

Product-Specific Criteria for EP and IJ Printer (PSC-ID: AD-03)

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No.	Major key	Minor key	Class	Requirements
1	Preconditions	Target product	Description	Output devices for the computers in general use in homes, offices, and other places, using either the ink jet (IJ) technology or the electrophotographic (EP) technology. Not included are color EP printers, EP printers using continuous form paper, or printers using paper sizes larger than A3.
2			Scope	<p>Accessories include the following.</p> <p>EP: Photoreceptor, toner, carrier (integrated cartridges for printers that use them)</p> <p>IJ: Printhead, ink</p> <ul style="list-style-type: none"> • All packaging (except for packaging that is used repeatedly in general application) • Accessories for performing functions include printer drivers provided on floppy disks, CD-ROMs, or other media, and manuals provided in printed form, CD-ROMs, or other forms.
3			Scope	All lifecycle stages (all stages specified in the PEIDS of this program: manufacturing, distribution, use, discarding, and recycling)

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4	Product data sheet (PDS) Input data for the LCI: Lifecycle inventory analysis	Manufacturing stage information (product information)	Product materials or ingredient makeup	<p>1) Items classified as class A parts (see section 3.4 of implementation guidelines):</p> <p><u>EP Printers</u> Photoreceptor Notes: 1. Concerning cylinder processing: <ul style="list-style-type: none"> • Use processing energy data collected in house (when in-house data collection is possible). • See No. 14 when in-house data collection is impossible. 2. Use processing energy data collected in house for processing from making cylinder to applying coating.</p> <p>Toner Note: Use processing energy data collected in house.</p> <p>Carrier Note: Same conditions as toner.</p> <p><u>IJ Printers</u> Printhead Ink Notes: 1. All ink constituents are treated as water, and the intensity for “water” is used, but this does not restrict the use of individual intensities. 2. For processing, use the processing energy data obtained in house.</p> <p>To evaluate materials in class A parts, go back to the MSDS material level.</p> <p>2) To determine resource input amounts, use material mass for the stage at which materials become products, get a breakdown of the masses of the materials making up at least 90% of total product mass, and prorate the rest to come out to 100%.</p> <p>3) The 11 materials listed on the product data sheet are: “Normal steel, Stainless steel, aluminum, other metals, thermoplastic resins, thermosetting resins, rubber, glass, paper, semiconductor substrates, and wood.” For other materials, list their intensities.</p> <p>4) Open recycling and reuse When open recycling and reuse are included, each company can calculate these categories by creating scenarios considered appropriate, and while taking careful note of the following items. The soundness of scenario bases is subject to verification. (1) Processes regarded within the scope of “indirect effects” (2) Deductions and impacts within the scope of “indirect effects”</p> <p>Note: PSC-AD-01: No distinction is made between direct and indirect effects with regard to recycling effectiveness.</p>

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5		Manufacturing stage information (production site information)	Material and energy inputs, consumption, and emissions	<p>Input and consumption items</p> <p>Electricity, fuel oil A, diesel fuel, kerosene, gasoline, LNG (town gas), LPG, city tap water, industrial water supply, groundwater</p> <p>However, determine the impact of processing energy for class A parts by going back to the MSDS material level.</p> <p>Emissions</p> <p>Not specified. Each company should list those which it deems important.</p> <p>Transport impact for material inputs (raw materials and energy) is not factored in.</p> <p>Byproducts and sub-materials are not factored in.</p> <p>Sub-materials: Defined as materials input and discarded at manufacturing sites, and not shipped with products.</p>
6		Distribution stage information	Product transport conditions	<ol style="list-style-type: none"> 1) Means of transport to the user and loading ratios are based on models developed by each applicant company. 2) Total domestic transport distance (transport to site of product use) is calculated as 100 km. Product transport from overseas to Japan is considered to be marine transport only, and total distance is that set by each company, or the actual transport distance. <p>Note</p> <p>PSC-AD-01: Overseas transport impact is not included.</p> <p>PSC-AD-02: Total domestic transport distance calculated according to a model developed by each applicant company. No limitation is placed on the means of product transport from overseas.</p> <ol style="list-style-type: none"> 3) Discarding and recycling of printer packaging are entered in No. 8 "Waste/recycling."

No.	Major key	Minor key	Class	Requirements
7		Usage stage information	Product usage conditions	<p>1) Usage conditions</p> <p>IJ system: Pattern printed for color is JIS* SCID (bicycle) N5 8 × 10 inch, and for monochrome it is the JEITA** standard pattern J1.</p> <p>Number of pages printed: 10 pages/day (5 color and 5 monochrome), with 8 hours/day, 20 days/month, and 12 months/year, and the printer being used for 3 years.</p> <p>Printing mode equivalent to high-quality mode on plain paper.</p> <p>Each company sets the standby power consumption conditions (switched off with hardware or software, amount of time plugged in) when power cord is plugged into an outlet.</p> <p>The foregoing conditions are stated clearly in the explanation space in the PEIDS.</p> <p>EP system: Pattern printed is a monochrome of 5% printing ratio. Usage mode is 8 hours/day, 20 days/month, and 12 months/year, with a 5-year usage period.</p> <p>Calculation criteria conform to the conditions for measuring energy consumption efficiency set forth in the Ministry of International Trade and Industry's Notification No. 193 of March 31, 1999, "Criteria for Determinations by Manufacturers and Other Parties to Improve the Functions of Copy Machines," which is based on the Law Concerning the Rational Use of Energy. Number of pages printed is determined as follows in accordance with EP system capacity.</p> <p>Maximum pages/minute: up to 10, 11–20, 21–30, 31–40, 41–60, 61–85</p> <p>Actual pages/hour: 2, 10, 20, 40, 60, 80</p> <p>2) Paper needed in the usage state is not included when calculating impact.</p> <p>3) Numbers of regularly replaced parts and consumables used</p> <p>Items included: based on plan when printer was designed, or on actual parts and consumables used.</p> <p>Quantities: The quantities used based on the above (EP: 5 years; IJ: 3 years), with fractions rounded up to integers.</p> <p>Transport: Each company develops a model based on the above.</p> <p>4) Conditions for discarding and recycling of regularly replaced parts for consumables are set forth in No. 8 "Waste/recycling."</p>

*JIS: Japanese Industrial Standards

**JEITA: Japan Electronics and Information Technology Industries Association

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8		Waste/ recycling stage information	Product waste/ recycling condition s	<p>1) Scenario development Use the appendix: "Discarding and Recycling Scenarios for Scrapped Products." 1. Recovery routes are those in each company's scenarios which include transport.</p> <ul style="list-style-type: none"> • Reuse scenario • Recycling scenario <p>Each company sets material-specific recycling rates ($=\eta$).</p> <ul style="list-style-type: none"> • Industrial waste management scenario with no reuse or recycling. <p>2. For non-recovery route, use "Municipal Solid Waste Management Scenario" (see appendix).</p> <p>2) Deduction scenario Use appendix: "Discarding and Recycling Scenarios for Scrapped Products."</p> <p>3) Criteria for determination of recyclability and reusability Each company decides on its own criteria.</p> <p>4) Product recovery rate (the "part recovery rate" for consumables and replacement parts shall be the same) EP: $\eta_2=40\%$ IJ: $\eta_2=1\%$ Or, each company may use its own actual rate (η_1).</p> <p>5) When products are reused Based on its design values, each company sets the number of times a product is reused (N_1) after the 5-year usage period. N_1 is an integer. To calculate the impact, use the above N_1: deduction amount for part reuse = "possible reuse amount planned at time of design by each company" x "product recovery rate η_2 (or η_1)" x "reuse deduction ratio $N_1/(N_1+1)$"</p> <p>6) For consumables and replacement parts The number of times an item is reused during its lifetime is N_2, and the number of items used in 5 years is n, with fractions rounded up to integers. Impact calculation uses the above N_2 and n: part impact = "impact generated until one part is manufactured" x "number of items used in 5 years (n)" deduction amount for part reuse = "possible reuse amount planned at time of design by each company" x "product recovery rate η_2 (or η_1)" x "reuse deduction ratio $N_2/(N_2+1)$" x "number of items used in 5 years (n)"</p> <p>7) How to factor in the impact of handling products or parts that are discarded instead of being recycled or reused Use the appendix: "Discarding and Recycling Scenarios for Scrapped Products."</p> <p>8) Open recycling and reuse When open recycling and reuse are included, each company can calculate these categories by creating scenarios considered appropriate, and while taking careful note of the following items. The soundness of scenario bases is subject to verification.</p> <p>(1) Processes regarded within the scope of "indirect effects"</p> <p>(2) Deductions and impacts within the scope of "indirect effects"</p> <p>Note, PSC-AD-01: No distinction is made between direct and indirect effects with regard to recycling effectiveness. The following quality-weighting coefficients are multiplied by the amount of recycled materials recovered: $Z = 0.5$ for metals, $Z = 0.35$ for other materials.</p>

No.	Major key	Minor key	Class	Requirements
9	Product Environmental Information Disclosure Sheet (PEIDS)	Inventory analyses	Lifecycle inventory calculation rules	<p>When measured data from production site are not available, assembly impact is product mass x 2 x assembly intensity.</p> <p>When open recycling and reuse are included, calculate direct and indirect effects separately and express the indirect portion as “recycling effectiveness.” On the PEIDS put the indirect effect total in the “Recycling Effectiveness” space.</p> <p>Note</p> <p>PSC-AD-01: No distinction is made between direct and indirect effects with regard to recycling effectiveness.</p>
10	Merge Product Environmental Information Disclosure Sheet (PEIDS)	Impact analysis	Additional impact category	“Ozone layer depletion,” “eutrophication,” and “photochemical oxidants” deleted from the PEIDS.
11	Breakdown data sheet (PDS-related)	Data processing	Allocation rule	Not unified; each company decides as it sees fit.
12		Data collection	Coverage	When data are unobtainable, you may substitute data (including intensities) that include the conditions used in designing or planning.
13			Cut-off rules	When a cut-off is applied for assembly or other impact, note this fact and clearly state the reason.

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14	Breakdown data sheet (PEIDS-related)	Database	Intensity selection	<p>1. The “parts assembly” intensity is used for assembly of purchased parts decided by each company.</p> <p>2. The “A1 plate” intensity is used for photoreceptor materials.</p> <ol style="list-style-type: none"> 1. The intensity for iron oxide (if used) is that for “cold-rolled steel sheets,” but this does not restrict the use of individual intensities. 2. Processing of cylinders for photoreceptors uses the “nonferrous press” intensity. 3. For ink composition use the intensity category “service (water).” <p>See the “List of Intensities” for the names of these intensities.</p>
15			Intensity addition	None.
16			Addition of characterization factor	None.
17	Product environmental information	Product specification		<p>EP Printers</p> <ol style="list-style-type: none"> 1. Printing speed 2. Maximum paper size 3. Functions subject to verification (two-sided printing, etc.) 4. System (EP) <p>IJ Printers</p> <ol style="list-style-type: none"> 1. Maximum paper size 2. System (IJ)

No.	Major key	Minor key	Class	Requirements
18		Data disclosure		<p>1. Items to list</p> <p>Compulsory items—“global warming impact, acidification impact, and energy consumption”—are specified (in the guidelines), while the 7 optional items (guidelines) may be listed as desired.</p> <p>2. Life cycle stages included</p> <p>As desired.</p> <p>3. Usage conditions</p> <p>List: period of use (X years), amount of use (X pages [in multiples of 10,000])</p> <p>4. Method of representation</p> <p>Use text, tables, and graphs as desired.</p> <p>When open recycling and reuse are included:</p> <ul style="list-style-type: none"> • Show recycling effectiveness with dotted lines independently for each stage, without integrating actual impact. <p>Note</p> <p>PSC-AD-01: No distinction is made between direct and indirect effects with regard to recycling effectiveness.</p>
19	Other environment-related information	Optional items		<p>The following may be entered:</p> <p>(1) Type I and/or Type III environmental label</p> <p>(2) Acquisition of ISO 14001 certification</p> <p>(3) Certificates, approvals, or awards from national or industry organizations</p> <p>(4) Information on hazardous substances</p>

Discarding and Recycling Scenario for Scrapped Products

- 1 Product recovery rate η_1 (η_2)
- 2 Product
- 3 Recovery
- 4 Recovery route η_1
- 5 Non-recovery route $1-\eta_1$
- 6 Times reused N
- 7 Amount of reused parts
- 8 Determination
- 9 Potential recycling amount
- 10 Discarding
- 11 No reuse or recycling
- 12 MSW disposal scenario
- 13 Reuse scenario
- 14 Repair, inspection, cleaning, etc.
- 15 Recycling scenario
- 16 Crushing, classification, recycling, etc.
- 17 Industrial waste disposal scenario
- 18 Amount of material recycled η
- 19 Quality
- 20 Reused parts quality weighting coefficient Z
- 21 Recycled material quality weighting coefficient Z
- 22 Material-specific recycling rate η
- 23 Amount that can be reused (deducted) as parts
- 24 Amount that can be reused (deducted) as materials
- 25 Municipal solid waste (MSW) disposal scenario
- 26 Crushing
- 27 Material
- 28 Combustibles
- 29 Noncombustibles
- 30 MSW incineration
- 31 MSW landfilling
- 32 Explanation of Terms

- “Product recovery rate”: Ratio of number of products recovered from among all those scrapped
- “Times reused”: Number of times reused on an individual parts basis
- “Quality weighting coefficient”: Ratio deductible by reusing and recycling
- “Material-specific recycling rate”: Yield in recycling process
- “Combustibles”: Plastic, rubber, paper, wood
- “Noncombustibles”: Materials other than combustibles