

# HJ

## **Sector Standard for Environmental Protection of the People's Republic of China**

HJ/T 296-2006  
Replacing HBC 16—2003

**Technical requirement for environmental labeling products**

**Sanitary wares**

Issued on August 23, 2006

Putting into effect as of September 1, 2006

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Issued by Ministry of Environmental Protection

## Foreword

This standard is developed for the purpose of implementing the Law of the People's Republic of China on Environmental Protection, effectively utilizing and saving resources, minimizing the adverse impacts of the production, use and disposal of sanitary wares on the environment and human health, guiding and promoting the production and utilization of environment-friendly products.

Referring to the environmental standard for the Building Materials for Civil Engineering and Domestic Use of the Republic of Korea, this standard specifies the limits of soluble lead and cadmium in sanitary wares; develops the radioactivity specific activity for sanitary wares in line with the utilization situation in China; specifies the maximum water consumption amount of toilet bowl according to China's policy on water conservation and identifies the recycling and reuse rate of industrial solid waste generated during the production of sanitary wares.

This standard has revised some technical contents of the Technical Requirements for Certification of Environmental Labeling Products — Sanitary Wares (HBC 16—2003)

Compared with the Technical Requirements for Certification of Environmental Labeling Products — Sanitary Wares (HBC 16—2003), the current standard has the following major changes:

- Requirements for the limits of soluble lead and cadmium in sanitary wares are added. It also adds the requirements for the maximum water consumption of urinal and squatting wc pan as well as the requirement for recycling rate of industrial solid waste generated during the production of sanitary wares;

- It changes the radioactivity specific activity indicator for sanitary wares;

- Requirements for water absorptivity and anti-cracking of sanitary wares are deleted.

This standard is a guiding standard and applicable to the certification of environmental labeling products in China.

This standard is put forward by the Department of Science, Technology and Standards of the Ministry of Environmental Protection.

Major organizations in charge of the development of this standard: Environment and

Development Center of MEP and National Building Materials Test Center.

This standard was approved by the Ministry of Environmental Protection on August 23, 2006.

This standard shall be put into effect as of September 1, 2006, and replace the Technical Requirements for Certification of Environmental Labeling Products — Sanitary Wares (HBC 16—2003) from the data of putting into effect.

This standard shall be interpreted by the Ministry of Environmental Protection.

Historical version of standard replaced by the current Standard is:

—— HBC 16—2003.

# Technical Requirement for Environmental Labeling Products

## Sanitary Wares

### 1. Application Scope

This standard specifies the definition, basic requirements, technical contents and determination method for environmental labeling product — sanitary wares.

This standard is applicable to sanitary ware products such as face basin, toilet bowl, urinal, bidet, sink, squatting wc pan and bathtub.

### 2. Standard Quotation Documents

The provisions of the following documents become the provisions of the current standard through quotation. All quoted document with specified date and their follow-up medications (excluding corrigenda) or revised versions shall be not applicable to the current standard. However, it is encouraged that all stakeholders reaching an agreement according to this standard study the possibility of utilizing the latest versions of these documents. The latest versions of all quotation documents without any specific date are applicable to the current standard.

GB 6566 Limit of radioactive nuclide for building materials

GB 6952 Sanitary wares

GB/T 15555.2—1995 Solid waste — Determination of copper, zinc, lead and cadmium — Atomic absorption spectrometry

### 3. Terminology and Definition

#### 3.1 Internal radiation index

It refers to the quotient of the radioactive specific activity of natural radioactive nuclide of radium-226 in sanitary wares divided by the limit specified by the current standard.

Its formula is as the following:

$$I_{Ra} = C_{Ra} / 200$$

Where  $I_{Ra}$ —Internal radiation index;

$C_{Ra}$  — The radioactive specific activity of natural radioactive nuclide radium -226 in sanitary wares, Bq/kg;

200 — It refers to the limit for radioactive specific activity of radioactive nuclide of radium-226 in sanitary wares specified in this standard with the consideration of only internal radiation with unit as Bq/kg.

#### 3.2 External radiation index

It refers to the summary of the quotient of radioactive specific activity of natural radioactive nuclide radium -226, thorium-232 and potassium -40 in sanitary wares divided by the individual limit specified by the current standard.

The formula is as the following:

$$I_{\gamma} = \frac{C_{Ra}}{370} + \frac{C_{Th}}{260} + \frac{C_K}{4200}$$

Where  $I_{\gamma}$  —external radiation index;

$C_{Ra}$ ,  $C_{Th}$ ,  $C_K$  — is the radioactive specific activity of natural radioactive nuclide of radium-226,

thorium-232 and potassium-40 respectively in sanitary wares, Bq/kg;  
370, 260 and 4200 — They refer to the specified limits for radioactive specific activity of natural radioactive nuclide radium -226, thorium-232 and potassium -40 with individual existence in sanitary wares covered in the current standards under only external radiation, Bq/kg.

### 3.3 Radioactive specific activity

It is the quotient of radioactive specific activity of certain radioactive nuclide in substance divided by its mass.

The formula is as the following:

$$C = A/m$$

Where  $C$  — radioactive specific activity, Bq/kg;

$A$  — radioactive specific activity of radioactive nuclide, Bq;

$m$  — substance mass, kg

## 4. Basic Requirements

4.1 The quality of the products shall comply with the requirements of GB 6952.

4.2 The discharge of pollutants from the enterprises shall comply with the requirements of national or local standards for the discharge of pollutants.

## 5. Technical Contents

5.1 The internal radiation index of sanitary wares shall be no bigger than 0.9 and external radiation index no bigger than 1.2.

5.2 The contents of soluble lead in sanitary wares shall not exceed 20 mg/kg and soluble cadmium not exceed 5 mg/kg.

5.3 The maximum water consumption each time shall not exceed 3 L for urinal, 6 L for toilet bowl and 8 L for squatting wc pan.

5.4 The recycling & reuse rate of industrial solid waste generated during the production of sanitary wares shall be over 70%.

## 6. Determination Method

6.1 Technical contents in 5.1 shall be tested according to the method specified in GB 6566.

6.2 Technical contents in 5.2 shall be tested according to the method specified in Annex A.

6.3 Technical contents in 5.3 shall be tested according to the method specified in GB 6952.

6.4 Technical contents in 5.4 shall be verified by site inspection and document review.

## **Annex A**

### **(Standard Annex)**

## **Determination of Lead and Cadmium in Ceramic Sample**

### **A.1 Principle**

Employ strong acid to treat the powder sample of ceramic tiles, use flame atomic absorption spectrometry to determine lead and cadmium concentration in the sample solution.

### **A.2 Reagents**

- $\text{HNO}_3$ ,  $\rho = 1.42 \text{ g/ml}$ , GR;
- (1+1) nitric acid;
- Deionized water or distilled water.

### **A.3 Instruments**

- Atomic absorption spectrophotometer;
- Filtering device: filter with glass sand core, fiber membrane (porous diameter of  $\Phi 0.45 \mu\text{m}$ );
- Adjustable electric heating plate.

### **A.4 Sample Preparation**

After washing, drying, smashing and reduction process, grind the sample so that it can pass  $80 \mu\text{m}$  (180 meshes) sieve, store the sample into a clean weighing bottle in reserve. Impurities shall be avoided in sample preparation process.

### **A.5 Preparation of test solution**

Weigh 10 g (with accuracy down to 0.0001 g) sample into a 100 ml beaker, add 25 ml (1+1) nitric acid, employ small amount of distilled water to wash the beaker wall, blend it until the solution is homogeneous, cover the solution with watch glass. Put the solution onto a  $200^\circ\text{C}$  low-temperature heating plate for 2h heating, cool it for 1 h, immediately filter it into a 50 ml volumetric flask and wash to the mark, shake the flask until the solution is homogeneous. This is the test solution of the sample.

### **A.6 Blank test solution**

Employ deionized water or distilled water to replace the sample with the application of same procedures and reagents with that of the sample, prepare the blank solution when handling the sample.

### **A.7 Determination**

The determination of the concentrations of soluble lead and cadmium in the subject solution shall be conducted in line with the method specified in GB/T 15555.2—1995.

#### A.8 Result calculation

The concentration of heavy metals is calculated with the following formula:

$$\omega = (\rho_1 - \rho_0) \times 50 \times F/m$$

Where  $\omega$  — concentration of soluble heavy metals (lead, cadmium), mg/kg;

$\rho_0$  — mass concentration of the reagent blank,  $\mu\text{g/ml}$ ;

$\rho_1$  — mass concentration of test solution (lead, cadmium) measured from the standard curve (standard curve is drawn according to the requirement of GB/T 15555.2—1995),  $\mu\text{g/ml}$ ;

$F$  — dilution factor;

50 — constant volume of the extract, ml;

$m$  — sample mass, g.