

Product-Category Rules (PCR)  
for Preparing an Environmental Product  
Declaration (EPD) for  
Insulated Containers

PCR 2012:1.0

Crown Manufacturing Corporation  
THERMOS L.L.C.

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## 1. General Information

This document is to be used as the product category rules (PCR) for the manufacturing of insulated containers (“products”), with HS Code of 961700 (vacuum flasks and other vacuum vessels, complete with cases; parts thereof other than glass liners). The requirements specified in this PCR are intended to be used for EPDs certified in accordance with ISO 14025 standard. This document shall be valid until December 31<sup>st</sup>, 2014.

This PCR was jointly prepared by THERMOS L.L.C., and its Taiwan affiliate Crown Manufacturing Corporation. Representatives from major Taiwanese manufacturers of similar products and stakeholders were invited to the open consultation meeting on September 9<sup>th</sup>, 2012, to participate in the discussion and review of this PCR. The Environment and Development Foundation (EDF) then reviewed and approved this PCR.

For further information and comments concerning this PCR, please contact: THERMOS L.L.C. affiliate in Taiwan: Crown Manufacturing Corporation, Allen Hsieh (Tel: 886-2-8771-8696 #206; Fax: 886-2-8771-6196; email : Allen@thermos.com.tw.)

## 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 is applicable to both business-to-consumer/customer (B2C) or business-to-business (B2B) communications. While conducting certification of environmental impact assessment, the inventory of products also includes the raw materials and packaging materials.

### 2.1 Product group function

The insulated container (“product”) is a container used to reduce the temperature change of the substance inside the container, through reducing the conduction, convection, and radiation heat transfer. The products are mainly made of stainless steel or glass, and they do not include products which achieve the same insulation performance through the use of external energy.

### 2.2 Product components

The insulated container’s main components include:

- **Main components:** cap, insulated flask and support bottom.
  - Cap: the upper part of the container, capable of holding liquid in the insulated flask and provide an opening to pour the liquid out.
  - Insulated flask: the part where liquid is stored, with insulation achieved through reducing thermal conduction, convection, and radiation.
  - Support bottom: the part that holds the bottom of the insulated flask. It provides a complete seal together with the insulated flask, and allows the product to stand on a surface.

- **Other components:** e.g., handle, holding bag, packaging materials.

The data quality requirements for the main components are described in Section 9 on calculation rules and data quality requirements. The EPD shall also include the secondary/other components of the product, but their data quality requirements are different from those of the main components/constituents.

### **2.3 Product technical description**

The product technical description part of the EPD may include, but is not limited to the following information:

- Product dimensions
- Keeping hot/cold hours
- Product capacity
- Product material
- Insulation technology

### **3. List of materials and chemical substances**

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

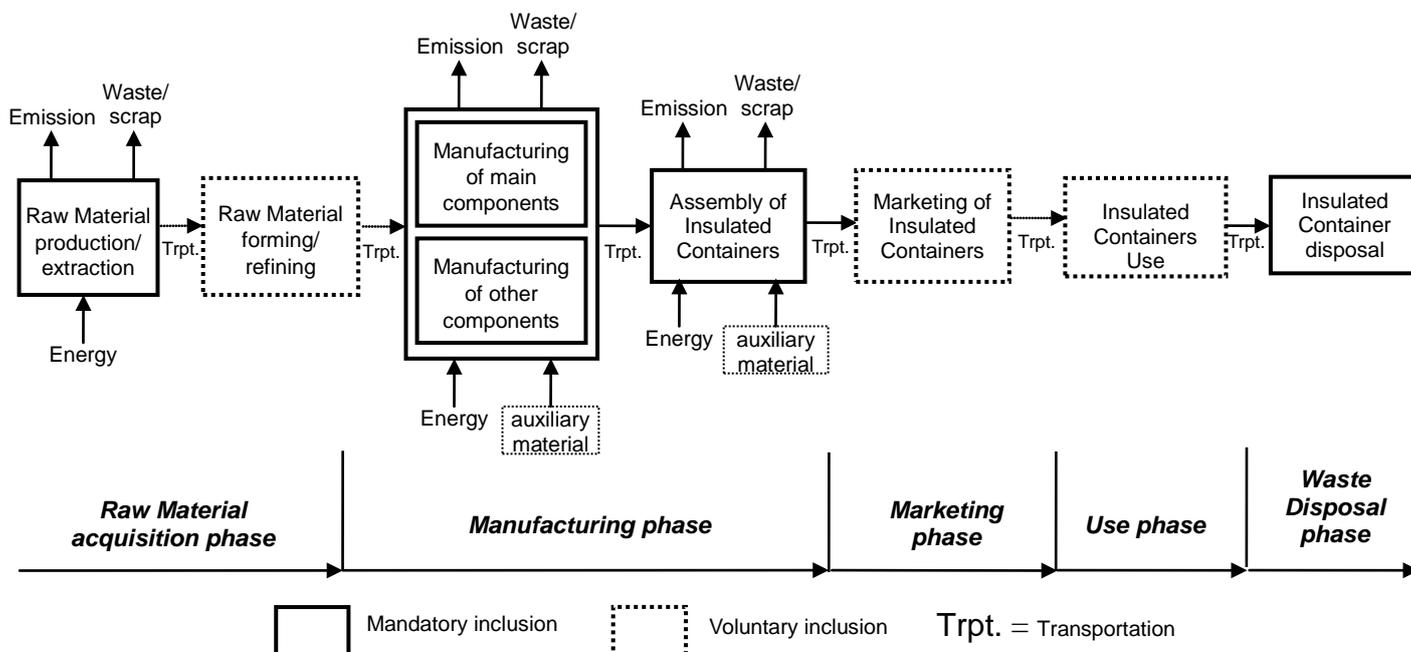
- All materials of the product (excluding packaging material) with weight ratio (material weight/product weight (excluding packaging))  $\geq 1\%$ ;
- All materials of the packaging with weight ratio (material weight/packaging weight)  $\geq 1\%$ ;
- All substances/materials in the product restricted/regulated by legal, customer and environmental requirements. For example, hazardous substances (heavy-metal contents), RoHS-regulated substances. The declaration of no RoHS-regulated substances may only be made when appropriate evidences are available (for example, 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) set of product (specify accessories if included), with the indication of product weight, capacity and insulating technology. The reason for selecting this unit is that the products are marketed and sold in such a unit.

## 5. System boundaries

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



**Note:** Auxiliary materials mean materials which are in contact with the product during the manufacturing process, but do not appear in the product as product components/ingredients.

Figure 1 System boundary of the product system

As noted in Figure 1 above, the life cycle of the product covers five life cycle stages: raw material acquisition, product manufacturing, distribution, product use and waste disposal. The data quality requirements for the main and other components are described in Section 9 on calculation rules and data quality requirements.

### Raw Materials Acquisition Stage

The LCA shall include information for the following unit processes:

- Relevant processes for the production and extraction of raw materials used for the main and other components.

Reporting of information regarding the relevant raw materials' forming and refining processes, as well as transportation of raw materials is optional (voluntary).

### Manufacturing Stage

The LCA shall include information for the following unit processes:

- Inputs of energy/resources during the production of main and other components and product assembly processes;
- Environmental impacts of waste generation during the product manufacturing and assembly processes;
- Transportation of main and other components to the product assembly plant.

### **Distribution and Marketing Stage**

- Transportation of products from the manufacturing plant to the distribution sites or distributor designated sites;
- Reporting of inputs of energy/resource and waste generation during the marketing/sales stage is optional;
- Reporting of transportation from the distributors/retailers' site to the consumers is optional.

### **Use Stage**

During the use stage, this product has no environmental impact. The energy saving of the product during the use stage may be declared, but this energy saving is not included in the calculation of environmental impacts.

Note: To maintain a liquid at certain temperature requires inputs of energy and resources during this stage, but the use of insulated containers can reduce such inputs.

### **Recycling/end-of-life Stage**

The LCA shall include information for the following unit processes:

- Transportation of end-of-life products and consumerables to the treatment/recycling facility;
- Reporting of recycling information (such as recycling ratio, dis-assembly report or information on recycling channels) is mandatory in the EPD. Also, the environmental impact shall be calculated based on the declared recycling rate.

## **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 1. The construction of the site and infrastructure, as well as the production of manufacturing equipment 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 site 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%. 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: m
- capacity unit: m<sup>3</sup>
- area unit: m<sup>2</sup>
- weight unit: kg

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

- 10<sup>9</sup> = giga, symbol “G”
- 10<sup>6</sup> = mega, symbol “M”
- 10<sup>3</sup> = kilo, symbol “k”
- 10<sup>-2</sup> = centi, symbol “c”
- 10<sup>-3</sup> = milli, symbol “m”
- 10<sup>-6</sup> = micro, symbol “μ”
- 10<sup>-9</sup> = nano, symbol “n”

## 9. Calculation rules and data quality requirements

### **Data quality requirements for the raw material acquisition stage**

- Generic data may be used for the extraction, production, forming and refining of the raw materials used for the components of the products. Please refer to Appendix I for the common sources of generic data.

### **Data quality requirements for the manufacturing stage**

- Site specific data (for example, specific data for a manufacturing plant’s manufacturing process or transportation data) shall be used for the manufacturing of main components and product assembly process. If other types of information are used, description of the information and rationale for using the information shall be provided. For site specific data of main component manufacturing plants, specific data from a plant representative of such a site may be used.
- Generic data may be used for the manufacturing of other components for the products, and based

the calculation on actual consumption. 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, as well as the technology and system boundaries of the referred generic system with the declared product system shall be considered. Moreover, it is also recommended to consider the date or geographic aspects of the data quality when feasible.
- 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. But 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. If the average data for a specific year cannot be obtained, the average data for a specific time period may be used, the data shall be representative, and the reason for using such data shall be provided.
- 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.
- The definition of hazardous waste 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 and other components/constituents 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 the transportation of products to the distribution sites or retailer sites, the actual mode of transportation and distance traveled shall be considered.

#### **Date quality requirements for the use stage**

- Explanation on the energy saving resulted from using the product may be considered.

#### **Date quality requirements for the recycling/waste disposal stage**

- For transportation of end-of-life products for delivery to the processors/recyclers, the data from national, industry or consumer surveys can be used. When such data cannot be obtained, evaluation based on assumed scenario can be made, and the assumptions for such a scenario shall be reported in the EPD.
- If for specific reason the site specific data for the recycling/waste disposal system cannot be obtained, generic data and recycling rate may be used to calculate environmental impact. Please refer to Appendix I for the common sources of generic data used internationally.

## **10. Parameters to be declared in the EPD**

The following parameters shall be declared in the EPD:

### **Energy use**

- The energy consumption during each product life cycle stage shall be declared. If the product is intended for end-users, the power consumption during the use stage shall also be declared.
- The following units shall be used preferentially:  
kW or W for power; J or MJ for energy.

### Resource use

The information on resource input during the product life cycle stages shall be declared.

### Impact equivalents expressed as potential environmental impacts

-Global warming	kg CO <sub>2</sub> equivalent
-Acidification	kg SO <sub>2</sub> equivalent
-Photochemical oxidant formation	kg C <sub>2</sub> H <sub>4</sub> equivalent
-Eutrophication	kg PO <sub>4</sub> <sup>3-</sup> equivalent
-Ozone depletion	kg CFC-11 equivalent

Note: For characterization factors of each impact category, please refer to *EPD Supporting Annexes*, Version 1.0 (2008-02-29), The International EPD Cooperation, downloadable from [www.environdec.com](http://www.environdec.com).

### Additional information

- Recyclable materials (optional)
- Information on secondary materials (optional)
- Waste (classification):
  - Hazardous waste as defined in Taiwan's Waste Disposal Act. Follow host countries' laws for sites outside Taiwan.
  - Other waste.
- Plastic parts marking: Where technologically possible, plastic parts of the vehicle weighing  $\geq 25$  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.

## 11. Recycling information

The recycling information shall include information such as disassembly instructions, which parts/components are suitable for recycling (such as metal casing) or not suitable for recycling. The information which the EU WEEE Directive requires the end product manufacturer to provide may also be included in the product declaration information for products.

If practical, information for the components which can not be recycled and therefore should be disposed of properly during the end-of-life stage may also be included.

## **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.



## **14. References**

The EPD shall make reference to the following documents:

- EPD General Program Instructions, Version 1.0 (2008-02-29), The International EPD Cooperation, downloadable from <http://www.environdec.com/>;
- Relevant PCR documents;
- The underlying LCA report.

When available, the following documents shall also be referenced:

- Other documents and recycling instructions which verify and complement the EPD.

## 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, that data should be used instead. When data from the following generic databases are used, the most current and updated data should be used.

<b>Material</b>	<b>Database</b>	<b>Published</b>
Packing materials, transport, Waste treatments	BUWAL 250, 2 <sup>nd</sup> edition	2004
Steel, Primary copper, Copper products, Electricity, Fuels, Aluminum, Chemicals, Transports, Waste management	ELCD version 2.0	2009
	EIME (Environmental Information and Management Explorer) EcoBilan	1998-2000
Plastics	PE Plastics Europe (Association of Plastics Manufacturers in Europe)	1993-1998
	ELCD	2009
	EIME (Environmental Information and Management Explorer) EcoBilan	1998-2000
Electronic components	ELCD	2009
	EIME (Environmental Information and Management Explorer) EcoBilan	1998-2000
General Database	Ecoinvent 2 <sup>nd</sup> edition	2007
	The Boustead Model 5.0	2007
	PE-GaBi	2006
	DoITPro(Taiwan)	2010

## **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.*

#### ***Manufacturing stage (see Section 10)***

#### ***Use stage (see Section 10)***

- *Geographical region for product delivery*
- *Transportation data*
- *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*
- *EPD General Program Instructions, Version 1.0 (2008-02-29)*
- *underlying LCA study*
- *other supporting documents for LCA information*
- *other relevant documents regarding company/organization's environmental activities*

### Appendix III Abbreviations

<b>Acronym</b>	<b>Common Name</b>
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