# GREEN CHOICE PHILIPPINES

NELP-GCP-PRP 2010003
**CERAMIC TILE**

## I. ENVIRONMENTAL SCENARIO

Ceramic tile is a common building and construction material and is generally used for covering floors, walls and can also be used as roofing material. It is classified as glazed and unglazed tiles. Major raw materials are clay, feldspar and silica which are locally available. The manufacture of ceramic tiles involves milling of raw materials, pressing or tile forming, glazing and firing of raw tiles.

Ceramic tile manufacturing is a capital and energy intensive process, relying on bunker, liquefied petroleum gas (LPG) and electricity as primary sources of thermal energy. Energy cost is 50% of the total ceramic tiles manufacturing cost in the Philippines, therefore, one of the critical success factors for a ceramic tile manufacturer to survive is to reduce the energy cost by energy saving and using alternative energy such as rice husk for gasifier. Both the raw material cost and solid waste are reduced by using silica obtained as waste from rice husk fired gasifier and grog from waste broken tiles as replacement to body materials.

The potential for climate change as a result of increased atmospheric levels of greenhouse gases is a major issue concerning the ceramic tile industry. Greenhouse gases are produced directly from the burning of fossil fuels and indirectly from the generation of electricity used. Among the greenhouse gases, $CO_2$ emission from the ceramic tile industry is significant. An estimate of around 450 kg of $CO_2$ is produced for each ton of fired ceramic tiles. In the Philippines, 2008 data from Ceramic Tile Manufacturers Association (CTMA) shows that the total ceramic tile production was 19 million square meters with a per capita consumption of 0.378 square meter. As such, the local ceramic tile industry produced an estimate of 120,000 tons of $CO_2$ in the same year.

Though, efforts have been made to improve the production process and resources efficient through technologies and innovations, much has still need to be done among the ceramic tile industry to improve its energy efficiency and environmental performance practices specifically on $CO_2$ emission reduction.

## II. DEFINITION OF TERMS

1. Ceramic tile is a thin slab made from clay and/or other inorganic raw materials, generally used as covering for floor and walls, usually shaped by extruding or pressing at room temperature but may be formed by other processes, then dried and subsequently fired at temperatures sufficient to develop the required properties.

2. Ceramic glaze is a mixture of inorganic materials containing silica (glass former) as the major component; other components are fluxes (sodium oxide, potassium oxide, calcium oxide), opacifiers (zirconium dioxide, titanium dioxide) and colorants (copper oxide, cobalt oxide). Glaze can be applied in a variety of ways such as spraying and dipping. It melts at a particular temperature forming a glassy coating on ceramic surface and provides the fired product with technical and aesthetic properties such impermeability, cleanability, gloss, color, surface texture and chemical and mechanical resistance.

3. Dry-pressed tiles (Type B) are tiles formed from a finely milled body mixture and shaped in moulds at high pressure.

4. Extruded tiles (Type A) are tiles whose body is shaped in the plastic state in an extruder; the column obtained being cut into tiles of pre-determined dimension.

5. Firing involves subjecting a ceramic piece to high temperature during which a series of reactions takes place in the piece, providing the desired final properties.

6. Glazed tiles are tiles fired with glaze surface finish.

7. Global warming is the progressive gradual rise of the earth's surface temperature thought to be caused by the greenhouse effect and is responsible for changes in global climate patterns. It is an increase in the near surface temperature of the Earth. Global warming has occurred in the distant past as the result of natural influences, but the term is most often used to refer to the warming predicted to occur as a result of increased emissions of greenhouse gases.

8. Greenhouse gases (GHG) include substances such as carbon dioxide, methane and hypo-oxidation nitrogen, which cause the destruction of the ozonosphere. The $CO_2$ has the biggest influence on the greenhouse effect and it is discharged in large quantities with combustion of fossil fuel like oil and coal.

9. Grog is a ceramic raw material that has been produced by firing selected fire clays to high temperature before grinding and screening to desired particle sizes.

10. Hazardous material can be defined as any material that, because of its quantity, concentration, or physical or chemical characteristics, may pose a real hazard to human health or the environment.

11. Hazardous chemical is a chemical for which there is statistically significant evidence that acute or chronic health effects may occur in exposed human.

12. Unglazed tiles are tiles fired to a rigid finish without glaze surface coating.

13. Renewable Energy is energy generated from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are renewable or naturally replenished.

## III. SCOPE

These criteria shall apply to ceramic tile.

## IV. PRODUCT CRITERIA

1. The properties of the product shall comply with the Philippine National Standards, PNS ISO 13006/2007 Specification for ceramic tiles.

2. The production process of the product shall meet the requirements of all applicable environmental laws and regulations.

   2.1 Quarrying Permit for Raw Materials
   - The manufacturer shall comply with quarrying laws for raw materials.
   - The manufacturer shall submit a sustainable plan for sources of raw materials.
   - If the manufacturer is importing the raw materials, the manufacturer shall submit the copy of all relevant permits and the sustainable plan for sourcing of raw materials of the supplier/s.

   2.2 Clean Water Act (R.A. 9275)
   In addition to the requirements needed for R.A. 9275, the manufacturer shall provide information on the following:
   - Volume of water consumption and source of water
   - Volume of water recycled or reuse
   - Volume of waste water
   - Capacity of available storage / treatment facilities for waste water
   - Frequency of waste water treatment and / or discharge

   2.3 Clean Air Act (R.A. 8749)
   In addition to the requirements needed for R.A. 8749, the manufacturer shall provide information on the plan and means to reduce air pollutants such as suspended particulate matter, $CO_2$, etc. The information shall include the target reduction of the pollutant.

   2.4 Philippine Inventory of Chemicals and Chemical Substances (PICCS)
   In addition to the requirements needed for PICCS, the manufacturer shall submit information on the chemical name, brand and assay / composition of the chemicals and chemical substances used in manufacturing and water treatment operations. The information shall also include the name and address of the supplier.

2.5 Toxic Substances and Hazardous and Nuclear Wastes Control Act (R.A. 6969)

In addition to the requirements needed for R.A. 6969, the manufacturer shall provide information on the following:

- Quantity and type/ kind of waste produced
- Quantity or percentage and type/ kind of waste reduced due to recycling or reuse in production related operations

2.6 Philippine Ecological Solid Waste Management Act of 2000 (R.A. 9003)

In addition to the requirements needed for R.A. 9003, the manufacturer shall provide information on the quantity or percentage and type/ kind of solid waste reduced due to recycling or reuse as raw materials or other production related activities.

2.7 Revised Fire Code of the Philippines (RA 9514), The National Building Code of the Philippines (RA 6541) or its equivalent if the product is being manufactured in other country/ies.

Fire and manufacturing safety requirements for ceramic tile manufacturing plant must comply with RA 9514 and National Building Code of the Philippines (RA 6541). In addition to the requirements needed in this section, the manufacturer shall:

- Submit a plan and target on training of plant's personnel on safety, good manufacturing practices, and upgrading of manufacturing skills
- Provide regular training of plant's personnel on safety, good manufacturing practices, and upgrading of manufacturing skills

3. The manufacturer shall reduce the greenhouse gases or carbon dioxide emission of their product by 10% per unit of output through technology improvement/development such as but not limited to the use of renewable energy and carbon dioxide sequestration program(s) like tree planting. In this connection, the manufacturer shall:

- Submit a plan and target for use of renewable energy.
- Submit a plan and target for $CO_2$ sequestration by tree planting
- Implement regular monitoring of greenhouse gas emission.

## V. EVALUATION AND VALIDATION METHODS

Evaluation and validation methods include monitoring/ inspection, testing and license / permits.

1. Regarding criterion number one (1), the applicant shall submit a certified copy of the PS license or its equivalent of the products which include among others all the information such as the address of the licensee, and the brands covered by the license.

2. Regarding criterion number two (2), the applicant shall submit an environmental compliance certificates from the Department of Environment and Natural Resources and other relevant policies and regulations from concerned government agencies. Specifically, the manufacturer shall comply with the provisions of the laws on Clean Air Act (R.A. 8749), Clean Water Act (R.A. 9275), Philippine Inventory of Chemicals and Chemical Substances, Toxic Substances and Hazardous and Nuclear Wastes Control Act (R.A. 6969), Ecological Solid Waste Management Act (R.A. 9003), and Pollution Control Law (PD 984), Revised Fire Code of the Philippines (RA 9514), The National Building Code of the Philippines (RA 6541) and all other legal and regulatory requirements. The manufacturer shall comply with the additional criteria entered in Section IV.

3. Regarding criterion number three (3), the manufacturer shall submit its program on greenhouse gases or $CO_2$ reduction and/or sequestration which shall include plan and target for use of renewable energy and tree planting and the target reduction of greenhouse gas emission from fuel. The program shall ensure reduction of $CO_2$ per unit of output, which shall be evaluated and approved by the National Ecolabelling Programme (NELP). To ensure its effectiveness, the applicant shall implement regular monitoring of greenhouse gas emission. The applicant shall also implement a sustainable development program, where the manufacturer shall promote reduction of energy consumption through technology improvement such as the use of biomass or renewable energy and implement other environmental programs.

## VI. EFFECTIVITY

This interim product criteria shall take effect for three (3) *years* from the date of its approval, and subject to change or withdrawal by the *Green Choice Philippines – Ecolabelling Programme Board*, if necessary at any period of time.

## VII. REFERENCES

Ceramic Tile Manufacturing Association (CTMA)

Philippine National Standards, PNS ISO 13006:2007