Product Category Rules (PCR)

(Approved PCR ID: PA-BD-02)

Metallic Containers and Packaging (intermediate goods)

Release date: September 8, 2010

The Carbon Footprint of Products Calculation and Labeling Pilot Program

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(Provisional Translation)

Product Category Rule of "Metallic Containers and Packaging (intermediate goods)" (Approved PCR ID: PA-BD-02)

Foreword

- The contents provided in this PCR may be changed and revised as needed for further refinement, through PCR revision procedures, as a result of continued discussions with relevant stakeholders during the period of the Japanese CFP Pilot Project.
- This PCR can be used as "referenced PCR" when developing PCR of "goods (items packaged)" as "final goods (business to consumer products)".
- This PCR will expire at the end of the Project (scheduled until March 31, 2012).
- This English translation of the original Japanese PCR is provided for information purpose.

No.	Items	Contents
1	Scope	- This PCR prescribes rules, requirements and instructions applicable to "Metallic Containers and Packaging" under the CFP Pilot Project. - This PCR prescribes products to be covered, specification of assessment range, unit of greenhouse gas (GHG) emission values to be displayed, and range covered at each life cycle stage. - This PCR treats "metallic containers and packaging" as intermediate goods (B2B products).
2	Definitions of products	
2-1	Descriptions of product category	- A metal containers/packaging for protecting its content and providing it to consumers. - However, this first edition covers beverage can and processed food can. As for other metallic containers/packaging (e.g., aerosol can, general can, tube, 18 litter metal can) will be added to this PCR as necessary.
2-2	Components of products	Components are, a) Main components b) Accessories c) Material consumed in the containers/packaging production (excluding lubricant oil or parts for manufacturing equipments maintenance) d) Packing materials used for transport of containers/packaging However, following items are excluded, as they are not classified as containers and packaging even if they are made of metal 1) Attachments (e.g., stickers) 2) Giveaways (e.g., free gifts attached to the top of a can)
3	Referenced Standards and PCRs	Any of the following standards and TS referred to in this PCR shall constitute a part hereof: - JIS Z 0108: 2005 Glossary of Terms for Packaging; - TS Q0010: 2009 General Principles for the Assessment and Labeling of Carbon Footprint of Products
4	Terms and Definitions	(1) Metal can A collective term for cans made of metal. Beverage cans, processed food cans, aerosol cans, general cans, tubes, and 18 liters metal cans are some of the example. [See JIS Z 0108: 2005] (2) Steel can A can whose body is made mainly of steel. (3) Aluminum can A can whose body is made mainly of aluminum or aluminum alloy. (4) Beverage can A can designed to hold beverages. (5) Processed food can A can designed to hold food and not categorized as a general can. (6) Aerosol can A can designed to hold an aerosol. It shall withstand the pressure generated by a propellant. [See JIS Z 0108: 2005] (7) General can A steel can that has resistance of shock, moisture, and oxidation. Cans for

		holding tea leaves, snacks, seaweeds, cooking oil, medicines, oil, or paints are examples. (8) Tube A cylindrical metallic squeezable container that allows its contents to be squeezed out when the body is pressed and folded. It is made of aluminum, tin, or lead, and manufactured by extrusion press molding process. (9) 18 liter metal can A type of a can that holds a content of approximately 18 liters. It is made of tinplate or tin-free steel. The side seam is soldered, glued, or welded. The top and bottom plates are seamed to the can body. [See JIS Z 0108: 2005] (10) Main components Components associated with sealing of a cylindrical body, open-top can, or end (metal, plastic, or heat seal lid). (11) Body A cylinder made with metal. [See JIS Z 1571: 2005] (12) Open-top can An item consisting of a body and a bottom end. It is also known as an empty can. [See JIS Z 1571: 2005] (13) End A metallic material that is joined to an open-top can by seaming or by other methods after the open-top can is filled with the content. (14) Accessories Items other than a container. Overcaps, handles, and labels that can be removed from a container are examples. (15) Handle A part that is grabbed to lift up a can, commonly attached to an 18 liter can. (16) Label It is a type of an accessories. It shows a product name or has necessary data such as content information, and is attached to a container. It can be plastic or paper. (17) Overcap A cap usually made of plastic. It is put on a container. (18) Sealing compound A rubber sealing component to keep a can seam airtight. [See JIS Z 0108: 2005] (19) Printing plate Consisting of an image and non-image parts, it serves as a media for creating printed images by selectively receiving print ink on the image part and then transferring the ink to paper. Note: It is also known as a machine plate or press plate. [See JIS Z 8123: 1995] (20) Decoration An act of decorating a container surface. It can be done by directly printing images on the container or by putting a printed laminate sheet on the container. (21) Die-cutting metal scraps Scraps after cut metal plate or other items no longer required, such as defective item, from production process
5	Range of assessment	
5-1	Calculation unit	Sales unit.
5-2	Life cycle stages	Raw material acquisition stage and disposal and recycling stage are covered - This PCR divides the raw material acquisition stage into the following three stages: (1)Containers/packaging raw material acquisition stage (2)Containers/packaging production stage (3)Containers/packaging transport stage
6	General requirements applied to all stages	
6-1	Life cycle flow chart	- Life cycle flow chart is provided in Annex A (normative). It is a conceptual chart intended to make it easy to identify the "processes covered by each life cycle

		stage. - When calculating GHG emissions, a detailed life cycle flow chart for each type of “metallic container/packaging covered by this assessment” shall be created. It is recommended that the chart in Annex A is used as the basis for such detailed chart, but it is not limited to this chart only.
6-2	Range of data collection	- Indirect departments (e.g., clerical department, research departments, etc.) shall be excluded. If it is difficult to exclude those indirect departments, indirect departments may be included.
6-3	Data collection period	- Activity data shall be collected from the most recent and consecutive one-year period. - If data is not collected on the above condition, its reason shall be specified. - Locality shall not be considered. - Seasonality will be excluded by collecting primary data as annual data. - For newly constructed plant or established manufacturing process, calculation may be based on the designing or planning conditions. When the data from the most recent and consecutive one-year period becomes available, such calculation results shall be updated.
6-4	Allocation	- Weight ratio shall be used. - If any other allocation method is used due to the characteristics of the product, the allocation method used and its validity shall be verified.
6-5	Cut-off criteria	- Cut-off shall not be conducted unless data collection is difficult. - When conducting cut-off, the range of cut-off shall be within 5% of the total life cycle GHG emissions, and the range shall be clearly reported. Cut-off shall, however, be conducted, provided that it is difficult to use any scenarios, similar data, and estimated data.
6-6	Others	[Rules related to transport] (1) Domestic transport: a) Primary data shall be collected either by the fuel consumption method, the fuel cost method, or the ton-kilometer method. b) If there are more than one transport route, weighted average may be used. c) More information, see "Annex B (informative): Collection of fuel consumption data and calculation of GHG emissions for truck transport”. (2) International transport is involved: Primary data shall be collected conforming to rules described in the case of (1) domestic transport. If any rule on transport is prescribed by the authorities or private sectors in a country, data on overland transport within such country may be collected according to the rules.
7	Requirements for raw material acquisition stage	
7-1	Range of the processes	The following processes shall be included: (1) for containers/packaging raw material acquisition stage - Processes related to acquisition and manufacture of the main components’ raw materials - Processes related to acquisition and manufacture of accessories’ raw materials, and process related to manufacture the accessories. - Processes related to domestic and international transport of components. (2) for containers/packaging production stage - Process related to manufacture of metallic containers/packaging (including transport between manufacturing sites) - Process related to raw material acquisition and manufacture required for containers/packaging production (e.g., copper wire, chemicals, etc.) - Processes related to domestic/international transport for raw materials consumed in the containers/packaging production (e.g., copper wire, chemicals, etc.) and packing materials - Processes from raw material acquisition to manufacture for packing

		materials used for transport of container/packaging - Processes related to waste transport and proper treatment from the production process (3) for containers/packaging transport stage Processes related to domestic and international transport of containers/packaging from shipment site to delivery destination.
7-2	Data collection items	(1)Containers/packaging raw material acquisition stage a) Processes related to acquisition and manufacture of the metallic container/packaging's raw materials. For following items, GHG emissions (kg-CO2e) and input amounts per unit associated with processes from resource mining to production shall be collected. 1) Metal for can's body and end. (Surface treated steel plate/aluminum plate). 2) Plastic film used for decoration and/or protection of content 3) Lacquer and adhesive 4) Ink The amount of ink used can be the average amount of ink used for the can model. This is because one metal can model may have a wide variety of designs but there is not much difference in the use amount of ink. 5) Diluent solvent used to dilute the resin or ink mentioned in "3)" and "4)" above, respectively. 6) Sealing compound 7) Raw materials other than 1) through 6), constituting container per se b) Processes related to acquisition and manufacture of accessories' raw materials, and process related to manufacture the accessories. For following items, the GHG emissions (kg-CO2e) and input amounts per unit associated with processes from resource mining to production shall be collected. 1) Plastic molding 2) Labels 3) Accessories other than "1)" and "2)" above c) GHG emissions (kg-CO2e) and input amounts per unit associated with processes from resource mining to production for all the packing materials used for acquisition of materials from "a)" to "b)" above shall be collected. d) Processes related to domestic and international transport of components. GHG emissions (kg-CO2e) per unit associated with transport for acquisition of materials from "a)" to "b)" above shall be collected. (2) Containers/packaging production stage a) GHG emissions (kg-CO2e) and input amounts per unit associated with energy and water, etc. consumed in all the production processes of containers/packaging shall be collected. b) Materials consumed for the production of containers/packaging. For following items, GHG emissions (kg-CO2e) and input amounts per unit associated with processes from resource mining to production shall be collected. 1) Copper wire used when welding a can 2) Chemicals used in can surface treatment and wastewater treatment during making a can. 3) Processing coolant (for lubrication and cooling) directly involved in metal processing.

		4) Printing plates used for printing on metallic cans. 5) Other raw materials than described in "1)" to "5)" above that are used during production of metallic containers/packaging. c) Packing materials used for transport of containers/packaging For following items, GHG emissions (kg-CO2e) and input amounts per unit associated with processes from resource mining to production shall be collected. 1) Plastic packing materials (e.g., pallet, shrink wrap, band, and plastic bag, etc.). 2) Paper packing materials (e.g., separator sheet, craft paper, corrugated paper, etc.). 3) Other packing materials than described in "1)" and "2)" above that are used for packing metallic containers/packing. d) GHG emissions (kg-CO2e) and input amounts per unit associated with processes from resource mining to production for all the packing materials used for acquisition of materials from "b)" to "c)" above shall be collected. e) GHG emissions (kg-CO2e) per unit associated with transport for acquisition of materials from "b)" to "c)" above shall be collected. f) Exhaust emissions and wastes from the containers/packaging production stage 1) Solvents and alcohol used in coating and printing processes are incinerated by exhaust gas processor and exhausted out into the air, GHG emissions (kg-CO2e) generated shall be calculated based on the amount of carbon contained in the solvents used. 2) Amount of die-cutting metal scraps and wastes from the containers/packaging production stage and GHG emissions (kg-CO2e) associated with transport and proper waste treatment shall be collected. Note: Die-cutting metal scraps, and used metallic containers/packaging are mixed with raw materials and then are input by steel can manufacturer or aluminum can manufacturer. Therefore, calculation shall be based on the direct and indirect impact described in (11) below and the result shall be included in the “container/packaging raw material acquisition stage”. (3) Containers/packaging transport stage For processes related to domestic and international transport of containers/packaging from shipment site to delivery destination, following data shall be collected. a) Weight of metallic containers/packaging and packing materials transported b) GHG emissions (kg-CO2e) associated with fuel consumption
7-3	Primary data collection items	Primary data shall be collected on the items in No.7-2.
7-4	Primary data Collection method and Requirements	In the case where private power generation is used, data on consumption of each of the types of fuel used for producing electricity shall be collected.
7-5	Scenario	[Transport scenario] If primary data collection is difficult, the following scenarios may be used. (1) Transport for raw material acquisition, and transport of intermediate goods between manufacturing sites

		a) Domestic transport: 1) Steel plate (based on an interview with a metal can manufacturer) i) Domestic marine transport (from port to port) - Means: container vessel (4,000 TEU or lower), - Distance: 850 km one way ii) Domestic land transport (from a port to the production site of a subject product) - Means: 28-ton trailer (light oil) - Distance: 60 km (one way), - Loading ratio: 62% 2) Aluminum plate (domestic land transport, based on an interview with a metal can manufacturer) - Means: 28-ton trailer (light oil); - Distance: 850 km (one way); - Loading ratio: 80% 3) Items other than a steel or aluminum plate (domestic land transport) - Means: 4-ton truck (light oil); - Distance: 500 km (one way) - Loading ratio: 25% b) When international transport is involved: 1) Land transport in the country where a raw material is manufactured (from the raw material production site to a port of the country where the raw material is manufactured) - Means: 4-ton truck (light oil), - Distance: 500 km one way, - Loading ratio: 25% 2) Marine transport from raw material production country to metallic containers/packaging production country (from port of raw material production country to port of metallic containers/packaging production country) - Means: container vessel (4,000 TEU or lower), - Distance: distance between ports - International transport distance data will be prepared and provided by the Office of the CFP Pilot Project as "reference data." 3) Land transport within containers/packaging production country (from port of production country to production site) - Means: 4-ton truck (light oil), - Distance: 500 km one way, - Loading ratio: 25% (2) Transport of wastes a) If it is difficult to collect primary data of GHG emissions related to transport of wastes, the following scenario may be used. - Means: 4-ton truck (light oil); - Distance: 100 km one way, - Loading rato: 25% (3) Transport of containers/packaging a) In the case of domestic transport (domestic land transport): - Means: 10-ton truck (light oil); - Distance: 500 km (one way);

		- Loading ratio: 25% b) When international transport is involved: 1) Land transport within containers/packaging production country (from containers/packaging production site to port of containers/packaging production country) - Means: 10-ton truck (light oil), - Distance: 500 km one way, - Loading ratio: 25% 2) Marine transport from containers/packaging production country to delivery destination country (from port of containers/packaging production country to port of delivery destination country) - Means: container ship (4,000 TEU or less), - Distance: sailing distance between ports - The "reference data" provided by the CFP Pilot Project Secretariat shall be used as the transport distance of the international marine transport. 3) Land transport within delivery destination country (from port of delivery destination country and thereafter) - Means: 10-ton truck (light oil), - Distance: 500 km one way, - Loading ratio: 25% [Waste treatment scenario] (1) In order to avoid undervaluation, assume that all “plastic or paper accessories” are incinerated. If the data in "general waste incineration (excluding CO_2 from waste)" specified in the GHG Emission Common Factor Database is used as secondary data, GHG emissions derived from the carbon contained in plastic wastes shall be separately calculated and included. (2)For die-cutting scrap metals, calculated conforming to direct or indirect impact provided in “Annex C” and “Annex D,” and include “up to and including recycling preparation processes (intermediate treatment)” in the containers/packaging raw material acquisition stage.
7-6	Other	[Recycled material acquisition] - Recycled metal (steel, aluminum) used for raw material. When metal (steel, aluminum) is recycled and then used for raw material, calculate transport from intermediate treatment site and the subsequent process mentioned in No.11-6, “When calculating direct impact of recycling,” and then include the result in the containers/packaging raw materials acquisition stage. - Other recycled materials used for raw material When recycled materials are procured, GHG emissions associated with transport process of materials ready to be recycled and the subsequent processes (e.g., transport from pretreatment site, recycling processing, etc.) shall be calculated. [Data collection from multiple suppliers] Primary data shall be collected from all the suppliers. If this is difficult, however, more than 60% of the primary data shall be collected and used as the secondary data of other suppliers. [International raw material acquisition] Primary data associated with processes from resource mining to manufacture shall be collected using the same method as used for domestic raw material acquisition.

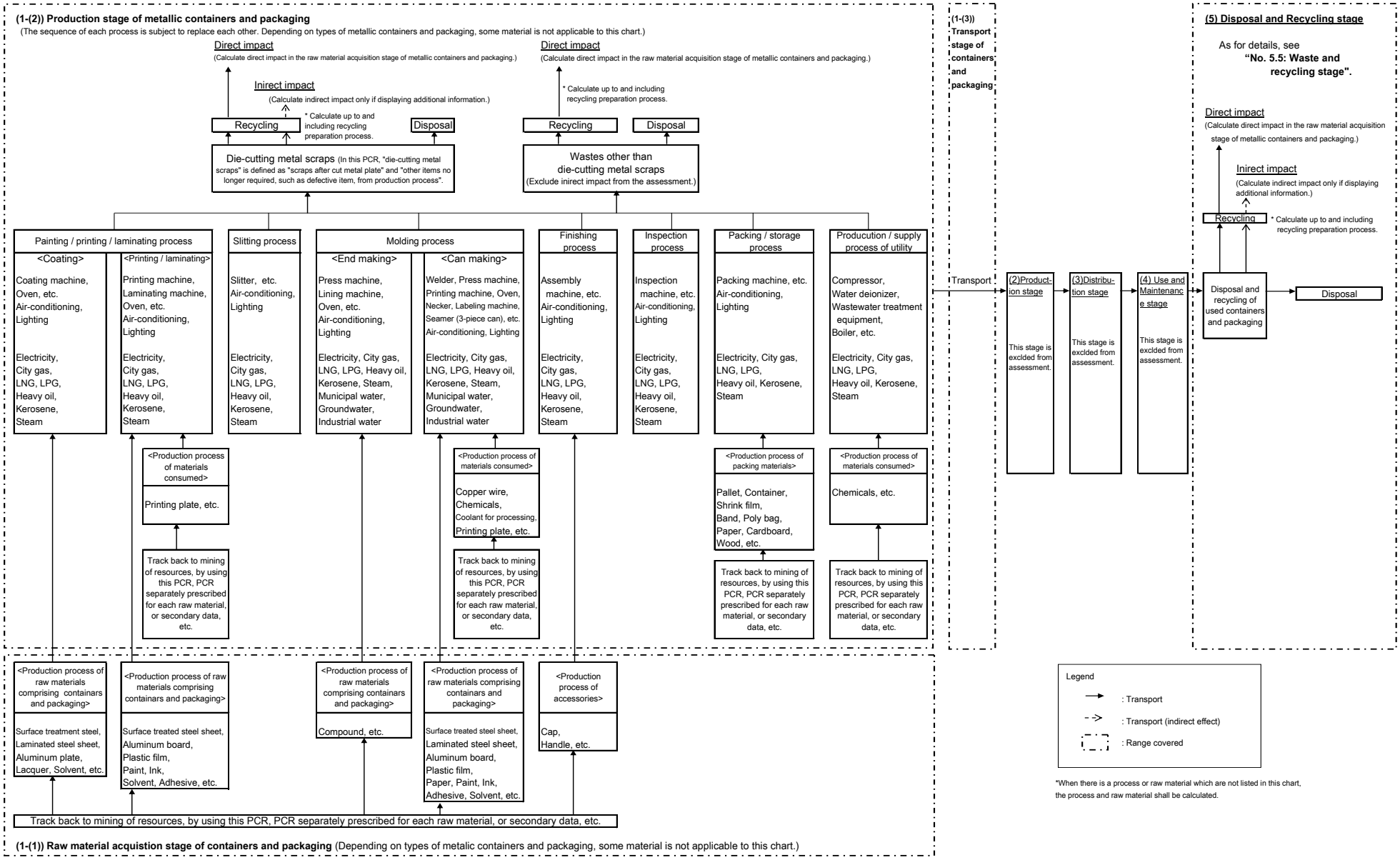
		[Cut-off] (1)Containers/packaging raw material acquisition stage - No cut-off shall be conducted for 7-2, a), 1) through 6), and b), 1) and 2) - 7-2, c), 1) shall not be included since its GHG emissions per product are negligible. (2) Containers/packaging production stage - No cut-off shall be conducted on the following items: a) energy which are input to the container/packaging production stage, b) materials consumed in the container/packaging production (copper wire, chemicals, processing coolant), c) packing materials used for transport of container/packaging (plastic or paper packing material), d) transport for acquiring materials consumed and packing materials, and e) discharge from the container/packaging production stage (from solvent or alcohol combustion, or from wastes) . - 7-2, (2), b), 4) and d) shall not be included since GHG emissions per product are negligible.
8	Requirements for the production stage	
8-1	Range of the processes	Excluded from the assessment.
8-2	Data collection items	Excluded from the assessment.
8-3	Primary data collection items	Excluded from the assessment.
8-4	Primary data Collection method and Requirements	Excluded from the assessment.
8-5	Scenario	Excluded from the assessment.
8-6	Other	Excluded from the assessment.
9	Requirements for the distribution stage	
9-1	Range of the processes	Excluded from the assessment.
9-2	Data collection items	Excluded from the assessment.
9-3	Primary data collection items	Excluded from the assessment.
9-4	Primary data Collection method and Requirements	Excluded from the assessment.
9-5	Scenario	Excluded from the assessment.
9-6	Other	Excluded from the assessment.
10	Requirements for the use and maintenance stage	
10-1	Range of the processes	Excluded from the assessment.
10-2	Data collection items	Excluded from the assessment.
10-3	Primary data collection items	Excluded from the assessment.
10-4	Primary data Collection method and Requirements	Excluded from the assessment.
10-5	Scenario	Excluded from the assessment.
10-6	Other	Excluded from the assessment.
11	Requirements for the disposal and recycling stage	
11-1	Range of the processes	The following process shall be covered. - Processes related to transport and proper treatment of used containers/packaging. NOTE: Used metallic container/packaging is collected as recyclable waste or is

		collected from unburnable waste. The part of unburnable waste is used as raw material of a new metallic containers/packaging. Although the direct impact of recycling shall be included in the container/packaging raw material acquisition stage, it is described here due to a complicated disposal and recycling flow as described earlier. Note that the direct impact of transport of materials, which are ready for recycling, and the subsequent processes shall be included in the container/packaging raw material acquisition stage.
11-2	Data collection items	For processes related to transport and proper treatment of used containers/packaging, following data shall be collected. a) Weights of "used metallic containers/packaging" and “die-cutting metal scraps discharged from the containers/packaging production stage”. b) Ratios of "used metallic containers/packaging" that are recycled and landfilled, respectively. c) GHG emissions (kg-CO2e) associated with incineration of "plastic accessories" and "paper accessories" at treatment facility, and GHG emissions (kg-CO2e) generated when "plastic accessories" are incinerated. d) GHG emissions (kg-CO2e) associated with transport of "used metallic containers/packaging" to treatment facility. e) GHG emissions (kg-CO2e) associated with landfill at treatment facility. f) GHG emissions (kg-CO2e) associated with processes from transport for recycling up to and including recycling preparation process (intermediate treatment).
11-3	Primary data collection items	Primary data shall be collected on the items provided in No.11-2.
11-4	Primary data Collection method and Requirements	Not stipulated.
11-5	Scenario	When primary data collection is difficult, calculation may be made for “steel can” according to “Annex C,” and for “aluminum can” according to disposal/recycling scenario in “Annex D”.
11-6	Other	[Closed-loop recycling] Process related to transport from intermediate treatment facilities, and process related to recycling process, for “die-cutting scrap metals” from the “used metallic containers/packaging” and the “containers/packaging production” after they have been collected and have undergone preprocessing (intermediate treatment). (1) Data collection items For calculating direct impact of recycling, following data shall be collected: a) Weights of “used metallic containers/packaging” and “die-cutting scrap metals from the containers/packaging production stage” b) Recycling ratio of “used metallic containers/packaging” and “die-cutting scrap metals from the container/packaging production stage” c) Input ratios of “used metallic containers/packaging” and “die-cutting scrap metals from the containers/packaging production stage” to converter furnace (in the case of steel can), or the can-to-can ratio (in the case of aluminum can) d) GHG emissions (kg-CO_2e) associated with transport to recovery treatment facilities e) GHG emissions (kg-CO_2e) associated with recycling at recovery treatment facilities f) Substituted value of recycling (GHG emissions associated with production of crude steel, mining of iron ore, or production primary aluminum) (2) Scenarios When primary data collection is difficult, the following scenarios may be applied: a) In the case of steel can Conforming to Annex C, and assuming that steel can is recycled into crude steel or iron ore substitute, include GHG emissions of transport and the subsequent processes (transport from intermediate treatment

		facilities, recycling processing) of used containers/packaging readying for recycling in the container/packaging raw material acquisition stage. b) In the case of aluminum can Conforming to Annex D, and assuming that aluminum can is recycled to primary aluminum, include the GHG emissions of transport and the subsequent processes (transport from intermediate treatment facilities, recycling processing) of used containers/packaging readying for recycling in the container/packaging raw material acquisition stage. [Waste treatment scenario for plastic or paper accessories] (1) In order to avoid undervaluation, assume that all “plastic or paper accessories” are incinerated. GHG emissions associated with transport of these items to incinerate disposal facilities may be calculated based on the following scenario: - Means: 2-ton truck (light oil), - Distance: 50 km (assumed as within a city); - Loading ratio: 25% (2) If the data in "general waste incineration (excluding CO_2 from waste)" specified in the GHG Emission Common Factor Database is used as secondary data, GHG emissions derived from the carbon contained in plastic wastes shall be separately calculated and included. [Open-loop recycling] Process related to transport from intermediate treatment facilities, and process related to recycling process, for the “used metallic containers/packaging”, and for “die-cutting scrap metals” from the “containers/packaging production stage”. (1) Data collection items Data listed in [Calculating direct impact of recycling] (1) a), b), d) and e), and following data shall be collected - Input ratios of “used metallic containers/packaging” and “die-cutting scrap metals from the containers/packaging production stage” to a furnace other than converter furnace (in the case of steel can), or the ratios other than can-to-can ratio (in the case of aluminum can) - Allocation factor of substitutes (GHG emissions associated with production of a crude steel or new metal substitute) (2) Scenarios When it is difficult to collect primary data, the following scenarios may be used: a) In the case of steel can Conforming to Annex C, and assuming that steel can is recycled into crude steel substitute, include GHG emissions of transport and the subsequent processes (transport from intermediate treatment facilities and recycling) of used containers/packaging readying for recycling as "recycling effect." b) In the case of aluminum can Conforming to Annex D, and assuming that aluminum can is recycled into new metal substitute, include GHG emissions of transport and the subsequent processes (transport from intermediate treatment facilities and recycling) of used containers/packaging readying for recycling as "recycling effect".
12	Items applied secondary data	- For emission factor, use the data provided in the “Tentative Database of GHG Emission Factors for the CFP Pilot Project”. - Of secondary data which is not included in the Database, the data will be prepared as “reference data” by the CFP Pilot Project Secretariat. - For foreign country data, use its country emission factor. If it does not exist, domestic secondary data may be used with its reason.
13	Communication requirements	

13-1	Unit to be displayed on the label	- Calculation unit shall be used. The communication methods described in the “Guideline of CFP system” and the “Standards of PCR development” can be used. However, in this case, its appropriateness shall be examined at the CFP verification panel. [Details of labeling method] In the case of intermediate goods, labeling may be made on packaging (shipping cartons) in addition to invoices and delivery notes. To avoid confusion with CFP labeling for "final goods", GHG emissions of intermediate goods may not be printed on metallic containers/packaging itself. However, it is permitted that manufactures calculating GHG emissions post such information in their catalogues or on their websites. [Information Disclosure Sheet] - Regardless of whether labeling is made or not, "Information Disclosure Sheet" specified in Annex E shall be made to provide information on GHG emissions to manufactures involved in the production stage. "Information Disclosure Sheet" shall include such information as product information, life cycle stages covered, GHG emissions, and additional information. - The total GHG emissions shall be disclosed in principle, but disclosure of such values as obtained process-by-process is also acceptable.
13-2	Label position and Size	- Follow the “Specifications of CFP Label and Displaying Other Information”. Labeling shall be accordance with the indication of "Intermediate Goods" in the specification.
13-3	Contents of additional information	To communicate the GHG reduction efforts made by manufacturers calculating GHG emissions properly to consumers, additional information on the following may be included in the label: the reduction amount in GHG emissions over years, and the process-by-process GHG emissions. The additional information about the GHG reductions by indirect effects of recycling may also be included. For the contents of additional information, only the contents approved as proper by the CFP Verification Panel can be displayed. Note: Used metals can be recycled into a product other than a metal can depending on the demands, this "non-metal can product" may however be recycled again into a material to be used in metal can production. With some key beverage containers, the Environment Ministry conducted environmental impact assessment using the LCA method from FY2002 to FY2004 (“Research Project Report on LCA of Container and its Packaging in FY2004” by the Institute for Policy Sciences). In this assessment, disposal and recycling processes were thoroughly examined in detail. At the same time, not only the direct but also indirect impact of recycling was assessed, and as a result, a recycling flow was created. Since recycling of metal cans have large effect, additional information on GHG reduction by indirect impact of recycling should be displayed. [Additional information of indirect impact] When indirect impact data is additionally indicated, make sure that the value of indirect impact shall not be double counted with that of direct impact.

Annex A (normative): Life Cycle Flow Chart (This is a life cycle flow chart of "metallic containers and packaging" from a standpoint of user.)



Annex B (reference): Collection of fuel consumption data and calculation of GHG emissions for truck transport

B.1 Fuel consumption method

B.1.1 Collect data on fuel consumption for each transport mean, and convert the unit of fuel consumption from “L” to “kg”.

Fuel consumption (kg) = Fuel consumption (L) x Fuel density (kg/L)

- Fuel density of gasoline= 0.75kg/L
- Fuel density of light oil= 0.83kg/L

B.1.2 Calculate GHG emissions by multiplying fuel consumption (kg) by secondary data for each type of fuel.

B.2 Fuel cost method

B.2.1 Collect data on fuel cost (km/L) and transport distance (km) for each transport mean, and calculate fuel consumption by using the following equation.

Fuel consumption (kg) = [Transport distance (km) / Fuel efficiency (km/L)] x fuel density (kg/L)

- Fuel density of gasoline= 0.75kg/L
- Fuel density of light oil= 0.83kg/L

B.2.2 Calculate GHG emissions by multiplying fuel consumption (kg) by secondary data for each type of fuel.

B.3 Ton-kilometer method

B.3.1 Calculate fuel consumption per freight transport amount following the formula "a)" or "b)"below.

a) In the case of truck using gasoline as fuel:

$\ln x = 2.67 - 0.927 \ln (y/100) - 0.648 \ln z$

x: Fuel consumption per freight transport amount (1/t-km)
y: Loading ratio (%)
z: Maximum loading capacity of truck (kg)

b) In the case of truck using light oil as fuel:

$\ln x = 2.71 - 0.812 \ln (y/100) - 0.654 \ln z$

x: Fuel consumption per freight transport amount (L/t-km)
y: Loading ratio (%)
z: Maximum loading capacity of truck (kg)

B.3.2 Calculate GHG emissions by multiplying fuel consumption (kg) by secondary data for each type of fuel.

Annex C (normative): Disposal and recycling scenarios for steel can

Steel can scenarios applied to this PCR are below.

C.1 Disposal and recycling flow

The figure below shows a disposal and recycling flow of used steel can.

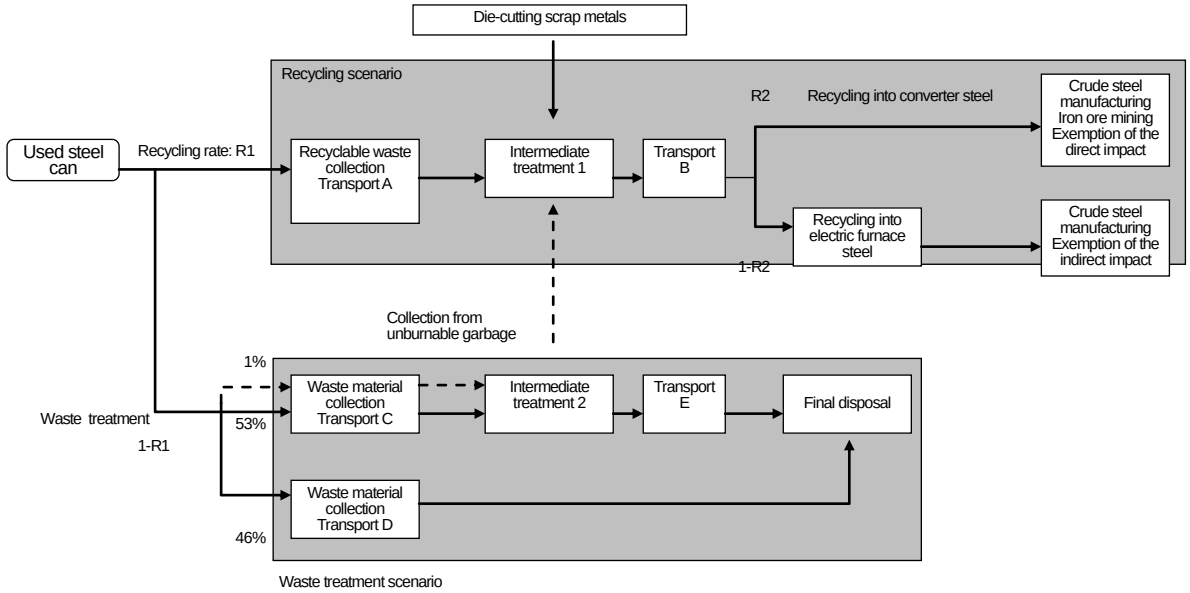


Figure C.1 Disposal and recycling flow of used steel can

C.1.1 Disposal and recycling rate

The steel can recycling rate is based on the value provided by the Japan Steel Can Recycling Association in FY2008.

a) Recycling rate R1: 88.5%
b) Percentage of steel cans that are recycled into converter steel R2: 12.6% (Percentage by industry of the amount of steel cans that are purchased by blast furnace manufacturers as scrap)

C.1.2 Disposal and recycling stage

Among steel cans that are collected as wastes (1 – R1), 53% are subject to final disposal after intermediate treatment 2, and 46% are subject to final disposal without any intermediate treatment. Therefore, GHG emissions in the processes up to final disposal are included in the disposal and recycling stage. Also, among steel cans that are collected as wastes (1 – R1), 1% is collected in intermediate treatment 2 and recycled. Therefore, GHG emissions in transport C and intermediate treatment 2 are also included in the disposal and recycling stage.

For steel cans (R1) collected as recyclable waste, include GHG emissions of transport A and intermediate treatment 1 in the disposal and recycling stage.

As for die-cutting scrap metals generated in the container/packaging production stage, include GHG emissions of intermediate treatment 1 in the container/packaging production stage.

Source: "Research Project Report on LCA of a Container and its Packaging in FY2004" by the Institute for Policy Sciences, Japan (March 2005)

C.1.3 Direct impact

a) Among steel cans that are collected as recyclable garbage (R1), the ones that are mixed with steel cans collected from intermediate treatment 2 during intermediate treatment 1 ((1 – R1) x 0.01) and die-cutting scrap metals generated in the container/packaging production stage, and that are recycled into converter steel (R2), shall be included in the container/packaging raw material acquisition stage.
b) Calculate the effect of recycling of steel can into converter steel using the formulas shown below. Note that the converter aluminum end exemption formula shall be applied only when the secondary data "aluminum end metal and board manufacturing" of the container/packaging raw material acquisition stage is used.
Recycling effect of converter steel = converter open-top can exemption + converter aluminum lid exemption
Converter open-top can exemption = {S1 x R1 + [S1 x (1 – R1) x 0.01] + S2} x R2 x (0.79 x GHG emissions from

crude steel + 0.32 x GHG emissions of iron ore)
Converter aluminum lid exemption = {S3 x R1 + {S3 x (1 – R1) x 0.01} x R2 x {4.6 [GHG emissions from crude steel] – 7.1 x [GHG emissions from iron ore]}

S1: weight of steel in used steel can
S2: weight of steel in die-cutting scrap metals
S3: weight of an aluminum lid in used steel can
R1: recycling rate
R2: percentage of steel cans that are recycled into converter steel

Source: "Steel Can LCA Examination Report" by the Steel Can LCA Study Committee (published in July 2003)

C.1.4 Indirect impact

Among steel cans that are collected as recyclable garbage (R1), the recycling effect of the ones that are mixed with steel cans collected from intermediate treatment 2 during intermediate treatment 1 ((1-R1) x 0.01) and die-cutting scrap metals generated in the container/packaging production stage, and that are recycled into electric furnace steel (1-R2), may be calculated using the formulas below for additional information to be displayed.
Note that the electric furnace aluminum lid exemption formula shall be applied only when the "aluminum end metal and board manufacturing" specified in the Database of GHG Emission Factors is used in the container/packaging raw material acquisition stage.

Recycling effect of electric furnace steel
= electric furnace open-top can exemption + electric furnace aluminum lid exemption

Electric furnace open-top can exemption
= {[S1 x R1 + S1 x (1 – R1) x 0.01 + S2] x (1 – R2)} x (GHG emissions from crude steel – GHG emissions from recycling steel cans into electric furnace steel)

Electric furnace aluminum lid exemption
= {[S3 x R1 + S3 x (1 – R1) x 0.01] x (1 – R2)} x 6.9 x GHG emissions from electricity

S1: weight of steel in used steel can
S2: weight of steel in die-cutting scrap metals
S3: weight of an aluminum end in used steel can
R1: recycling rate
R2: percentage of steel cans that are recycled into converter steel

Source: "Steel Can LCA Examination Report" by the Steel Can LCA Study Committee (published in July 2003)

C.1.5 Transport scenarios

Calculate GHG emissions during transport of used steel cans and die-cutting scrap metals based on the fuel consumption data (light oil) provided in the table below.

Table C.1 Used steel can transport scenarios

	Transport means	(1) Distance (km/t)	(2) Truck mileage (km/L)	(1)/(2) Light oil consumption (L/t)
Transport A	2-ton garbage truck	109.68	7.0 (light oil)	15.669
Transport B	10-ton truck	2.15	3.5 (light oil)	0.614
Transport C	2-ton garbage truck	50.91	7.0 (light oil)	7.273
Transport D	2-ton garbage truck	50.91	7.0 (light oil)	7.273
Transport E	10-ton truck	1.07	3.5 (light oil)	0.306
Source	Source 1		Source 2	

Source 1: “Quantitative Analysis of Recycling of Waste Packages" by Nomura Research Institute (published in March 1995)
Source 2: "Research Project Report on LCA of a Container and its Packaging in FY2004" by the Institute for Policy Sciences, Japan (published in March 2005)

C.1.6 Intermediate treatment and final disposal scenarios

Calculate GHG emissions during intermediate treatment and final disposal of used steel cans and die-cutting scrap metals based on the scenarios provided in the table below.

Table C.2 Intermediate treatment and final disposal scenarios

	Electricity consumption (kWh/t)	Light oil (L/t)	LSC heavy oil (L/t)	Source
Intermediate treatment 1	14.53	-	-	Source 1
Intermediate treatment 2	60.49	-	-	Source 1
Final disposal	30.639	0.620	2.398	Source 2

Source 1: "Quantitative Analysis of Recycling of Waste Packages" by Nomura Research Institute (published in March 1995)

Source 2: "LCA Study Report on Processing and Disposal of Waste Plastic" by the Plastic Waste Management Institute (published in March 2001)

Annex D (normative): Aluminum can disposal and recycling scenarios

Aluminum can scenarios applied to this PCR are below.

D.1 Disposal and recycling flow

The figure below shows the used aluminum can disposal and recycling flow.

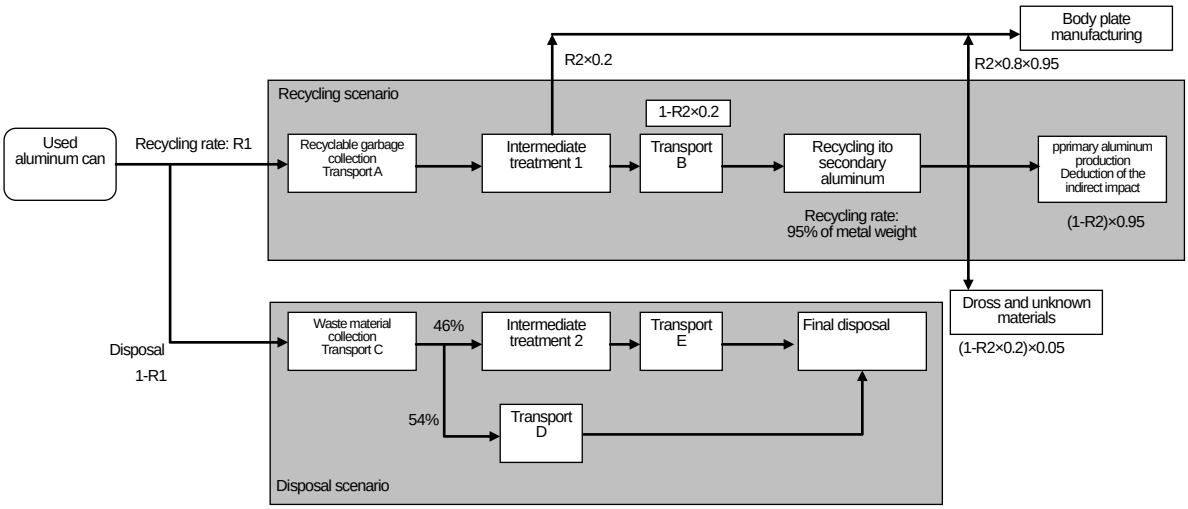


Figure D.1 Disposal and recycling flow of used aluminum can

D.1.1 Disposal and recycling rates

The aluminum can recycling rate is based on the value provided by the Japan Aluminum Can Recycling Association in FY2008.

a) Recycling rate R1: 87.3%
b) Can-to-can rate R2: 66.8%

D.1.2 Disposal and recycling stage

Among aluminum cans that are collected as waste material (1-R1), 46% are subject to final disposal after intermediate treatment 2, and 54% are subject to final disposal without any intermediate treatment. Therefore, GHG emissions in processes up to final disposal are included in the disposal and recycling stage.
For aluminum cans (R1) collected as recyclable waste, include GHG emissions of transport A and intermediate treatment 1 in the disposal and recycling stage.

For manufacturing of plates for aluminum cans, if GHG emissions are calculated based on "aluminum plates (3004 can body material)" specified in the Database of GHG Emission Factors for the CFP Pilot Project in the container/packaging raw material acquisition stage, do not include GHG emission of die-cutting scrap metals. This is because processing of die-cutting scrap metals has already been excluded from the GHG emission factor.

Source: "Study Report on Life Cycle Assessment of a Container and Packaging in FY2004" by the Institute for Policy Sciences, Japan (published in March 2005)

D.1.3 Direct impact

a) Collecting primary activity data from manufacturing of plates for aluminum cans
Include GHG emissions of transport and the subsequent processes (transport from intermediate treatment facilities and recycling) of used aluminum cans ready for recycling in the container/packaging raw material acquisition stage.
Calculate the amount of recycled metal that is not going to be used as can material so that the sum of the amount of recycled metal to be used as can material (direct impact) and the amount of recycled metal that is not going to be used as can material (indirect impact) is equal to the industry standard. If the calculation results in a negative value, review the calculation method.

b) Using the GHG emission factor to calculate GHG emissions in manufacturing of plates for aluminum cans

If GHG emissions are calculated based on "aluminum plates (3004 can body material)" specified in the Database of GHG Emission Factors for the CFP Pilot Project in the container/packaging raw material acquisition stage, die-cutting scrap metals and materials of used aluminum cans subject to can-to-can processing are excluded from the GHG emission factor. Therefore, include GHG emissions of only transport B of used aluminum cans and production of recycled metal (R2 x 0.8 x 0.95).

D.1.4 Indirect impact

Among aluminum cans that are collected as recyclable garbage (R1), the ones that are converted into recycled metal (1 – R2 x 0.95) can be calculated using the formulas below and the calculation result can be additionally provided as the primary aluminum recycling effect.

Primary aluminum recycling effect = primary aluminum exemption

Primary aluminum exemption = A x R1 x (1 – R2 x 0.2) x 0.95 x (GHG emissions from production of recycled aluminum metal – GHG emissions from primary aluminum production)

A: weight of aluminum contained in used aluminum can
R1: recycling rate
R2: can-to-can rate

D.1.5 Transport scenarios

Calculate GHG emissions due to transport of used aluminum cans based on the fuel consumption data (light oil) provided in the table below.

Table D.1 Used aluminum can transport scenarios

	Transport means	(1) Distance (km/t)	(2) Truck mileage (km/L)	(1)/(2) Light oil consumption (L/t)
Transport A	2-ton packer	297.71	7.0 (light oil)	42.530
Transport B	10-ton truck	25	3.5 (light oil)	7.143
Transport C	2-ton packer	138.7	7.0 (light oil)	19.814
Transport D	10-ton truck	1.07	3.5 (light oil)	0.306
Transport E	10-ton truck	1.07	3.5 (light oil)	0.306
Source	Source 1		Source 2	

Source 1: "Quantitative Analysis of Recycling of Waste Packages" by Nomura Research Institute, Ltd (March 1995)
Source 2: "Research Project Report on LCA of Container and Packaging in FY2004" by the Institute for Policy Sciences, Japan (March 2005)

D.1.6 Intermediate treatment and final disposal scenarios

Calculate GHG emissions due to intermediate treatment and final disposal of used aluminum cans and die-cutting scrap metals based on the scenarios provided in the table below.

Table D.2 Intermediate treatment and final disposal scenarios

	Electricity consumption (kWh/t)	Light oil (L/t)	LSC heavy oil (L/t)	Source
Intermediate treatment 1	67.56	-	-	Source 1
Intermediate treatment 2	60.49	-	-	Source 1
Final disposal	30.639	0.620	2.398	Source 2

Source 1: "Quantitative Analysis of Recycling of Waste Packages" by Nomura Research Institute, Ltd. (March 1995)
Source 2: "LCA Study Report on Treatment and Disposal of Waste Plastic" by the Plastic Waste Management Institute (March 2001)

Annex E (reference): Information disclosure sheet

Date of disclosure:

Information Disclosure Sheet

1. Product information				
1.1	Verification ID		Registration date	
1.2	Product name		Open-top can and can end/Open-top can only/Can end only	
1.3	Product specifications			

2. Company information			
2.1	Company name	Name	
		Dept.	
2.2	Contact information	Address	
		Phone number	

3. Information on CO_2e emissions				
3.1	Unit to be labeled			
3.2	Subtotal of each stage (subtotal of each stage viewed from user of container/packaging)			
	Raw material acquisition stage (Raw material acquisition, manufacture and transport of container/packaging)			kg-CO_2e
	Disposal/recycling stage (Disposal and recycling of container/packaging)			kg-CO_2e
3.3	Total value			kg-CO_2e
3.4	Accessories included in calculation (handle, paper label, overcap, and so on)			
3.5	Life cycle stage included in calculation (check if included)			
	Raw material acquisition stage		Container/packaging production stage	
	Container/packaging transport stage		Disposal/recycling stage	
3.6	Additional information to be labeled			
3.7	Remarks			

4. Approved PCR, GHG Emission Factor Database		
4.1	Approved PCR name	
4.2	Approved PCR ID	
4.3	Name of GHG Emission Factor Database	

Annex F (reference): Bibliography

F.1 Guidelines of CFP (Carbon Footprint of Products) system (revised edition):
The CFP rules study committee (July 16, 2010)

F.2 Standards of PCR (Product Category Rules) development (revised edition):
The CFP rules study committee (July 16, 2010)

F.3 Specifications of CFP Label and Displaying Other Information:
The Ministry of Agriculture, Forestry and Fisheries, the Ministry of Economy, Trade and Industry, the Ministry of Land, Infrastructure, Transport and Tourism, and the Ministry of the Environment (August 3, 2009)

F.4 Tentative Database of GHG Emission Factors for the CFP Pilot Project:
The CFP Pilot Project Secretariat (Japan Environmental Management Association for Industry) (August 18, 2009)

F.5 Research Project Report on Life Cycle Assessment of Containers and Packaging in FY2004:
Institute for Policy Sciences (March 2005)

F.6 Report on Steel Can LCA Examination Report:
The Steel Can LCA Study Committee (July 2003)

F.7 Quantitative Analysis of Recycling of Container and Packaging Waste:
Nomura Research Institute, Ltd. (March 1995)

F.8 LCA Study Report on Treatment and Disposal of Waste Plastic:
The Plastic Waste Management Institute (March 2001)

F.9 JIS Z 1571: 2005 Hermetically sealed metal cans for food and beverages

F.10 JIS Z 8123: 1995: Graphic arts - Glossary - Fundamental terms

[PCR revision histories]

Approved PCR ID	Release date	Contents revised
PA-BD-02	September 8, 2010	(1) Changed corresponding to the revisions of the basic rules. (2) Adapting the contents to the new PCR draft template. (3) For handling of recycling of the wastes discharged from each stage (other than the disposal and recycling stage), up to and including recycling preparation process shall be calculated. (It applies to "No.2-(7): Handling of recycling standards" provided in the "Guide of Establishing Product Category Rules (PCR)".) (4) For handling of the wastes collected for value, up to and including the recycling preparation process shall be calculated. (It applies mutatis mutandis to "No.2-(7): Handling of recycling standards" provided in the "Guide of Establishing Product Category Rules (PCR)".)