



# **Green Label Product Steel Tubes (TGL-125/2-24)**

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## TGL-125/2-24

### Steel Tubes

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#### 1. Background

Steel pipes, commonly known as black steel pipes, are characterized by a hollow cylindrical shape, black color, and lightweight while maintaining strength and durability. These pipes have smooth seams and can withstand pressure from both friction and wind. These pipes are commonly used in construction for applications that do not require heavy loads, such as water pipes for high-rise buildings, various structural formations, connections, and general applications like electrical conduit, fences, doors, traffic sign frameworks, scaffolding, multipurpose buildings, and many other works. When considering the potential impacts throughout the product's life cycle, it is evident that it can have environmental effects from production, transportation, usage, and post-use product disposal.

Therefore, the green label requirements for steel pipe products focus on avoiding the use of toxic substances, reducing greenhouse gas emissions, and managing energy consumption during both the production process and product maintenance, as well as recycling to minimize resource usage.

#### 2. Scope

This criteria covers steel pipe and coated steel pipe.

#### 3. Definition

- 3.1 Scrap:** Pieces of metal waste generated both during the production process and after use, such as scrap metal from building demolition or metal scraps from vehicles.
- 3.2 Post-Consumer Waste:** Products that have become waste or have been used.
- 3.3 Post-Industrial Waste:** Waste or by-products generated during the manufacturing or processing stages within a facility before reaching the consumer.
- 3.4 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.
- 3.5 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.
- 3.6 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 relevant industrial product standards 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 applicants shall submit evidence of an industrial product manufacturing or import license **or** a license displaying the standard mark of industrial products **or** test results demonstrating compliance with the desired characteristics according to industrial product standards or international standards (ISO) or national standards such as ASTM, JIS, DIN, or EN.

- 4.2 Manufacturing, transportation and post-industrial waste disposal shall comply with national laws and regulations or the manufacturer shall be accredited by ISO14001.

**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.
2. Certification of ISO14001 from the manufacturer

**Remark:** In the case of imported products, the manufacturing facility must be certified according to the following standards:

- ISO 9001 (Quality Management System) **and**
- ISO 14001 (Environmental Management System) **and**
- ISO 50001 (Energy Management System) **and**
- TIS 18001 or OHSAS 18001 (Occupational Health and Safety Management System)

#### 5. Environmental requirements

- 5.1 The product must have a radiation level not exceeding five times the background radiation level of the respective area. Measurement should be conducted specifically on raw materials that use steel scrap.

**Verification method**

1. The applicant must submit a standard operating procedure document that outlines the steps for measuring radiation for the product.
2. The applicant must provide evidence or documentation demonstrating that radiation levels in the product have been measured, with records of these measurements dating back at least six months.

3. The radiation measuring instruments used for assessing radiation levels must be calibrated by a government agency that provides calibration services for radiation measurement devices. The calibration results must be no older than one year from the date of issuance by the calibration provider.

5.2 Heavy Metal Content must comply with the following criteria:

5.2.1 The coatings used on the product must contain the following substances within the specified limits:

- Chromium hexavalent: no more than 1,000 mg/kg
- Cadmium: no more than 100 mg/kg
- Mercury: no more than 1,000 mg/kg
- Lead: no more than 1,000 mg/kg

**Verification method**

The applicant must submit test results for the heavy metal content in the product coatings, including:

1. Test results for chromium hexavalent content according to the testing method in ISO 3856-5 **or** another method capable of measuring hexavalent chromium levels.
2. Test results for cadmium content according to the testing method in ISO 3856-4 **or** ASTM D3335, **or** another method that can measure cadmium levels.
3. Test results for mercury content according to the testing method in ISO 3856-7 **or** ASTM D3624, **or** another method capable of measuring mercury levels.
4. Test results for lead content according to the testing method in ISO 3856-1 **or** ASTM D3335, **or** another method that can measure lead levels.

The testing must be conducted by a laboratory accredited under standard ISO/IEC 17025 **or** a laboratory registered in accordance with the criteria and conditions for laboratory registration (RR-203).

5.2.2 Hot-dip Galvanized pipes

The concentration of heavy metals and contaminants detected in the water passing through the pipe shall not exceed the limits specified in Table 1.

**Remark:** In the case of hot-dip galvanized pipes, testing can be conducted according to either section 5.2.1 or 5.2.2.

**Table 1** Concentration of heavy metals and contaminants in the leachate passing through the pipe

Parameter	Heavy Metals and Contaminants (mg/L)
Iron (Fe) <sup>1</sup>	0.5
Manganese (Mn) <sup>1</sup>	0.3
Copper (Cu) <sup>1</sup>	1.0
Zinc (Zn) <sup>1</sup>	5.0
Lead (Pb) <sup>1</sup>	0.05
Chromium (Cr) <sup>1</sup>	0.05
Cadmium (Cd) <sup>1</sup>	0.005
Arsenic (As) <sup>1</sup>	0.05
Mercury (Hg) <sup>1</sup>	0.001
Cyanide (CN) <sup>1</sup>	0.1
Barium (Ba) <sup>2</sup>	0.7

**Verification method**

The applicant shall submit test results for heavy metals and contaminants in the pipe leachate according to the testing method outlined in AWWA: Standard Methods for the Examination of Water and Wastewater, 20th Edition. The sample preparation method for pipe leachate should follow the guidelines in Requirement 6.3 or other methods that can accurately test the levels of heavy metals and contaminants in the pipe leachate.

5.3 Steel tubes products must be made from scrap steel derived from post-consumer products or leftover scrap from production processes, according to the following criteria:

5.3.1 For steel produced by the Electric Arc Furnace (EAF) method, at least 90% of the raw material must be scrap steel.

5.3.2 For steel produced by the Basic Oxygen Furnace (BOF) process, the use of scrap steel is not required.

**Remark:** From January 1, 2027, at least 10% of scrap steel must be used in the Basic Oxygen Furnace (BOF) process.

<sup>1</sup> Rural Drinking Water Quality Standards, Project Steering Committee for Providing Clean Water in Rural Areas Nationwide, Ministry of Interior, 1988 (B.E. 2531).

<sup>2</sup> The Industrial Product Standard for Drinking Water, Standard No. TIS 257

**Verification method**

The manufacturer shall submit a declaration letter ensuring that the product complies with the criteria outlined in Requirement 5.3. This letter must be stamped with the company's official seal and signed by the legally authorized person as per the company's registration certificate.

5.4 Fresh water usage in the production process (specifically for the steel rolling process), considering only fresh water that enters the steel pipe production process, must comply with the following criteria:

5.4.1 For the production of black steel pipes and Pipe Pre-Zinc Galvanized Steel (GI), fresh water usage must not exceed 5 m<sup>3</sup> per ton of steel produced.

5.4.2 For the production of Hot-Dip Galvanized Pipes, fresh water usage must not exceed 10 m<sup>3</sup> per ton of steel produced.

**Verification method**

The manufacturer shall submit a credible evidence demonstrating that fresh water used in the steel pipe production process does not exceed the specified limits, considering only fresh water used in the production process. 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.

5.5 The Specific Energy Consumption (SEC) per unit of product in the steel pipe production process, specifically in the steel rolling process, which includes energy usage for the furnace, rolling, and other applications, must not exceed the following criteria:

5.5.1 For the production of black steel pipes and Pipe Pre-Zinc Galvanized Steel (GI), the total energy consumption must not exceed 500 megajoules per ton of steel product, calculated as an average over a 12-month period.

5.5.2 For the production of Hot-dip Galvanized pipes, the total energy consumption must not exceed 1,000 megajoules per ton of steel product, calculated as an average over a 12-month period

**Verification method**

The applicant shall submit evidence or declaration letter demonstrating compliance with the specified criteria. 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. Examples include reports or records of energy consumption, among others.

5.6 The greenhouse gas emission rate in the steel pipe production process must not exceed the following:

- 5.6.1 For the production of carbon steel pipes, the greenhouse gas emission rate must not exceed 2.6 tCO<sub>2</sub>eq per ton of steel produced.
- 5.6.2 For the production of Pipe Pre-Zinc Galvanized Steel (GI), the greenhouse gas emission rate must not exceed 3.2 tCO<sub>2</sub>eq per ton of steel produced.
- 5.6.3 For the production of hot-dip galvanized steel pipes (HDG), the greenhouse gas emission rate must not exceed 3.3 tCO<sub>2</sub>eq per ton of steel produced.

**Remark:** The calculation formula for greenhouse gas emissions is based on the IPCC 2006 guidelines, with emission factors referenced from the Thailand Greenhouse Gas Management Organization (Public Organization).

**Verification method**

The applicant shall submit one of the following documents:

1. A third-party certified results of greenhouse gas emission value calculation (third-party must be registered with Thailand Greenhouse Gas Management Organization)
2. Certification of Carbon Footprint Reduction.

5.7 Ink, dye or pigments used for printing on labels shall not contain heavy metals including chromium hexavalent, cadmium, mercury, and lead.

In cases where contamination with heavy metals occurs in the product due to impurities or contamination from raw materials, it must not exceed 0.01% by weight (100 milligrams per kilogram) (if relevant).

**Verification method**

The applicant shall submit test results for heavy metals in the inks, dyes, or pigments used for printing on labels, including:

1. Test results for the concentration of hexavalent chromium according to the testing method in standard ISO 3856-5 **or** other methods capable of testing for hexavalent chromium.
2. Test results for the concentration of cadmium according to the testing method in standard ISO 3856-4 **or** ASTM D3335 **or** other methods capable of testing for cadmium.
3. Test results for the concentration of mercury according to the testing method in standard ISO 3856-7 **or** ASTM D3624 **or** other methods capable of testing for mercury.



Test results for the concentration of lead according to the testing method in standard ISO 3856-1 or ASTM D3335 or other methods capable of testing for lead.

The testing must be conducted by a laboratory accredited under standard TIS 17025 or ISO/IEC 17025 or a laboratory registered in accordance with the criteria and conditions for laboratory registration (RR-203).

## 6. Testing and Certificate

### 6.1 Testing

6.1.1 The laboratory with the competence of testing and calibration by TIS 17025 Standard or ISO/IEC 17025 with the relevant scope or laboratories that with the criteria and conditions for laboratory registration (RR-203) will be accepted.

### 6.1.2 Testing result

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 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 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)

### 6.3 Method for Preparing Pipe Leachate Sample<sup>3</sup>

6.3.1 Cut a pipe sample measuring 1,000 square millimeters.

6.3.2 Immerse the sample in 1 liter of distilled water in a borosilicate glass container

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<sup>3</sup> AS/NZS 4020 Testing of products for use in contact with drinking water (Appendix H)

for 24 (+2) hours at a temperature of 20 (+2) °C.

- 6.3.3 Use the obtained water to test for heavy metals and contaminants according to the drinking water testing method outlined in AWWA: Standard Methods for the Examination of Water and Wastewater, 20th edition.