Outline of the Ministerial Ordinance of the Standards for Structure and Material of Domestic Water Supply Equipment

Article 5 of the Government ordinance of Water Works Law.		Clarified standards defined by Ministerial ordinance based on article 5 of the Government ordinance of Water Works Law			
		Performance-based standards for pipes, valves and fittings			Plumbing standards
		Item	Judgement criteria	Application	
No.1	Joint point of service pipe joining on the distribution pipe shall be at least 30cm away from that of any other service pipe.				
No.2	Bore of service pipe joining on the distribution pipe shall not be excessively large in comparison to water consumption.				
No.3	There shall be no direct connection to water pumps which may influence the hydraulic pressure of distribution pipe.				
No.4	Sufficient structural strength of equipment shall be provided in regard to ground pressure and other loads.				
	Sufficient structural strength of equipment shall be provided in regard to hydraulic pressure. --- There shall be no fear of water leakage.	Hydrostatic Pressure Resistance	(1) Pipes, valves and fittings (excluding storage type closed vessel water heater and other valves and fittings installed downstream of this water heater) When hydrostatic pressure of 1.75MPa is applied for 1 minute,there shall be no water leakage, deformation, breakage or other damage. (2) Storage type closed vessel water heater and other valves and fittings installed downstream of this water heater. (excluding its part defined (3)) When hydrostatic pressure of 0.3MPa is	Pipes, valves and fittings (Excluding those installed on the outlet side of last stop valve)	(1) Pipes, valves and fittings (excluding those installed on the outlet side of last stop valve) shall meet the performance-based standard of hydrostatic pressure resistance. (2) Suitable connections shall be executed according to structure and material of pipes, valves and fittings in order to assure the required resistance to hydraulic pressure. (3) The location of main service line shall be easy to repair in case of water leakage like avoiding its passage under structures.

The Ministerial Ordinance of Technical Standards for Water Supply Facilities

The Regulation of Chemical Additives and the Quality of Materials and Mechanical Equipment by the Ministerial Ordinance of Technical Standards for Water Supply Facilities

Based on the report of the Expert Committee on Standardization of Water Supply Facilities, the Ministerial Ordinance of Technical Standards for water supply facilities (the Ministerial Ordinance No.15 of the Ministry of Health and Welfare, 2000),which prescribes the regulation on chemical additives and the quality of materials and mechanical equipment, was promulgated on 23rd February and enforced on 1st April 2000.
The guidelines for testing methods are stipulated separately.

The following is the excerpt of the Ordinance describing the regulation on the quality of materials and mechanical equipment:
(General Matters)
Article 1 Waterworks shall satisfy the following requirements:

17. The quality of materials and mechanical equipment to be used (hereinafter referred to as "materials and equipment") shall satisfy the following requirements:
    ⅰ.That they have strength, durability, abrasion resistance, corrosion resistance and watertight as required by the condition of the site where they are used
    ⅱ.That they do not contaminate water
    ⅲ.That the quality of the materials and equipment that are exposed to purified water or water under the purifying process (excluding pumps, fire plugs and materials and equipment, only very small areas of which are exposed to water), is demonstrated to satisfy the standards in the right column of the a Attached table 2 regarding the items listed in the left column of the same table by the experiment of extraction that is conducted with their samples by order of Minister for Health and Welfare

Attached table 2 (in relation to Article 1)　　(Revised bill)

Items	Standard
Cadmium	0.001mg/L or less
Mercury	0.00005mg/L or less
Selenium	0.001mg/L or less
Lead	0.001mg/L or less
Arsenic	0.001mg/L or less
Chrome	0.005mg/L or less
Cyanide	0.001mg/L or less
Nitrate Nitrogen & Nitrite-nitrogen	1.0mg/L or less
Fluorine	0.08mg/L or less
Boron	0.1mg/L or less
Carbon Tetrachloride	0.0002mg/L or less
1,4 Dioxane	0.005mg/L or less
1,2-Dichloroethane	0.0004mg/L or less
Cis-1, 2-Dichloroethylene & Trans-1,2- Dichloroethylene	0.004mg/L or less
Dichloromethane	0.002mg/L or less
Tetrachloroethylene	0.001mg/L or less
1,1,2-Trichloroethane	0.0006mg/L or less
Trichloroethylene	0.003mg/L or less
Benzene	0.001mg/L or less
Formaldehyde	0.008mg/L or less
Zinc	0.1mg/L or less
Aluminium	0.02mg/L or less
Iron	0.03mg/L or less
Copper	0.1mg/L or less
Sodium	20mg/L or less
Manganese	0.005mg/L or less
Chloride ion	20mg/L or less
Evaporation residue	50mg/L or less
Anionic surfactant	0.02mg/L or less
Nonionic surfactant	0.005mg/L or less
Phenols	0.0005mg/L or less as convert it into the amount of phenol
Organic substances (total organic carbon)	0.5mg/L or less
Taste	Not abnormal
Odor	Not abnormal
Color	0.5 degree or less
Turbidity	0.2 degree or less
Epichlorohydrin	0.01mg/L or less
Amines	0.01mg/L or less as Triethylenetetramine
2,4-Toluenediamine	0.002mg/L or less
2,6-Toluenediamine	0.001mg/L or less
Vinyl Acetate	0.01mg/L or less
Styrene	0.002mg/L or less
1,2-Butadiene	0.001mg/L or less
1,3-Butadiene	0.001mg/L or less
N,N-Dimethyl Aniline	0.01mg/L or less

For the time being, as for "0.0005mg/L" of "phenols", the criteria shall be set at "0.005mg/L" for those materials and mechanical equipment where rubber (including synthetic rubber) or synthetic resin touches water as a material or a part (except packing).

(Comparative table)

Standard for water quality effect standard

items	Judgment criteria (mg/L or less)
Cadmium	0.001
Mercury	0.00005
Selenium	0.001
Lead	0.001
Arsenic	0.001
Chromium	0.005
Cyanide	0.001
Nitrate nitrogen & nitrite nitrogen	1.0
Fluorine	0.08
Boron	0.1
Carbon tetrachloride	0.0002
1,4-Dioxane	0.005
1,2-dichloroethane	0.0004
1,1-dichloroethylene	0.002 → non
Cis-1,2-dichloroethylene	0.004 → non
Cis-1,2-dichloroethylene & Trans-1,2-dichloroethylene	non → 0.004
Dichloromethane	0.002
Tetrachloroethylene	0.001
1,1,2-trichloroethane	0.0006
Trichloroethylene	0.003
Benzene	0.001
Formaldehyde	0.008
Zinc	0.1
Aluminium	0.02
Iron	0.03
Copper	0.1
Sodium	20
Manganese	0.005
Chlorine ion	20
Evaporation residue	50
Anion surfactants	0.02
Nonionic surfactant	0.005
Phenols	0.0005 as convert it into the amount of phenol
Organic substances	0.5

(total organic carbon)	
Taste	Not abnormal
Smell	Not abnormal
Color	0.5 degrees or less
Turbidity	0.2 degrees or less
Epichlorohydrin	0.01
Amines	0.01 as Triethylenetetramine
2,4-toluenediamine	0.002
2.6-toluenediamine	0.001
Vinyl acetate	0.01
Styrene	0.002
1,2-butadiene	0.001
1,3-butadiene	0.001
N,N-dimethyl aniline	0.01

Reference:

For the time being, as for "0.0005mg/L" of "phenols", the criteria shall be set at "0.005mg/L" for those materials and mechanical equipment where rubber (including synthetic rubber) or synthetic resin touches water as a material or a part (except packing).

			applied for 1 minute, there shall be no water leakage, deformation, breakage or other damage. (3) Secondary waterway of storage type closed vessel water heater with two waterways in a heat exchanger When hydrostatic pressure of 1.75MPa is applied for 1 minute, there shall be no water leakage, deformation, breakage or other damage. Additionally, secondary waterway inside heat exchanger shall not have joint. (excluding welded joint) (4) Valves and fittings whose watertightness is ensured by compressing O-rings or other seals by hydraulic pressure In addition to meet the required performance among (1)~(3), when hydraulic pressure of 20kPa is applied for 1 minute, there shall be no leakage, deformation, breakage or other damage.	Expansion fittings, Expansion and flexible fittings, etc.	
	There shall be no fear of water contamination.	Water Quality effect	When exposure test shall be executed under static condition, normalized concentration of analysis result shall meet the judgement criteria shown in appendix.	Pipes, valves and fittings coming into contact with potable water.	(1) Pipes, valves and fittings coming into contact with potable water shall meet the performance-based standard of water quality effect. (2) Dead-end piping or other piping which cause stagnancy of water shall be avoided, or otherwise drain valve shall be installed at the end of pipeline. (3) Domestic water supply equipment shall not be installed close to the facilities which store or treat water contaminants like cyanide, chromium and so on. (4) At the location there is a fear of infiltration of mineral oil, organic solvents or other oils, material of pipes, valves and fittings shall have a resistance against infiltration of oils. Or otherwise suitable measures like protection by means of casing pipe shall be taken.

No.5	Suitable measures shall be taken to protect domestic water supply equipment from freezing.	Freezing temperature resistance	(1) Pressure reducing valve, relief valve, check valve, air valve and solenoid operated valve shall meet required performance-based standards among hydrostatic pressure resistance, water hammer prevention, backflow prevention and back siphonage prevention after they are operated 100,000 cycles and exposed to the temperature of -20℃±2℃ for 1 hour. (2) Other valves and fittings shall meet required performance-based standards among hydrostatic pressure resistance,water hammer prevention, backflow prevention and back siphonage prevention after they are exposed to the temperature of -20℃±2℃ for 1 hour.	Pipes, valves and fittings with cold district specification	At the location there is a fear of freezing of water, pipes, valves and fittings shall meet the performance-based standard of freezing temperature resistance. Or otherwise, suitable measure like covering with insulation materials against freezing of water shall be taken.
	Suitable measures shall be taken to protect domestic water supply equipment from breakage.	Water hammer prevention	When water is flowed with a flow velocity of 2m/sec or dynamic hydraulic pressure of 0.15MPa, then stop valve is suddenly closed, maximum pressure rise by generated water hammer shall be 1.5MPa or less.	Valves and fittings with water hammer prevention specification	Faucets or other valves and fittings with a fear of occuracy of water hammer shall meet the performance-based standard of water hammer prevention. Or otherwise, suitable measures against water hammer is taken like installation of water-hammer arrester or air chamber on the upstream side of the valves and fittings within an effective range.
	Suitable measures shall be taken to protect domestic water supply equipment from corrosion.				(1) At the location there is a fear of corrosion by acid or alkali,material of pipes, valves and fittings shall have a resistance against corrosion by acid or alkali, or otherwise suitable measures against corrosion, like covering with corrosion proof materials, shall be taken. (2) At the location there is a fear of corrosion by leaking electric current, material of pipes, valves and fittings shall be non-metallic, or otherwise suitable measures against electric corrosion like covering with insulating materials shall be taken.
No.6	There shall be no direct connection to water pipes or other facilities other than respective domestic water supply equipment.				

No.7	Suitable measures shall be taken to prevent back flow of water.	Backflow prevention	When hydrostatic pressure of 3kPa and 1.5MPa are applied for 1 minute, there shall be no water leakage, deformation, breakage or other damage. Additionally, when vacuum pressure of -54kPa is applied from the inlet side, water level rise in a transparent tube connected to the device shall not exceed 3mm.	Reduced pressure principal backflow preventer	(1) At the location there is a fear of back-flow from spout, either (A) or (B) below shall be taken. (A) Valves and fitting which meet the performance-based standard of backflow prevention shall be installed at proper position. In case of vacuum breaker, it shall be installed 150mm or more above the water surface of receptacle (B) Air gap specified on table 1 or 2 shall be maintained according to the nominal size of fittings. (2) In case of domestic water supply equipment supplying water to the place where water contaminants are used by business purpose, suitable measures against backflow, like being separated by cistern with specified air gap, shall be taken.
			Check valves (excluding reduced pressure principal backflow preventer) or valves and fittings with built-in backflow preventer (excluding (A) and (B)) When a hydrostatic pressure of 3kPa and 1.5MPa are applied for 1 minute, there shall be no water leakage, deformation, breakage or other damage. (A) Pressure reducing valve When hydrostatic pressures of 3kPa and its set pressure are applied for 1 minute, there shall be no water leakage, deformation, breakage or other damage. (B) Valves and fittings with built-in backflow preventer with no stop valve on the outlet side of backflow preventer and the outlet is open to the atmosphere(excluding (a)and(b)) When a hydrostatic pressure of 3kPa is applied for 1 minute, there shall be no water leakage, deformation, breakage or other damage. (a) Water heater and bathtub water heater directly connected to a bathtub and automatically supply hot water(excluding (b)) When hydrostatic pressure of 3kPa and 50kPa are applied for 1 minute, there shall be no water leakage, deformation, breakage or other damage. (b) Water heater and bathtub water heater	Check valves or, valves and fittings with built-in backflow preventer	※ Specified air gap 1. Following table shall be applied when the nominal size of fitting is 25mm or less. <table><tr><th>Nominal size of fitting</th><th>Horizontal distance from side wall to the center of spout</th><th>Vertical distance from the flood level to the center of spout</th></tr><tr><td>13mm or less</td><td>25mm or more</td><td>25mm or more</td></tr><tr><td>Over 13mm up to 20mm</td><td>40mm or more</td><td>40mm or more</td></tr><tr><td>Over 20mm up to 25mm</td><td>50mm or more</td><td>50mm or more</td></tr></table> Notes: (1) In case of fittings (excluding fittings equipped with air gap, hereinafter similar in the notes of tables) supplying water to a bathtub, the air gap shall not be less than 50mm. (2) In case of fittings supplying water to pool or other water tanks where waves can be caused easily, as well as to fixtures where detergents or chemica-

			directly connected to a bathtub and automatically supply hot water with circulation pump on the outlet side of backflow preventer. When hydrostatic pressure of 3kPa and higher rate among maximum discharge pressure of the pump and 50kPa are applied for 1 minute, there shall be no water leakage, deformation, breakage or other damage.	
		Back siphonage prevention	When vacuum pressure of -54kPa is applied from the inlet side, water level rise in a transparent tube connected to the device shall not exceed 75mm	Vacuum breaker
			When vacuum pressure of -54kPa is applied from the inlet side, water level rise in a transparent tube connected to the device shall not exceed half of vertical distance between the atmospheric vent valve seat of vacuum breaker and water surface of receptacle.	Valves and fittings with built-in vacuum breaker
			When vacuum pressure of -54kPa is applied from the inlet side, no water shall be vacuumed from the inner spout which discharge water to the receptacle.	Fittings equipped with air gap (Low tank, Water cooler etc.)
Common		Durability	Pressure reducing valve, relief valve, check valve, air valve and solenoid operated valve without cold district specification shall meet required performance-based standards among hydrostatic pressure resistance, water hammer prevention, backflow prevention and back siphonage prevention after they are operated 100,000 cycles.	Pressure reducing valves, Relief valves, Check valves, Air valves and Solenoid operated valves

ls are used by business purpose, the air gap shall not be less than 200mm.

2. Following table shall be applied when the nominal size of fitting is over 25mm.

Type		Horizontal distance from side wall to the near side of spout	Vertical distance from the flood level to the end of spout
When not affected by side walls			1.7d'+5mm or more
When affected by side walls	one side wall	3d or less	3.0d' or more
		Over 3d up to 5d	2.0d'+5mm or more
		Over 5d	1.7d'+5mm or more
	two side walls	4d or less	3.5d' or more
		Over 4d up to 6d	3.0d' or more
		Over 6d up to 7d	2.0d'+5mm or more
		Over 7d	1.7d'+5mm or more

Notes:

(1) d : Diameter of the spout (mm)
d': Diameter of the effective opening (mm)

(2) When spout is rectangular, longer side shall be d.

(3) Any wall higher than the flood level shall be considered as a side wall.

(4) In case of fittings supplying water to a bathtub, the air gap shall not be less than 50mm.

(5) In case of fittings supplying water to pool or other water tanks where waves can be caused easily, as well as to fixtures where detergents or chemicals are used by business purpose, the air gap shall not be less than 200mm.

(Appendix 1)

Judgment criteria for water quality effect standard (Revised bill)

items	Judgment criteria	
	In-line devices	Endpoint devices
Cadmium	0.01mg/L or less	0.001mg/L or less
Mercury	0.0005mg/L or less	0.00005mg/L or less
Selenium	0.01mg/L or less	0.001mg/L or less
Lead	0.01mg/L or less	0.001mg/L or less
Arsenic	0.01mg/L or less	0.001mg/L or less
Chromium	0.05mg/L or less	0.005mg/L or less
Cyanide	0.01mg/L or less	0.001mg/L or less
Nitrate nitrogen & nitrite nitrogen	10mg/L or less	1.0mg/L or less
Fluorine	0.8mg/L or less	0.08mg/L or less
Boron	1.0mg/L or less	0.1mg/L or less
Carbon tetrachloride	0.002mg/L or less	0.0002mg/L or less
1,4 Dioxane	0.05mg/L or less	0.005mg/L or less
1,2 dichloroethane	0.004mg/L or less	0.0004mg/L or less
Cis-1,2-dichloroethylene & Trans-1,2-dichloroethylene	0.04mg/L or less	0.004mg/L or less
Dichloromethane	0.02mg/L or less	0.002mg/L or less
Tetrachloroethylene	0.01mg/L or less	0.001mg/L or less
1,1,2 trichloroethane	0.006mg/L or less	0.0006mg/L or less
Trichloroethylene	0.03mg/L or less	0.003mg/L or less
Benzene	0.01mg/L or less	0.001mg/L or less
Formaldehyde	0.08mg/L or less	0.008mg/L or less
Zinc	1.0mg/L or less	0.1mg/L or less
Aluminium	0.2mg/L or less	0.02mg/L or less
Iron	0.3mg/L or less	0.03mg/L or less
Copper	1.0mg/L or less	0.1mg/L or less
Sodium	200mg/L or less	20mg/L or less
Manganese	0.05mg/L or less	0.005mg/L or less
Chlorine ion	200mg/L or less	20mg/L or less
Evaporation residue	500mg/L or less	50mg/L or less
Anion surfactants	0.2mg/L or less	0.02mg/L or less
Nonionic surfactant	0.02mg/L or less	0.005mg/L or less
Phenols	0.005mg/L or less as convert it into the amount of phenol	0.0005mg/L or less as convert it into the amount of phenol
Organic substances (total organic carbon)	3mg/L or less	0.5mg/L or less
Taste	Not abnormal	Not abnormal
Smell	Not abnormal	Not abnormal
Color	5 degrees or less	0.5 degrees or less
Turbidity	2 degrees or less	0.2 degrees or less
Epichlorohydrin	0.01mg/L or less	0.01mg/L or less
Amines	0.01mg/L or less as Triethylenetetramine	0.01mg/L or less as Triethylenetetramine
2,4-toluenediamine	0.002mg/L or less	0.002mg/L or less
2.6-toluenediamine	0.001mg/L or less	0.001mg/L or less
Vinyl acetate	0.01mg/L or less	0.01mg/L or less
Styrene	0.002mg/L or less	0.002mg/L or less
1,2-butadiene	0.001mg/L or less	0.001mg/L or less
1,3-butadiene	0.001mg/L or less	0.001mg/L or less

Reference:

For endpoint devices which copper alloy is used for their main components, judgment criteria for lead, copper, and zinc shall be 0.007mg/L, 0.98mg/L, and 0.97mg/L respectively, instead of above table.

For the time being, as for "0.0005mg/L" of "phenols", the criteria shall be set at "0.005 mg/L" for those domestic water supply endpoint devices where rubber (including synthetic rubber) or synthetic resin touches water as a material or a part (except packing) .

(Comparative table)

Judgment criteria for water quality effect standard

items	Standard (mg/L or less)	
	In-line devices	Endpoint devices
Cadmium	0.01	0.001
Mercury	0.0005	0.00005
Selenium	0.01	0.001
Lead	0.01	0.001
Arsenic	0.01	0.001
Chromium	0.05	0.005
Cyanide	0.01	0.001
Nitrate nitrogen & nitrite nitrogen	10	1.0
Fluorine	0.8	0.08
Boron	1.0	0.1
Carbon tetrachloride	0.002	0.0002
1,4-Dioxane	0.05	0.005
1,2-dichloroethane	0.004	0.0004
1,1-dichloroethylene	0.02 → non	0.002 → non
Cis-1,2-dichloroethylene	0.04 → non	0.004 → non
Cis-1,2-dichloroethylene & Trans-1,2-dichloroethlene	non → 0.04	non → 0.004
Dichloromethane	0.02	0.002
Tetrachloroethylene	0.01	0.001
1,1,2-trichloroethane	0.006	0.0006
Trichloroethylene	0.03	0.003
Benzene	0.01	0.001
Formaldehyde	0.08	0.008
Zinc	1.0	0.1
Aluminium	0.2	0.02
Iron	0.3	0.03
Copper	1.0	0.1
Sodium	200	20
Manganese	0.05	0.005
Chlorine ion	200	20
Evaporation residue	500	50
Anion surfactants	0.2	0.02
Nonionic surfactant	0.02	0.005

Phenols	0.005 as convert it into the amount of phenol	0.0005 as convert it into the amount of phenol
Organic substances (total organic carbon)	5 → 3	0.5
Taste	Not abnormal	Not abnormal
Smell	Not abnormal	Not abnormal
Color	5 degrees or less	0.5 degrees or less
Turbidity	2 degrees or less	0.2 degrees or less
Epichlorohydrin	0.01	0.01
Amines	0.01 as Triethylenetetramine	0.01 as Triethylenetetramine
2,4-toluenediamine	0.002	0.002
2.6-toluenediamine	0.001	0.001
Vinyl acetate	0.01	0.01
Styrene	0.002	0.002
1,2-butadiene	0.001	0.001
1,3-butadiene	0.001	0.001

Reference:

For endpoint devices which copper alloy is used for their main components, judgment criteria for lead, copper, and zinc shall be 0.007mg/L, 0.98mg/L, and 0.97mg/L respectively, instead of above table.

For the time being, as for "0.0005mg/L" of "phenols", the criteria shall be set at "0.005mg/L" for those domestic water supply endpoint devices where rubber (including synthetic rubber) or synthetic resin touches water as a material or a part (except packing) .