

EL745. Blocs, Tiles, and Board Materials

[EL745-2008/1/2008-72]



1. Scope

The criteria shall apply to blocs [Note 1], tiles [Note 2], and board materials [Note 3] formed by using inorganic waste materials, including waste, lime waste, plaster waste casting, and sand waste lime powder generated in the manufacturing process of waste ceramic materials, such as inorganic civil engineering construction waste material, waste glass, waste ceramic waste tile incineration residue, inorganic sludge, and other products. However, those products for which separate certification criteria are specified shall be excluded.

Note 1) For the bloc type, hollow concrete blocs, bricks, bordering blocs for sidewalks and driveways, interlocking blocs for sidewalks and driveways, and concrete waterfront blocs shall be included.

Note 2) For tile types, KS L 1001 (ceramic tile) and KS F 4035 (precast terrazzo) shall be included.

Note 3) For board materials, KS F 4001 (concrete board for sidewalks) and KS F 4736 (extrusion molding light weight concrete panels) shall be included.

2. Definitions

2.1

“Inorganic construction waste material” refers to the inorganic waste material (excluding metal) among wastes generated in construction site from the construction start point to the completion.

2.2

“Construction” refers to the facilities installation, maintenance, repair work, site developing work, machinery facility and other structure installation or break up.

2.3

“Incineration residue” refers to combustion ash and fly ash such as coal ash • briquette

generated after the combustion of fuel.

2.4

“Inorganic sludge” refers to what separates powder-type inorganic substance released with waste water after cutting • abrasive works or what incinerates lake • sewage sludge or makes it melting slag.

2.5

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

2.6

“Post-consumer waste material” refers to the material that finishes its purpose of use and is let out after passing through normal circulation stages.

2.7

“Pre-consumer waste material” refers to the unused material as a product that is generated in a form of scrap in the manufacturing process. However, the material that is generated in the manufacturing process and then used again as raw material in the same process is excluded.

2.8

“Usage rate of waste material” refers to the weight percentage of waste material amount among the raw materials that are used as products.

3. Certification Criteria

3.1 Environmental Criteria

3.1.1

With respect to the resource consumption in the manufacturing stage, the waste material usage rate shall satisfy the following criteria by type of the used waste material.

Type of Waste Materials	Usage Rate of Waste Material [Weight%]	
	Firing processing product	Non- firing processing product

Waste lime, waste plaster	≥50	≥60
Incineration residue, waste glass, waste ceramic material, waste molding sand	≥40	≥50
Waste lime power	≥40	≥40
Inorganic sludge	≥10	≥10
Other	≥40	≥50

Note) In case of mixing and using more than 2 types of waste materials, the total waste material use rate shall satisfy the waste material use rate of main raw materials.

3.1.2

With respect to the harmful elements emission in the disposal stage, in case of the product made using designated waste materials as recycling raw materials, harmful elements including heavy metal shall satisfy the criteria specified in the table 1. However, in case of firing processing product, 6+ chrome, cyanide, organic phosphorus, trichloroethylene and tetrachloroethylene shall be excluded.

<Table 1> Standard Amount of Harmful Elements

Item	Standard Amount [mg/L]	Item	Standard Amount [mg/L]
Cadmium(Cd)	<0.3	6+ Chromium(Cr ⁶⁺)	<1.5
Lead(Pb)	<3	Cyanide(CN ⁻)	<1
Copper(Cu)	<3	Organic Phosphorus	<1
Arsenic(As)	<1.5	Trichloroethylene	<0.3
Mercury(Hg)	<0.005	Tetrachloroethylene	<0.1

3.2 Quality Criteria

3.2.1

By-produced lime brick, by-produced lime bloc for sidewalk and driveway, concrete interlocking bloc for sidewalk and driveway made by using waste casting sand, concrete brick made by using waste casting sand and combustion material brick shall satisfy respectively the quality criteria of KS L 8510(by- produced lime brick), KS L 8511(by-produced lime bloc for sidewalk and driveway), KS L 8512(concrete interlocking bloc for sidewalk and driveway made by using recycling molding sand), KS L 8513(recycling molding sand concrete brick) and KS L 8520(ash brick).

3.2.2

Air-dried gravity of hollow concrete bloc, compression strength on shear area and absorption rate shall satisfy the quality criteria of KS F 4002(hollow concrete bloc).

3.2.3

Air-dried gravity of hollow concrete bloc, compression strength and absorption rate shall satisfy the quality criteria of KS F 4004(concrete brick).

3.2.4

Compression strength and absorption rate of concrete revetment shall satisfy the following criteria.

Quality Item	Test Sample Size(mm)	Standard Type and Deformed Block	
		Type [Note 1]	Type [Note 2]
Compression Strength [N/mm ²]	100×100×100	Respectively≥17.64 Average≥20.58	Respectively≥20.58 Average≥23.52
	50×50×50 [Note 3]	Respectively≥15.68 Average≥18.62	Respectively≥18.62 Average≥21.56
Compression strength after the freezing and thawing of 100 cycles [N/mm ²]	100×100×100	Respectively≥17.64 Average ≥ 20.58	Respectively≥20.58 Average≥23.52
	50×50×50 [Note 3]	Respectively≥15.68 Average≥18.62	Respectively≥18.62 Average≥21.56
Absorption Rate [%]	Respectively ≤ 10, Average ≤7		

Note 1) In case that the corrosion, neutralization, melting and freezing of bloc are not severe - a part above the water surface of river or sea, or a river excluding city or industrial area

Note 2) In case that the corrosion, neutralization, melting and freezing of bloc are severe - a part below the water surface of river or sea, or a river including city or industrial area

Note 3) The figure of 50×50×50mm compression strength is determined based on 100×100×100mm intensity.

3.2.5

Bordering block for sidewalk and driveway and bending strength and absorption rate of interlocking bloc for sidewalk and driveway shall satisfy respectively KS F 4006(concrete bordering bloc) and KS F 4419(concrete interlocking bloc for sidewalk

and driveway).

3.2.6

Compression strength and absorption rate of clay brick shall satisfy the quality criteria of KS L 4201(clay brick).

3.2.7

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.

3.2.8

If no Korean Industrial Standards are available as a national standard of the product in question, it should satisfy the quality and performance standard 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.).

3.2.8.1

National standards other than Korean Industrial Standards.

3.2.8.2

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

3.2.8.3

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

3.2.8.4

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

3.3 Information for Consumers

Inorganic waste material use (%)

4. Test Methods

Certification Criteria		Test and Verification Methods
Environmental Criteria	A	Verification of submitted documents
	B	1) Test report by an accredited testing laboratory in accordance with test methods of processing waste material (test of eluting heavy metal)
		2) Test report conducted by an accredited testing laboratory in accordance with UV-spectrophotometry by the diphenylcarbazide method or UV-spectrophotometry by the lead acetate trihydrate method
Quality Criteria	A	Test report conducted by an accredited testing laboratory in accordance with KS L 8510 (by-produced lime brick), KS L 8511 (by-produced lime blocs for sidewalks and driveways), KS L 8512 (recycling molding sand, concrete interlocking blocs for sidewalks and driveways), KS L 8513 (recycling molding sand concrete bricks), KS L 8520 (ash material bricks), or equivalent certificates
	B	Test report by an accredited testing laboratory in accordance with KS F 4002(hollow concrete bloc) or certificate of equivalent
	C	Test report by an accredited testing laboratory in accordance with KS F 4004(concrete brick) or certificate of equivalent
	D	<input type="checkbox"/> Compression strength and absorption rate: Test report conducted by an accredited testing laboratory in accordance with test methods 1) and 2) <input type="checkbox"/> Compression strength after freezing and thawing: KS B 2456 (test method for concrete resistance for quick freezing and thawing)
	E	Test report by an accredited testing laboratory in accordance with KS F 4006(concrete bordering bloc), KS F 4419(concrete interlocking bloc for sidewalk and driveway)or certificate of equivalent
	F	Test report by an accredited testing laboratory in accordance

		with KS L 4201 (clay brick) or certificate of equivalent
	G-H	Test report by an accredited testing laboratory in accordance with the relevant criteria
Consumer Information		Verification of submitted documents

4.1 General Matters

4.1.1

One test sample shall be required for each applied product. However, if more than one test sample is needed, the former requirement may not be met.

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, details on the method of gathering samples of aggregate shall be in accordance with KS F 2501 (methods of gathering samples of aggregate)

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).

4.2 Test Methods of Compression Strength and Absorption Rate of Concrete Revetment

4.2.1

Test Methods of Compression Strength

4.2.1.1

Cut the test sample to 100×100×100mm cube and measure the dimension of it. However, in case that cutting is impossible with the dimension above, the test sample may be cut to 50×50×50mm cube. Measure the dimension down to the unit of 0.1mm, and calculate the average value to the fourth place of effective number.

4.2.1.2

Cut test samples shall be capping to be as much as thin and flat necessarily to make both pressed aspects perpendicular to axis of ordinate.

4.2.1.3

After capping is stiffened, soak it into clear water for more than 2 hours to be absorbed and tested. In the case, compressed direction shall be the direction on which load is actually putting, whole aspects shall be evenly pressed and press in the speed of 0.2N/mm² every second per pressed shear area by using voltage equipment having sphere wetted surface in the center.

4.2.1.4

Compression strength shall be calculated in accordance with the following equation. At this time, in case that the reading value of maximum load is the unit of 'kgf', the value shall be read to the third place of effective number, and the value of compression intensity[N/mm²] shall be calculated down to the two decimal place.

$$\text{Compression Intensity}[N/mm^2] = \frac{\text{Maximum load}}{\text{Pressed Shear Area}}$$

4.2.2

Test Methods of Absorption Rate

4.2.2.1

Take two test samples from the test sample as identical as the test samples for compression strength, and then measure the absolute dry weight and standard dry weight of the following test sample.

Note 1) 'Absolute dry weight' refers to the weight when the test sample is dried in the dryer with temperature of 105±5°C for 24 hours and then pulled out and frozen.

Note 2) 'Standard dry weight' refers to the weight measured right after wiping out visible water drops with fabric with good absorption capability when the test sample is absorbed in clear water with the temperature of 20±5°C for 24 hours and the pulled out.

4.2.2.2

Absorption rate shall be calculated by the following equation:

$$AbsorptionRate[\%] = \frac{StandardDryWeight[g] - AbsoluteDryWeight[g]}{AbsoluteDryWeight[g]} \times 100$$

5. Reason for Certification :

“Available resource recycling”

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.