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Test Report

Client Reinforced Concrete Care of Japan

Japan Food Research Laboratories

52-1, Motoyoyogi-cho, Shibuya-ku, Tokyo

Test body RC Guardex

Title Leach test

Here reports the result of test conducted for test body shown above which was submitted to this center on July 30, 2010.

Leach test

1. Client

Reinforced Concrete Care of Japan

2. Test body

RC Guardex

3. Outline of test

The leach test for cadmium and its compound etc. was conducted for the test body by test related to materials of equipment etc. (notification of the Ministry of Health, Labour, and Welfare No. 45 of 2000) based on the ministerial ordinance for deciding technological criteria of water utility (Ordinance of the Ministry of Labour No. 15 of 2000) Article 1 No. 17 Ha.

4. Test result

The test result is shown in Table-1.

Table-1-1 Result of leach test

Item	Result	Minimum determination limit
Cadmium and its compound	Not detected	0.0001 mg/L
Mercury and its compound	Not detected	0.00005 mg/L
Selenium and its compound	Not detected	0.001 mg/L
Lead and its compound	Not detected	0.001 mg/L
Arsenic and its compound	Not detected	0.001 mg/L
Hexavalent chromium compound	Not detected	0.005 mg/L
Cyanide ion and cyanogen chloride	Not detected	0.001 mg/L
Nitrate nitrogen and nitrite nitrogen	Not detected	0.2 mg/L
Fluorine and its compound	Not detected	0.05 mg/L
Boron and its compound	Not detected	0.1 mg/L
Carbon tetrachloride	Not detected	0.0002 mg/L
1, 4-dioxane	Not detected	0.005 mg/L
1, 2-dichloroethane	Not detected	0.0002 mg/L
Cis-1, 2-dichloroethylene and trans-1,2-dichloroethylene	Not detected	0.001 mg/L
Dichloromethane	Not detected	0.001 mg/L
Tetrachloroethylene	Not detected	0.001 mg/L

Table-1-2 Result of leach test

Item	Result	Minimum determination limit
Trichloroethylene	Not detected	0.001 mg/L
Benzene	Not detected	0.001 mg/L
Formaldehyde	Not detected	0.008 mg/L
Zinc and its compound	Not detected	0.01 mg/L
Aluminum and its compound	Not detected	0.02 mg/L
Iron and its compound	Not detected	0.03 mg/L
Copper and its compound	Not detected	0.01 mg/L
Sodium and its compound	Not detected	0.1 mg/L
Manganese and its compound	Not detected	0.005 mg/L
Chloride ion	Not detected	5 mg/L
Residue on evaporation	10mg/L or less	***
Anion surfactant	Not detected	0.02 mg/L
Non-ionic surfactant	Not detected	0.005 mg/L
Phenol	Not detected	0.0005 mg/L
Organic substance (amount of total organic carbon (TOC))	Not detected	0.3 mg/L
Taste	No defect	***
Odor	No defect	***
Chromaticity	0.5 degrees or less	***
Turbidity	0.05 degrees or less	***
Epichlorohydrin	Not detected	0.001 mg/L
Amines	Not detected	0.01 mg/L
2,4-toluenediamine	Not detected	0.002 mg/L
2,6-toluenediamine	Not detected	0.001 mg/L
Vinyl acetate	Not detected	0.01 mg/L
Styrene	Not detected	0.002 mg/L
1,2-butadiene	Not detected	0.001 mg/L
1,3-butadiene	Not detected	0.001 mg/L
N,N-dimethylaniline	Not detected	0.01 mg/L

5. Testing method

1) Leaching operation

After the concrete chip to which test body was applied was washed with running tap water (Tama-shi, Tokyo) for one hour, it was washed with purified water three times. Next, it was soaked in leaching solution (pH 7.0 ± 0.1 , hardness 45 ± 5 mg/L, alkali level 35 ± 5 mg/L, residual chlorine 1.0 ± 0.2 mg/L) and left to stand at approx. 23 °C for 24 hours and the solution was replaced. This operation was repeated twice and the conditioning operation was implemented. After the conditioning was terminated, the test body was soaked in leaching solution and left to stand at approx. 23 °C for 72 hours. Then, the obtained solution was treated as leach liquor. Moreover, the concrete chip to which test body was not applied was soaked in the leaching solution and left to stand under the same conditions. Then, the obtained solution was treated as blank test solution.

The contact area ratio of test body was 50 cm²/L.

2) Measurement method

The measurement method is shown in Table-2.

Table-2-1 Measurement method

Item	Measurement method
Cadmium and its compound	Inductively coupled plasma source mass spectrometry
Mercury and its compound	Cold vapor atomic absorption spectrophotometry
Selenium and its compound	Inductively coupled plasma source mass spectrometry
Lead and its compound	Inductively coupled plasma source mass spectrometry
Arsenic and its compound	Inductively coupled plasma source mass spectrometry
Hexavalent chromium compound	Inductively coupled plasma atomic emission spectrophotometry
Cyanide ion and cyanogen chloride	Ion chromatography - post-column absorption spectrophotometry
Nitrate nitrogen and nitrite nitrogen	Ion chromatography
Fluorine and its compound	Ion chromatography
Boron and its compound	Inductively coupled plasma atomic emission spectrophotometry
Carbon tetrachloride	Purge trap - gas chromatograph-mass spectrometry
1,4-dioxane	Solid phase extraction - gas chromatograph-mass spectrometry
1,2-dichloroethane	Purge trap - gas chromatograph-mass spectrometry
Cis-1,2-dichloroethylene and trans-1,2-dichloroethylene	Purge trap - gas chromatograph-mass spectrometry
Dichloromethane	Purge trap - gas chromatograph-mass spectrometry
Tetrachloroethylene	Purge trap - gas chromatograph-mass spectrometry
Trichloroethylene	Purge trap - gas chromatograph-mass spectrometry
Benzene	Purge trap - gas chromatograph-mass spectrometry
Formaldehyde	Solvent extraction - derivatization - gas chromatography - mass spectrometry
Zinc and its compound	Inductively coupled plasma atomic emission spectrophotometry
Aluminum and its compound	Inductively coupled plasma atomic emission spectrophotometry
Iron and its compound	Inductively coupled plasma atomic emission spectrophotometry

Table-2-2 Measurement method

Item	Measurement method
Copper and its compound	Inductively coupled plasma atomic emission spectrophotometry
Sodium and its compound	Inductively coupled plasma atomic emission spectrophotometry
Manganese and its compound	Inductively coupled plasma atomic emission spectrophotometry
Chloride ion	Ion chromatography
Residue on evaporation	Gravimetric method
Anion surfactant	Solid phase extraction - high performance liquid chromatography
Non-ionic surfactant	Solid phase extraction - absorptiometry
Phenol	Solid phase extraction - derivatization - gas chromatograph - mass spectrometry
Organic substance (amount of total organic carbon (TOC))	Total organic carbon measuring method
Taste	Sensory test method
Odor	Sensory test method
Chromaticity	Transmitted light measurement method
Turbidity	Integrating-sphere photoelectric photometry
Epichlorohydrin	Purge trap - gas chromatograph-mass spectrometry
Amines	Absorptiometry
2,4-toluenediamine	Solid phase extraction - gas chromatograph-mass spectrometry
2,6-toluenediamine	Solid phase extraction - gas chromatograph-mass spectrometry
Vinyl acetate	Headspace gas chromatography - mass spectrometry
Styrene	Headspace gas chromatography - mass spectrometry
1,2-butadiene	Headspace gas chromatography - mass spectrometry
1,3-butadiene	Headspace gas chromatography - mass spectrometry
N,N-dimethylaniline	Headspace gas chromatography - mass spectrometry