

## **EL177. Chairs and tables for educational institutions** [EL177-2007/3/2011-10]



### **1. Scope**

This criteria shall apply to school chairs whose back plates are made from synthetic resin, wood(including lumber and plywood) or wooden materials and school tables whose upper parts are made from synthetic resin or wood, wooden materials. Chairs with the upper parts of tables shall be included. However, the product for which separate certification criteria is specified shall be excluded.

### **2. Definitions**

#### 2.1

“Wood waste” refers to the wood waste as stipulated in “Wood waste classification and recycling standard” in accordance with the enforcement regulations of the Waste Management Law.

#### 2.2

“Fibrous wastes of herbaceous plants” is the cellulose raw material obtained from herbaceous plants, such as the byproduct of the green land (reed, silver grass, etc.), or product production and processing (chaff, residuals of bamboo, etc.).

#### 2.3

“Wood material” refers to a material molded using waste wood, such as particle boards, fiberboards, glued laminated timber, etc.

#### 2.4

“Particle board” refers to a wood product molded and pressed with an adhesive, and that is made out of small particles such as wood chips.

#### 2.5

“Fiberboard” refers to a wood product made out of vegetable fibers such as timber or chaff, and that is classified into Insulation Board (IB), Medium Density Fiberboard (MDF), or Hard Board (HB), depending on the density.

## 2.6

“Edge glued panels” refer to the glued processed timbers, such as small lumbered wood or wood layers, that are formed and pressed into sheet form in the direction of fiber, paralleled each other and bonded with resin.

## 2.7

“Synthetic resin” refers to the singular or multi-type polymer product and the product mixed with an additive or filler in addition to polymer, main raw material, in order to reinforce the performance of product.

## 2.8

“Waste synthetic resin” refers to the ‘post-consumer waste synthetic resin’ and ‘pre-consumer waste synthetic resin.’

## 2.9

“Synthetic Resin Sheet” refers to synthetic resin decoration sheet or interior sheet used for surface decoration or finishing of the product.

## 2.10

“Surface decoration sheet” refers to a synthetic resin sheet with no adhesive layer, and that is used primarily as a finishing material for the surface of interior construction materials, furniture, electronic products, etc. Note that sheets made from thermosetting plastics such as melamine resin are excluded from this definition.

## 2.11

“Interior Sheet” refers to synthetic resin adhesive sheet applied with adhesives on one side of the product that is mostly used as interior finishing material of buildings.

## 2.12

“Volatile organic compounds(VOCs)” refer to the organic compound in the fluid or solid state that constantly volatilize by a certain temperature and pressure in air.

## 2.13

“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 them as VOCs from n-hexane to n-hexadecane on the chromatogram, which is created by the gas chromatograph equipped with the mass spectrometer

### **3. Certification criteria**

#### **3.1 Environmental criteria**

##### 3.1.1

With respect to the resource consumption in the manufacturing process, the product materials shall comply with the following requirements.

##### 3.1.1.1

In case of using wood as product material, wood shall be acquired the certification by the third party for using sustainable forest resource or produced in accordance with the sustainable forest management standard according to the UNCED forest principle.

##### 3.1.1.2

With respect to waste wood usage by wood material in the manufacturing process, the product shall satisfy the following requirements.

Items	Particle board	Fiberboard	Other Materials
Percentage of used waste timbers [weight%]	≥ 70	≥ 30	≥ 70

##### 3.1.1.3

With respect to the using synthetic resin as product material, the usage weight of synthetic resin shall be 60 weight% or more than 60 weight%.

##### 3.1.2

With respect to the discharge of harmful substance in the stage of use and disposal, the product shall satisfy the following requirements.

##### 3.1.2.1

The synthetic resin(synthetic resin sheets is excluded) used on the product shall comply with the following requirements.

a) Halogenated synthetic resin including vinyl chloride resin (PVC) as synthetic resin(excluding synthetic resin sheet) shall not be used. However, readily separable synthetic resin by normal tools is excluded.

b) As a flame-retardants, PBBs (polybrominated biphenyls), PBDEs (polybromodiphenyl ethers), or short-chain chlorinated paraffins (C= 10~13) whose chlorine concentration is 50% or more shall not be used as flame-retardants.

c) As a stabilizer or activator, TBT, TPT, lead, and cadmium compounds shall not be used.

### 3.1.2.2

The synthetic resin sheet used on the surface of the product shall comply with the following requirements. However, in case of using the product certified by "Decorative synthetic resin sheets (EL252)" of Korean Eco-mark certification criteria, it is considered as satisfying this requirement.

a) With respect to the product with halogen synthetic resin such as PVC, the content of vinyl chloride monomer shall be not more than 1mg/kg.

b) As additives of resin, organo-tin compound (TBT, TPT), lead compound and cadmium compound shall not be used. Pb, Cd, Hg included in the product shall satisfy following criteria.

Item	Pb	Cd	Hg
Criteria [mg/kg]	≤ 50	≤ 0.5	≤ 0.5

c) As a Plasticizer, phthalate plasticizer with the same or low boiling point with DEHP(di-(2-ethylhexyl) phthalate) shall not be used.

### 3.1.2.3

The paint used on the surface of the product shall comply with any one of the following with respect to harmful elements.

a) The sum of lead(Pb), cadmium(Cd), mercury(Hg), and hexavalent chromium(Cr<sup>+6</sup>) included in the paint shall be not more than the weight percentage{1000 mg/kg} of 0.1

b) With respect to harmful elements included in the non-volatilized amount of paint, it shall satisfy the following requirements

Item	Pb	As	Cd	Sb	Ba	Cr	Hg	Se
Criteria [mg/kg]	≤ 90	≤ 25	≤ 75	≤ 60	≤ 500	≤ 60	≤ 60	≤ 500

c) The product shall use paint that has obtained the certification of environmental certificate of 'Paint(EL 241)'.

#### 3.1.2.4

Nickel emission of the metal part excluding screws, bolts, and hinges shall be below 0.5  $\mu\text{g}/\text{cm}^2 \cdot \text{week}$ .

#### 3.1.3

With respect to the emission of pollutants during the stage of use, the wood or wooden material shall satisfy the following requirements.

##### 3.1.3.1

With respect to the formaldehyde emission amount of wood (log, plywood), or ligneous materials, it shall be complied with the following requirements. However, in case of using the product certified by "Recycled wood products (EL723)" of Korean Eco-mark certification criteria, it is considered as satisfying this requirement.

a) According to Desiccators test, the emission of formaldehyde from wood or wooden materials shall be not more than 0.5mg/L.

b) According to Small Chamber test, the emission of formaldehyde after 7 days from wood or wooden materials shall be not more than 0.12mg/  $\text{m}^3 \cdot \text{h}$ .

##### 3.1.3.2

With respect to the VOCs emission of wood-based materials (limited to particle board and fiber board), the product shall satisfy one of the following requirements.

a) All the surface of the wood-based material constituting the product shall be packaged to prevent the emission of VOCs, and in particular, the remaining part excluding the girth of the

wooden material shall be packaged with interior sheets which has obtained environmental mark certification of 'Decorative Synthetic Resin Sheet (EL252)' among certification standards by Eco-label products or thermosetting resin sheets such as melamine sheets. However, in case part of the surface is exposed for assembly using screws, it shall be excluded.

b) The emission of VOCs after 7 days shall be not more than  $0.4\text{mg}/\text{m}^3 \cdot \text{h}$  and Toluene shall be not more than  $0.080\text{ mg}/\text{m}^3 \cdot \text{h}$ .

c) The product shall use materials that have obtained environmental mark certification for 'wood forming product (EL723)' among the certification criteria by products for environmental mark. However, cases where the surface of the wood forming products which has obtained environmental mark certification is finished using separate material shall be excluded.

#### 3.1.4

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 [ $\mu\text{g}/\text{m}^3$ ]	$\leq 27$	$\leq 220$

#### 3.1.5

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.

#### 3.1.6

With respect to the recycling capability of product at the disposal stage, the product shall satisfy the following requirements

##### 3.1.6.1

Synthetic resin (with 25g or more than 25g weight and  $200\text{ mm}^2$  or more than  $200\text{ mm}^2$  flat area) used in product shall be marked with the indication of quality classification to make separation-collection easy.

##### 3.1.6.2

In case of using metal materials, the metal materials shall be consisted of separable materials within 3 types. However, those metal parts used for assembly such as screw, bolt, nut and hinge shall be excluded.

### **3.2 Quality criteria**

#### 3.2.1

If Korean Industrial Standards are available as a national standard of the product in question, it should satisfy the quality or performance criteria of the standard in question. However, items related to “3.1 Environmental Criteria” are excluded.

#### 3.2.2

If no Korean Industrial Standards are available as a national standard of the product in question, it should satisfy the quality and performance criteria according to the following sequence. However, the items related to “3.1 Environmental Criteria” are excluded. Also, if the E-Mark Certification Criteria Setting Committee determines that the applying criteria are not reasonable considering the characteristic of the product, it should satisfy the standards that were modified by the committee (test item, test method, standards, etc.).

##### 3.2.2.1

National standards other than Korean Industrial Standards.

##### 3.2.2.2

Overseas national standards or international standards regarding the product quality in question.

##### 3.2.2.3

Standards of the organizations at home and abroad that are referred by the current E-mark target product and certification standard.

##### 3.2.2.4

A private standard that is recognized as higher than the national standard in the industry of the product in question.

### **3.3 Consumer Information**

3.3.1

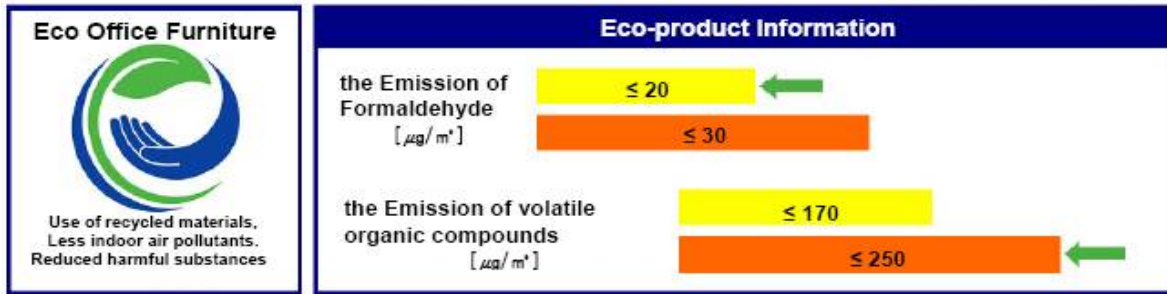
Guide for method of maintaining product and supply of replaceable parts.

3.3.2

Indication of matters contributing to reasons (reduction of indoor air pollution, reduction of harmful substances) for the certification of relevant product at the stage of consumption.

3.3.3

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.



4. Test and Verification Method

Certification Criteria		Test and Verification Methods			
Environmental Criteria	3.1.1		Verification of submitted documents		
		3.1.2.1	Test report by an accredited testing laboratory in accordance with KS M 0024(General rules for infrared spectrophotometric analysis)		
	3.1.2	3.1.2.1	b)~ c)	Verification of submitted documents	
			3.1.2.2	a)	Test report by an accredited testing laboratory in accordance with KS M 0031(General rules for gaschromatographic analysis)
		b)		Verification of submitted documents and Test report by an accredited testing laboratory in accordance with KS M 0016(General rules for atomic absorption spectrochemical analysis), KS M 0032(General rules for ICP emission spectrochemical analysis)	
		c)		Verification of submitted documents	
		3.1.2.3	a)		The test results of the officially recognized agency according to the following test method.
					<ul style="list-style-type: none"> <li>Pb : KS M ISO 3856-1 (Paints and varnishes - Determination of "soluble" metal content - Part 1: Determination of lead content - Flame atomic absorption</li> </ul>



			<p>spectrometric method and dithizone spectrophotometry)</p> <ul style="list-style-type: none"> <li>▪ Cd : KS M ISO 3856-4 (Paints and varnishes - Determination of "soluble" metal content - Part 4: Determination of cadmium content - Flame atomic absorption spectrometric method and electrolytic reaction analysis)</li> <li>▪ Cr<sup>6+</sup> : KS M ISO 3856-5 (Paints and varnishes - Determination of "soluble" metal content: Determination of hexavalent chromium content of the liquid paint or the paint in powder – Diphenylcarbazide)</li> <li>▪ Hg : KS M ISO 3856-7 (Paints and varnishes - Determination of "soluble" metal content - Part 7: Determination of mercury content of the pigment portion of the paint and of the varnish portion of the paint - Non-flame atomic absorption spectrometric method)</li> </ul>	
		b)	Test report by an accredited testing laboratory in accordance with ISO 8124-3(Safety of toys – Part 3 : Elution of certain substances	
		c)	Verification of submitted documents.	
	3.1.2.4		The test results of the officially recognized agency according to KS K 0853 (Test method for determination of nickel release from products intended to come into direct and prolonged contact with the skin: Alternate Exposure).	
	3.1.3	3.1.3.1	a)	Test report by an accredited testing laboratory in accordance to KS F 3200(Fiberboards) or equivalent testing method.
			b)	Test report by an accredited testing laboratory in accordance to the following test method or equivalent test method. <ul style="list-style-type: none"> <li>▪ Test method of indoor air quality process(pollutant emitting construction material test method) or</li> <li>▪ KS M ISO 16000-9[Indoor air -- Part 9: Determination of the emission of volatile organic compounds -- Emission test chamber method] and KS M ISO 16000-3(Indoor air – Part 3: determination of formaldehyde and other carbonyl compounds – Active sampling method)</li> </ul>
		3.1.3.2	a)	Verification of submitted documents and actual location.

			b) Test report by an accredited testing laboratory in accordance to the following method or equivalent test method <ul style="list-style-type: none"> <li>▪ Test method of indoor air quality process (pollutant emitting construction material test method) or</li> <li>▪ KS M ISO 16000-9 (Indoor air -- Part 9: Determination of the emission of volatile organic compounds -- Emission test chamber method) &amp; KS M ISO 16000-6 (Indoor air - Part 6: Determination of volatile organic compounds in indoor and chamber air by active sampling on TENAX TA sorbent, thermal desorption and gas chromatography using MSD/FID)</li> </ul>
			c) Verification of submitted documents
		3.1.4	GREENGUARD Certification Program GGTM.P066.R2 (method of measuring chemical emissions from various sources using dynamic environmental chambers) or test report by an accredited testing laboratory in accordance with this method
		3.1.5~3.1.6	Verification of submitted documents
Quality Criteria			Test report by the relevant accredited testing laboratory in accordance to the relevant standards or certificate of standards equivalent or higher.
Information for Consumers			Verification of submitted documents

#### 4.1 General Matters

##### 4.1.1

One test sample shall be required for each applied product. However, in case that more than one test is needed, it shall not be required.

##### 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 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

Test result 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**

5.1 Product using wooden materials:

"Less indoor air pollutants, Reduced harmful substances, Saving resources or Use of recycled materials(confined to products using waste wood) "

5.2 Product using synthetic resin:

"Reduced harmful substances, Use of recycled materials"

## **Common Criteria, Notice No. 2012-36, the Ministry of Environment**

1. Eco-label products must follow the following provisions with regard to the proper treatment of environmental pollution substances, such as air and water wastes and noxious chemical substances emitted in the process of manufacturing or service operation.

A. When first applying for certification, the product manufacturer should observe the environment related laws and agreements pertaining to the region where the production factory or the place of service operation is located for a period of one year prior to the date of application. Any case of violation of the penalty clause will be verified by confirming documents involved during a period of one year to the date of application. Regarding any violation not related to the penalty clause, confirmation will be made on the completion of appropriate measures.

B. A person who has received a certification of eco-labeling shall observe the environment related laws and agreements pertaining to the region where the production factory or the place of service operation is located during the period of certification. However, regarding any violation besides a penalty, confirmation will be made on the completion of appropriate measures.

2. As a general rule, information for consumers shall be indicated on the surface of the product in such a way not to be easily erased. However, in case that indication on the surface of the product is impossible or undesirable, it can be indicated on the appropriate part such as product packaging, product guidebook and user's manual that consumers can recognize. However, the service information should be indicated inside and outside of the place of service operation. In case that indication inside and outside of the place of service operation is impossible or undesirable, it can be indicated on the appropriate part such as an agreement, letter of delivery, letter of guarantee, and PR materials that consumers can recognize.

3. In order to establish fair trade and to protect consumer, the applicant for eco-label and the holder of eco-label license shall observe the Act on the Fairness of Indication and Advertisement with respect to the environmental aspects of the product.

4. For Various standards referred in the certification criteria by target product, the latest revised edition applies at the date of application, if not specified otherwise.

5. In applying the quality related criteria for each target product, if no standard is available that can be applied as the quality criteria, the president of Korea Environmental Industry & Technology Institute (KEITI) (hereafter referred to as "president of KEITI") may establish and operate the quality criteria for the product involved after review by a competent committee.