

Product Category Rules (PCR)

(Approved PCR ID: PA-CA-01)

Printing Ink (intermediate goods)

Release date: March 28, 2011

The Carbon Footprint of Products Calculation and Labeling Pilot Program

NOTICE:

This English translation is provided for information purpose.

Use latest version for your calculation. Check the website if it is the newest one.

<http://www.cfp-japan.jp/english/pcr/pcrs.html>

* This approved PCR will expire at the end of the CFP Pilot Project (scheduled until March 31, 2012).

If this PCR is revised during the Pilot Project, the revised PCR will become effective.

**Product Category Rule of
“Printing Ink (intermediate goods)”
(Approved PCR ID: PA-CA-01)**

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 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	<ul style="list-style-type: none">- This PCR prescribes rules, requirements and instructions applicable to “printing ink” under the CFP Pilot Project.- This PCR was developed as “intermediate goods (business-to-business product)” as far as printing ink manufacturers can be directly involved, and so that printing businesses can use the assessment result as raw materials.
2	Definitions of products	
2-1	Descriptions of product category	This PCR covers printing inks used for printings with a printing plate, such as lithographic ink, flexographic ink, metal decorating ink, gravure ink, news ink, screen ink, ultraviolet (curing) ink, and resist ink.
2-2	Components of products	Components are solvent (including water), monomer, resin, printing varnish, pigment, vegetable oil, additives, indirect materials, container, and packing materials.
3	Referenced Standards and PCRs	There is no referenced PCR, as of February, 2011.
4	Terms and Definitions	<p>(1) Industrial, textile, graphic arts; printing A general term for the process of manufacturing and processing printed matter. Specifically, the term refers to the technique of reproducing multiple copies of an original containing images and characters by creating a plate using that original, applying ink to the plate, and transferring the information on the plate (in the form of ink) to paper, etc. [Source: <i>Printing Terminology - Basic Terms</i>, JIS Z 8123 (1995)]</p> <p>(2) Printing ink Image-foaming materials for forming and fixing a plate image on the surface of paper, etc. Remarks: printing ink is generally composed of color materials (e.g., pigment), vehicles for dispersing pigments, and additives adjusting various properties. [Source: <i>Printing Terminology - Basic Terms</i>, JIS Z 8123 (1995)]</p> <p>(3) Lithographic ink A general term of the ink used for lithographic printing. There are two ink types; oxidation polymerization type ink used for sheet-fed printing press, and heat setting type ink used for web offset press. This ink is made by dispersing pigments in a printing varnish being composed of rosin modified phenolic resin, alkid resin, vegetable oil (drying oil), and petroleum solvent. Lithographic printing applies such property that oil and water repel one another. Printing is performed by using a plate whose asperities are too negligible. Currently, most lithographic printings in the field of commercial printing are offset</p>

printing. Thus, lithographic ink is generally called offset ink.

(4) Flexographic ink

A general term of the ink used for flexographic printing for corrugated cardboard, wrapping paper, and paper, etc. It is a low-viscosity and fast-drying type of ink used for flexographic printing. Also called, flexo ink or rubber plate ink. This ink is classified into solvent type and water-based type.

Flexographic printing refers to a printing method using relief plate (made from elastic materials such as rubbers and photopolymers) and liquid printing ink.

(5) Metal decorating ink

A general term of the ink used for metal printing such as for tin plate and for aluminum plate.

Metal decorating ink belongs to lithographic ink since most of metal printings use offset printing method. Resin varnish or oil-modified alkyd resin is used for a vehicle. Dry film needs to have much flexibility and resistance to several types of can-making processing.

(6) Gravure ink

A general term of the ink used for gravure printing.

It is made by mixing pigments with a vehicle by dissolving a resin in a solvent. A low-boiling organic solvent is often used as a solvent for this type of ink. Non-toluene ink, which does not be made with toluene, and water-based gravure ink have been developed.

An intaglio plate (cylinder) by photoengraving or mechanical engraving is used for gravure printing.

Ink is supplied from ink pan to cylinder, and ink on non-image areas is removed by a doctor blade. Then, substrates (paper or films, etc.) are passed through from a plate cylinder to an impression cylinder, being applied pressure, and inks remaining in the depressed image area are transferred to the substrates.

(7) News ink

A general term of the ink used for newspaper printing. Mostly printed on newsprint. It is a penetration drying type of ink, which is fixed and dried due to penetration of vehicles into paper.

Letterpress printing used to be applied for newspaper, but today, offset printing is applied, and most newspaper has been adopted color printing.

(8) Screen ink

Screen ink refers to a type of stencil ink, and a general term of the ink used for screen printing. Components of this ink vary according to types of substrates.

Screen printing refers to a stencil printing method using a printing plate which has non-image areas on its screen fabric surface, through which no printing ink can be passed.

Types of screen ink are divided into the following;

- oxidation polymerization type of ink, made with drying oil, is applied for paper,
- evaporation drying type or curing reaction type of ink, made with synthetic resin and solvent, is applied for plastic, and
- thermal fusion bonding type of ink is applied for glass.

		<p>(9) Ultraviolet (UV) ink An ink momentarily cured and dried by irradiating ultraviolet. Also called, ultraviolet curing ink. It is composed of UV curable prepolymer, monomer, and photo-initiator. It is used for printing for paper containers, plastic materials, business foam, label, and printed-circuit, and used for various types of coatings.</p> <p>(10) Resist ink Resist ink refers to an ink which has excellent chemical resistance, heat resistance, and electrical insulation, and it is for protecting from chemical/ physical reaction and/or action in plating, etching, and soldering, etc. It also refers to a general term of the ink used for printed-circuit board.</p> <p>(11) Printing varnish Printing varnish is one of base agents of printing ink, used for pigment dispersing. It is also called “vehicle,” meaning to a carrier of pigment. The main components of printing varnish for offset printing ink are resin, drying oil, and solvent. It needs proper fluidity, and the functions to have inks dried and solidified and to have pigments fixed on substrates to which inks were transferred. It is necessary to provide printing effects such as gloss and rub resistance, etc.</p> <p>(12) Pigment Pigment refers to colorant, and fine particles insoluble in water, solvent, oil and the like. It is distinguished from dyes with respect to insoluble in water. It is used as colorant for coating, printing ink, plastic, and lubber, etc. It is classified into inorganic pigment and organic pigment.</p>
5	Range of assessment	
5-1	Calculation unit	Sales unit
5-2	Life cycle stages	<p>Following life cycle stages shall be covered.</p> <ul style="list-style-type: none"> - Raw material acquisition stage - Production stage <p>(Since this PCR is for “intermediate goods (B-B product),” the distribution or later stages are excluded from the assessment.)</p>
6	General requirements applied to all stages	
6-1	Life cycle flow chart	Provided in Annex A (normative).
6-2	Range of data collection	Prescribed in each stage.
6-3	Data collection period	<ul style="list-style-type: none"> - Collect the data on actual results. - Since various types of printing inks are produced according to customer orders, there is little possibility that the same product has been continuously produced for a long period such as one year. Therefore, collect the data on actual results in principle. Requirements for data collection period are prescribed in each stage.
6-4	Allocation	<ul style="list-style-type: none"> - Physical quantity (weight) shall be used. - When physical quantity other than weight [e.g., area, operating time, etc.], and economic value are used, its validity shall be verified.
6-5	Cut-off criteria	When conducting cut-off, the range of cut-off shall be within 5% of the total GHG emissions from “the raw material acquisition stage” and “the production stage” covered by this PCR, 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	[Indirect department]

		<p>Collect data excluding indirect departments (e.g., business office, research and development facility [department], etc.). If it is difficult to exclude, data from indirect department may be included.</p> <p>[On-site electricity generation] When on-site electricity generation is used, the input fuel amount shall be collected as primary data, and calculate the GHG emissions associated with the production and combustion of the fuel.</p>
7	Requirements for raw material acquisition stage	
7-1	Range of the processes	<p>Following processes shall be covered.</p> <p>(1) Processes related to production of raw materials procured (including intermediate, etc.)</p> <p>(2) Processes related to production of containers (including 1kg can, 18-liter can, and drum can, etc., and excluding a tank equipped to a tank truck) and packing materials procured</p> <p>(3) Processes related to domestic/international transport from the production sites of raw materials, containers, and packing materials, to the production site of applicable product</p>
7-2	Data collection items	<p>Collect data on the following items for each product type and each color of printing inks.</p> <p>(1) Process related to production of raw materials procured (including intermediate, etc.)</p> <p>1) GHG emissions (kg-CO₂e) per unit and input amounts (including containers and packing materials) related to production of raw materials of printing ink, such as solvent (including water), monomer, resin, printing varnish, pigment, and vegetable oil, and production of additives, etc.</p> <ul style="list-style-type: none"> - If printing varnish, pigment, and/or intermediate, etc. are self-produced, these raw materials are included in the assessment. - If well water is used as the water for production, calculate GHG emissions from the input amounts of electricity and fuels consumed for pumping up and usage of the well water. <p>2) GHG emissions (kg-CO₂e) per unit and input amounts (including containers and packing materials) related to production of indirect materials used in the production stage (e.g., waste*, filter, cleaning detergent, etc.)</p> <p>(*“Waste” in this paragraph refers to cloth or paper to be used for cleaning a machine, and does not refer to any discharged materials.)</p> <p>3) GHG emissions (kg-CO₂e) per unit and input amounts related to production of “paper bags, 18-liter can, and/or drum can, etc.” used for storing self-produced printing varnish, pigment, and intermediate, etc., by the time of production of printing inks</p> <p>(2) Processes related to production of containers and packing materials procured.</p> <p>1) GHG emissions (kg-CO₂e) per unit and input amounts related to production of containers with which printing inks will be filled</p> <p>2) GHG emissions (kg-CO₂e) per unit and input amounts related to production of packing materials to be used for packing the containers with which printing inks are filled</p> <p>(3) Processes related to domestic/international transport from the production site of raw materials, etc. to the production site of applicable product</p>

		<p>- As for such processes, collect the data on the items listed in No.7-3-(3).</p> <p>- As for the calculation of fuel consumption amount related to transport, use either the “fuel consumption method,” the “fuel cost method,” or the “ton-kilometer method” prescribed in the “Act on the Rational Use of Energy”.</p> <p>Refer to Annex B for the details of each method of calculating fuel consumption amount.</p>
7-3	Primary data collection items	<p>Collect primary data on the following items.</p> <p>(1) Process related to production of raw materials procured (including intermediate, etc.)</p> <p>1) Input amounts of raw materials of printing ink, such as solvent (including water), monomer, resin, printing varnish, pigment, and vegetable oil, and of additives, etc. (including containers and packing materials)</p> <p>If printing varnish, pigment, and/or intermediate, etc. are self-produced, these raw materials are included in the assessment.</p> <p>2) Input amounts of indirect materials (e.g., waste*, filter, cleaning detergent, etc.) used in the production stage of printing ink (including containers and packing materials)</p> <p>(*“Waste” in this paragraph refers to cloth or paper to be used for cleaning a machine, and does not refer to any discharged materials.)</p> <p>3) Input amounts of “paper bags, 18-liter can, and drum can, etc.” used for storing self-produced printing varnish, pigment, and/or intermediate, etc., by the time of production of printing inks</p> <p>(2) Processes related to production of containers and packing materials procured</p> <p>1) Input amount of containers with which printing inks will be filled</p> <p>2) Input amount of packing materials of containers with which printing inks are filled</p> <p>(3) Processes related to domestic/international transport from a production site of raw materials, etc. to a production site of applicable product</p> <p>1) Cargo weight</p> <p>2) GHG emissions associated with fuel usage</p> <p>(the fuel consumption method)</p> <p>- Fuel consumption amount</p> <p>(the fuel cost method)</p> <p>- Distance</p> <p>(the ton-kilometer method)</p> <p>- Distance</p> <p>- Loading ratio</p>
7-4	Primary data Collection method and Requirements	<p>- As for each item listed in data collection items of No.7-3, collect data on actual results for individual product.</p> <p>- If it is difficult, however, collect the data on the total input amounts of the manufacturing line or of the manufacturing site, for the duration of the product manufacturing period, and then allocate it by the manufacturing amount of applicable product.</p> <p>- If the primary data on input amount for the duration of applicable manufacturing period cannot be obtained, allocation can be conducted by using annual input amounts.</p> <p>- When allocating input amount, its validity shall be verified.</p>
7-5	Scenario	[Transport scenario]

		If it is difficult to collect primary data on transport, scenario in Annex C (normative) may be used.
7-6	Other	<p>[Collecting data from multiple suppliers]</p> <p>Primary data shall be collected from all suppliers. As for suppliers whose primary data is difficult to be collected, primary data from other suppliers may be used. In this case, use weighted-average value based on the input amount of the supplier whose primary data were collected. The substitution ratio of such primary data from other suppliers shall, however, be less than 50% of the total amount of the raw material.</p> <p>[Rules related to recycled materials and reused products]</p> <p>If recycled materials and reused products are used as inputs, GHG emissions related to the manufacture and transport of them shall include the emissions emitted after the processes for ones readying for the recycling preparations (e.g., collection, regeneration processing, etc.) or the reusing (e.g., collection, cleaning, etc.).</p>
8	Requirements for the production stage	
8-1	Range of the processes	<p>The following processes shall be covered.</p> <p>(1) Processes related to manufacture, filling, and packing of printing inks (including the processes of startup, shutdown, and cleaning of machine)</p> <p>(2) Processes related to treatment of waste materials handled as wastes</p> <p>(3) Processes related to transport when transport of intermediate goods, etc. between production sites is conducted (excluding the transport within the same site)</p> <p>(4) Processes of transport relating to disposal and recycling</p>
8-2	Data collection items	<p>Collect the data on the following items.</p> <p>(1) Processes related to manufacture, filling, and packing of printing inks (including the processes of startup, shutdown, and cleaning of machine)</p> <ol style="list-style-type: none"> 1) Manufacturing amount of applicable product 2) Input amounts of electricity and fuels 3) Input amount of water (when well water is used, calculate GHG emissions from input amounts of electricity and fuels consumed for pumping up and usage of the well water.) 4) Input amount of steams purchased (as for steams generated within a production site, collect input amount of electricity, fuels, and water consumed for it.) 5) GHG emissions (kg-CO₂e) related to supply and usage of electricity, fuels, water, and steams purchased <p>(2) Processes related to treatment of waste materials to be handled as wastes</p> <ol style="list-style-type: none"> 1) Discharged amount of wastes 2) Discharged amount of waste water 3) GHG emissions (kg-CO₂e) related to transport and treatment of wastes and waste water (including GHG emissions associated with combustion of carbon derived from fossil fuels in the wastes to be incinerated) 4) Amount of wastes to be recycled 5) GHG emissions (kg-CO₂e) related to transport of wastes to be recycled and related to recycling preparation processes <p>(3) Processes related to transport when transport of intermediate goods, etc.</p>

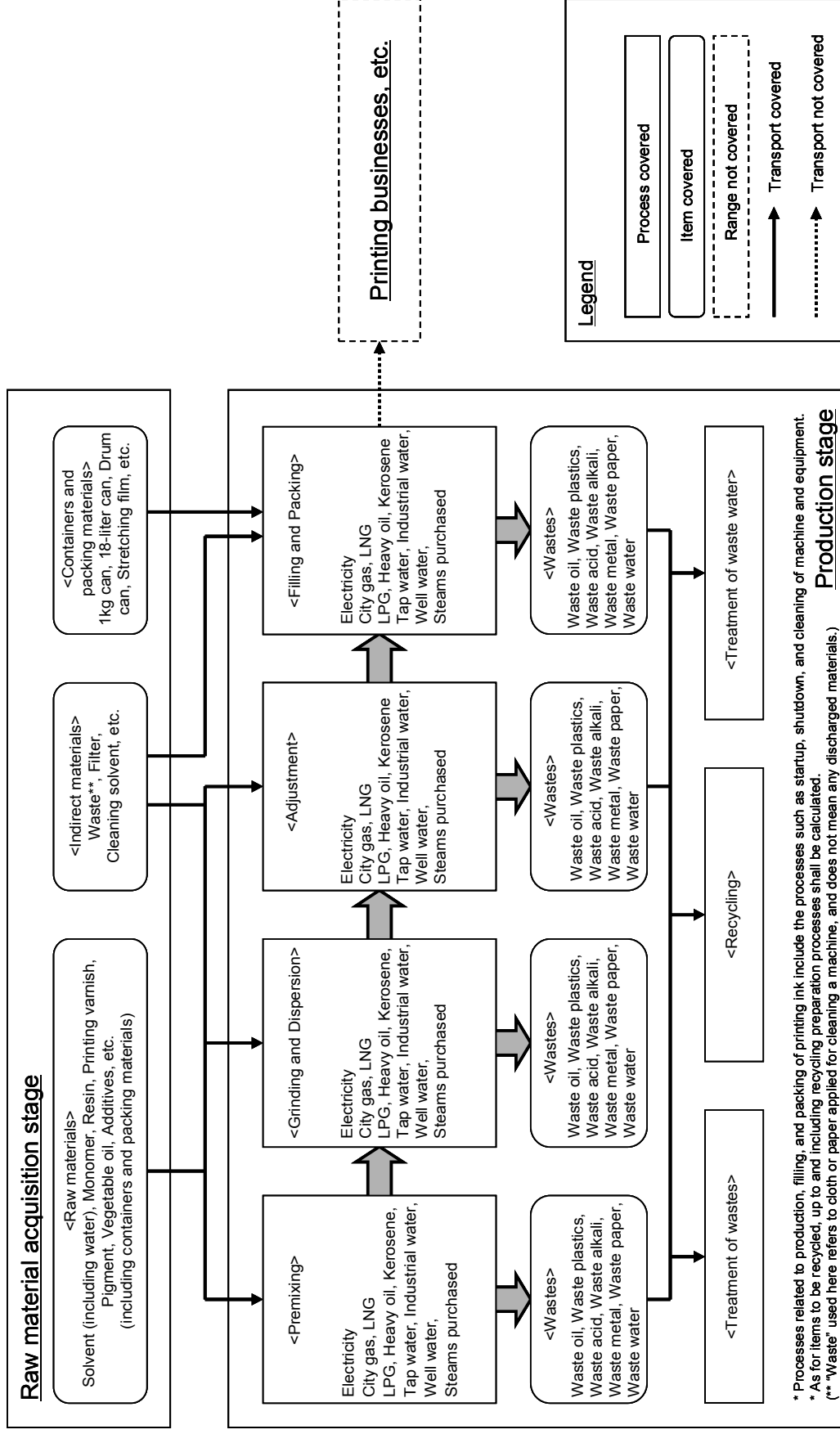
		<p>between production sites is conducted (excluding the transport within the same site)</p> <ul style="list-style-type: none"> - As for such processes, collect the data on the items listed in No.8-3-(3). - As for the calculation of fuel consumption amount related to transport, use either the “fuel consumption method,” the “fuel cost method,” or the “ton-kilometer method” prescribed in the “Act on the Rational Use of Energy”. Refer to Annex B for the details of each method of calculating fuel consumption amount. <p>(4) Processes of transport relating to disposal and recycling</p> <ul style="list-style-type: none"> - As for such processes, collect the data on the items listed in No.8-3-(4). - As for the calculation of fuel consumption amount related to transport, use either the “fuel consumption method,” the “fuel cost method,” or the “ton-kilometer method” prescribed in the “Act on the Rational Use of Energy”. Refer to Annex B (normative) for the details of each method of calculating fuel consumption amount.
8-3	Primary data collection items	<p>Collect primary data on the following items.</p> <p>(1) Processes related to manufacture, filling, and packing of printing inks (including the processes of startup, shutdown, and cleaning of machine and equipment)</p> <ol style="list-style-type: none"> 1) Manufacturing amount of applicable product 2) Input amounts of electricity and fuels 3) Input amount of water 4) Input amount of steams purchased (as for steams generated within a production site, collect input amount of electricity, fuels, and water consumed for it.) <p>(2) Processes related to treatment of waste materials to be handled as wastes</p> <ol style="list-style-type: none"> 1) Discharged amount of wastes 2) Discharged amount of waste water 3) Amount of wastes to be recycled <p>(3) Processes related to transport when transport of intermediate goods, etc. between production sites is conducted (excluding the transport within the same site)</p> <ol style="list-style-type: none"> 1) Cargo weight 2) GHG emissions associated with fuel usage <ul style="list-style-type: none"> (the fuel consumption method) <ul style="list-style-type: none"> - Consumption amount of fuels (the fuel cost method) <ul style="list-style-type: none"> - Distance (the ton-kilometer method) <ul style="list-style-type: none"> - Distance - Loading ratio <p>(4) Processes of transport relating to disposal and recycling</p> <ol style="list-style-type: none"> 1) Cargo weight 2) GHG emissions associated with fuel usage <ul style="list-style-type: none"> (the fuel consumption method) <ul style="list-style-type: none"> - Amount of fuel consumption (the fuel cost method)

		<ul style="list-style-type: none"> - Transport distance (the ton-kilometer method) - Transport distance - Loading ratio
8-4	Primary data Collection method and Requirements	<ul style="list-style-type: none"> - As for each item listed in data collection items of No.8-3, the data on actual results of individual product shall be collected. - If it is difficult, however, you may collect the data on the total input amounts of the manufacturing line or of the manufacturing site, for the duration of the product manufacturing period, and then allocated it by the production amount of applicable product. - If input amounts for the duration of product manufacturing period cannot be obtained, allocation can be conducted by using annual input amounts. When allocating input amounts, its validity shall be verified. - As for input amount of electricity, if it is difficult to collect actual results by measurement, “power rating” of machine and equipment used may be used. In this case, however, the reason why actual results were difficult to be collected by measurement shall be reported.
8-5	Scenario	<p>[Scenarios for the transport between production sites and for the transport relating to disposal and recycling in the production stage]</p> <p>As for the transport between production sites and for the transport relating to disposal/recycling in the production stage, scenarios in Annex C may be used, if it is difficult to collect primary data.</p> <p>[Scenarios for disposal and recycling in the production stage]</p> <p>As for disposal and recycling in the production stage, primary data related to its treatment method (details of the treatment) and treatment facility shall be collected. If it is difficult, however, the following scenario may be used (Values are the ratio of generated amounts by treatment method):</p> <ul style="list-style-type: none"> - For waste paper, incineration shall be set as 2%, recycling as 98% (*). (CO₂ derived from incineration of paper are assumed to be carbon-neutral and excluded from the assessment.) - For waste metals, recycling shall be set as 100% (*). - For waste oil, waste plastics, waste acid, and waste alkali, incineration shall be set as 100%. <p>(Calculate GHG emissions associated with combustions of carbons derived from fossil fuels in the wastes to be incinerated.)</p> <p>(* Source: “<i>Investigation into the State of By-Products Generation (2006 Results)</i>,” Clean Japan Center (issued on March 2008)</p>
8-6	Other	Not stipulated.
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	Excluded from the assessment.
11-2	Data collection items	Excluded from the assessment.
11-3	Primary data collection items	Excluded from the assessment.
11-4	Primary data Collection method and Requirements	Excluded from the assessment.
11-5	Scenario	Excluded from the assessment.
11-6	Other	Excluded from the assessment.
12	Items applied secondary data	<ul style="list-style-type: none"> - The data provided in the “Tentative Database of GHG Emission Factors for the CFP Pilot Project” (hereinafter called “GHG Emission Factor Database”). Use the database of the latest version. - Of secondary data which is not included in GHG Emission Factor Database, but the data prepared as “reference data” by the CFP Pilot Project Secretariat.
13	Communication requirements	
13-1	Unit to be displayed on the label	<ul style="list-style-type: none"> - Calculation unit. - The communication methods described in the “<i>Basic Guideline of the Carbon Footprint of Products</i>” and the “<i>Guide of Establishing Product Category Rules</i>” can be used. In this case, however, its appropriateness shall be discussed by the CFP verification panel. - In the case of sales by using tank truck, displays of amount of GHG emissions per unit weight or unit volume (e.g., “per ton,” “per kiloliter”) can be used.
13-2	Label position and Size	<ul style="list-style-type: none"> - Follow the “<i>Specifications of CFP label and Displaying Other Information</i>”. The indication of “Intermediate goods” shall be displayed. - Communication to consumer by using label shall not be allowed. - CFP information can, however, be displayed on catalog, invoice, and/or packing slip, etc. of individual product
13-3	Contents of additional information	Not stipulated.

Annex A (normative): Life cycle flow chart

Note: When there are any process and/or raw materials which are not described in this flow chart, include all of them in the assessment.



Annex B (normative): Calculation method for GHG emissions associated with fuel consumption during Transport

B.1 Fuel consumption method

- 1) Collect data on fuel consumption [L] for each mean of transport, and convert the fuel unit, "L," to "kg" by using following equation.

$$\text{"Fuel consumption" [kg]} = \text{"fuel consumption" [L]} \times \text{"fuel density" "\gamma" [kg/L]}$$

Fuel density of gasoline: $\gamma = 0.75\text{kg/L}$

Fuel density of light oil: $\gamma = 0.83\text{kg/L}$

- 2) Calculate life cycle GHG emissions by multiplying fuel consumption [kg] and the "life cycle GHG emissions related to supply and use of fuel" [kg-CO₂e/kg] (secondary data) for each type of fuel

B.2 Fuel cost method

- 1) Collect data on fuel cost [km/L] and transport distance [km] for each mean of transport, and calculate fuel consumption by using the following equation.

$$\text{"Fuel consumption" [kg]} = (\text{"transport distance" [km]} / \text{"fuel cost" [km/L]}) \times \gamma \text{ [kg/L]}$$

- 2) Calculate life cycle GHG emissions by multiplying fuel consumption F [kg] and the "life cycle GHG emissions related to supply and use of fuel" [kg-CO₂e/kg] (secondary data) for each type of fuel.

B.3 Ton-kilometer method

- 1) Collect data on loading ratio [%] and transport load (transport ton-kilometer) [t-km] for each mean of transport.
- 2) Calculate life cycle GHG emissions by multiplying the transport load (transport ton-kilometer) [t-km] by the "life cycle GHG emissions related to fuel consumption per transport ton-kilometer" [kg-CO₂e/t-km] (secondary data) for different transport loads for each mean of transport.

Annex C (normative): Transport scenario

Transport scenarios for each stage when primary data cannot be obtained are shown below.

Life cycle stage	Scenario
Raw material acquisition stage	<p>(1) Domestic transport: [Transport only by road]</p> <ul style="list-style-type: none"> - Distance: one way as 500 km (assumed the transport between prefectures; the transport between Tokyo to Osaka) - Means: 10-ton truck - Loading ratio: 50 % <p>[Marine transport is involved]</p> <p>Domestic transport (production site or procurement site of raw materials => port)</p> <ul style="list-style-type: none"> - Distance: one way as 100 km (assumed the transport within a prefecture; the distance from a prefectural boarder to the opposite side of the prefecture boarder) - Means: 10-ton truck - Loading ratio: 50 % <p>Domestic marine transport (port => port)</p> <ul style="list-style-type: none"> - Distance: one way as 1,500 km (assumed the domestic transport; the distance between Tokyo and Hokkaido, or Tokyo and Kyusyu) - Means: container ship (4,000TEU or less) <p>Domestic transport (port => manufacturing site of applicable product)</p> <ul style="list-style-type: none"> - Distance: one way as 500 km (assumed the transport between prefectures; the transport between Tokyo to Osaka) - Means: 10-ton truck - Loading ratio: 50 % <p>(2) International transport is involved: Transport within a country produced the material (production site or procurement site of raw materials => port)</p> <ul style="list-style-type: none"> - Distance: one way as 500 km - Means: 10-ton truck - Loading ratio: 50 % <p>International marine transport (port => port)</p> <ul style="list-style-type: none"> - Distance: marine transport distance between ports ("reference data" prepared by the CFP Pilot Project Secretariat) - Means: container ship (4,000TEU or more) <p>Domestic transport (port => manufacturing site of applicable product)</p> <ul style="list-style-type: none"> - Distance: one way as 500 km (assumed the transport between prefectures; the transport between Tokyo to Osaka) - Means: 10-ton truck - Loading ratio: 50 %
Production stage	<p>(1) Scenario for transport between manufacturing sites</p> <ul style="list-style-type: none"> - Distance: one way as 500 km (assumed the transport between prefectures; the transport between Tokyo to Osaka) - Means: 10-ton truck - Loading ratio: 50 % <p>(2) Scenario for transport for wastes and recycling in the production stage</p> <ul style="list-style-type: none"> - Distance: one way as 100 km (assumed the transport within a prefecture; the distance from a prefectural boarder to the opposite side of the prefecture boarder) - Means: 4-ton truck - Loading ratio: 25 %