



**Green Label Product  
(Battery Electric Vehicles : BEVs)  
(TGL-129-24)**

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## **1. Background**

Vehicles are essential for transportation and the movement of goods. Currently, various types of vehicles are used, depending on the fuel type used for propulsion. Although vehicles provide convenience in travel, they still have environmental impacts from the combustion of fuel in their engines. When the engine burns fuel to propel the vehicle, it releases exhaust gases, including carbon monoxide, hydrocarbons, nitrogen oxides, black smoke, and fine particulate matter. As a result, there has been development of new types of vehicles that use electric power for propulsion instead of fuel combustion, known as electric vehicles (EVs). Although electric vehicles reduce exhaust emissions during operation, the rate of electricity consumption must also consider the source of electricity production, as electricity generation often emits significant quantities of carbon dioxide. Additionally, the production of spare parts and components for vehicles also has environmental impacts. This includes the manufacturing of spare parts, lubricants, refrigerants, filters, batteries, plastic components, tires, and other parts that deteriorate or reach the end of their useful life. If these parts and components are not properly managed, they may also have negative effects on the environment.

Therefore, the development of green label requirements for electric vehicles focuses on considering the environmental impact of the product and its contribution to climate change, as well as consumer safety. The regulations stipulate the use of refrigerants in the vehicle's cooling system, ensuring that production processes do not involve substances that contribute to climate change. The regulations also define the quantity of carbon dioxide emissions from the vehicle to the atmosphere. Furthermore, the management of the disposal of vehicle components and spare parts must include guidelines for proper sorting and disposal, controlling hazardous substance contamination, and requiring clear labeling of tire and plastic types to facilitate easier sorting after use.

## **2. Scope**

This criteria covers battery Electric Vehicles (BEVs) in the M1 (passenger cars) and N1 (light commercial vehicles) categories only.

### 3. Definitions

- 3.1 Passenger vehicles (M<sub>1</sub>):** A passenger vehicle with four or more wheels, designed by the manufacturer for passenger transport, with a seating capacity of up to 9 occupants, including the driver.
- 3.2 Trucks (N<sub>1</sub>):** A four-wheel or more vehicle designed by the manufacturer for freight purposes, with a maximum gross vehicle weight of 3,500 kilograms. This definition includes vehicles designed with integrated passenger and cargo areas. The vehicle must meet the conditions specified in Annex 1 of the Department of Land Transport's announcement on "Specifications, Characteristics, Criteria, Methods, and Conditions for Certifying Electric Power Generation Systems in Vehicles B.E. 2022.
- 3.3 Battery Electric Vehicle (BEVs):** An electric vehicle that is powered solely by an electric motor to drive the vehicle, using only the electrical energy stored in a battery, with no other engines in the vehicle.
- 3.4 Global Warming Potential (GWP):** The greenhouse gas potential for global warming, which depends on the efficiency of heat radiation and the lifespan of the gas in the atmosphere, is expressed relative to the heat radiation of carbon dioxide.
- 3.5 Ozone Depletion Potential (ODP):** The value representing the potential of a chemical to deplete ozone in the atmosphere, which is the ratio of the chemical's ozone depletion potential compared to that of CFC-11.
- 3.6 Letter for Declaration of Compliance:** A certification document issued by the applicant or manufacturer confirming compliance with the special requirements specified in the Green Label criteria for the product being applied for.
- 3.7 Certificate:** A document issued by a Certification Body accredited by the Office of the National Standardization Council (ONSC) or an Accreditation Body under the mutual recognition agreements of the International Accreditation Forum (IAF).
- 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 according to the industrial product standards for M and N category vehicles: Specific requirements for electric drive systems, under standard number TIS 3026 **or** UN Regulation No. 100, **or** have passed testing according to the desired criteria in the industrial product standards, TIS 3026 **or** UN Regulation No. 100.

**Verification method**

The applicants shall submit a license to display the Industrial Product Standard Mark, Standard Number TIS 3026, **or** test results according to the Industrial Product Standard, Standard Number TIS 3026, **or** test results according to UN Regulation No. 100-02 or higher.

- 4.2 The product must comply with the laws on motor vehicles or land transportation in effect at that time.

**Verification method**

The applicants shall submit evidence or a certificate from the Department of Land Transport showing that the vehicle meets all the required qualifications and is eligible for registration (vehicle inspection record issued by the Department of Land Transport).

- 4.3 The manufacturing factory must be certified for a quality management system according to ISO 9001<sup>1</sup>, or a quality management system for the automotive industry and automotive parts according to ISO/TS 16949<sup>2</sup> or IATF 16949<sup>3</sup> standards.

**Verification method**

The applicant shall submit evidence of certification for the ISO 9001 quality management system or the quality management system for the automotive industry and automotive parts according to ISO/TS 16949 or IATF 16949.

- 4.4 Manufacturing, transportation and post-industrial waste disposal shall comply with national laws and regulations or the manufacturer shall be accredited by ISO14001<sup>4</sup>

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<sup>1</sup> ISO 9001: Quality Management System

<sup>2</sup> ISO/TS 16949: Quality Management System for the Automotive Industry and Automotive Parts

<sup>3</sup> IATF 16949: Quality Management System for the Automotive Industry and Automotive Parts

<sup>4</sup> ISO 14001: Environmental Management

**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

**5. Environmental Requirement**

5.1 The color used for the product must comply with the following criteria:

- 5.1.1 The quantity of heavy metals or heavy metal compounds, including cadmium, mercury, lead, and hexavalent chromium, resulting from impurities and contamination, must comply with the criteria specified in Table 1.

**Table 1:** The permissible quantity of heavy metals or heavy metal compounds allowed as contaminants in the paint used for products.

<b>Metals</b>	<b>Cd</b>	<b>Hg</b>	<b>Pb</b>	<b>Cr<sup>6+</sup> *</b>
quantity (mg/kg)	≤100	≤1000	≤1000	≤1000

**Remark:** 1) \*If the total chromium (Cr) content is less than or equal to 1000 mg/kg, it shall be considered in compliance with the criteria for hexavalent chromium (Cr6+).  
2) The unit mg/kg = ppm.

**Verification method**

The applicant shall submit test results for the concentrations of cadmium, mercury, lead, and hexavalent chromium according to the following specified testing methods.

1. Cadmium concentration tested according to the testing methods specified in ISO 3856-4<sup>5</sup>, **or** ASTM D 3335<sup>6</sup>, USEPA 3052<sup>7</sup>, **or** IEC 62321<sup>8</sup>, **or** any other method capable of determining cadmium content.
2. Mercury concentration tested according to the testing methods specified in ISO 3856-7<sup>9</sup>, **or** ASTM D 3624<sup>10</sup>, **or** USEPA 3052, **or** IEC 62321, **or** any other method capable of determining mercury content.

<sup>5</sup> ISO 3856-4: Paints and varnishes - Determination of soluble metal content - Part 4: Determination of cadmium content.

<sup>6</sup> ASTM D 3335: Standard Test Method for Low Concentrations of Lead, Cadmium, and Cobalt in Paint.

<sup>7</sup> USEPA 3052: Microwave Assisted Acid Digestion of Siliceous and Organically Based Matrices

<sup>8</sup> IEC 62321: Electro technical products - Determination of levels of six regulated substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominateddiphenyl

<sup>9</sup> ISO 3856-7: Paints and varnishes - Determination of soluble metal content - Part 7: Determination of mercury content of the pigment portion of the paint and of the liquid portion of water-dilatable paints.

<sup>10</sup> ASTM D 3624: Standard Test Method for Low Concentrations of Mercury in Paint.

3. Lead concentration tested according to the testing methods specified in ISO 3856-1<sup>11</sup>, **or** ASTM D 3335, **or** USEPA 3052, **or** IEC 62321, **or** any other method capable of determining lead content.
4. The quantity of hexavalent chromium is tested according to the testing methods specified in the standards ISO 3856-5<sup>12</sup>, **or** USEPA 3060A & 7196A<sup>13</sup>, **or** IEC 62321, **or** other testing methods capable of determining the quantity of hexavalent chromium.

5.1.2 There must be no compounds of arsenic, antimony, and triphenyl tins tributyl tins (TBT), or tributyltin oxide (TBTO) in the paint used in the manufacturing process of the product.

**Verification method**

The applicant shall submit a certification letter stating that no components of the compound are used, as specified in Special Requirement Clause 5.1.2, in the manufacturing process of the product.

5.2 The quantity of lead in aluminum-containing components used in the product, resulting from impurities and contamination, must not exceed 0.4% (4000 mg/kg)<sup>14</sup> by the weight of the homogeneous material.

**Remark:** 1) The unit mg/kg = ppm (parts per million).

**Verification method**

The applicant shall submit evidence of a production management system free from prohibited substances, in accordance with Special Requirement Clause 5.2.

5.3 The brake pads used in the product must not contain asbestos fibers.

**Verification method**

The applicant shall submit evidence of a production management system free from prohibited substances, in accordance with Special Requirement Clause 5.3.

<sup>11</sup> ISO 3856-1: Paints and varnishes - Determination of soluble metal content -Part 1: Determination of lead content.

<sup>12</sup> ISO 3856-5: Paints and varnishes - Determination of soluble metal content - Part 5: Determination of chromium hexavalent content of the pigment portion of the liquid paint or the paint in powder.

<sup>13</sup> USEPA 3060A & 7196 A: Hexavalent Chromium Testing Method & Procedure

<sup>14</sup> Directive 2000/53/EC of European Parliament and of the council of 18 Sep. 2000 on end of life vehicles.

- 5.4 The refrigerant used in the air conditioning system must have an Ozone Depletion Potential (ODP) of 0 and a Global Warming Potential (GWP100a) not exceeding 1,300<sup>15</sup> KgCO<sub>2</sub>eq.

**Verification method**

The applicant shall submit a certification letter stating that the refrigerant used in the air conditioning system complies with Special Requirement Clause 5.4 (as referenced by the Thailand Greenhouse Gas Management Organization (Public Organization)).

- 5.5 There is a user manual that provides instructions on the disposal of waste or used materials, such as lubricating oil, brake fluid, coolant, and high-voltage batteries, which may be provided as separate specific documents.

**Verification method**

The applicant shall submit a user manual that provides instructions on the disposal of waste or used materials, in accordance with Special Requirement Clause 5.5.

- 5.6 Parts and elastomer materials weighing more than 200 grams must be labeled with symbols indicating the type of rubber and elastomer in accordance with ISO 1629<sup>16</sup> standards, except for tires.

**Verification method**

The applicant shall submit a certification letter stating that the rubber parts and materials display symbols indicating the type, in accordance with Special Requirement Clause 5.6, along with supporting evidence, such as photographs of sample rubber parts.

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<sup>15</sup> [https://ar5-syr.ipcc.ch/ipcc/ipcc/resources/pdf/IPCC\\_SynthesisReport.pdf](https://ar5-syr.ipcc.ch/ipcc/ipcc/resources/pdf/IPCC_SynthesisReport.pdf)

<sup>16</sup> ISO 1629: Rubber and latices –Nomenclature.

5.7 Plastic components used in the product must comply with the following criteria:

5.7.1 The quantity of heavy metals or heavy metal compounds, including cadmium, mercury, lead, and hexavalent chromium, resulting from impurities and contamination, must comply with the specified criteria as shown in Table 2.

**Table 2:** The permissible quantity of heavy metals or heavy metal compounds allowed as contaminants in the paint used for products.

Metals	Cd	Hg	Pb	Cr <sup>6+*</sup>
quantity (mg/kg)	≤100	≤1000	≤1000	≤1000

**Remark:** 1) \*If the total chromium (Cr) content is less than or equal to 1000 mg/kg, it shall be considered in compliance with the criteria for hexavalent chromium (Cr6+).  
 2) The unit mg/kg = ppm.

**Verification method**  
 The applicant shall submit evidence of a production management system free from prohibited substances, in accordance with Special Requirement Clause 5.7.1

5.7.2 Plastic components weighing more than 100 grams must display a symbol indicating the type of plastic in accordance with the Thai standard TIS 1310<sup>17</sup>, or include abbreviations indicating the type of plastic according to ISO 1043<sup>18</sup> or ISO 11469<sup>19</sup> standards.

**Verification method**  
 The applicant shall submit a certification letter stating that the plastic components display a symbol indicating the type of plastic in accordance with Special Requirement Clause 5.7.2, along with supporting evidence, such as photographs of sample plastic components.

<sup>17</sup> TIS 1310: Symbols for Recycled Plastics.

<sup>18</sup> ISO 1043: Plastics -Symbols and abbreviated terms - Part 1: Basic polymers and their special characteristics.

<sup>19</sup> ISO 11469: Plastics - Generic identification and marking of plastics products.

5.8 The electricity consumption rate must not exceed the limits specified in Table 3.

**Table 3:** Electricity consumption rate

Empty vehicle mass (kg)	Electricity consumption rate (Watt-hours per kilometer)
$0 < CM \leq 1,090$	130
$1,090 < CM \leq 1,430$	145
$1,430 < CM \leq 1,540$	151
$1,540 < CM \leq 1,660$	158
$1,660 < CM \leq 1,770$	165
$1,770 < CM \leq 1,880$	172
$1,880 < CM \leq 2,000$	180
$2,000 < CM \leq 2,110$	188
$2,110 < CM \leq 2,280$	200
$2,280 < CM \leq 2,510$	217
$2,510 < CM$	228

**Verification method**

The applicant shall submit a certification letter stating compliance with the requirements specified in Special Requirement Clause 5.8, along with supporting evidence of the electricity consumption rate **or** an eco-sticker in accordance with Special Requirement Clause 5.8.

5.9 There must be management of high-voltage batteries (High Voltage) covering the following issues:

1. There is a method for storing the battery.
2. There is a process for battery take-back and a procedure for managing batteries after their useful life has expired or batteries that are degraded and no longer suitable for use.

**Verification method**

The applicant shall submit documents/evidence in accordance with the requirements specified in Special Requirement Clause 5.9.

## 6. Testing and certificate

### 6.1 Testing

6.1.1 The test shall be performed in laboratory as follows;

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

6.1.1.2 An organization responsible for inspecting production to ensure compliance with the prototype as outlined in the Agreement concerning the Adoption of Uniform Technical Prescriptions for Wheeled Vehicles, Equipment, and Parts which can be fitted and/or be used on Wheeled Vehicles, and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these Prescriptions (1958 Agreement) under the United Nations Economic Commission for Europe (UNECE).

### 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

**Except** Results of the type approval tests as general requirements in clause 4.1 does not specify the validity period of the test results.

### 6.2 Declaration letter to verify compliance with Green label requirements

6.2.1 Shall have been issued no more than 1 year following the application date.

6.2.2 Shall be signed by the authorized directors and have the company seal affixed (if relevant)

7. In the next review of the Green Label requirements for electric vehicle products, the topics of greenhouse gas emissions and the battery pathway should be reconsidered.