



# **Green Label Product**

## **Precast Prestressed Concrete Floor Slabs**

### **(TGL-130-24)**

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## TGL-130-24

Precast Prestressed Concrete Floor Slabs

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## 1. Background

In the contemporary construction industry, which serves as a fundamental component of human habitation and exhibits continuous growth, "floor structures" - particularly precast concrete floor slabs - constitute an essential building element. These slabs, reinforced with high-strength prestressed wire for load-bearing capacity and structural integrity, are widely implemented in general building construction. However, the procurement of raw materials, specifically cement, results in significant greenhouse gas emissions contributing to global warming, while the manufacturing process necessitates the utilization of various chemical substances.

The establishment of specifications for environmentally conscious precast prestressed concrete floor slabs emphasizes the incorporation of eco-friendly raw materials in the manufacturing process and the reduction of product-related pollutant emissions, thereby mitigating environmental impact and diminishing potential hazards to building occupants.

## 2. Scope

This criteria covers precast prestressed concrete slabs for concrete floor systems and precast prestressed concrete elements for composite floor systems

## 3. Definition

- 3.1 Concrete floor systems:** Concrete floor utilizing single precast concrete slabs laid continuously across beams. This system is designed to bear all loads as specified and is integrated with a topping material for structural coherence.
- 3.2 Composite floor systems:** Concrete floor constructed by assembling precast prestressed concrete elements, which are then topped with reinforced concrete to provide sufficient strength as required.
- 3.3 Precast prestressed concrete slabs for concrete floor systems:** Concrete slabs designed for assembly into a flooring system to support loads between beams or load-bearing walls.
- 3.4 Precast prestressed concrete elements for composite floor systems:** Concrete elements designed for assembly into a flooring system to support loads between beams or load-bearing walls.
- 3.5 Covering:** The thinnest layer of concrete between the surface of reinforcing steel and the surface of the concrete.
- 3.6 Letter for Declaration of Compliance:** A certification document issued by the

applicant or the manufacturer that it meets the special requirements specified in the Green Label requirements for the applied product.

- 3.7 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.
- 3.8 Legally Authorized person:** A person authorized to sign under the Civil and Commercial Law.

#### 4. General requirements

- 4.1 The product must be certified to the applicable industrial product standard or tested according to the required specifications set by the relevant industrial product standard listed in Table 1 or an equivalent or higher international standards, such as ISO or ASTM.

**Table 1** List of Industrial Product Standards for Bricks and Concrete for Wall Construction

No.	TIS no.	Title
1	TIS 576	Precast prestressed concrete slabs for concrete floor systems
2	TIS 828	Precast prestressed concrete elements for composite floor systems

##### **Verification method**

The applicants shall submit evidence of an industrial product standard mark license **or** test results demonstrating compliance with the desired characteristics according to industrial product standards equivalent or higher international or national standards, such as ISO or ASTM.

- 4.2 Manufacturing, transportation and post-industrial waste disposal shall comply with national laws and regulations or the manufacturer shall be accredited by ISO 14001.

##### **Verification method**

The applicant shall submit one of the following documents:

1. License or evidences to prove that manufacturing, transportation, and post-industrial waste disposal complies with national laws and regulations. **or**
2. Certification of ISO 14001 from the manufacturer

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

## 5. Environmental requirements

5.1 Product must meet one of the following carbon footprint criteria:

- 1) Certified Carbon Footprint Reduction Label
- 2) The carbon footprint of the product for the current year (with a full 12-month dataset) has reduced by 2%<sup>1</sup> or more compared to the product's carbon footprint in the base year (with data no older than 3 years).
- 3) For new facilities without prior baseline data, the carbon footprint of the product for the current year (with a full 12-month dataset) must be lower than the benchmark value for products of the same category.

### **Verification method**

The applicant shall submit one of the following documents:

1. A certificate for the Carbon Footprint Reduction Label. or
2. Results of the current year carbon footprint calculation for the product (with data covering 12 months) compared to the base year carbon footprint (historical data not exceeding 3 years), certified by a third-party registered with the Thailand Greenhouse Gas Management Organization (Public Organization)
3. Results of the current year carbon footprint calculation for the product (with data covering 12 months) compared to the benchmark for similar products, certified by a third-party registered with the Thailand Greenhouse Gas Management Organization (Public Organization).

5.2 Precast prestressed concrete floor slabs must not contain the following:

- 1) Phosphogypsum
- 2) Asbestos
- 3) Heavy metals or compounds of heavy metals, such as cadmium, mercury, lead, and chromium hexavalent, must meet the limits specified in Table 2.

**Table 2 Allowable Heavy Metal Content in Products**

<b>Parameter</b>	<b>Concentration (mg/kg)</b>
Cadmium	≤ 100
Mercury	≤ 1,000
Lead	≤ 1,000
Chromium hexavalent	≤ 1,000

<sup>1</sup>Carbon Footprint Reduction Label for Products, Thailand Greenhouse Gas Management Organization (Public Organization)

**Verification method**

The applicant shall the following documents/evidence:

1. A declaration letter ensuring the absence of phosphogypsum in the product.
2. A declaration letter ensuring the absence of asbestos in the product.
3. Test results for heavy metals, including lead, mercury, cadmium, and hexavalent chromium, obtained by sampling the fully mixed raw materials of the product applying for certification. The quantity and sampling method should follow the relevant industrial product standards for the product under certification. Testing should comply with US EPA SW 846 standards or equivalent testing methods capable of detecting heavy metals, such as lead, mercury, cadmium, and hexavalent chromium, using an extraction method suitable for the sample type and composition.

### 5.3 Guide or Manual for the Management of Precast Prestressed Reinforced Concrete Slabs During Demolition

**Verification method**

The applicants shall submit evidence of a guide or manual outlining the procedures for managing precast prestressed concrete floor slabs during demolition. This document must be stamped with the company's official seal and signed by the legally authorized person as per the company's registration certificate.

## 6. Testing and Certificate

### 6.1.2 Test results

- 6.1.2.1 The testing report that the method specified in the Green Label requirements.
- 6.1.2.2 In case, the applicant submits the testing report with according to other test methods equivalent to the method specified in the green label requirements, the applicant shall submit the document as follow;
  - 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 validation of the method (Validation Method) used by the applicant to test the product, compared to the testing methods specified in the Green Label requirements
- 6.1.2.3 The test report must not be more than 1 years 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)