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Hypochlorous acid water producing apparatus

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law.

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Hypochlorous acid water producing apparatus

1 Scope

This Japanese Industrial Standard specifies the producing apparatuses with a rated voltage of no greater than 250 V (hereafter referred to as producing apparatuses) that produce water containing available chlorine through electrolysis of an aqueous solution containing chloride ions¹⁾.

This Standard is applicable to the apparatuses for producing mainly hypochlorous acid water which is designated as a food additive. However, it is not applicable to apparatuses that produce specified pesticides (specified agricultural chemicals)²⁾ or medical electrical equipment (**JIS T 0601-1**).

Notes ¹⁾ An aqueous solution containing chloride ions refers to drinking water that originally contained chloride ions or drinking water to which chloride ions have been added.

²⁾ Specified pesticides (specified agricultural chemicals) are those pesticides that are defined in Article 2, Paragraph 1 of the revised Agricultural Chemicals Control Act and specified in No. 2 Notification of the Ministry of Agriculture, Forestry and Fisheries, and the Ministry of the Environment.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS C 0920 *Degrees of protection provided by enclosures (IP Code)*

JIS C 1102-2 *Direct acting indicating analogue electrical measuring instruments and their accessories Part 2: Special requirements for ammeters and voltmeters*

JIS C 9335-1 *Household and similar electrical appliances—Safety—Part 1: General requirements*

JIS C 9335-2-207 *Safety of household and similar electrical appliances—Part 2-207: Particular requirements for electrolyzed water producing appliances*

JIS H 4650 *Titanium and titanium alloys—Bars*

JIS K 0050 *General rules for chemical analysis*

JIS K 0116 *General rules for atomic emission spectrometry*

JIS K 0121 *General rules for atomic absorption spectrometry*

JIS K 0133 *General rules for high frequency plasma mass spectrometry*

JIS K 0557 *Water used for industrial water and wastewater analysis*

JIS K 8150 *Sodium chloride (Reagent)*

JIS K 8180 *Hydrochloric acid (Reagent)*

JIS K 8637 *Sodium thiosulfate pentahydrate (Reagent)*

JIS S 3200-1 *Equipment for water supply service—Test methods of hydrostatic pressure*

JIS S 3200-3 *Equipment for water supply service—Test method of water hammer*

JIS S 3200-4 *Equipment for water supply service—Test method of prevention from back current*

JIS T 0601-1 *Medical electrical equipment—Part 1: General requirements for basic safety and essential performance*

JIS Z 2801 *Antibacterial products—Test for antibacterial activity and efficacy*

JIS Z 8802 *Methods for determination of pH of aqueous solutions*

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions apply.

3.1 continuous producing apparatus, continuous type

producing apparatus that continuously performs electrolysis on a flowing aqueous solution containing chloride ions

3.2 tank type producing apparatus, tank type

producing apparatus that performs electrolysis on a stored aqueous solution containing chloride ions

3.3 substance to undergo electrolysis

electrolytes to be supplied for electrolysis

3.4 electrolytic bath

container that performs electrolysis

It may be with or without a diaphragm.

3.5 electrode

electronic conductors that allow external electric current to flow into the electrolytic solution or expel electric current from this system

3.6 diaphragm

film separating the positive and negative electrodes in the electrolytic bath

3.7 available chlorine

chlorine existing as hypochlorous acid and chlorite ions

3.8 drinking water

water that meets the standards for water to be used for producing food products as stipulated by the Specifications and Standards for Food and Food Additives, etc. (Notification No. 370 of the Ministry of Health and Welfare, 1959)

3.9 hypochlorous acid water

water containing available chlorine produced by performing electrolysis of an aqueous solution containing chloride ions using a producing apparatus

However, it is not applicable if the available chlorine does not contain hypochlorous acid.

4 Classification

The producing apparatuses are classified into the continuous producing apparatus (hereafter referred to as continuous type) and the tank type producing apparatus (hereafter referred to as tank type).

5 Quality and safety

5.1 Performance of producing apparatus

5.1.1 Performance of control section

The performance of the control section shall meet the following provisions when the testing stipulated in **7.2.1** is performed.

a) For continuous types, the following applies.

- 1) When subjected to the testing in **7.2.1 a)** to **7.2.1 c)** and **7.2.1 e)**, the producing apparatus shall stop releasing hypochlorous acid water. If the release of water from the spout is not stopped, the basic performance described in **5.3.1** shall be met.
- 2) When subjected to the testing in **7.2.1 d)**, the producing apparatus shall stop operation and release of hypochlorous acid water. If the release of water from the spout is not stopped, the basic performance described in **5.3.1** shall be met.

b) For tank type apparatuses, the following applies.

- 1) When subjected to the testing in **7.2.1 a)**, the producing apparatus shall stop operation.
- 2) When subjected to the testing in **7.2.1 b)** and **7.2.1 c)**, the producing apparatus shall stop operation or the warning device shall be activated.

5.1.2 Performance of electrode

For performance of electrode, the following applies.

- a) **Elution performance** When the testing as stipulated in **7.2.2 a)** is performed, the heavy metal concentration from the electrode shall meet the criteria shown in Table 1.
- b) **Cycle performance** When the testing as stipulated in **7.2.2 b)** is performed, the available chlorine emission rate shall be at least 70 %.

Table 1 Permissible elution concentration of electrode

Unit: mg/L

Item	Permissible concentration	Test methods
Nickel Chromium Ruthenium Lead	Total amount ^{a)} below 0.01	7.2.2 a)
Titanium	Below 0.05	
Note ^{a)} Total concentration of nickel, chromium, ruthenium and lead.		

5.2 Safety of producing apparatus

5.2.1 Electrical safety

When the testing in **7.3.1** is performed, there shall be no abnormalities.

5.2.2 Mechanical safety

For mechanical safety of the producing apparatus, the following applies.

- a) **Pressure resistance** When the testing prescribed in **7.3.2 a)** is performed, there shall be no leakage, deformation, damage or other abnormalities. This testing does not apply to apparatuses that are not directly connected to the water supply.
- b) **Water hammer** When the testing prescribed in **7.3.2 b)** is performed, buildup pressure shall be no greater than 1.5 MPa. This testing does not apply to apparatuses that are not directly connected to the water supply.
- c) **Reflux prevention** When the testing prescribed in **7.3.2 c)** is performed, there shall be no leakage to the inflow side of the producing apparatus, or deformation, damage or other abnormalities. This testing does not apply to apparatuses that are not directly connected to the water supply.

5.3 Performance and safety of hypochlorous acid water

5.3.1 Basic performance of hypochlorous acid water

When the testing prescribed in **7.4.1** is performed, the hypochlorous acid water shall satisfy pH 2.2 to pH 8.6 and available chlorine 10 mg/kg to 100 mg/kg.

5.3.2 Bactericidal performance of hypochlorous acid water

The bactericidal performance of hypochlorous acid water shall meet the criterion in Table 2 when the testing stipulated in **7.4.2** is performed.

Table 2 Bactericidal performance of hypochlorous acid water

Item	Bactericidal performance	Test methods
<i>Escherichia coli</i>	6.0 or higher	7.4.2
<i>Staphylococcus aureus</i>		