

## **EL483. Beds**

[EL483-2005/5/2014-164]



### **1. Scope**

These criteria shall apply to beds intended for use in homes and in commercial lodging facilities, including bed structures and mattresses that can be sold as a separate product. The criteria shall not apply to hospital beds or furniture beds.

### **2. Definitions**

#### **2.1**

A “mattress” refers to a product on which the people rest or sleep, which is made of a fabric case filled with elastic material.

#### **2.2**

A “bed structure” refers to a product that is made of wood or metal to support the mattress.

#### **2.3**

“Ozone depletion potential (ODP)” refers to the value representing the relative impact of ozone depleting substances when the impact of CFC-11 to ozone depletion is set to 1.

## 2.4

"Global warming potential(GWP)" shall refer to a value that indicates the relative effects of greenhouse gases when the global warming effect of CO<sub>2</sub> is set to 1.

Note) A 100-year GWP shall be applied in accordance with the Fourth Assessment Report: Climate Change (2007) of IPCC (Intergovernmental Panel on Climate Change) in the criteria.

## 2.5

"Azo dyestuffs" is a general term for dyestuff employing Azo (-N=N-) as an initiator. Azo dyestuffs are compounds that can be reduced into the following amines.

## 2.6

"Volatile Organic Compounds (VOCs)" refer to liquid or solid organic compounds that are volatilized into the air at a constant temperature and pressure.

## 2.7

"Volatile organic compounds emissions (VOCs emissions)" refers to the quantity of the VOC (Volatile Organic Compounds) per unit hour that is discharged to the outside while the product is running under the defined conditions.

Note) This standard tentatively defines these emissions as VOCs from n-hexane to n-hexadecane on the chromatogram, which is created by a gas chromatograph equipped with a mass spectrometer.

### **3. Certification Criteria**

#### **3.1 Environmental Criteria**

##### **3.1.1**

Bed structure shall satisfy the requirements specified in the '3.1.1 Environmental Criteria' of 'Furniture (EL172)', one of the certification criteria applied to the target product.

##### **3.1.2**

Mattress shall satisfy the following requirements.

###### **3.1.2.1**

With respect to the use of chemical substances in manufacturing, Polyurethane foam and foam rubber of the bed mattress shall use a substance with zero ODP and GWP below 3000 as a foaming agent.

###### **3.1.2.2**

The following requirements related to the emission of harmful substances shall be satisfied throughout the stages of use and disposal.

###### **a)**

With respect to the emission of harmful substances during use and disposal, if woven fabric used in the surface of the mattress is not E-mark certified as a 'Direct Skin Contact Product' as defined

in '(Fabric and Knitting Material and Simply Processed Product, (EL314)', one of the certification criteria applied to the target product, the following requirements shall be satisfied.

Items		Content
Formaldehyde [mg/kg]		≤ 75
Chlorophenols [mg/kg]	PCP(pentachlorophenol)	≤ 0.5
	TeCP(2,3,5,6-tetrachlorophenol)	≤ 0.5
Harmful elements [mg/kg]	Arsenic(As)	≤ 1.0
	Lead(Pb)	≤ 1.0
	Cadmium(Cd)	≤ 0.1
	Copper(Cu)	≤ 50
	Total chromium (total Cr)	≤ 2.0
	Cobalt(Co)	≤ 4.0
	Nickel(Ni)	≤ 4.0
	Antimony(Sb)	≤ 10
Organic tin compound (TBT) [mg/kg]		≤ 1.0
Azo dyestuffs [mg/kg] note)		each ≤ 30

Note) Apply to only dyed product

b)

Polybrominated biphenyls (PBBs), polybromodiphenyl ethers (PBDEs) and tetrabromobisphenol A (TBBPA) shall not be used as flame retardants for fabric, non-woven fabric or foam in mattresses. However, this restriction does not apply if the total PBBs, PBDFs, TBBPA and HBCD content is less than 100 mg/kg or the total bromine (Br) content is less than 30 mg/kg.

### 3.1.2.3

With regard to the emission of air pollution substances during the stage of use, if the mattress is not E-mark certified as 'Bed (EL483),' one of the certification criteria applied to the target product, the emission from polyurethane and foam rubber of the mattress after 7 days shall satisfy the following requirements.

Item	Formaldehyde	VOCs	Toluene
Criteria [mg/m <sup>2</sup> ·g/	0.01 or lower	0.4 or lower	0.080 or lower

### 3.1.2.4

In the case of indicating the effect of final product on the indoor air, the emission after 7 days according to Full scale chamber test shall satisfy the following requirements.

Item	Formaldehyde	VOCs
Criteria [ $\mu\text{g}/\text{m}^3$ ]	$\leq 25$	$\leq 200$

### 3.1.2.5

With regard to a product life span that affects the consumption of resources at the consumption phase, parts with the same color and equivalent capacity should be provided so that exchangeable parts can be exchanged when damaged.

## **3.2 Quality Criteria**

Products shall meet the applicable quality and performance criteria specified in the Korean Industrial Standards. However, the four-week waiting period for the surface resistance test of liquid at room temperature in accordance with 'KS G ISO 4211 (The Method of Surface Resistance to Cold Liquid for Furniture)' may be skipped, and the restrictions in "3.1 Environmental Criteria" shall be excluded.

## **3.3 Consumer Information**

### **3.3.1**

Information on the replaceable parts supply and how to manage the product

### **3.3.2**

Information that can prevent indoor air pollution due to VOCs emission.

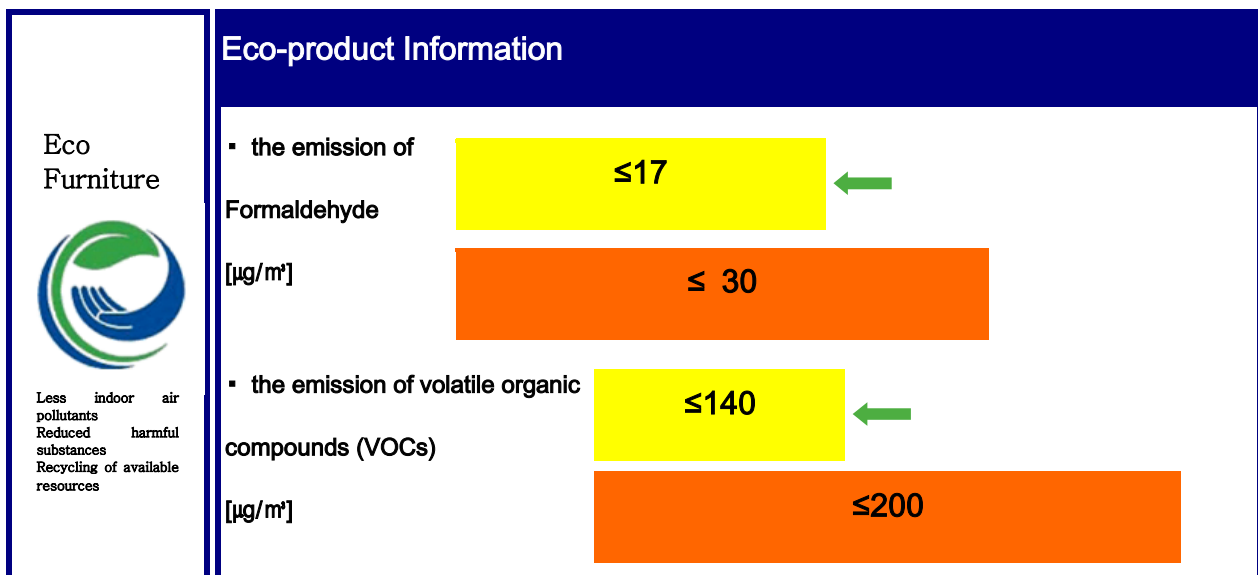
ex) "Since pollutants of indoor air can be emitted in the initial stage of use (approx. 4 weeks after removing packaging material), please be sure to ventilate the indoor air regularly."

### **3.3.3**

Indication on the items that the product contributes to the reasons for certification ("recycling of available resources, reduction of indoor air pollution, reduction of harmful substances) during its consumption stage

### 3.3.4

In the case of indicating the effect of final product on the indoor air, the following 'Detail information indication type' of eco-label designs shall be used.



### 3.3.5

Indication requirements in accordance with the applicable law

## 4. Test Methods

Certification Criteria			Test and Verification Method
Environmental Criteria	3.1.1	3.1.1.1	Verification of submitted documents and test reports issued by an accredited testing laboratory in accordance with '3.1 Environmental Criteria' in '4. Test Methods' of 'Furniture (EL172)'.
	3.1.2	3.1.2.1	Verification of submitted documents.
		3.1.2.2	a)

Certification Criteria			Test and Verification Method
			<p>① Formaldehyde: KS K ISO 14184-1 [Textiles - Determination of formaldehyde - Part 1: Free and hydrolyzed formaldehyde (water extraction method)]</p> <p>② Chlorophenols: GC-ECD, HPLC</p> <p>③ Harmful elements: ICP, AAS <sup>note1</sup>)</p> <p>④ Hexavalent chromium(Cr<sup>6+</sup>): KS M 6902(Determination of chromium(VI) content in leather)</p> <p>⑤ Organic tin compound (TBT) : GC/MS-SIM</p> <p>⑥ Azo dyestuffs: KS K 0147 (Test method for determination of aryl amine level on the dyestuff and dyed product) <sup>note2</sup>) or KS K 0734 (Test method for the determination of arylamines in polyester textiles) <sup>note3</sup>)</p>
		b)	<p>Verification of submitted documents or test reports issued by an accredited testing laboratory in accordance with the following or equivalent test method.</p> <p>① PBBs, PBDEs: KS C IEC 62321 (Electrotechnical Products – Determination of Levels of Six Regulated Substances (Lead, Mercury, Cadmium, Hexavalent Chromium, Polybrominated Biphenyls, Polybrominated Diphenylethers)</p> <p>② TBBPA, HBCD: KS M 1072 (Determination of TBBPA (Tetrabromobisphenol-A) and HBCD (Hexabromocyclododecan) in Polymer Materials)</p> <p>③ Total Bromine (Br): KS M 108 (combustion followed by ion chromatography detection (Combustion ion chromatography - CIC))</p>
		c)	<p>Verification of submitted documents or test reports issued by an accredited testing laboratory in accordance with the following or equivalent test method.</p>



Certification Criteria			Test and Verification Method
			① Formaldehyde <ul style="list-style-type: none"> <li>- Method for test of indoor air quality process (pollutant emitting construction material test method), or</li> <li>- ISO 16000-9[Indoor air -Part 9: Determination of the emission of volatile organic compounds -Emission test chamber method] and ISO 16000-3(Indoor air – Part 3: determination of formaldehyde and other carbonyl compounds – Active sampling method)</li> </ul> ② VOCs and Toluene <ul style="list-style-type: none"> <li>- Method for test of indoor air quality process (pollutant emitting construction material test method), or</li> <li>- ISO 16000-9[Indoor air -Part 9: Determination of the emission of volatile organic compounds -Emission test chamber method] and KS M ISO 16000-6(Indoor air - Part 6: Determination of volatile organic compounds in indoor and chamber air through active sampling on TENAX TA sorbent, thermal desorption and gas chromatography using MSD/FID)</li> </ul>
			d) Verification of submitted documents or test reports issued by an accredited testing laboratory in accordance with the test method specified in KS I 2007 (Determination of the Emission of Formaldehyde and Volatile Organic Compounds from Furniture and Building Related Products) and (Large Chamber Method) or equivalent method.
			e) Verification of submitted documents
Quality Criteria	3.2.1		Test report by an accredited testing laboratory in accordance with the applicable safety standard or certificate of equivalent
	3.2.2~3.2.3		Test report by an accredited testing laboratory in accordance

Certification Criteria		Test and Verification Method
		with the safety standards for electric appliances or certificate of equivalent
Consumer Information		Verification of submitted documents

Note1) Sample extraction by the artificial perspiration : ISO 105-E04 (Textiles - Tests for colour fastness - Part E04: Colour fastness to perspiration)

Note2) Apply to the general fiber

Note3) Apply to the polyester fiber

## 4.1 General Matters

### 4.1.1

One test sample for each applied product is required in principle with the exception that more than one test sample is necessary.

### 4.1.2

Test samples shall be collected at random by a certification institute from products in market or those in storage at the production site. However, the test sample collection method for verifying Environmental Criteria 3.1.3 follows KS M ISO 16000-11(Indoor air -- Part 11: Determination of the emission of volatile organic compounds -- Sampling, storage of samples and preparation of test specimens) and the test sample collection method for verifying Environmental Criteria 3.1.4 follows GGTM.P066.R2(Method for measuring chemical emissions from various sources using

dynamic environmental chambers) by GREENGUARD Certification Program.

#### 4.1.3

The result of test shall be numerically set according to KS Q 5002 (Statistical interpretation method of the data – Part 1: Statistical description of the data).

### **5. Reasons for Certification**

“Reduction of indoor air pollutants, reduction of harmful substances, recycling of available resources (limited to relevant product)”