

Cement Roofing Tiles

1. Rationale

Roofing tiles are important materials in the construction of buildings and houses. With the present forecast of a strong economy, the real estate sector is expanding to keep up with consumer demands. As a result, the demand for roofing tiles has also increased. The production of roofing tiles requires many raw materials such as concrete, soil, asbestos, and sand, resulting in the depletion of natural resources. Furthermore, some raw materials such as asbestos is harmful to human health and causes diseases such as lung cancer, and pleura and peritoneum cancer.

In addition, paints used on roofing tiles can be hazardous to workers and consumers if such paints contain heavy metals such as Lead, Mercury, and Cadmium. These metals accumulate in the human body if inhaled or exposed via direct contact and is harmful to human health.

As a result, awarding the Green Label to cement roofing tiles with the following characteristics can help Thailand efficiently use natural resources as well as decrease social and environmental impacts.

2. Category Definitions

The term '*cement roofing tiles*' here includes only cement roofing tiles with a thickness of not more than 8 millimeters.

3. Definitions

The term '*cement roofing tiles*' refers to products made from cement, water, and other fibers that are in sheets and used for roofing

The term '*fiber*' refers to organic fibers derived from plants such as coconuts, sisal hemp, and/or synthetic inorganic fibers that are clean and without sugar and/or asbestos.

4. General Requirements

4.1 Fibre-cement profile sheets must be certified to the Thai Industrial Standard for Fibre-cement profile sheets, TIS 1407. For fibre-cement flat sheets, the quality of the product must be in accordance with the ISO 9125 standard, except for no. 3.3.3.3 Frost resistance test and 3.3.3.5 Warm water.

4.2 Production, transportation, and waste disposal must be in accordance with all applicable government acts and regulations.

5. Product Specific Requirements

5.1 The product must not comprise of asbestos.

5.2 Toxic substances released during construction and use must not exceed the standards specified in the following table:

Toxic Substances	Standard (Milligrams per cubic deci-meters)
Arsenic	0.05
Cadmium	0.005
Chromium	0.05
Lead	0.05
Mercury	0.001
Cyanide	0.1

5.3 The product must have a solar reflectance value of no less than 0.45 (45 percent) in the near infrared (NIR) range (wavelengths between 780 – 2500 nano-meters) and a margin of error of not more than 0.005 (0.5 percent).

6. Testing Methods

6.1 The manufacturer shall submit papers permitting the use of symbols indicating compliance of the product's Industrial Standard or submit results of tests verifying the product characteristics that are in accordance with the Industrial Standards for that product or submit results of tests that are in accordance with international standards or recognized national standards.

6.2 The manufacturer shall submit documents certifying that the raw materials used in the production process do not contain asbestos, signed by the company's Managing Director or other authorities within the company.

6.3 The manufacturer shall submit test results indicating compliance with requirement no. 5.2 using testing procedures specified in the Thai Industrial Standard for Asbestos-cement roof tile acrylic paints, TIS 1097-2535.

6.4 The manufacturer shall submit test results indicating the solar reflectance value for tests that are in accordance with the ASTM E903-82 Standard Test Method for Solar Absorbance, Reflectance, and Transmittance of Materials Using Integrating Spheres.