

Product-Category Rules (PCR)
for Preparing an Environmental Product
Declaration (EPD) for
Lead Acid Rechargeable Battery
PCR 2015:1.0

TAIWAN YUASA BATTERY CO., LTD.

and

Taiwan Battery Association (TBA)

Version 1.0
2015-11-30

This document complies with the relevant requirements of the International EPD®SYSTEM, as well as the management requirements of the Environment and Development Foundation (www.edf.org.tw)

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1. General Information

This document is to be used as the product category rules (PCR) for the manufacturing of lead acid rechargeable batteries (“product”) globally. This PCR covers products with the following Harmonized System (HS) Codes: 8507.20.00.00-8. The requirements specified in this PCR are intended to be used for EPDs certified in accordance with the ISO 14025 standard. This document shall be valid until November 30, 2018.

This PCR was first jointly drafted by the TAIWAN YUASA BATTERY CO., LTD. and Taiwan Battery Association (TBA). Representatives from major Taiwanese manufacturers of similar products and stakeholders were invited by the Taiwan Battery Association to the open consultation meeting held on November 4, 2015, to participate in the discussion and review of this PCR. The Environment and Development Foundation (EDF) subsequently reviewed and approved this PCR.

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2. Company and product description

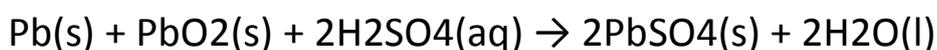
The EPD shall include information about the manufacturing company/organization. The information may include manufacturing process related information, and environmental related information, such as the environmental management system information. The information may also include special issues which the company/organization would like to emphasize, such as the products meeting certain environmental criteria, or environmental safety and health related information.

This PCR covers the whole life stages of the product, and is applicable to both Business-to-Business (B2B) and Business-to-Consumer/Customer (B2C) communications. During the inventory of product related environmental impacts, the scope of inventory shall cover both the product and its packaging and accessories.

2.1 Product group function

The lead acid rechargeable batteries find their main applications in electricity/energy storage systems (e.g., for renewable energy system, fire safety system, uninterruptible power system, communications and electronic test equipment, and medical equipment), motor vehicles or other related products.

The lead acid rechargeable battery consists of a positive plate (PbO₂) and a negative plate (lead), with sulfuric acid serving as the electrolyte. The lead acid rechargeable battery works through the following chemical reaction:



One cell of the lead-acid rechargeable battery has a nominal voltage of 2 volts. Batteries with different voltages can be configured through connecting multiple cells in series depending on different applications.

2.2 Product components/compositions

The product's components include but not limited to the following major and secondary components:

Major/main components:

- **Internal structure:** Perform the most important function of power storage, include active materials (positive and negative plates), separator and electrolyte, and lead-based components.
- **External structure:** Basic components which form the body of the battery, include battery cell casing, terminals and screws. Other components vary depending on applications, for example:
 - Valve regulated battery: sealing agent, safety valve, filters, wires
 - Motorcycle battery: aluminum foil paper seal, electrolyte container, filter, exhaust tube, sealing cap, wires
 - Automotive battery: aluminum foil paper seal, filter, indicator
- **Packaging materials:** e.g., interior packaging box, exterior box, cushioning material, plastic film, pallets.

Minor/secondary components: Vary according to product features or customers' needs and selections, e.g. terminal protective caps, stickers, user manuals.

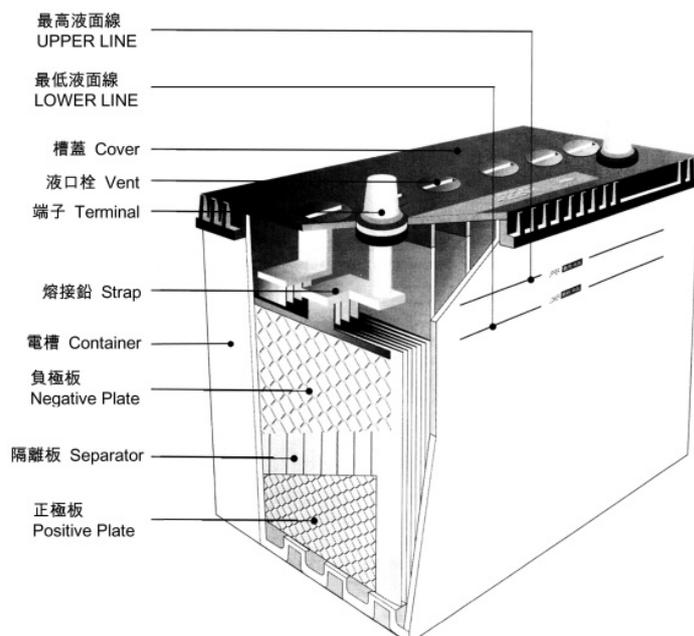


Figure 1 Schematic Diagram of a typical lead acid rechargeable battery

2.3 Product technical description

For a single product, the product technical description part of the EPD may include but not limited to the following information:

- Casing material: e.g., ABS, PP, PE.
- Capacity (C): ampere-hour (Ah).
- Nominal voltage: e.g., 12V.
- Charging voltage: e.g., 14.4V.
- Maximum charging current: e.g., 3 amps.
- Maximum discharging current: e.g., 100 amps discharge time shall not exceed 5 seconds.
- Discharge Cutoff Voltage: e.g., 6V.
- Charge/Discharge/Storage Temperature: e.g., -15 °C ~ 60 °C.
- Weight: excluding accessories and packaging materials.
- Dimensions: e.g., length, width, height (L x W x H).

3. List of materials and chemical substances

The contents of the following materials and substances in the product shall be declared:

- Excluding accessories and packaging materials, all materials of the product with weight ratio (material weight/product weight) $\geq 2\%$;
- All substances/materials in the product restricted/regulated by legal and customer requirements; and
- The materials in the main components regulated by EU's Battery Directive (2006/66/EC).

The declaration of materials regulated by the Battery Directive (2006/66/EC), may only be made when appropriate evidences are available (for example, MSDSs or test reports from accredited laboratories/testing facilities). The following organizations may provide accreditation for testing facilities: Taiwan Accreditation Foundation (TAF), (Asia Pacific Laboratory Accreditation Cooperation (APLAC), International Laboratory Accreditation Cooperation (ILAC) or ILAC Mutual Recognition Arrangement (ILAC MRA). For definitions of testing methodology and confirmations of regulated hazardous substances based on the accredited laboratories' product testing methods, please refer to IEC 62321 Standard.

4. Declared unit

The declared unit is one (1) unit of lead acid rechargeable battery, with the indication of battery voltage and capacity. The reason for adopting this unit is that the product is sold and marketed in this unit.

5. System boundaries

The main system boundaries for the declared product system are described as follows:

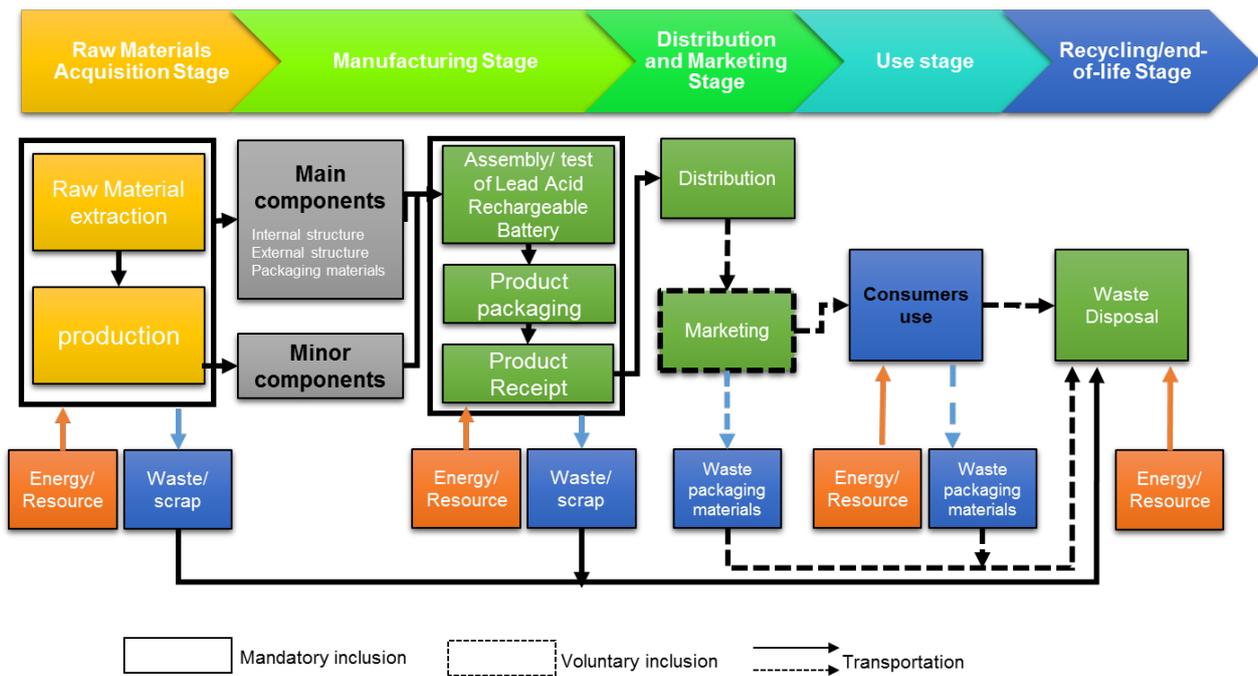


Figure 2 System boundary of the product system

As noted in Figure 2 above, in accordance with the principles of ISO 14025, the life cycle of a lead acid rechargeable battery covers five life cycle stages: raw material acquisition, product manufacturing, distribution and marketing, product use and recycling/end-of-life. The boundaries of each stage are described as follows:

Raw Materials Acquisition Stage

Environmental impacts information for product components shall be obtained through inventory of upstream suppliers' operations. The inventory process shall cover:

- Composition and weight of each component, including auxiliary material and packaging material.
- Energy and resources consumption during manufacturing of components, e.g., electricity and water consumption, and amount of coolant added.
- Information related to transportation to finished components to the product assembly plant, e.g., transportation vehicle, distances traveled and number of trips.
- Information related to waste generation and disposal during component manufacturing.
- Information on appropriate allocation rules based on component characteristics, such as production, area, volume, etc.
- Information related to material and weight of packaging materials.

The data quality requirements for the main components and other components are described in Section 9 on calculation rules and data quality requirements. Data related to the packaging materials or other components shall also be included in the EPD, but their data quality requirements are different from those of the main components.

Manufacturing Stage

The inventory for this stage shall include the processes related to the assembly, testing, packaging and warehousing of the product, and shall cover the following:

- Energy and resources consumption during manufacturing of components, e.g., electricity and water consumption, and amount of coolant added.
- Information related to waste generation and disposal during product manufacturing.

Distribution and Marketing Stage

The transportation during the distribution and marketing stage may be divided into two parts:

- **Distribution Transportation:** Transportation from the product final assembly plant to customer designated locations, logistics center or points-of-sales. The reporting of such information is mandatory. Inventory and reporting of such information shall cover: information related to transportation of finished products to customer designated locations, logistics center or points-of-sales, e.g., transport vehicles, distances traveled and number of travels.
- **Sales and Marketing Transportation:** Transportation from the end of distribution part to end user or consumer receiving the product. The reporting of such information is voluntary (optional).

Use Stage

The energy consumption during the use stage of the lead-acid rechargeable battery is calculated based on the usage scenario at the user side, with the power voltage information. The assumed usage scenarios are presented as follows:

- **Valve- regulated lead-acid rechargeable batteries**

In accordance with Section 7.3 of *JIS C 8702-1 Small-sized valve regulated lead-acid batteries—Part 1: General requirements, functional characteristics—Methods of test*, the following assumptions are adopted: Discharge current = 0.25CA, discharge time = 2 hours, Depth of Discharge (DOD) = 50%.

Battery's use stage energy consumption can be calculated as follows:

Use stage energy consumption (kWh) = lead-acid battery stored energy (Wh) x depth of discharge (%) x No. of lifetime charge/discharge cycle / 1000

While:

Lead-acid battery stored energy (Wh) = battery nominal capacity (Ah) x battery nominal voltage (V)

Depth of discharge = 50%

No. of lifetime charge/discharge cycle = 400.

- **Lead-acid rechargeable batteries for motorcycles**

In accordance with Section 7.3.6 of *CNS 3330 Small type lead storage batteries for or JIS D 5302*

Lead-acid batteries for motorcycles, the battery's use stage energy consumption can be calculated as follows:

Use stage energy consumption (kWh) = lead-acid battery stored energy (Wh) x depth of discharge (%) x No. of lifetime charge/discharge cycle / 1000

While:

- *Lead-acid battery stored energy (Wh) = battery nominal capacity (Ah) x battery nominal voltage (V)*
- *Depth of discharge (%) = discharge current (A) x discharge time (hr) / battery capacity (Ah)*
- *Nos. of lifetime charge/discharge cycle are stipulated in the CNS standards.*

For example, for battery Model BTX5 (starting battery for motorcycle), the following values are stipulated:

- *Discharge current 1A (stipulated by CNS),*
- *discharge time: one hour,*
- *depth of discharge = 25%,*
- *No. of lifetime charge/discharge cycle = 375.*

● **Lead-acid rechargeable batteries for automobiles**

In accordance with Section 7.5.5(b) of *CNS 3330 Lead-acid batteries for automobiles* or *JIS D 5302 Lead acid starter batteries*, the battery's use stage energy consumption can be calculated as follows:

Use stage energy consumption (kWh) = lead-acid battery stored energy (Wh) x depth of discharge (%) x No. of lifetime charge/discharge cycle / 1000

While:

- *Lead-acid battery stored energy (Wh) = battery nominal capacity (Ah) x battery nominal voltage (V)*
- *Depth of discharge (%) = discharge current (A) x discharge time (hr) / battery capacity (Ah)*
- *Nos. of lifetime charge/discharge cycle are stipulated in the CNS standards.*

For example, for battery Model 55D23L (lead acid battery for automobiles), the following are stipulated:

- *Discharge current: 20A (stipulated by CNS),*
- *discharge time: one hour, depth of discharge = 41.7%,*
- *No. of lifetime charge/discharge cycle = 315.*

● **Lead-acid batteries for industrial uses**

In accordance with *CNS 6038 Stationary lead-acid batteries* or *JIS C 8704-2-2 Stationary lead-acid batteries -- Part 2-2: Valve regulated types -- Requirements*, this type of batteries are used in

applications involving electromagnetic communications, electrical machinery, and emergency power supplies. Such batteries often have stationary synthetic resin casing and are charged through float charging mode. The battery's use stage energy consumption can be calculated as follows:

Use stage energy consumption (kWh) = float charging current voltage (V) x 24 (hr) x 365 (day / year) x 10 (No. of lifetime float charging cycles, year) / 1000

Recycling/end-of-life Stage

- Reporting of recycling information is mandatory in the EPD.

5.1 Specification of different boundary settings

Boundary in time

The validity period for the LCA results presented in the LCA report shall be defined.

Boundary towards nature

If the manufacturing processes are located within Taiwan, the solid waste categories as defined in Taiwan's Waste Disposal Act shall be adopted. If the processes are located in other countries, equivalent legal requirements shall be considered.

The natural boundary of the system shall describe the boundary where the materials and energy resources flow from nature into the system, and where the water and air emissions and waste are released out of the system.

Only the quantity of the disposed waste needs to be considered; landfilling process does not need to be considered. If the waste is generated through wastewater treatment or incineration process, such waste should be included into the wastewater treatment or incineration process.

Boundaries in the life cycle

The boundaries in the product life cycle are described in Figure 2. The construction of the site and infrastructure, as well as the production of manufacturing equipment and activities of site operators do not need to be included.

Boundaries towards other technical systems

Boundaries towards other technical systems describe the inputs of material and other components towards other systems, as well as outputs of materials towards other systems. For the inputs of recycled materials and energy towards the product manufacturing stage, the transportation between the recycling process and use of recycled materials shall be included in the data set. For the production of recyclable products during the manufacturing stage, the transportation towards the recycling process shall be included.

(Note: Further explanations are provided in Section 7 on open-loop recycling.)

Boundaries regarding geographical coverage

The manufacturing stage may cover manufacturing processes located on any sites around the world. For processes located in a specific region, the data used should be representative of the region. The data for the main constituents shall be the specific regional data for the region where the process takes place (see Section 9). For ease of comparison, no matter where the emissions are generated, the same environmental impact parameters should be used for life cycle impact assessment (see Section 10).

6. Cut-off rules

For any impact category, if the sum of various impacts from a specific process/activity is less than 1% of the impact equivalent in that category, such a process/activity may be neglected during the inventory analysis. Nonetheless, the accumulated impact of neglected process/activity may not exceed 5%. That is, at least 95% of the potential life cycle emissions shall be evaluated. Components and materials omitted from the LCA shall be documented.

(Note: This judgment for this “1% Rule” is based on the environment relevance assessment of material input to the system, and does not consider special and exceptional environmental impacts.)

7. Allocation rules

The main allocation rules shall be valid for the entire product system. For other secondary processes, other allocation rules may be defined; however, the use of these rules should be justified. Product-specific information should be preferentially collected in order to avoid the need for allocation. While selecting allocation rules, the following principles are recommended.

- **Multi-output:** The allocations are based on the changes in the resource consumption and pollutant emissions (for example, adopted quantity allocation for some main component, or surface allocation for some components), following the changes in the studied system’s output product or function or economical relationship.
- **Multi-input:** The allocation is based on actual relationship. For example, the manufacturing process’s emissions may be affected by the change in waste flow input.
- **Open loop recycling:** For the input of recycled materials or energy during the manufacturing stage of the product system, the transportation between the recycling process and the recycling to material use shall be included in the dataset. For the product which shall be recycled during the manufacturing stage, the transportation towards the recycling process shall be included.

Notes: Allocation may be avoided through avoidance of dividing processes, for example as described in Section 6.3 of ISO/TR 14049; or through expansion of system boundary (for example as described in Section 6.4), so that the amended system shares the same product exchanges as the original system.

8. Units

The base units and derived units of the International System of Units (SI, Système International d'unités) shall be used preferentially.

Power & energy units:

- power unit: W
- energy unit: J

Specification units:

- length unit: mm
- capacity unit: m³
- area unit: m²
- weight unit: kg

If necessary, prefixes may be used before the SI units:

10⁹ = giga, symbol "G"

10⁶ = mega, symbol "M"

10³ = kilo, symbol "k"

10⁻² = centi, symbol "c"

10⁻³ = milli, symbol "m"

10⁻⁶ = micro, symbol "μ"

10⁻⁹ = nano, symbol "n"

9. Calculation rules and data quality requirements

Data quality requirements for the raw material acquisition stage and manufacturing stage

- Generic data may be used for the acquisition, extraction, production, forming and refining of raw materials used for components of the products. Please refer to Appendix I for the common sources of generic data. The year of the data cannot be older than 1990.
- Site specific data (for example, specific data for manufacturing plant or transportation) shall be used for the manufacturing and assembly of major components. When suppliers refuse

to provide specific data, or other types of data are used when specific generic data are not available, the rationale for using such data shall be provided.

- Generic data may be used for the manufacturing of packaging materials and secondary components. Please refer to Appendix I for the common sources of generic data.
- When generic data are used, the equivalence between the chemical and/or physical process of referred systems shall be considered.
- Generic data may also be used when suppliers refuse to provide specific data, or when even if generic data are used in place of specific data, there is only minor impact to the results. The general rule is that if generic data are used in place of specific data, their combined contribution for all life cycle stages shall not be greater than 20% of total impacts for each impact category. However, there may be certain exception to specific products, and such exceptions shall be explained.
- The data shall be representative for the average of a specific year.
- The electricity mix for the manufacturing stage should be site specific data. If site specific data cannot be obtained, the official electricity mix for the country where the site is located may be used as approximate value. The electricity mix should be documented.
- For the definition of hazardous waste, the definition as defined in Taiwan's Waste Disposal Act shall be used for sites located in Taiwan. For sites located outside Taiwan, legal requirements for the host country shall be observed.
- For the transportation of main components to the manufacturing plant, the actual transportation modes used and distance traveled shall be considered.

Data quality requirements for the distribution and marketing stage

- For transportation of products to the distributors or distribution sites, the actual mode of transportation and distance traveled shall be considered.
- The inputs of energy and resources and generation of waste during the distribution and marketing stage shall be considered.

Date quality requirements for the use stage

- The energy consumption of the product shall be determined based on testing methodology stipulated in the countries/regions the product is marketed.
- For the electricity mix for the use stage, the official electricity mix for the country where the product is exported may be used as approximate value or generic data. Please refer to Appendix I for the common sources of generic data. The year of the data cannot be older than 1990.

Date quality requirements for the recycling/end-of-life stage

- If for specific reason the site specific data for the recycling/waste disposal system cannot be obtained, generic data may be used during the recycling/end-of-life stage. Please refer to Appendix I for the common sources of generic data. The year of the data cannot be older than 1990.

10. Parameters to be declared in the EPD

The following parameters shall be declared in the EPD:

Resource use

- non-renewable resources
 - materials resources
 - energy resources (used for energy conversion purposes)
- renewable resources
 - material resources
 - energy resources (used for energy conversion purposes)
- secondary resources
 - material resources (pre-consumer or post-consumer recycling and reuse)
 - energy resources (used for energy conversion purposes)
- recovered energy flows (such as thermal energy) expressed in MJ
- water use divided into:
 - total amount of water (consider make-up water for in-plant recycling and reuse)
 - direct amount of water used by the core process

The following requirements on the resource declaration also apply:

- all parameters for resource consumption shall be expressed in mass, with the exception of renewable energy; resources used for the generation of hydroelectric, wind electricity and solar energy, which shall be expressed in MJ;
- all parameters shall not be aggregated but reported separately. Resources which contribute for less than 5% in each category shall be included in the resources list as “other”;
- nuclear power shall be reported among the non-renewable energy resources as kg of uranium calculated by converting the thermal energy (MJ) considering a reactor of III generation with an efficiency of 33%;
- the PCR can define other resources (for example rare materials originating from the LCI data) which may be listed and detailed in the EPD for each specific product category;
- the energy content into some products (such as paper or plastic based products) is useful information for the end of life management. For this reason, the “energy content of product” shall be declared in MJ: its estimation shall be made considering the gross calorific value of the product. Only the energy that is suitable for an eventual energy recovery at the end of life shall be considered (energy content of steel due to its carbon content for example shall not be considered since it is not practically recoverable);
- energy content of biomass used for feed or food purposes shall not be considered.

Impact equivalents expressed as potential environmental impacts

The potential environmental impacts associated with the various types of use of resources and pollutant emissions shall be reported into the following impact categories:

- Emission of greenhouse gases (expressed as the sum of global warming potential, GWP, 100 years, in CO₂ equivalents).
- Emission of acidifying gases (expressed as the sum of acidifying potential in sulphur dioxide (SO₂) equivalents).
- Emission of gases that contribute to the creation of ground-level ozone (expressed as the sum of ozone-creating potential, ethene-equivalents).
- Emission of substances to water contributing to oxygen depletion (expressed as phosphate (PO₄) equivalents).

Impact categories for optional declaration

- Emission of ozone-depleting gases (expressed as the sum of ozone-depleting potential in mass of CFC 11-equivalents, 20 years).

Waste

- hazardous waste (as defined in Taiwan's Waste Disposal Act, or follow host countries' laws for sites outside Taiwan).
- non-hazardous waste

Note: For characterization factors of each impact category, please refer to *General Programme Instructions For The International EPD System, Version 2.01 (2013-09-18)*.

11. Recycling information

The recycling information shall include information on product labeling and recycling options. The information which the EU Battery Directive requires the end product manufacturer to provide may also be included in the declaration information for products. If practical, information for the parts which cannot be recycled and therefore should be disposed of properly during the end-of-life stage may also be included.

Recycling marking for product's plastic components and plastic packaging material (optional information):

- Plastic parts marking: Where technologically possible, plastic parts of the product weighing ≥ 25 g shall be marked in accordance with the ISO 11469 and ISO 1043 Part 1/2/3/4, SPI or other international standard label to facilitate their identification and recovery at the end of life.
- Plastic packaging material marking: The Plastic packaging materials shall be labeled on the parts with SPI or other international standards for ease of sorting.
- Battery marking: Batteries shall be marked with the crossed-out wheeled bin symbol in

accordance with the *EU Directive on batteries and accumulators and waste batteries and accumulators*, in order to facilitate the identification and treatment of end-of-life products. Batteries and accumulators containing more than 0.0005 % mercury, more than 0.002 % cadmium or more than 0.004 % lead, shall be marked with the chemical symbol for the metal concerned: Hg, Cd or Pb. The symbol indicating the heavy metal content shall be printed beneath the symbol of crossed-out wheeled bin. Product marking shall be conducted in accordance with the *EU Directive on batteries and accumulators and waste batteries and accumulators*, in order to facilitate the identification and treatment of end-of-life products.

12. Other environmental information (Optional)

The EPD may cover information including technology adopted, site of product manufacturing and assembly, as well as information on other working environment, health and risk-related aspects.

If this PCR is to be used for product carbon footprint declaration purpose, in the declaration, information regarding commitment on GHG reduction should be included and shall ensure that the commitment is measurable, reportable and verifiable. The organization may also list environmental and energy management related information, such as awards, commendations and system certifications (e.g., ISO 14001, ISO 14064-1, IECQ HSPM) etc.

13. Information about the certification

The information on PCR review, EPD verification and verification organization shall be included.

EPD Certification is valid until 20XX-__-__

According to the Requirements for the international EPD system, *General Programme Instructions, Version 2.01 (2013)* – www.environdec.com.

The PCR review for _____ (PCR 2015:) was administered by the Environment and Development Foundation and carried out by an LCA expert panel chaired by Dr. Wen-Ching Chen (wencc@edf.org.tw).

Independent verification of the declaration, according to ISO 14025:2006

Internal External

Third party verifier: Environment and Development Foundation in Taiwan.

Accredited by :

Name:.....

Title:.....

Organization:.....

Signature:_____

Name:.....

Title:.....

Organization:.....

Signature:_____

Name:.....

Title:.....

Organization:.....

Signature:_____

Environmental declarations from different programmes may not be comparable.

14. References

The EPD shall refer to the following documents:

- GENERAL PROGRAMME INSTRUCTIONS FOR THE INTERNATIONAL EPD® SYSTEM, Version 2.01 (2013-09-18), downloadable from:
http://www.environdec.com/Documents/GPI/General_programme_instructions_2_01_20130918.pdf
- Relevant PCR documents
- The underlying LCA report
- When available, the following documents shall also be referenced:
- Other documents and recycling instructions that verify and complement the EPD.

References for this PCR:

Appendix I – Generic Data Sources to Refer to

For processes located within Taiwan, Taiwan generic data or the data published by the commercial, industrial and energy competent authorities of the Republic of China (ROC) government, may be used. However, for other regions (such as EU), if there are more relevant generic data available, these data should be used instead. Most recent data from the following generic databases are recommended for use.

Material	Database	Published
Industrial processes	ecoinvent 3.1	2014
Packing materials, transport, Waste treatments	BUWAL 250, 2 nd edition	2004
Steel, Primary copper, Copper products, Electricity, Fuels, Aluminum, Chemicals, Transports, Waste management	ecoinvent 3.1	2014
	LCA Database for Taiwan : DoITPro	2008-2014
	PE-GaBi 14	2014
	ELCD version 3.2	1995-2014
	The Boustead Model 5.0	2013
	EIME (Environmental Information and Management Explorer) EcoBilan	1999-2014
Plastics	PE Plastics Europe (Association of Plastics Manufacturers in Europe)	1993-1998
	PE-GaBi 14	2014
	ELCD version 3.2	1995-2014
	ecoinvent 3.1	2014
	The Boustead Model 5.0	2013
	EIME (Environmental Information and Management Explorer) EcoBilan	1999-2014
Electronic components	LCA Database for Taiwan : DoITPro	2008-2014
	PE-GaBi 14	2014
	ELCD version 3.2	1995-2014
	ecoinvent 3.1	2014
	The Boustead Model 5.0	2013
	EIME (Environmental Information and Management Explorer) EcoBilan	1999-2014
LCA Database in Taiwan	Carbon factor database from EPA, ROC.	2013

	DoITPro	2014
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Appendix II – Reporting Format for the EPD

This appendix provides guidance information for the titles of sections, types of data and required information to be reported in the mandatory reporting part of the EPD. As a generic reporting template, the following titles and sub-titles are recommended:

(Refer to the PCR manual for the section numbering, the information in Italics are the recommended data/information for inclusion)

Introductory part

Each EPD should have an introduction part on the top part of the EPD which includes the following information:

- *Company/organization name*
- *Product name*
- *EPD registration number*

Description of the company/organization and product/service

Company/Organization

- *Description of company/organization*
- *Description of overall working environment, existing quality system and environmental management system*

Product and services (see Section 2)

- *Product's main applications*
- *Description of product specification, manufacturing process, manufacturing sites (if there are several sites)*
- *For product's environmental performance aspects, characteristics which may improve the usefulness of product*
- *Other types of relevant information, for example, special manufacturing processes with special advantages to the environment*

List of materials and chemical substances

- *Content declaration (see Section 3)*

Presentation of the environmental performance

- *Outline of the LCA methodology, for example, period of LCA, declared units, system boundaries (graphical presentation), cut-off and allocation rules, and data sources.*

Raw Materials Acquisition Stage (see Section 10)

Manufacturing stage (see Section 10)

Distribution, Use and End-of-Life stage (see Section 10)

- *Geographical region for product delivery*
- *Transportation data*
- *Design life*
- *Description of use stage and energy consumption*
- *Annual electricity consumption during use stage and global warming potential*
- *End-of-life information*

Information about Company and Certification Organization

Recycling information (see Section 11)

Other environmental information (see Section 12)

Information regarding certification (see Section 13)

- *Names of certification and verification organizations*
- *Validity of certification certificates*
- *Compliance with legal and relevant requirements*

References (see Section 14)

- *relevant PCR documents*
- *General Programme Instructions for the International EPD® System, Version 2.01 (2013-09-18)*
- *underlying LCA study*
- *other supporting documents for LCA information*
- *other relevant documents regarding company/organization's environmental activities*

Appendix III Abbreviations

Acronym	Common Name
APLAC	Asia Laboratory Accreditation Cooperation
CFP	Carbon Footprint of Product
EPD	Environmental Product Declaration
ErP	Energy Related Product
ILAC	International Laboratory Accreditation Cooperation
ILAC MAR	International Laboratory Accreditation Cooperation Mutual Recognition Arrangement
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
PCR	Product Category Rule
RoHS	The Restriction of the use of certain Hazardous Substances in electrical and electronic equipment
SPI	Society of the Plastics Industry
TAF	Taiwan Accreditation Foundation
TEC	Typical Energy Consumption
Trpt	Transportation
WEEE	The Waste Electrical and Electronic Equipment Directive