water supplied from non-central water supplies.

2. Normative References

Clauses involved in the following documents constitute the ones in this standard through reference in this standard. If any reference is dated, the following amendment or revised versions (excluding errata) are not applicable to this standard. However, the study of whether the latest version of these documents can be used by all parties who reach agreement according to this standard is encouraged. Any latest version of the non-dated reference is applicable to this standard.

GB 3838 *Quality Standards for Surface Water Environment*

GB/T 5750 *Drinking Water Standard and Testing Methods (All Sections)*

GB/T 14848 *Quality Standards for GroundWater*

GB 17051 *Hygiene Specifications for Secondary Water Supply Facilities*

GB/T 17218 *Hygiene and Safety Evaluation for Chemical Treatment Reagents Used in Drinking Water*

GB/T 17219 *Safety Evaluation Standard for Transportation Facilities and Protection Materials of Drinking Water*

CJ/T 206 *Water Quality Standards for Urban Water Supply*

SL 308 *Qualification Standards for Rural Water Supply Units*

Hygiene Standards of Central Water Supply for Drinking Water – Ministry of Health

3. Terms and Definition

The following terms and definitions will apply to this standard.

3.1 Drinking Water

Refer to drinking water and water for domestic uses, meant for day-to-day usage by people.

3.2 Type of Water Supply

3.2.1 Central Water Supply

Refer to method of supplying water from a central source of water supply, through water distribution networks or through public water points to the user households, including self-established water supply

facilities. Water stations supplying drinking water to user households and dual water supply providing water to public venues or residential communities are also classified under central water supply category.

3.2.2 Secondary Water Supply

Refer to method of supplying water through water pipes or water containers to user households, of which the content water has been stored, pressurized and sterilized or thoroughly processed after being channeled from a central water supply.

3.2.3 Small Central Water Supply

Refer to a type of central water supply that provides water of volume less than 1,000 m³ (or provides water to less than 10,000 individuals) on a daily basis in rural areas.

3.2.4 Non-central Water Supply

Refer to method of supplying water without any water supply facilities or only with simple facilities, where user households draw water directly from primary sources of water.

3.3 Regular Indices

Refer to water quality indexes that reflect the basic water quality situation of drinking water.

3.4 Non-regular Indices

Refer to drinking water quality indexes that are implemented according to regions, time and special circumstances.

4. Hygiene Requirements for Drinking Water

4.1 Drinking water should comply with the following requirements so as to ensure the safety of user households drinking the water.

4.1.1 Drinking water should not contain any pathogenic microorganisms.

4.1.2 Chemical substances in drinking water should not cause harm to the health of the drinkers.

4.1.3 Radioactive substances in drinking water should not cause harm to the health of the drinkers

4.1.4 Sensory properties of drinking water should be good.

4.1.5 Drinking water should be sterilized.

4.1.6 Drinking water quality should comply with the hygiene requirements listed in Table 1 and 3. Quantity limits of disinfectant in product water from central water supplies, residual quantity of disinfectant in product water and peripheral water within water pipe networks all should comply with the requirements of Table 2.

4.1.7 Water quality indexes of small central water supply and non-central water supply can be temporarily implemented according to Table 4 due to circumstantial restrictions, while rest of the required indexes should still comply with Table 1, 2 and 3.

4.1.8 Under the circumstance that a public event causes material impact on water quality, requirements on sensory properties and general chemical indexes can be relaxed appropriately if approved by state

authorities at municipal level or above.

4.1.9 When drinking water contains indexes listed in Table A.1 of Appendix A, quantity limits listed in the table can be referenced and based upon for evaluation.

Table 1 Conventional Quality Indexes and Limits for Water

Index	Limits
1. Microorganism Indexes^a	
Total Coliform / (MPN/100mL or CFU/100mL)	Should not be detected
Heat-resistant Coliforms / (MPN/100mL or CFU/100mL)	Should not be detected
Escherichia coli / (MPN/100mL or CFU/100mL)	Should not be detected
Total Bacterial Count / (CFU/mL)	100
2. Toxicological Indexes	
Arsenic / (mg/L)	0.01
Cadmium / (mg/L)	0.005
Chrome (Hexavalent) / (mg/L)	0.05
Lead / (mg/L)	0.01
Mercury / (mg/L)	0.001
Selenium / (mg/L)	0.01
Cyanide / (mg/L)	0.05
Fluoride / (mg/L)	1.0
Nitrate (by N) / (mg/L)	10 Underground source limited to 20
Trichloromethane / (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 sterilizing with chlorine monoxide) / (mg/L)	0.7
Chlorate (When sterilizing with compound chlorine monoxide) / (mg/L)	0.7
3. Sensory Properties and General Chemical Indexes	
Chroma (Platinum Cobalt Chroma Unit)	15
Turbidity (Scattered Turbidity Unit) / NTU	1 Water source and purification technology limited to 3
Smell and Taste	No unusual odor and taste
Visible Impurities	None
pH	$6.5 \leq \text{pH} \leq 8.5$
Aluminum / (mg/L)	0.2
Iron / (mg/L)	0.3
Manganese / (mg/L)	0.1
Copper / (mg/L)	1.0
Zinc / (mg/L)	1.0
Chloride / (mg/L)	250
Sulfate / (mg/L)	250
Total Soluble Solids / (mg/L)	1000
Index	
Limits	
Total Hardness (CaCO ₃) / (mg/L)	450
Oxygen Consumption (COD _{Mn} , by O ₂) / (mg/L)	3 Water source limited to 5, when original O ₂ consumption > 6 mg/L
Volatile Phenols (by phenol) / (mg/L)	0.002
Anionic Synthetic Detergent Solution / (mg/L)	0.3
4. Radioactive Indexes^b	
Guidance Values	
Total α Radioactivity / (Bq/L)	0.5

Total β Radioactivity / (Bq/L)	0.1
^a MPN represents most possible value; CFU represents unit of bacterial colony forming. When coliforms are detected in water sample, tests for Escherichia coli or heat-resistant coliforms should be conducted next; if coliforms are not detected, the step above will not be necessary.	
^b If radioactive indexes exceed the guidance value, nuclide analysis and evaluation should be conducted so as to determine if the water is drinkable or not.	

Table 2 Conventional Indexes and Requirements for Disinfectants in Drinking Water

Disinfectant Name	Time of Contact with Water	Limits on Product Water (mg/L)	Residues in Product Water (mg/L)	Residues in Water at End of Pipe Network (mg/L)
Chlorine Gas and Free Chlorine Agents (Free Chlorine Ions)	≥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 Cl added, Total Cl≥0.05
Chlorine Dioxide (ClO ₂)	≥30min	0.8	≥0.1	≥0.02

Table 3 Unconventional Quality Indexes and Limits for Water

Index	Limits
1. Microorganism Indexes	
Giardia / (qty/10L)	<1
Cryptosporidium / (qty/10L)	<1
2. Toxicological Indexes	
Antimony / (mg/L)	0.005
Barium / (mg/L)	0.7
Beryllium / (mg/L)	0.002
Boron / (mg/L)	0.5
Molybdenum / (mg/L)	0.07
Nickel / (mg/L)	0.02
Silver / (mg/L)	0.05
Thallium / (mg/L)	0.0001
Cyanogen Chloride (by CN ⁻) / (mg/L)	0.07
Monochloride Dibromomethane / (mg/L)	0.1
Dichloro Monobromomethane / (mg/L)	0.06
Dichloroacetic Acid / (mg/L)	0.05
1,2-dichloroethane / (mg/L)	0.03
Dichloromethane / (mg/L)	0.02
Trihalomethane (Subtotal of Chloroform, Monochloride Dibromomethane, Dichloro Monobromomethane, Bromoform)	Sum of proportion percentages of the concentration of each of substances in the compound should 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

Table to be continued...

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Index	Limits
Pentachlorophenol / (mg/L)	0.009
BHC (Total Content) / (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
Carbofuran / (mg/L)	0.007
Lindane / (mg/L)	0.002
Chlorpyrifos / (mg/L)	0.03
Glyphosate / (mg/L)	0.7
Dichlorvos / (mg/L)	0.001
Atrazine / (mg/L)	0.002
Deltamethrin / (mg/L)	0.02
2,4-dichlorophenoxyacetic Acid / (mg/L)	0.03
Dichlorodiphenyl Trichloroethane (DDT) / (mg/L)	0.001
Ethylbenzene / (mg/L)	0.3
Xylene (Total Content) / (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
Trichlorethylene / (mg/L)	0.07
Trichlorobenzene (Total Content) / (mg/L)	0.02
Hexachlorobutadiene / (mg/L)	0.0006
Acrylamide / (mg/L)	0.0005
Tetrachloroethylene / (mg/L)	0.04
Methylbenzene / (mg/L)	0.7
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
Chloroethylene / (mg/L)	0.005
Chlorobenzene / (mg/L)	0.3
Microcystin-LR / (mg/L)	0.001
3. Sensory Properties and General Chemical Indexes	
Ammonia Nitrogen (by N) / (mg/L)	0.5
Sulfide / (mg/L)	0.02
Sodium (Na) / (mg/L)	200

Table 4 Partial Quality Indexes and Limits for Water of Small Central Supply and Non-central Supply

Index	Limits
1. Microorganism Indexes	
Total Coliform / (MPN/100mL or CFU/100mL)	500
2. Toxicological Indexes	
Arsenic / (mg/L)	0.05
Fluoride / (mg/L)	1.2
Ammonia Nitrogen (by N) / (mg/L)	20
3. Sensory Properties and General Chemical Indexes	
Chroma (Platinum Cobalt Chroma Unit)	20
Turbidity (Scattered Turbidity Unit) / NTU	3 Water source and purification technology limited to 5
pH	$6.5 \leq \text{pH} \leq 9.5$
Total Soluble Solids / (mg/L)	1500
Total Hardness (CaCO ₃) / (mg/L)	550
Oxygen Consumption (COD _{Mn} , by O ₂) / (mg/L)	5
Iron / (mg/L)	0.5
Manganese / (mg/L)	0.3
Chloride / (mg/L)	300
Sulfate / (mg/L)	300

5. Hygiene Requirements for Water Source Quality of Drinking Water

5.1 Surface water used as source of drinking water should comply with the requirements in GB 3838.

5.2 Underground water used as source of drinking water should comply with the requirements in GB/T 14848.

6. Hygiene Requirements for Central Supply Units

Hygiene requirements on central supply units should be implemented in accordance with Ministry of Health's *Hygiene Standards of Central Water Supply for Drinking Water*.

7. Hygiene Requirements for Secondary Water Supply

Facilities and treatment of secondary water supply should be implemented in accordance with GB 17051.

8. Hygiene Requirements for Products Pertaining to Hygiene & Safety of Drinking Water

8.1 Chemical reagents used in processes such as flocculation, coagulation aid, sterilization, oxidation, adsorption, pH adjustment, rust protection, scale inhibition should not contaminate the drinking water and should comply with the requirements in GB/T 17218.

8.2 Water transportation facilities, protection materials and water processing materials also should not contaminate the drinking water and should comply with the requirements in GB/T 17219.

9. Inspection of Water Quality

9.1 Inspection of Water Quality at Water Supply Unit

9.1.1 Unconventional quality indexes for water of water supply units are selected and determined by local water supply administrative and management authorities or departments (county level and above) after

negotiation and discussion with the Ministry of Health.

9.1.2 Selection of sampling site, inspection items and frequency, qualified percentage computation with regards to water quality inspection of urban central supply unit should be implemented in accordance with CJ/T 206.

9.1.3 Selection of sampling site, inspection items and frequency, qualified percentage computation with regards to water quality inspection of rural central supply unit should be implemented in accordance with SL 308.

9.1.4 Results of water quality inspection of water supply units should be reported up to the regional hygiene administrative authorities regularly, where the content and procedures of the reporting process should be determined through proper negotiation and discussion between local water supply administrative authorities and the hygiene administrative authorities.

9.1.5 If drinking water quality shows abnormality, reports should be filed to the local water supply administrative authorities and health administrative authorities in a timely manner.

9.2 Inspection of Water Quality during Hygiene Inspection

9.2.1 Hygiene administrative authorities at every level should conduct hygiene supervision and inspections on the water quality of individual types of water supply units periodically according to actual circumstances and practical needs.

9.2.2 Under the circumstance that a public event causes material impact on water quality, hygiene administrative authorities (of provincial level and above) should set up plans for hygiene supervision and inspections on drinking water quality according to practical needs.

9.2.3 Scope of inspection, items and frequency of hygiene supervision will be determined by the regional health administrative authorities of city level and above.

10. Inspection Method for Water Quality

Water supervision of drinking water quality should be implemented in accordance with GB/T 5750 (all sections).

Appendix A

(Informative Appendix)

Reference Indexes and Limits for Drinking Water Quality

Table A.1 Reference Indexes and Limits for Drinking Water Quality

Index	Limits
Enterococcus / (CFU/100mL)	0
Clostridium Perfringens / (CFU/100mL)	0
Bis (2-ethyl-ethyl) Adipate / (mg/L)	0.4
Ethylene Dibromide / (mg/L)	0.00005
Dioxins (2,3,7,8-TCDD) / (mg/L)	0.00000003
Geosmin (Dimethylnaphthalene Ethanol) / (mg/L)	0.00001
Pentachloropropane / (mg/L)	0.03
Bisphenol A / (mg/L)	0.01
Acrylonitrile / (mg/L)	0.1
Acrylic Acid / (mg/L)	0.5
Acrolein / (mg/L)	0.1
Tetraethyl Lead / (mg/L)	0.0001
Glutaraldehyde / (mg/L)	0.07
Methyl Isobutyl Ethanol Camphane-2 / (mg/L)	0.00001
Petroleum Type (Total Content) / (mg/L)	0.3
Asbestos (>10 µm) / (10 thousand pieces/L)	700
Nitrite / (mg/L)	1
Polycyclic Aromatic Hydrocarbons (Total Content) / (mg/L)	0.002
Polychlorinated Biphenyls (Total Content) / (mg/L)	0.0005
Diethyl Ester Phthalic Acid / (mg/L)	0.3
Dibutyl Ester Phthalic Acid / (mg/L)	0.003
Naphthenic Acid / (mg/L)	1.0
Anisole / (mg/L)	0.05
Total Organic Carbon (TOC) / (mg/L)	5
B-naphthol / (mg/L)	0.4
Butyl Xanthic Acid / (mg/L)	0.001
Ethyl Mercury 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 98/93/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] Russia Federation Drinking Water Standard, Implemented on Jan 2002.
- [5] Japan Drinking Water Quality Standard, Implemented on Apr 2004.