Green Label Product
Cement and Cement products
(TGL-99-R2-25)

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1. Background

Cement is important in the public utility and construction sector. Currently, it is mainly used as construction materials for buildings, houses, roads, bridges and barrages. Cements are categorized according to its property and use. Proper environmental management of cement is needed in order to prevent environmental impacts.

Therefore, in order to promote environmental management, the Green Label criteria for Cement and Cement Product was developed. The criteria focus on reducing environmental impacts, preserving biodiversity and ensuring the safety and fairness of labor. and consumer safety by require the implementation of measures for managing, analyzing the prevention of impacts on biodiversity, as well as the efficient use of resources. The controlling emissions of greenhouse gases include packaging management measures, requiring guidelines for the reuse of packaging and the disposal of packaging waste after use. In addition, inks, dyes, or pigments printed on the packaging shall contain heavy metals not exceeding the specified limits.

2. Scope

This criterion covers cement and cement products. However, it does not include Portland cement under TIS No. 15.

1. Cement Group
   1.1. Cement for structural work
      - Hydraulic cement, TIS No. 2594
      - Portland pozzolan cement, TIS No. 849
      - Portland blast-furnace slag cement, TIS No. 2587
   1.2. Cement for construction and plastering
      - Mixed cement, TIS No. 80
      - Masonry cement, TIS No. 2595
2. Cement Product Group
   - Mortar for masonry, TIS No. 598
   - Mortar for plastering, TIS No. 1776
   - Masonry mortar for lightweight concrete block, TIS No. 2706
   - Plastering mortar for lightweight concrete, TIS No. 2735
   - Skim coat mortar, TIS No. 3056

- Self-leveling mortar, TIS No. 3057
- Dry premixed concrete, TIS No. 3202
- Dry premixed concrete for marine environment, TIS No. 3203

3. Definition

3.1 Primary raw materials: Materials obtained directly through mining or extraction processes, such as stone, soil, and various types of minerals.

3.2 Hydraulic Cement: Cement that sets and hardened after it has been mixed with water or when it is underwater

3.3 Masonry Mortar: A mixture obtained from combining binder materials and fine aggregates, which may also include additives or colors. When it is to be used, it must be mixed with water to achieve the desired consistency. It is used for bonding or fixing masonry units together.

3.4 Plastering Mortar: A mixture obtained from combining binder materials and fine aggregates, which may also include additives or colors. When it is to be used, it must be mixed with water to achieve the desired consistency. It is used for plastering masonry walls or concrete surfaces, either in single or multiple layers, to achieve the specified thickness.

3.5 Admixtures: Materials other than fine aggregates, cement, or water that are added before or during the mixing of mortar to alter its properties. Admixtures are classified into chemical and mineral types.

3.6 Clinker: Crystals made from sintering many substances together. The main chemical component is hydraulic calcium silicate.

3.7 Letter for Declaration of Compliance: A certification document issued by the applicant or the manufacturer that meets the special requirements specified in the Green Label requirements for the applied product.

3.8 Certificate: A document issued by a certification body, which has been accredited by the National Accreditation Council (NAC) or other accreditation body under the IAF (International Accreditation Forum) agreement.

3.9 Legally Authorized person: A person authorized to sign under the Civil and Commercial Law.

4. General requirements

4.1 The product must be certified according to the relevant industrial product standards related to the product for which certification is requested or pass testing for the required characteristics according to the relevant industrial product standards or international standards (ISO), or national standards such as ASTM, JIS, DIN, EN.

Verification method

The applicant shall submit one of the following documents:

1. A license to manufacture or import industrial products (for products that comply with mandatory TIS standards).
2. A license to display the relevant industrial product standard mark or test results demonstrating the required characteristics according to the relevant industrial product standards for the product being submitted for Green Label certification (for products that comply with general TIS standards).

4.2 Manufacturing, transportation and post-industrial waste disposal shall comply with national laws and regulations. Alternatively, the factory shall be certified under the ISO 14001[1] Environmental management system.

Verification method

The applicant shall submit one of the following documents:

1 . License or evidence to prove that manufacturing, transportation, and post-industrial waste disposal complies with national laws and regulations or

2. Certificate of ISO14001

Remark: For imported products, the manufacturing facility must be certified to ISO 9001 (Quality Management System) and ISO 14001 (Environmental Management System)

4.3 Factories required to prepare an Environmental Impact Assessment (EIA) report shall implement the mitigation measures specified in the EIA report.

Verification method

The applicant shall submit a report on the implementation of environmental impact mitigation measures and environmental quality monitoring measures, demonstrating full and continuous compliance with the applicable measures and legal requirements for the past two years.

5. Environmental requirements

5.1 Primary Raw Materials

(1) Quarried and mined

Manufacturer or raw materials extraction site shall prepare the Environmental Impact Assessment (EIA) report that identifies and assesses the potential environmental and social impacts of the project, evaluates alternatives, and recommends appropriate mitigation, management, and monitoring measures, associated with national laws which applied to the site location

Verification method

The applicant shall submit the following documents:

1. An EIA report should include the following items (not necessarily in the order shown):
   - ☐ Executive summary
   - ☐ Policy, legal, and administrative framework
   - ☐ Project description
   - ☐ Baseline data
   - ☐ Environmental and social impacts
   - ☐ Analysis of alternatives
   - ☐ Environmental and social measures
2. The report demonstrates continuous implementation of environmental impact mitigation measures and environmental quality monitoring in full compliance with prescribed measures and regulations for the past 2 consecutive years.
3. In the case of a newly established mine (with an operational period of less than two years), the applicant shall submit either: Two consecutive years of approved reports on the implementation of environmental impact prevention and mitigation measures, as well as environmental quality monitoring measures, approved by the Office of Natural Resources and Environmental Policy and Planning (ONEP); or Evidence of submission of monitoring reports as published on the SMART EIA Plus website of ONEP.

(2) Biodiversity protection

The applicant required to ensure that the site of raw material extraction is in line with and does not contradict the National Biological Diversity policies and plans, while ensures quarries follow eco-friendly land restoration programs.

Verification method

1. Information on raw material sourcing (As specified in Item 5(1)), the applicant shall also submit records from the supplier, including the characteristics and geographical origin of the raw materials extracted from the mine (under a mining concession license). Alternatively, in cases where the raw material supplier is certified under the Green Label scheme, a copy of the Green Label certificate from the supplier may be submitted as supporting evidence.
2. Management plans to minimize adverse effects from noise, vibration, dust, and discharges to water and land.
3. Evidence of implemented Environmental Management System;
   - ☐ Mine rehabilitation documents
   - ☐ Activities that promote biodiversity, such as conducting biodiversity surveys

and establishing local biodiversity learning centers
☐ Community engagement activities aimed at promoting biodiversity conservation

(3) Responsibility toward labor and social welfare

1. The applicant required to ensure that the company have certified ISO on environmental, occupational safety and health and quality management systems in place.
2. The applicant must ensure that all workers receive fair wages, work in safe conditions, and have their rights protected in line with national and international labor standards

Verification method

1. Copy of valid certificate for ISO 14001, ISO 45001, and ISO 9001
2. Supporting documents shall be included:
   - ☐ Employment records showing compliance with wage and hour laws, ensuring fair compensation.
   - ☐ Documentation of worker contracts and adherence to national and international labor rights conventions (e.g., ILO standards).
   - ☐ Reports on working conditions and regular audits of labor practices.
   - ☐ Evidence of grievance mechanisms for addressing worker concerns.
   - ☐ Work Satisfaction Record

(4) Resources efficiency

The product shall be designed for sustainability and shall promote the use of recyclable materials or alternative materials accounting for at least 10 percent by weight. Examples of alternative materials include:

- blast furnace slag
- coal washery reject
- fly ash
- furnace bottom ash
- granulated blast furnace slag
- glass cullet
- plastic aggregates
- recycled concrete and masonry
- steel furnace slag
- reclaimed aggregate
- reclaimed asphalt pavement
- recycled concrete aggregate
- scrap tyres
- used foundry sand or spent foundry sand
- washed copper slag
- Limestone
- Synthetic Gypsum

- Limestone Calcined Clay Cement
- Other alternative materials

Verification method

- ☐ Material consumption records
- ☐ Documents certifying the contents of materials
- ☐ Details of the pre-treatment implemented, issued by the material supplier

5.2 Production phase

(1) Energy management

The cement manufacturer must have effective energy management policies and procedures and/or an energy management programmed.

Verification method

Energy efficiency management policies and procedures such as;

- ☐ The adoption of energy-efficient technologies and processes
- ☐ Waste heat recovery
- ☐ Use of alternative fuels
- ☐ Transitioning to renewable energy sources, such as solar and wind
- ☐ Other practices

(2) Control of air and water pollutants

In cases where air and water pollutants are discharged outside the factory premises, the emission levels shall not exceed the following limits:

Air pollutants	**CO****	**SO_x**	**NO_x (as of NO_2)**	**PM**
Limit (ppm)	175	Grey cement 30 White cement 190	500	50
Limit (mg/m^3)**	200	White cement 80 Grey cement 500	800	50

Note: Tested under reference conditions at a temperature of 25 °C, pressure of 1 atmosphere (760 mm Hg), on a dry basis, and with 7% excess oxygen.

** Required to be reported in cases where certification under the Environmental Label Program of MRA member countries.

The conversion from mg/m^3 to ppm is calculated as follows:
Specified concentration (ppm) = 24.45 × Specified concentration (mg/m^3) ÷ Molecular weight of the substance

Water pollutants	Arsenic	Cadmium	Hexavalent Chromium	Lead	Mercury	Selenium**
Limit (ppm)	0.01	0.01	0.05	0.1	0.005	0.01

** Required to be reported in cases where certification under the Environmental Label Program of MRA member countries.

Verification method

- ☐ A certification letter signed by the executive officer of the manufacturer shall be provided to confirm compliance with pollution control requirements, which have been monitored and reported in accordance with national laws and standards.
- ☐ **Air pollutant testing results** — Tests shall be conducted in accordance with the *Notification of the Ministry of Industry on the Determination of Air Pollutant Levels Emitted from Cement Plants, B.E. 2549 (2006)*, using testing methods referenced from the standards established by the United States Environmental Protection Agency (U.S. EPA).
- ☐ **Wastewater testing results for arsenic, cadmium, hexavalent chromium, lead, mercury, and selenium** — Tests shall be conducted in accordance with the *Notification of the Ministry of Industry on Effluent Discharge Standards from Factories, B.E. 2560 (2017)*, using testing methods referenced from the Standard Methods for the Examination of Water and Wastewater, published by the American Public Health Association (APHA), American Water Works Association (AWWA), and the Water Environment Federation (WEF), *23rd Edition (2017), Method Section 3120B*.

(3) **GHG reduction and Product carbon footprint**

1. Manufacturers must measure, report, and verify their carbon footprint product using internationally recognized methodologies such as ISO 14064-1 (GHG inventories) and ISO 14067 (Carbon Footprint of Products) or ISO 14025 (Environmental Product Declaration).
2. Manufacturers shall establish clear and achievable targets for reducing greenhouse gas (GHG) emissions such as implementation of carbon capture and storage technologies.
3. The CO2 emission limits are
   - less than 800 kg CO_2/ton of product (for structural works)
   - less than 500 kg CO_2/ton of product (for brickwork/plastering)
   - less than 230 kg CO_2/ton of product (mortar/others)

Verification method

The applicant shall submit the following documents:

- ☐ Documents on established targets for GHG emission reduction.
- ☐ Records on regular monitoring and assessment of progress towards the targets set.
- ☐ Records on implementation of corrective actions and continuous improvement initiatives.
- ☐ The greenhouse gas emission calculation results shall be verified by a third party, such as a Carbon Reduction Label certificate, Carbon Footprint Product verification evidence, or an Environmental Product Declaration (EPD) report.

5.3 Use phase

(1) Hazardous substances in finish product

The test results for heavy metals in the product, obtained through the Waste Extraction Test (WET) method as specified in the *Notification of the Ministry of Industry on the Management of Unused Wastes, B.E. 2566 (2023)*, shall not exceed the following limits:

Arsenic	<2	mg/L
Cadmium	<1	mg/L
Lead	<2	mg/L
Mercury	<0.2	mg/L
Hexavalent Chromium	<2	mg/L
Selenium	< 1	mg/L

Verification method

Applicants shall submit the heavy metal leaching test results obtained using the Waste Extraction Test (WET) method, in accordance with the *Notification of the Ministry of Industry on the Management of Unused Wastes, B.E. 2566 (2023)*.

The concentration of heavy metals extracted using the WET method, expressed in milligrams of substance per liter of extract (mg/L), shall be equal to or greater than the Soluble Threshold Limit Concentration (STLC). The extraction procedure shall comply with the method specified in the Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846), as established by the United States Environmental Protection Agency (U.S. EPA).

5.4 End-of-life phase

(1) Control of packaging

The appropriate initiatives/measures should be taken toward reducing the impact of the product's end-of-life phase or a mechanism for encouraging product takeback should be implemented for recycling or safe disposal.

Instructions for managing the packaging after use shall include the following information that is specific to the product type and:

☐ Caution for hazard statement "May cause and allergic skin reaction"
☐ Recommendation to reuse or recycle the cement bag
☐ A recommendation stating that "cement bags can be used as fuel in authorized facilities.
☐ Guidelines on how to return products and packaging.

Verification method

The applicant shall submit a declaration letter ensuring that the paper or plastic packaging includes instructions for managing cement bags after use, along with a picture of the text or documentation showing that the instructions meet the requirements specified

(2) Ink, dye or pigments used for printing or labels on packaging shall not contain heavy metals and heavy metal compounds. In cases where contamination from heavy metals (lead, mercury, and chromium hexavalent) occurs due to impurities or contamination from raw materials in packaging shall not exceed 0.01 % (≤100 mg/kg) by weight.

Verification method

The applicant shall submit one of the following documents:

1. A declaration letter from ink manufacturer or supplier, including test results for lead, mercury, cadmium and chromium hexavalent, according to IEC 62321 testing standards or
2. Test results for mercury, lead, cadmium, and chromium hexavalent in the ink, paint, or pigments used for printing on the packaging or attached labels, tested according to IEC 62321 or any other method capable of determining these levels. The testing laboratory must be ISO 17025 accredited or registered with Thailand Green Label.

6. Testing and Certificate

6.1 Testing

6.1.1 The laboratory shall meet the following requirements:

Only laboratories accredited in accordance with TIS 17025 or ISO/IEC 17025, or laboratories that meet the criteria and conditions for registration of testing laboratories (RR-203), shall be accepted.

6.1.2 Testing result

6.1.2.1 The testing reports that the method specified in the green label requirements.

6.1.2.2 In case the applicant submits the testing report according to other test methods equivalent to the method specified in the green label requirements, the applicant shall submit the document as follows.

1) The certified signature document of the apply product from the laboratory that equivalent with test method standard specified in the green label requirements.

2) The method validation document of the product specified in the green label requirements.

6.1.2.3 The test report must not be more than 1 year up to the date of application for green label certification.

6.2 Declaration letter to verify compliance with green label requirements

6.2.1 The declaration letter shall not exceed 1-year duration since the apply date

6.2.2 The declaration letter by legally authorized person and stamped with the company hallmark (if any)