



**Green Label Product  
Unplasticized Polyvinyl Chloride  
Pipes for Drinking Water  
(TGL-103-15)**

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## TGL-103-15

### Unplasticized Polyvinyl Chloride Pipes for Drinking Water

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#### 1. Background

Unplasticised PVC pipe for drinking water is used in both exterior and interior water supply systems for transport and distribution of water to relevant equipment. Because of its durability and longevity, unplasticised PVC pipe plays an important role in our daily life. However, chemical leachates or contamination from heavy metals in additives, pigments or inks used in the manufacture of unplasticised PVC pipe might be released during the manufacturing process, or during usage and after life management. These toxic substances can have adverse impacts on both the environment and consumers.

Green label specification of unplasticised PVC pipe for drinking water will focus on minimizing the product's environmental impact and ensuring consumer safety.

To achieve these objectives, raw materials for the production of unplasticized PVC pipe will be controlled. Any heavy metal content or heavy metal contamination in pigments and inks will be specified. Products will require symbols promoting recycling and waste segregation. This will enable and support both manufacturers and consumers to participate on environmental impact reduction.

#### 2. Scope

These specifications will be applied to rigid polyvinylchloride pipe that conforms with Thai Industrial Standard number TIS.17<sup>1</sup> only.

#### 3. Definitions

Unplasticised polyvinyl chloride pipe for drinking water means pipe made from polyvinyl chloride without plasticizer.

#### 4. General specification

4.1. The product must be certified by Thai Industrial Standard for unplasticised PVC pipe for drinking water no. TIS. 17.

#### **Verification method**

The applicant shall submit the relevant Thai Industrial Standard no.TIS.17 certificate.”

<sup>1</sup>TIS17 PVC pipe for drinking water

4.2. Manufacturing process, transportation and industrial waste management must comply with the related Laws and Regulations, or the factory must be certified ISO14001<sup>2</sup>.

#### **Verification method**

The applicant must submit one of the following;

1. Permit or evidence of compliance of the manufacturing process, transportation and waste management with related Laws and Regulations.
2. ISO14001 Environmental management system certificate.

### **5. Environmental requirements**

5.1. PVC resin used as a raw material for the production of the unplasticised PVC pipe for drinking water must comply with the following;<sup>3</sup>

5.1.1.1. Its residual vinyl chloride monomer (VCM) must not exceed 1 mg/kg.

5.1.1.2. Clean technology manufacturing processes must be implemented wherein;

- 1) Chlorine shall not be sourced from production plants using graphite anodes, mercury cells or asbestos diaphragms.
- 2) VCM shall be sourced from non-mercury production processes.

#### **Verification method**

The applicant must submit the following documents provided by the relevant PVC resin manufacturers:

1. Declaration letter or laboratory test result for compliance verification of vinylchloride monomer as defined in requirement no. 5.1.1. where the test methods must follow ASTM D3749<sup>4</sup> or ISO 6401<sup>5</sup>
2. Declaration letter stating that the manufacturing process meets the special requirements defined in 5.1.2

<sup>2</sup> ISO 14001: Environmental management System.

<sup>3</sup> Green Star PVC Credit, Australia, 2013.

<sup>4</sup> ASTM D 3749: Standard Test Method for Residual Vinyl Chloride Monomer in Poly (Vinyl Chloride) Resins by Gas Chromatographic Headspace Technique.

<sup>5</sup> ISO 6401: Plastics - Poly (vinyl chloride) -Determination of residual vinyl chloride monomer -- Gas-chromatographic method.

5.2. One of the following phrases must be illustrated on the product, “รีไซเคิลได้ห้ามเผา” or “Recyclable/do not burn”

**Verification method**

The applicant must submit a declaration letter and other evidence e.g. product sample or pictures to verify that the phrase specified in special requirement no.5.2 is clearly illustrated on the product.

5.3 The product must not contain heavy metals and compounds of heavy metals e.g. cadmium, mercury, lead and chromium hexavalent.

Note: In case of impurity and contamination of raw material, allowed content of heavy metal contamination i.e. lead, mercury, hexavalent chromium will not exceed 0.1% by weight (1,000 mg/kg) and the allowed content of cadmium will not exceed 0.01% by weight (100 mg/kg).

**Verification method**

The applicant shall submit test results of cadmium, mercury, lead and hexavalent chromium where the test method followed is IEC62321-3-16<sup>6</sup> or IEC 62321-4<sup>7</sup> or IEC 62321-5<sup>8</sup> or other comparable test method whose accuracy is confirmed based on unequivocal verification in the scientific literature.

**6. Testing and Certification**

6.1. Testing

6.1.1.1. The laboratory shall be operated by the government or under governmental control as defined by clause 5 of the Industrial Standard Act B.E. 2511 (and its addenda) or certified by TIS. 17025 or ISO 17025.

6.1.1.2. Test results

6.1.1.3. Shall be results of the testing methods defined in this document.

6.1.1.4. If “comparable test methods” are applied, the following documents shall be submitted with the test results;

1) Declaration letter from the laboratory verifying that the test methods are comparable to the methods defined in this document.

2) Method validation documents which enable unequivocal scientific verification that the testing methods and requirements defined in this document have been met.

<sup>6</sup> IEC 62321-3-1: Determination of certain substances in electrotechnical products - Part 3-1: Screening - Lead, mercury, cadmium, total chromium and total bromine using X-ray fluorescence spectrometry.

<sup>7</sup> IEC 62321-4: Determination of certain substances in electrotechnical products - Part 4: Mercury in polymers, metals and electronics by CV-AAS, CVAFS, ICP-OES and ICP-MS.

<sup>8</sup> IEC 62321-5: Determination of certain substances in electrotechnical products - Part 5: Cadmium, lead and chromium in polymers and electronics and cadmium and lead in metals by AAS, AFS, ICP-OES and ICP-MS.

- 6.2. Declaration letter to verify compliance with Green label specification
  - 6.2.1.1. Shall have been issued no more than 1 year following the application date.
  - 6.2.1.2. Shall be signed by the authorized directors and have the company seal affixed (if relevant).