**EcoLeaf Environmental Label Product Category Rules (PCR)**

| PCR No. | PCR Title | **Large Format Printer** |
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| **BN-02** | | Large format printer |



| No. | Major key | Minor key | Class | Requirements |
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| 1 | Pre-requisites for PCR develop-ment | Product | Definition | An output device for computers used in offices or other environments, including a large-size (for paper sizes exceeding A3) ink-jet (hereinafter referred to as IJ) and electrophotogenic (hereinafter referred to as EP) printer and a large-size (for paper sizes exceeding A3) multifunction device having a printing function. Large-size printers using solvent inks are excluded. |
| 2 | | | Scope | Accessories include the following:<br>・IJ printers: Print head, ink<br>・EP printers: Photoreceptor, toner, carrier (integrated cartridge, if there is an integrated cartridge)<br>・All packaging materials (except for those used widely and repeatedly)<br>・Accessories to perform the function include printer drivers provided on floppy disk, CD-ROMs, or other media, and manuals provided in printed form, CD-ROMs, or other forms. |
| 3 | | Stage | Scope | All life cycle stages (all stages specified in the PEIDS of this program: manufacturing, distribution, use, and disposal/recycling) |
| 4 | Product Data Sheet (PDS)<br>(LCI input data) | Production Stage Information (Product information) | Product materials or raw material constitu-tion | 1) Items classified as Class A parts (See "Section 3.4" of the implementation guidelines) are as follows:<br><br><u>IJ printers</u><br>(1) Print head<br>(2) Ink<br>Notes:<br>(i) All ink constituents shall be treated as water, and a basic unit of "water" shall be used for them, but this dose not limit the use of individual basic units.<br>(ii) For processing, processing energy data collected in-house shall be used.<br><br><u>EP printers</u><br>(1) Photoreceptor<br>Notes:<br>(i) For processing photoreceptor drums,<br>・Processing energy data collected in-house shall be used (when the data are available in-house.)<br>・When the data are not available in-house, see No. 14.<br>(ii) For processing from photoreceptor drums through coating, processing energy data collected in-house shall be used. |

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| | | | | (2) Toner<br>Notes:<br>(i) For processing, processing energy data collected in-house shall be used.<br><br>(3) Carrier<br>Notes: The same conditions as those for the above-mentioned toner are applied.<br><br>For materials of Class A parts, trace back to the MSDS material level.<br>2) To determine the amount of resource input, use material mass at the product level, categorize materials making up 90% or more of total product mass, and prorate the rest to adjust the percentage to total 100.<br><br>3) The names of materials shall be listed in the product data sheet for the following 12 items: ordinary steel, SUS, aluminum, other metals, thermoplastic resin, thermosetting resin, rubber, glass, paper, semiconductor substrate, wood, and water. For materials other than these 12 items, specify a basic unit name.<br><br>4) Open recycling and reuse<br>When open recycling and reuse processes are included, each company may account for these processes by setting a scenario that is considered appropriate, paying attention to the items below. The rationale for the scenario is subject to verification.<br>(1) Processes that fall in the scope of "indirect impacts"<br>(2) Deductions and impacts within the scope of "indirect impacts" |
| 5 | | Production stage information (production site information) | Materials and energy that are input/ consumed/ disposed of | 1) Input and consumed items:<br>Electricity, fuel oil A, diesel fuel, kerosene, gasoline, LNG (town gas), LPG, city tap water, industrial water supply, and groundwater<br>Note: For processing energies pertaining to Class A parts, determine the impact, tracing back to the MSDS material level.<br><br>2) Emitted items:<br>Not stipulated. Each company, however, shall specify items judged to be important.<br><br>3) Transportation impact for input materials (raw materials and energy) shall not be accounted for.<br><br>4) Byproducts and sub-materials shall not be accounted for.<br>Sub-material is defined as a material that is input and disposed of at manufacturing sites, and not shipped with products. |
| 6 | | Distribution stage information | Product transporta-tion conditions | 1) The means of transportation to users and the loading ratio should be based on a model established by each applicant company. |

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| | | | | 2) Total domestic transportation distance (transportation to the site of use) shall be calculated as 100 km. Product transportation from overseas to Japan shall be treated as overseas land transportation and sea transportation, and total distance shall be set by each company or based on the actual distance measured by each company.<br><br>3) Disposal and recycling processes of packaging materials for a main body shall be entered into No. 8 "Disposal and Recycling". |
| 7 | | Usage stage information | Product usage conditions | 1) Use conditions<br>IJ printers:<br>(i) The print pattern shall be JIS SCID (bicycle) in color. Print at the largest size available with the large format printer.<br>(ii) The number of printed pages shall be assumed to be 5 pages/day with a use period of 3 years (8 hours/day, 20 days/month, and 12 months/year.)<br>(iii) The print mode shall be the default mode for plain paper. If the setting for plain paper is not available, each company selects an appropriate paper type (Print in the default mode.)<br>(iv) When the printer is idle (for 16 hours/day), the primary-side power supply shall be off.<br>The above conditions shall be specified in the commentary section of PEIDS.<br><br>EP printers:<br>In principle, the conditions set for IJ printers [(i) through (iv) above] shall be used. However, the following conditions shall be added based on the actual use conditions of EP printers:<br>(v) In addition to the pattern specified in (i), the chart mentioned below may also be used. For printers working only in a monochrome mode, print in monochrome.<br>・ISO/IEC 10561:1999 Pattern A<br>(vi) The number of pages printed per day shall be determined according to the calculation below, based on pages per minute (hereinafter abbreviated as ppm. For color printers, use the ppm value when printing in color) using the largest standard-size paper that the target printer can print:<br>Number of pages printed per day = 5 × ppm value<br>*The fractional portion of the calculated figure shall be rounded down to an integer.<br>(vii) The estimated use period of printers shall be 5 years.<br><br>2) The paper necessary in the use stage is not included in the impact calculation.<br><br>3) Number of periodic replacement parts and consumables used<br>Item: Based on the plan at the design stage, or on the actual number.<br>Number: The number of items used under the above conditions (in a period of 3 years for IJ and 5 years for EP), with fractions rounded up to an integer.<br>* The ratio of color printing to monochrome printing shall be assumed to be 1:1.<br>Transportation: A model based on the above conditions shall |

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| | | | | be established at each company.<br><br>4) Conditions for disposal and recycling of periodic replacement parts and consumables are set forth in No. 8 "Discarding and Recycling". |

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| 8 | | Disposal/ recycling stage information | Product disposal/ recycling conditions | 1) Scenario setting<br>Follow the appendix "Discarding and Recycling Scenario for Used Products".<br>1. For recovery route, each company shall set a scenario including transportation.<br>・Reuse scenario<br>・Recycling scenario<br>Material-specific recycling rates (= η) shall be established at each company.<br>・Industrial waste processing scenario if not reused or recycled<br>2. For non-recovery route, follow the "General Waste Processing Scenario" (see the appendix).<br><br>2) Deduction scenario<br>Follow the appendix "Discarding and Recycling Scenario for Used Products".<br><br>3) Criteria for the possibility of recycling or reuse<br>Criteria shall be determined individually at each company.<br><br>4) Product recovery rate (the same rule applies to the "parts recovery rate" for consumables and replacement parts)<br><br>Product recovery rate shall be the actual value at each company ($\eta 1$). Alternatively, the following is also acceptable:<br>For IJ, $\eta_2 = 1\%$<br>For EP, $\eta_2 = 40\%$<br><br>5) For reuse of products<br>Based on its design value, each company shall set the number of times a product is reused ($N_1$) after the use period (3 years for IJ and 5 years for EP). $N_1$ is an integer.<br>The above $N_1$ is used for the impact calculation:<br>Parts reuse deduction amount = "reusable amount planned at the design stage by each company" × "product recovery rate $\eta_1$ (or $\eta_2$)" × "reuse deduction rate $N_1/(N_1 + 1)$"<br><br>6) For reuse of consumables and replacement parts<br>The number of reuses in the lifetime of an applicable item is $N_2$, and the number of the item used in the use period is n, with fractions rounded up to an integer.<br>The above $N_2$ and n are used for the impact calculation:<br>Parts impact = "impact until manufacturing of one part" × "number of parts used in the use period (n)"<br>Parts reuse deduction amount = "reusable amount planned at the design stage by each company" × "parts recovery rate $\eta_1$ (or $\eta_2$)" × "reuse deduction rate $N_2/(N_2+1)$" × "number of parts used in the use period (n)"<br><br>7) How to account for the impact of processing products or parts that are disposed of without being recycled nor reused<br>Follow the appendix "Disposal and Recycling Scenario for Used Products".<br>For accounting for the impact of transportation processes, the distance shall be estimated to be 60 km, the transportation means a 4-ton truck, and the loading ratio 62%.<br>References: |

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| | | | | Loading ratio: Appended table 3 in the Notification No. 66 from the Ministry of Economy, Trade and Industry<br>Transportation distance: "Study Report for LCA Investigation Pertaining to Plastic Waste Management/Discarding", March 2001 from the Plastic Waste Management Institute<br><br>8) Open recycling and reuse<br>When open recycling and reuse processes are included, each company may account for these processes by setting a scenario that is considered appropriate, paying attention to the items below. The rationale for the scenario is subject to verification.<br>(1) Processes that fall in the scope of "indirect impacts"<br>(2) Deductions and impacts within the scope of "indirect impacts" |
| 9 | Product environ-mental Information Data Sheet (PEIDS) | Inventory analysis | LCI calculation formula | When actual measured data at the production site are not available, the assembly impact shall be calculated as parts assembly impact of Class C parts ("Class C parts mass" × basic unit "parts assembly"), and the assembly impact at the production site shall be calculated as: "product mass" × basic unit "parts assembly".<br><br>When open recycling and reuse processes are included, indirect and direct impacts shall be calculated separately, and the indirect impact shall be expressed as "recycling effects". In the PEIDS, the sum of indirect impacts shall be specified in the "recycling effects" field. |
| 10 | | Impact assessment | Category additions | The items "ozone layer destruction", "eutrophication", and "photochemical oxidants" are deleted from the PEIDS. |
| 11 | Breakdown Data Sheet (relevant to product data sheet) | Data processing | Allocation | Not unified; each company determines appropriately. |
| 12 | | Data collection | Collection range | If data cannot be obtained, data that contain conditions (including basic units) at the design or planning stage may be used as a substitute. |
| 13 | | | Cut-off rules | A cut-off applied to the assembly impact or others shall be noted and the reasons for that shall be clarified. |
| 14 | Breakdown Data Sheet (relevant to PEIDS) | Database | Basic unit database selection | 1. Use a basic unit of "parts assembly" for assembling purchased parts by each company.<br>2. Use a basic unit of "cold-rolled steel plate" for iron oxide (if used), but this does not limit the use of individual basic units.<br>3. Use a basic unit category name of "utility (water)" for ink constituents.<br>4. Use a basic unit of "Al plate" for photoreceptors materials of EP printers.<br>5. Use a basic unit of "nonferrous press" for processing photoreceptor drums of EP printers.<br><br>See the "basic unit list" for the above-mentioned basic unit names. |

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| 15 | | | Basic unit database additions | None |
| 16 | | | Characterization factor additions | None |

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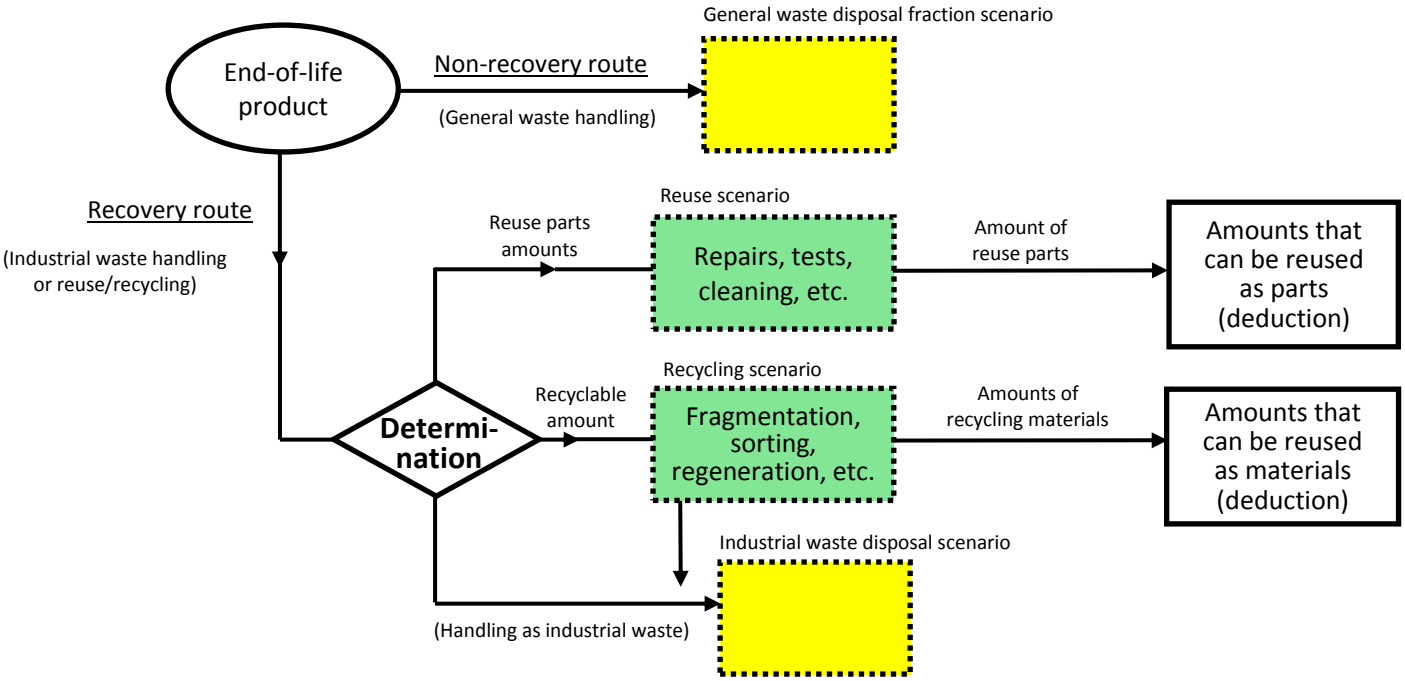
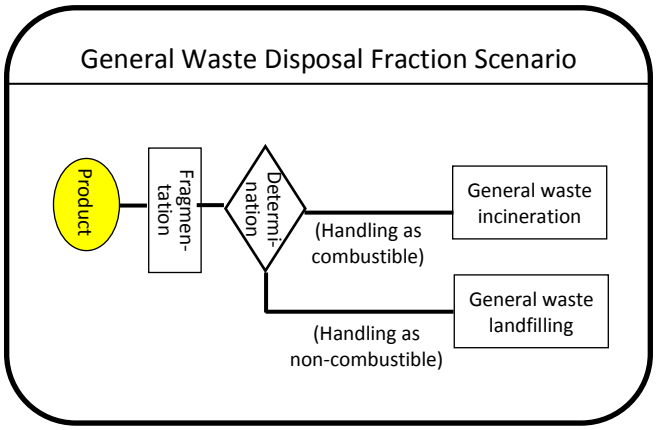
| 17 | | Product specifications | IJ printers:<br>1. Type (IJ)<br>2. Maximum paper size<br><br>EP printers:<br>1. Type (EP)<br>2. Maximum paper size<br>3. Monochrome or color<br>4. Printing speed (monochrome and color) |
| 18 | Product Environ-mental Information | Data publication contents | 1. Items to be listed<br>"Warming impact, acidification impact, and energy consumption amount", stipulated as mandatory items (in the guideline), shall be specified, while the 7 optional items (in the guideline) are not mandatory.<br>2. Target life cycle stages<br>Not mandatory.<br>3. Use conditions setting<br>Period of use (__ years), amount of use (__0,000 pages), and the type of paper prerequisite for evaluation (plain paper, matte paper, coated paper, and photo paper, etc.) shall be specified.<br>4. Ways of presentation<br>Any of text, table or graph may be selected.<br>When open recycling and reuse processes are included, "recycling effects" shall not be integrated with the actual impact, but presented independently with a dotted line for each stage. |
| 19 | Other Environ-mentally Relevant Information | Optional items | The following items may be entered:<br>1. Type I and/or Type III environmental label<br>2. ISO 14001 certification acquisition<br>3. Certifications, approvals or awards from national or industrial organizations<br>4. Hazardous substances |

<Separate Sheet>

Rev. 01 2004.3.1

# End-Of-Life Product Disposal/Recycling Scenario




"Non-recovery route": route taken if entry into the calculations is made in terms of disposal as general waste (municipalities' responsibility)

"Recovery route": route taken if entry into the calculations is made in terms of disposal as industrial waste (businesses' responsibility) or reuse/recycling

**Information on the development/approval of this PCR**

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| EcoLeaf deliberation commission | Representative: Yoji Uchiyama Affiliation: University of Tsukuba Graduate School | | |
| PCR development/revision date | March 19, 2014 | Validity period | March 19, 2014 to March18, 2017 |

Note: For the current PCR, the validity period is full three years from the development/renewal or revision with the purpose of continuation.

History of revisions, etc. for this PCR

| Implementation Date | Version No., etc. | Action taken |
|---|---|---|
| May 26, 2005 | 01 | Developed |
| February 1, 2011 | | Updated |
| March 19, 2014 | 02 | Revised |

# On the Changes in the Order of PCR Items Due to the Revision of the Product Category Rules (PCR) Development Rules (R-06)

Due to the May 1st, 2008 rule revision, the order of product category rules (PCR) items were changed.
As this PCR was developed prior to the rule revision, the order follows the previous item numbers.
Indicated below is the correspondence between PCR items before and after the rule revision.

**<PCR items prior to rule revision>**

| No. | PCR items prior to rule revision |
|---|---|
| 1 | Product definitions |
| 2 | Product constitutive elements and evaluation units |
| 3 | Product life cycle stage |
| 4 | Raw materials/parts constitution |
| 5 | Production stage data collection conditions |
| 6 | Distribution stage data collection conditions |
| 7 | Usage stage data collection conditions |
| 8 | Disposal/recycling stage data collection conditions |
| 9 | LCI FGD/BGD data collection/processing |
| 10 | LCIA impact category |
| 11 | Allocation |
| 12 | Data collection range |
| 13 | Cut-off rules |
| 14 | LCI BGD approximation substitution |
| 15 | LCI BGD PCR base unit |
| 16 | LCIA BGD characterization factor additions |
| 17 | Product specifications |
| 18 | LCA data publication contents |
| 19 | Other environmentally relevant information |

**<PCR items after rule revision>**

| No. | PCR items after rule revision | Related forms |
|---|---|---|
| | [LCA examination range setting and label publication contents] | |
| 1 | Product definitions | — |
| 2 | Product constitutive elements and evaluation units | — |
| 3 | Product life cycle stage | — |
| 4 | Product specifications | PEAD |
| 5 | LCA data publication contents | PEAD |
| 6 | New-to-old product comparison | PEAD |
| 7 | Other eco-design relevant information | PEAD |
| | [System area and data collection conditions setting] | |
| 8 | Product raw materials/parts constitution | Breakdown DS (product) PDS |
| 9 | Article production stage modelling/data division, etc. | Breakdown DS (production site) PDS |
| 10 | Distribution stage modelling/data division, etc. | Breakdown DS (distribution) PDS |
| 11 | Usage stage modelling/data division, etc. | Breakdown DS (usage) PDS |
| 12 | Disposal/recycling stage modelling/data division, etc. | Breakdown DS (disposal/recycling) PDS |
| 13 | Cut-off rules | Breakdown DS (each stage), PDS |
| 14 | Collection data quality requirements | Breakdown DS (each stage), PDS |
| 15 | Collection data allocation | Breakdown DS (each stage), PDS |
| | [Inventory calculations] | |
| 16 | Approach to LCI calculation | Breakdown DS (each stage), PEIDS |
| 17 | LCI common base unit usage conditions | Breakdown DS (each stage), PEIDS |
| | [Life cycle impact evaluation (characterization)] | |
| 18 | LCIA impact category and characterization factor additions | Breakdown DS (each stage), PEIDS |