

EL243. Lagging and Insulating Material

【EL243-1993/9/2015-5】



1. Scope

The criteria shall apply to the lagging and insulating materials made of inorganic materials, plastics, synthetic rubber or cellulose materials. However, the bricks shall be ruled out.

2. Definition

2.1

“Waste” shall refer to ‘the post-consumer waste’ and ‘the pre-consumer waste’.

2.2

“Post-consumer waste” shall refer to the materials which go through normal distribution steps and discharged after used up.

2.3

“Pre-consumer waste” shall refer to the materials which are not used as a product as assumed the form of scrap in the manufacturing steps. However, the materials created and put again in the same manufacturing process shall be excluded.

2.4

“Usage rate of waste” shall refer to the weight percentage of the waste input out of the materials used as products.

2.5

“Molded product” shall refer to the lagging and insulating materials in the shape of a plate, a sheet, a mat, or a barrel etc.

2.6

“Slag” shall refer to the gangue separated from the melted metal by specific gravity of objective material in the process of manufacturing metals in the shaft furnace and the converter.

2.7

“Ozone depletion potential (ODP)” shall refer to the value which indicates the relative effects of greenhouse gases when the effect of CFC-11 is set 1.

2.8

“Global warming potential (GWP)” shall refer to the value which indicates the relative effect of greenhouse gases when the effect of CO₂ is set 1.

Note) GWP of a 100-year duration shall be applied in accordance with Second Assessment Report: Climate Change(1995) of IPCC(Intergovernmental Panel on Climate Change) in the criteria.

2.9

“Volatile organic compounds (VOCs)” shall refer to the liquefied or the solid organic compounds volatilized continuously by the certain temperature and pressure in the air..

2.10

“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 steps, it shall be suited to the following criteria.

3.1.1.1 The molded product shall contain lagging and insulating materials more than 50weight% or 70volume% out of the constituent materials.

3.1.1.2 The usage rate of waste among the lagging and insulating materials shall be suited to the following criteria by the contained materials.

Classification of lagging and insulating materials		Usage rate of waste [weight, %]
Inorganic material	Slag	More than 40
	Glass	More than 50
	Others	More than 50
Synthetic resin, Synthetic rubber	Extruded polystyrene foam	More than 10
	Other foaming processed material	More than 5
	Others	More than 50
Cellulose material		More than 75

Note 1) In case of mixing more than 2 kinds of lagging and insulating materials, each usage rate of materials shall be suited to the criteria.

Note 2) These requirements may not have to be satisfied if it can be proved in an objective manner that the application of the usage rate of waste is not appropriate in order to support special functions like flame resistance, and the lagging and insulation performance meet the requirements specified in 3.1.3.

3.1.2 With respect to the use of chemical substances, it shall be suited to the following criteria.

3.1.2.1 It shall not use asbestos.

3.1.2.2 It shall not use polybrominated biphenyls (PBBs), polybromodiphenyl ethers (PBDEs), tetrabromobisphenol A (TBBPA) and hexabromocyclododecane (HBCD) as flame retardants. However, this requirement is deemed to have been satisfied if the total sum of all PBBs PBDEs, TBBPA and HBCD is below 100 mg/kg, or if the total bromine content (Br) is below 30 mg/kg.

Note) HBCD requirement shall be effective from Jan 1, 2017.

3.1.2.3 The flame retardant shall not use the materials belonging to 'Group 1', 'Group 2A' and 'Group 2B' of class symbols of IARC(International Agency for Research on Cancer).

3.1.2.4 Foaming product shall use the materials of which ODP is 0 and GWP is less than 3000 as the foaming agent. However, this requirement shall be effective from Jan 1, 2017 for products in the following categories.

a) The rigid polyurethane lagging and insulating materials for construction formed with the forming agent of which ODP is less than 0.11 and GWP is less than 3000.

b) The extruded polystyrene foam lagging and insulating materials for construction formed with the forming agent of which ODP is less than 0.07 and GWP is less than 3000

3.1.3 With respect to the energy consumption while the product is used, the lagging and insulating effect of products shall meet the following requirements.

3.1.3.1 In case of the products of which standards on the lagging and insulating capacities(thermal conductivity, thermal resistance, and resistance of heat transmission) are prescribed in Korean Industrial Standard, they shall meet the applicable requirements specified in the corresponding Korean Industrial Standard.

Note) Korean Industrial Standards that specify lagging and insulation performance (thermal conductivity, thermal resistance and resistance of heat transmission) for certain products include KS F 4714 (Water Repellent Heat Insulator Made of Perlite), KS F 6306 (Rock Wool Thermal Insulating Material for Dwelling), KS L 9106 (Mineral Wool Sheathing Boards), KS F 5660 (Polyester Fiber Sound Absorbing and Thermal Insulation), KS M 3808 (Foamed Polystyrene for Thermal Insulation), KS M 6962 (Standard Specification for Elastomeric Foam Thermal Insulation Material), KS M ISO 4898 (Rigid Cellular Plastics-Thermal Insulation Products for Buildings-Specifications).

3.1.3.2 For the products for which the lagging and insulation performance (thermal conductivity, thermal resistance and resistance of heat transmission) is not specified in the Korean Industrial Standard, the thermal conductivity shall be less than 44mW/m.K.

3.1.4 With respect to the noise in the using steps, the product indicated sound absorption capability shall demonstrate the superiority of the capability.

3.1.5 With respect to the discharge of pollutants in the using steps, the products of which VOCs and formaldehyde discharged may influence on indoor air shall not be contradictory to the standards on pollutant discharging building materials prescribed in 「Law on indoor air quality management at public facilities」.

3.2 Quality criteria

3.2.1 If there is a Korean industrial standard for the relevant product, the product shall satisfy the quality criteria of the standard. However, items associated with “3.1 Environmental Criteria” shall be excluded

3.2.2 If none of the Korea Industrial Standards are applicable, the product should meet the quality and performance requirements specified in one of the following standards, in the priority listed below. Items associated with “3.1 Environmental Criteria,” however, shall be excluded. Furthermore, if the E-Mark Certification Criteria Setting Committee determines that certain criteria are not reasonable considering the characteristics of the product, the product should meet the amended criteria provided by the committee specifically for the product, based on the given characteristics (test items, test methods, expected values, etc.).

3.2.2.1

National standards other than Korean Industrial Standards.

3.2.2.2

National standards of other countries or international standards that are applicable to the product.

3.2.2.3

Domestic or international collective standards that are applied to the current E-mark target product and certification standards.

3.2.2.4

Private standards that are recognized as equivalent to, or higher than the national standards in the corresponding industry.

3.3 Consumer information

3.3.1 Usage rate of waste (only for the applicable product)

3.3.2 Indication that the product contributes to the certificated reasons(resource and energy saving, and sound absorption) in the consuming steps

3.3.3 Directions for construction (Including the content that provide to be suited to the construction standard for prevention of heat loss in a building according to 「Rule of building facilities standards」 of Article 59 of 「the building act」)

4. Test method

Certification criteria	Methods of test and verification
3.1.1	Verification of submitted documents and site check
KS	3.1.2.1 Verification submitted documents and site check
	Verification of submitted documents and site check, or test report by an accredited testing laboratory in accordance with the following test methods or an equivalent <ul style="list-style-type: none"> • PBBs, PBDEs KS C IEC 62321 (Electrotechnical products – Determination of levels of six regulated substances(lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers)
	3.1.2.2 • TBBPA, HBCD KS M 1072 (Determination of TBBPA(Tetrabromobisphenol-A) and HBCD(Hexabromocyclododecan) in polymer materials) <ul style="list-style-type: none"> • Total bromine (Br) KS M 0180 (Standard Test Method for halogen(F, Cl, Br) and sulfur content by Oxidative Pyrohydrolytic Combustion followed by Ion Chromatography Detection(Combustion Ion Chromatography-CIC))
	3.1.2.3 ~ Verification of submitted documents and site check 3.1.2.4
3.1.3	3.1.3.1 Test report by an accredited testing laboratory in accordance with KS L 9016(Test methods for thermal transmission properties of thermal insulations), KS F 2277(Thermal insulation-Determination of steady-state thermal transmission properties-Calibrated and guarded hot box)
	3.1.3.2 Test report by an accredited testing laboratory in accordance with KS L 9016(Test methods for thermal transmission properties of thermal insulations) ^{note)}
3.1.4	Test report by an accredited testing laboratory in accordance with KS F 2805(Method for measurement of sound absorption coefficients in a reverberation room)
3.1.5	Test report by an accredited testing laboratory in accordance with the following test method or the equivalent test method <ul style="list-style-type: none"> ▪ Test method of indoor air quality process(pollutant emitting construction material test method) or

	<ul style="list-style-type: none"> KS M ISO 16000-9(Indoor air -- Part 9: Determination of the emission of volatile organic compounds -- Emission test chamber method) & 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), KS I ISO 16000-3(Indoor air – Part 3: determination of formaldehyde and other carbonyl compounds – Active sampling method) and KS I ISO 16000-11(Indoor air - Part 11: Measurement for the emission of VOCs – Sampling, storage of samples, and preparation of test pieces).
Quality criteria	Test report by an accredited testing laboratory in accordance with the relevant standard or the equivalent
Consumer information	Verification of the documents for submission

Note) In case of the product molded in construction, the production of molding sample ores for the measurement of thermal conductivity shall be followed to the standard molding method suggested by a producer.

4.1 General matters

4.1.1 The number of test samples shall be one sample a product applied in principle. However, it shall be excluded in case that it is required more than one sample.

4.1.2 A test sample shall be randomly sampled out of the commercial products and the product kept in the producing center by an entrusted institution of eco-label certification. However, the extracting method for verification of 3.1.5 shall be followed to KS I ISO 16000-11(Indoor air – Part 11: Determination of the emission of volatile organic compounds - sampling, storage of samples and preparation of test specimens).

4.1.3 The test result shall be expressed numerically according to KS Q 5002(Statistical interpretation of data-part1: Statistical presentation of data).

5. Reason for certification: “Recycling of effective resources, energy saving, sound absorption(applicable products only)”