

Eco Mark Product Category No. 142

## **“Ink Cartridges Version2.3” Certification Criteria**

**- Applicable Scope-**

**A. Original Ink Cartridge**

**B. Recycled Ink Cartridge**

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Japan Environment Association  
Eco Mark Office

NOTE: This document is a translation of the criteria written in Japanese. In the event of dispute, the original document should be taken as authoritative.

Eco Mark Product Category No. 142

## “Ink Cartridges Version2.3” Certification Criteria

Japan Environment Association

Eco Mark Office

### 1. Purpose of Establishing Criteria

Omitted.

### 2. Applicable Scope

Of the equipment subject to No.155 “Imaging Equipment Such as Copiers, Printers, etc. Version 1”, this product category shall cover ink cartridges used in equipment of the ink jet system.

#### A. Original Ink Cartridge

Ink cartridges manufactured or commission manufactured by a manufacturer of an equipment manufacturer of a main body and distributed.

#### B. Recycled Ink Cartridge

Ink cartridges recycled by refilling used ink cartridges with toner and replacing expendable parts, as necessary.

### 3. Terminology

Ink cartridge	A cartridge for printing, filled with ink and designed to integrally work with the main body when printing. The term refers to both cartridges with a head incorporated or those without a head.
Plastic	Material composed of single or multiple polymers, plus additives, fillers, etc. which are added to the polymer(s) to give specific characteristics.
Polymer	High molecular material which is the main constituent of plastic.
Casing parts	A part comprised of external covers that protect a device from environmental influences and that prevents users from contacting moving, light-emitting or high-voltage components
Recycled plastic	Plastic composed of post-consumer material and pre-consumer material
Pre-consumer material	Material or rejected product generated from a disposal route in a product manufacturing process, excluding those that are generated in a material manufacturing process and that are reused as raw materials within the same process (plant).
Post-consumer material	Materials or products disposed of after they have been used as goods.
Reuse/material recycling rate	Among mass of ink cartridges which have been used, disposed of, and collected, the mass rate of parts that are reused or material

	recycled. However, cartridges, which are published as being not subject to collection on the web site or in the catalog, etc., are excluded from those “collected ink cartridges”.
Material recycling	Recycling of material, excluding the recovery of energy, conversion to oil, gasification, blast furnace reduction, conversion to chemical materials by coke oven.
Recovery rate	To ink cartridges that have been used, disposed of, and collected, a mass ratio of parts that are reused, material recycled, energy recovered, converted to oil, gasified, or subject to blast furnace reduction or conversion to chemical materials by coke oven. However, cartridges which are released as being not subject to collection on the web site or in the catalog, etc., are excluded from those covered by “collected ink cartridges”.
Prescribed constituent	A material component added for the intended purpose of giving certain characteristics to a product. Impurities of 0.1wt% or less that are technically unavoidable in the manufacturing process are not included.
Biocidal product	Any substance consisting of, one or more active substances, with the intention of destroying, deterring, rendering harmless, preventing the action of, or otherwise exerting a controlling effect on any harmful organism by any means other than mere physical or mechanical action, and being synonymous with a biocidal product defined in (EU)No528/2012.

#### 4. Certification Criteria and Certification Procedure

The corresponding boxes in the Attached Certificates shall be checked/filled in, stamped with the applicant company seal and submitted.

[General rule]

This general rule applies to criteria items of 4-1-2.(9) [Emission of Hazardous Substances].

Analysis and testing laboratories shall develop ISO/IEC 17025 (corresponding JIS Q17025).or quality system including sampling and analysis and shall also be run in accordance with ISO9001(corresponding JIS Q9001) (not essential to be certified)..

Applicants shall bear the expenses for preparing documents and for the analyses.

Special requirements, if performed at the laboratories of manufacturers: if competent authorities are monitoring the sampling and analysis process, if the analyses and tests are authorized, or if the manufacturer has developed a quality system for sampling and analysis and has received the ISO 9001 (corresponding JIS Q9001) certification, or if the manufacturer has ISO 9001-compliant internal regulations concerning its quality system for sampling and analysis and performs measurements in line with those internal regulations, the laboratory of the manufacturer is authorized to perform analysis and tests.

note) When overseas Ecolabelling is acquired by utilizing the Mutual Recognition Agreement (MRA), it is required that testing is conducted at a testing laboratory certified by ISO/IEC 17025.

#### 4-1. Environmental Criteria and Certification Procedure

##### 4-1-1 Resource Saving and Resource Recycling

- (1) Ink cartridge used for the equipment shall conform to Appendix1 “Product Design Checklist”. However, for any recycled ink cartridges, this item shall apply to parts planned to be replaced.

[Certification Procedure]

Compliance with this item shall be indicated in the attached certificate. The applicant shall enter requirements in Form 1 “Product Design Checklist” and submit it.

- (2) Each individual plastic casing part of more than 25g shall be made of one single polymer or polymer blends. In addition, all plastic parts of more than 25g used for casing parts shall be made of four or fewer types of mutually separable polymers or polymer blends.

For any recycled ink cartridges, this item shall apply to parts planned to be replaced.

[Certification Procedure]

Compliance with this item shall be indicated in the attached certificate. The applicant shall submit a list (Form 2) of plastic materials and labels, etc. in use.

- (3) Collection systems for used ink cartridges shall be available and the systems are effective..

[Certification Procedure]

Compliance with this item shall be indicated in the attached certificate. In addition, explanatory documents for the collection systems of ink cartridges (including a collection method and records of actual collection values for about past three years) shall be submitted.

- (4) Systems shall be available for the material recycling of used ink cartridges. Reuse/material recycling rate of collected ink cartridge parts shall be 40% or more for the original ink cartridges, and 60% or more for the recycled ink cartridges of the total mass of collected used products (excluding ink).

## [Certification Procedure]

Compliance with this item shall be indicated in the attached certificate and the applicant shall submit explanatory documents describing the total mass of ink cartridges (excluding the ink), reuse and material recycling rates of ink cartridge parts, and the purposes of reuse and material recycling, etc. [Form 3](#)

- (5) The recovery rate of collected ink cartridges shall be 95% or more of the total mass of collected used products (excluding ink). Parts of collected ink cartridges which cannot be recovered shall not be simply landfilled but be appropriately processed after the weight reduction.

In addition, packaging materials, waste toner, and other wastes (including cartridges not subject to collection) that are collected together with cartridges shall be recycled as much as possible, and then remainders shall be appropriately processed.

## [Certification Procedure]

Compliance with this item shall be indicated in the attached certificate, and the applicant shall submit explanatory documents explaining the recovery rate and demonstrating that the system for processing/disposing of any part that cannot be recovered has been established (capacity of processing, content of processing, etc.). [Form 3](#)

- (6) If paper to be used falls under a. to c. listed below, based on the provisions on quality control of each company, use of at least one or more type of paper shall be possible:

- a. Applicable scope “PPC paper, business forms and coated paper for color printers (paper for ink jet printing)” of Eco Mark Product Category No. 106 “Paper for Communication Version 3”
- b. Applicable scope “Printing paper (Excluding drawing papers included in the “writing and art papers” category designated in the “Paper and Pulp Statistics Annual Report” by the Ministry of Economy, Trade and Industry.) of Eco Mark Product Category No. 107 “Printing Paper Version 3”
- c. [Information Paper] “Copier paper, forms, coated inkjet color printer paper”, and [Printing Paper] “Non coated printing paper, coated printing paper” of “2. Paper” of the Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities

However, this item is not applied to cartridges used for devices which only use

continuous forms, large format forms or photo / postcard paper.

[Certification Procedure]

Compliance with this item, and the name of the paper manufacturer and product brand shall be indicated in the Attached Certificate.

- (7) Packaging or packing of cartridges shall be as simple as possible and give consideration to ease of reuse and environmental burden when packaging or packing materials are disposed of. Specifically, the product shall comply with “Packaging Material Check List” of [Appendix 2](#).

[Certification Procedure]

Compliance with this item shall be indicated in the Attached Certificate. In addition, “Packaging Material Check List” of [Form4](#) shall be submitted.

#### 4-1-2 Restriction and Control of Hazardous Substances

- (8) The content rate of lead, mercury, cadmium and those compounds in the product, hexavalent chromium compounds, Polybrominated biphenyl (PBB), Polybrominated diphenylether (PBDE) or Phthalate esters in the cartridge shall comply with Annex II (Table 1) of the Commission Delegated Directive (EU)2015/863 amending Annex II to RoHS(II) Directive.(2011/65/EU). However, this does not apply to those substances specified in Annex III. In addition, the cartridge shall have no flame retardant of short-chain chlorinated paraffin (the number of chained C is 10 to 13 and contained chloride concentration is 50% or over) added as prescribed constituent.

For any recycled ink cartridges, this item shall apply to parts planned to be replaced.

Table 1. Content rate

Material	Content rate[wt%]
Lead and its compounds	≤ 0.1
Mercury and its compounds	≤ 0.1
Cadmium and its compounds	≤ 0.01
Hexavalent chromium compounds	≤ 0.1
Polybrominated biphenyl (PBB)	≤ 0.1
Polybrominated diphenylether (PBDE)	≤ 0.1
Bis(2-ethylhexyl) phthalate (DEHP)	≤ 0.1
Butyl benzyl phthalate (BBP)	≤ 0.1
Dibutyl phthalate (DBP)	≤ 0.1
Diisobutyl phthalate (DIBP)	≤ 0.1

\* The content rate refers to the content proportion in a homogeneous substance (minimum unit that can be separated by rule with totally uniform composition).

[Certification Procedure]

Compliance with this item shall be indicated in the Attached Certificate. In addition, it is recommended that checking is performed based on JIS Z 7201 “Management of chemical substances in products - Principles and guidelines”.

- (9) For devices loaded with a cartridge, values obtained with the measuring method defined by DE-UZ219 shall confirm to Table 2 for emission of hazardous substances during operation of monochrome device as well as during the monochrome and color operation mode of color devices. The large format devices shall be measured in accordance with Table 2-1.

If the emission rate during the color operation mode of color devices satisfies the monochrome criteria, measurements during the monochrome operation mode can be omitted.

Note that for devices measured before January 2022, test results according to the Blue Angle DE-UZ205 shall also be acceptable.

Table 2. Permissible Test Values for Emission Rates of TVOC, etc.

		Emission Rate (mg/h)			
		$\leq A3+^*$		$A2 \leq$ and $\leq A0+^*$	$>A0+^*$
		Monochrome Printing	Colour Printing	Monochrome / Colour Printing	Monochrome / Colour Printing
Print Phase (= Pre-operating + Print Phase)	TVOC	$\leq 10$	$\leq 18$	$\leq 39$	$\leq 55$
	Benzene	$< 0.05$	$< 0.05$	$< 0.2$	$< 0.3$
	Styrene	$\leq 1.0$	$\leq 1.8$	$\leq 4.7$	$\leq 6.6$
	Unidentified Single Substances VOC	$\leq 0.9$	$\leq 0.9$	$\leq 2.0$	$\leq 2.8$

\* Maximum Print Width

Table 2-1. Measurement conditions of emissions test

Type	Form	Test copy
Large format	A4 or full-size which can be printed with the product	A4 copy or A4 test enlarged to the full-size that can be printed with the product.

#### [Certification Procedure]

The applicant shall submit the Attached Certificate (including requirements for testing laboratories) **Form 5**.

If submission is difficult at the time of application, the applicant shall submit a signed consent form indicating that “a certificate indicating actual measurements should be submitted by the time the Eco Mark agreement on use is entered, and that if criteria are not met, the agreement should not be entered”.

The applicant shall conform to DE-UZ219 for a test classification. If there is more than one device applicable to the applying cartridge, the test may be carried out

at least on a device with the highest product speed. In addition, when there is more than one device applicable to the applying cartridge and the maximum print width to be applied differs, the test may be carried out at least on a device having the largest total print area on a single side in unit time. However, a standard value of the section whose maximum print width is smallest shall be applied

<Supplementary item>

If the applicant has verified from the test results of multiple samples that emissions of TVOC etc. (Table 2) from the cartridge applying for certification are equal to those from the equipment using the same cartridge for the toner component, the applicant may submit the test results of such cartridge only when accepted by the Eco Mark Examination Committee.

- (10) Each substance listed in Table 3 below that are classified into CMR category 1A, 1B or 2 of Table 3 in Annex VI of Regulation (EC) No. 1272/2008 shall not be added in inks as prescribed constituents

Table 3. Restricted materials

Hazard class	Category	
	Hazard category	CLP-regulation (EC) No. 1272/2008
Carcinogenicity	Carc. 1A, 1B	H350 May cause cancer
Carcinogenicity	Carc. 1A, 1B	H350i May cause cancer if inhaled
Carcinogenicity	Carc. 2	H351 Suspected of causing cancer
Germ cell mutagenicity	Muta. 1A, 1B	H340 May cause genetic damage
Germ cell mutagenicity	Muta. 2	H341 Suspected of causing genetic defects
Reproductive toxicity	Repr. 1A, 1B	H360 May damage fertility or the unborn child
Reproductive toxicity	Repr. 2	H361 Suspected of damaging fertility or the unborn child
Substances of the so-called candidate list according to REACH Article 59. The version of the candidate list at the point of application applies.		

Inks shall not be classified as a mixture in the hazard categories STOT SE1, SE2, RE1 and RE2 (Table 4) specified in Annex I of Regulation (EC) No. 1272/2008.



Table 4. Restricted materials

Hazard class	Category	
	Hazard category code	CLP-regulation (EC) No. 1272/2008
Specific target organ toxicity Single exposure	STOT SE 1	H370 Causes damage to organs
Specific target organ toxicity Single exposure	STOT SE 2	H371 May cause damage to organs
Specific target organ toxicity Repeated exposure	STOT RE 1	H372 Causes damage to organs through prolonged or repeated exposure
Specific target organ toxicity Repeated exposure	STOT RE 2	H373 May cause damage to organs through prolonged or repeated exposure

## [Certification Procedure]

Compliance with this item shall be indicated in the attached certificate. The applicant shall submit a certificate, etc. issued by an ink manufacturer (**Form 6**) and Safety Data Sheet (SDS) of colourants. If the SDS does not contain any description of the Ames test result, the applicant shall submit a test report. The test report shall include at least a name of the testing institute, name of the tested substances, testing period, used strain (5 strains) and test result.

- (11) Cadmium, lead, mercury, hexavalent chromium, nickel or compounds thereof shall not be added as prescribed constituents in inks (excluding complex compounds of high molecular weight nickel as a colouring agent). For example, production-related contaminations of heavy metals caused by production, such as cobalt, nickel oxides or organotin compounds, are to be kept as low as technically and economically possible (request for minimization).

## [Certification Procedure]

Compliance with this item shall be indicated in the attached certificate. The applicant shall submit a list (**Form 6**) issued by an ink manufacturer indicating whether the corresponding substance is added or not.

- (12) Inks shall not use azo colouring agents (dyes and pigments) that generate carcinogenic aromatic amines listed in Appendix 8, Annex XVII of REACH Regulation ((EC) (1907/2006)) (Table 5.).

Table 5. Amines that must not be generated due to the reduction of azo groups

Substances	CAS No.
1 4-aminobiphenyl	92-67-1
2 Benzedrine	92-87-5
3 4-chloro- <i>o</i> -toluidine	95-69-2
4 2-naphthylamine	91-59-8
5 <i>o</i> -aminoazotoluene	97-56-3
6 2-amino-4-nitrotoluene	99-55-8

7	<i>p</i> -chloroaniline	106-47-8
8	2,4-diaminoanisole	615-05-4
9	4,4'-diaminodiphenylmethane	101-77-9
10	3,3'-dichlorbenzidine	91-94-1
11	3,3'-dimethoxybenzidine	119-90-4
12	3,3'-dimethylbenzidine	119-93-7
13	4,4'-diamino-3,3' -dimethyldiphenylmethane	838-88-0
14	<i>p</i> -cresidine	120-71-8
15	4,4'-Methylene-bis – (2-Chloroaniline)	101-14-4
16	4,4'-oxydianiline	101-80-4
17	4,4'-4-Aminophenyl Sulfide Bis	139-65-1
18	<i>o</i> -toluidine	95-53-4
19	2,4-diaminotoluene	95-80-7
20	2,4,5-trimethylaniline	137-17-7
21	<i>o</i> -anisidine	90-04-0
22	4-amino- azo- benzen	60-09-3

[Certification Procedure]

Compliance with this item shall be indicated in the attached certificate. The applicant shall submit a list (Form 6) issued by an ink manufacturer indicating whether the corresponding substance is added or not.

- (13) If any insecticidal or bactericidal substance is used in inks, only constituents listed in Annex I of “REGULATION (EU) No 528/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 May 2012 concerning the making available on the market and use of biocidal products” and classified in product type 6 shall be added as prescribed constituents. If use of a substance not listed in the Annex is planned, addition thereof will be permitted provided that an application for approval is submitted based on said Directive. However, the addition will not be permitted if it is determined that the application should be rejected.

[Certification Procedure]

Compliance with this item shall be indicated in the attached certificate. The applicant shall submit a list (Form 6) issued by an ink manufacturer indicating whether the corresponding substance is added or not.

- (14) In manufacturing the applying product, related environmental laws and regulations and pollution control agreement (hereinafter referred to as the “Environmental Laws, etc.”) must be followed with respect to air pollution, water contamination, noise, offensive odor, and emission of hazardous substances in the area where the plant performing the final manufacturing process is located.

In addition, the state of compliance with the Environmental Laws, etc. for the last five years from the date of application (whether there is any violation) must be reported. If there is any violation, it is necessary that proper remedies and preventive measures have been already taken, and the related Environmental Laws, etc. must thereafter be followed appropriately.

[Certification Procedure]

With respect to the compliance with the Environmental Laws, etc. in the area where the plant performing the final manufacturing process is located, a certificate issued by the representative of the manufacturer of the applying product or the manager of the relevant plant (entry or attachment of the list of names of the Environmental Laws, etc.) must be submitted. **Form 7**

In addition, it is necessary to report whether there is any violation during the last five years, including a violation subject to administrative punishment or administrative guidance, and if there is, the following documents in a and b must be submitted:

- a. With respect to the fact of violation, guidance documents from administrative agencies (including order of correction and warning) and copies of written answers (including those reporting causes and results of correction) to such documents (making a series of progress clear);
- b. Following materials (copies of recording documents, and so on) concerning the management system for compliance with the Environmental Laws, etc. in 1)-5):
  - 1) List of the Environmental Laws, etc. related to the area where the plant is located;
  - 2) Implementation system (organizational chart with entry of roles, etc.);
  - 3) Document stipulating retention of recording documents;
  - 4) Recurrence prevention measures (future preventive measures);
  - 5) State of implementation based on recurrence prevention measures (result of checking of the state of compliance, including the result of onsite inspection).

#### 4-1-3 Information Provision to users

- (15) Either the package of a cartridge product, printed matter to be contained in the same package thereof, or the instruction manual of the main equipment product shall include a description of the details of “a.” through “j.” below so that the user can easily be seen by the user.

In addition, when giving the description, the Applicant shall attempt to save

paper resources as far as visibility to the user is not compromised.

- a. Name of the product for which application is filed
- b. Name of the applicant company (it may be the company's brand name or the like)
- c. Telephone number for contact
- d. Proper handling method
- e. Treatment in cases where the ink has attached to the hand or in the event that it has entered the eyes, mouth, etc.
- f. The product should be kept in a place out of reach of children.
- g. Collection method after use
- h. Information on after-sales service for users
- i. Indication that this is a recycled ink cartridge (applicable only to recycled ink cartridges)
- j. The fact that there may be differences in the colors of printing and long-term preservability of inks, if ink filled in original ink cartridges and ink filled in recycled ink cartridges are not the same. (applicable only to recycled ink cartridges)

[Certification Procedure]

Copies of relevant portions of packages, printed documents enclosed with the cartridge, or instruction manuals of the machine product shall be submitted.

- (16) The main parts of the cartridge shall contain a description of the items "a" and "b" below so that they can easily be seen by the user.

- a. Name of the product for which application is filed
- b. Name of the applicant company (it may be the company's brand name or the like)

[Certification Procedure]

Photos, samples, etc. of the applicable parts of the main parts containing the designated information shall be submitted.

- (17) Information shall be provided on the series of equipment on which the products can be used in their packages, printed matter for advertisement, or websites so that they can easily be seen by the user. Users shall be provided with a means for obtaining the latest information on the series of equipment on which the products can be used.

[Certification Procedure]

Among the packages, printed matter for advertisement, URLs of the applicable parts of websites, etc. containing a description of the designated information, necessary material shall be submitted.

#### 4-2 Quality criteria and certification procedures

- (18) (applicable only to B. recycled ink cartridges) The printing capacity of the recycled ink cartridge shall be equivalent to or higher than an original ink cartridge of the same type.

In particular, based on ISO/IEC24711 (Method for measurement) and ISO/IEC27412 (Images for measurement), the number of sheets to the service life (yield value) shall be measured and the printing capacity ratio shall not fall below 90% in all test samples. However, if the corresponding main body device is a printer only for photographs (L size), the test shall be conducted based on ISO/IEC29102 (Method for measurement) and ISO/IEC29103 (Images for measurement).

[Certification Procedure]

The Applicant shall submit an evidence document stating the printing capacity ratio. However, if corresponding main equipment is a printer only for photographs (L size), the Applicant shall clearly indicate a type of photo paper used in the test in the Attached Certificate. In addition, the test shall be carried out with the same type of printer.

- (19) Quality shall be managed by the manufacturer's own standard, and guarantee for quality shall be provided for any defective quality such as defective printing, leakage of ink, nozzle clogging, and main body breakage. In addition, quality control in the manufacturing stage shall be implemented sufficiently based on the quality control system.

For recycled ink cartridges, the Applicant shall also submit a list of parts to be replaced, and in-house standard values for the amount of ink to be filled as well as a method of management thereof.

[Certification Procedure]

Compliance with this item shall be indicated in the attached certificate. In addition, A certificate issued by the manager of the plant for manufacturing products shall be submitted, certifying that, as for the quality control system in the manufacturing stage, quality control in the manufacturing stage is implemented based on the manufacturer's own standard, and that only the

products that have been qualified in quality inspection shall be delivered. Note that if ISO 9001 or certification of any other quality management system has been acquired, submission of a copy of the approval certificate can replace this certificate. The Applicant shall also submit a list of parts to be replaced for the recycled ink cartridges, and in-house standard values for the amount of ink to be filled as well as a method of management thereof.

## 5. Product Category, Indication and Others

- (1) Product classification (application unit) shall be by a product type (original/recycled) and by each product number. However, products, under the same product number, with the different ink volume and colors of color cartridges shall be applied under the same product classification.
- (2) For the recycled ink cartridges, Eco Mark labelling on the ink cartridges to be recycled shall be removed and a proper indication shall be conducted according to the certification.
- (3) Regarding products which correspond to designated procurement items under the "Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities Authorities (Green Purchasing Law)", conformity status for evaluation criteria will be announced on the website of the Eco Mark Office.
- (4) In principle, Eco Mark shown as below shall be indicated on the product, etc. The licensees of Eco Mark Utilization Contract who own the Eco Mark products shall also be allowed to use the indication and the certification number as before.



(Note for the indication)

- \*For indicating the logo, Eco Mark certification number (eight-digit number) or the name of the licensee using the Eco Mark shall be appeared.
- \* Such expression as “Eco Mark product” can be used following the 2.(2) of the Guide to Eco Mark Usage.  
 “Eco Mark product”, “#Eco Mark”, “[www.ecomark.jp](http://www.ecomark.jp)”, “Eco Mark Certificate”
- \* If a licensee makes an environmental claim of the Eco Mark certified products

associating with the Eco Mark logo, please comply with the “Environmental Labeling Guidelines” of the Ministry of the Environment of Japan.

(<https://www.env.go.jp/policy/hozen/green/ecolabel/guideline/>)

- \* The Guide to Eco Mark Usage shall be followed for any cases not listed above.  
(<https://www.ecomark.jp/office/guideline/guide/>)

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July 15, 2015	Established (Version2.0)
April 1, 2016	Revised (4-1-2(9) Version2.1)
January 1, 2018	Revised (conforming to revision of RAL-UZ205 in Germany, Version2.2)
March 1, 2021	Extension of expiration
January 1, 2022	Revised (conforming to establishment of RAL-UZ219 in Germany, Version2.3)
July 31, 2027	Expiration date

The certification criteria of this product category will be revised as necessary.

## **Appendix 1 Product Design Check List**

**(Common to No.132“Toner Cartridges Version2”, No.142 “Ink Cartridges Version2”)**

### ■Intention of Product Design Checklist

The cartridge must be easily recyclable. The “Product Design Checklist” includes indices for improving ease of recycling by reference to the Blue Angel DE-UZ219 in Germany. The indices are based on the following design concepts:

#### [Structural Design and Joining Techniques]

- Non-use of any joint (e.g. glued or welded) that does not allow release of the joint between different materials unless it is technically required
- Use of easily detachable mechanical joints in the cartridge
- Easy disassembly of the cartridge which can be carried out by hand or by machine

#### [Material Selection]

- Casing parts: In order to limit the variety of materials, individual plastic casing parts have to consist of one single polymer or a polymer blend. All plastic parts used in the plastic casings shall consist of up to four separable polymers or polymer blends.
- Large-sized plastic casing parts must be designed in a way that the contained plastics can be reused for the production of high-quality durable products by applying available re-cycling techniques.
- The use of coatings for parts is to be reduced to a minimum. If applied, an appropriate reason for this use is to be given. Galvanic coatings are not permissible.
- Devices shall use, or shall be permitted to use, recycled plastics.

#### [Utilization of used cartridge]

- Operators shall gather information on reutilization of parts used in the cartridge and take advantage of it in product designing (e.g., information on a disassembly method, reuse of parts, and recycling).
- Any device that prevents reuse of a cartridge must not be attached to the cartridge.

### ■Items

- 1) The cartridge must be configured to be suitable for recycling, and must satisfy all Must (M) items of the requirements in the following groups. In addition, it is desirable to satisfy the Should (S) items, although they are not requirements for certification.



**A: Design and Joining Technique**  
**B: Selection and Marking of Materials**  
**C: Longevity**

## 2) Terminology

Casing parts	Parts comprising external covers that protect equipment from environmental influences and that prevents users from contacting moving, light-emitting or high-voltage components.
Assembly	Unit composed of at least two components linked by power or design.
Electric/electronic assemblies and parts	Assemblies (parts) which include at least one electric or electronic component.
Colourant	Mixture in which dyes, pigments and other additives are dissolved or dispersed in a carrier material such as a polymer matrix (e.g. for toners), liquids (e.g. for inks), gels or waxes (e.g. for solid inks).
Recycling	In this checklist, the term refers to utilization as materials for used (plastic) parts.
Reused parts	Parts that have previously been used, and reused.

## 3) Category classification

Any requirements are classified as either “M” or “S”.

Must-Requirement (M)	Requirements which must be met
Should-Requirement (S)	Requirements which should be met

Requirement		Applicable scope	Category	Compliance	Remarks
<b>A: Design and Joining Technique</b>					
A1	Are assemblies made of mutually incompatible materials separable or connected by separation aids?	toner cartridge, ink cartridge	M	<input type="checkbox"/> Yes/ <input type="checkbox"/> No <input type="checkbox"/> Not applicable because there is no replacement part.	Connections between casing and electric/electronic assemblies are important. Their separability is a prerequisite for separate reuse/recycling of assemblies and materials and for a quick and reliable separation of components containing hazardous substances. Glued nameplates (i.e. company logos and stickers) are also included. The term “separation aids” refers to predetermined breaking points, for example. [No.155V1 Appendix1 A1]
A2	Are connections that must be detached easy to find?	toner cartridge:M ink cartridge:S	M S	<input type="checkbox"/> Yes/ <input type="checkbox"/> No <input type="checkbox"/> Not applicable because there is no replacement part.	Connections that have to be detached during disassembly must be easy and quick to find. If they are hidden, this should be stated on the product (e.g. by laser labeling or injection moulding). [No.155V1 Appendix1 A3]
A3	Has consideration been given to the point of application and the work space required for disassembly?	toner cartridge	M	<input type="checkbox"/> Yes/ <input type="checkbox"/> No <input type="checkbox"/> Not applicable because there is no replacement part. or this	The point of application is where the force applied by the tool is transmitted to the connecting element. This requires enough work space for the tool to complete the loosening movement. This requires enough work space for the tool to complete the loosening movement. Then, in order to

Requirement		Applicable scope	Category	Compliance	Remarks
				is not an applicable cartridge	enable disassembly operation to be performed with the tool, there must be adequate work space. This requirement especially covers snap-on connections, which, in contrast to the assembly process, can often be loosened with the tool. [No.155V1 Appendix1 A5]
<b>B: Selection and Marking of Materials</b>					
B1	If labels, etc. to be attached to plastic casing parts are difficult to separate, they must be made of the same material as the plastic parts, or any material that does not prevent recycling.	toner cartridge, ink cartridge	M	<input type="checkbox"/> Yes/ <input type="checkbox"/> No/ <input type="checkbox"/> with no labelling	In order to recycle as high-quality materials, labels, etc. must be easily separable from plastic parts to which they are attached, or it is desirable that they are made of same materials (compatibilization). [No.155V1 Appendix1 B1]
B2	Is the variety of materials used for plastic components of similar function limited to one material?	Casing parts of 25g or more	M	<input type="checkbox"/> Yes/ <input type="checkbox"/> No <input type="checkbox"/> Not applicable because there is no replacement part	For instance, "similar functions" refer to functionality such as "impact resistance" and "abrasion resistance". The smaller the varieties of materials are, the more efficient the separation and recycling processes are. This requirement does not apply to parts that are demonstrably reused. [No.155V1 Appendix1 B2]
B3	Are components made of the same plastic material dyed uniformly or compatibly?	toner cartridge, ink cartridge	S	<input type="checkbox"/> Yes/ <input type="checkbox"/> No <input type="checkbox"/> Not applicable because there is no replacement part	Uniform colouring if parts consisting of the same plastic improves possibilities to introduce material cycles for recycling. 'Compatible colouring' refers to the same colour with different degrees of brightness (e.g. grey and anthracite). In addition, if different types of plastic materials have different colours, this "colour code" facilitates reliable type-specific sorting of the plastic. [No.155V1 Appendix1 B3]
B4	Has the coating of plastic components been limited to the minimum level required? Are galvanic coatings not used?	toner cartridge, ink cartridge	M	<input type="checkbox"/> Yes/ <input type="checkbox"/> No <input type="checkbox"/> Not applicable because there is no replacement part	'Coating' refers to a layer of coating material, vapor-deposited layer, and print. Galvanic coatings are not permissible. Large-area lacquer coatings, vapour deposition and imprints on plastic components require additional treatment for removal if the materials are to be recycled subsequently. Laser markings are not considered as prints. This requirement does not apply to demonstrably reused parts.[No.155V1 Appendix1 B4]
B5	Are recyclable materials and material composites used?	toner cartridge, ink cartridge	M	<input type="checkbox"/> Yes/ <input type="checkbox"/> No/ <input type="checkbox"/> Not applicable because there is no replacement part	'Recyclable material' means that recycled material identical to the original material (recycling at the original level) can be manufactured. This item asks the intention and goals upon designing and does not ask whether recycling is actually conducted. [No.155V1 Appendix1 B5]
B6	Is partial use of recycled plastic material permitted?	toner cartridge, ink cartridge	M	<input type="checkbox"/> Yes/ <input type="checkbox"/> No/ <input type="checkbox"/> Not applicable because	'Permitted' means that a material that meets the requirements provided in the specifications may be used if it is available. 'Partial' means some available plastic components are appropriate. (This does not require all

Requirement		Applicable scope	Category	Compliance	Remarks
				there is no replacement part	available components.) A closed cycle is realized only if the manufacturer has already used recycled materials, or if they announce the commitment to do so in the product specifications. [No.155V1 Appendix1 B6]
B7	Is the percentage of recycled material to the total plastic weight constantly 5% at a minimum?	Casing parts of toner cartridge, Casing parts of ink cartridge	S	<input type="checkbox"/> Yes/ <input type="checkbox"/> No/ <input type="checkbox"/> Not applicable because there is no replacement part	<p>'Total plastic weight' means the total weight of all applicable plastic parts. 'Recycled material' means recycled plastic pellets themselves, and not plastic parts that contain recycled plastics. The source of recycled pellets does not matter. In other words, the recycled plastic does not have to be recycled pellets obtained from parts in used printers or copiers; it may include recycled plastic from other product families on the market.</p> <p>Using appropriate recycled materials considerably contributes to resource saving and the use within the scope of availability is strongly desirable.</p> <p>[No.155V1 Appendix1 B7]</p>
B8	Are plastic parts weighing 25 g or more with a flat surface of larger than 200 mm <sup>2</sup> marked in accordance with ISO 11469, taking ISO 1043 into consideration?	Entire unit (Plastic parts contained in reused complex assemblies are not included.)	M	<input type="checkbox"/> Yes/ <input type="checkbox"/> No/ <input type="checkbox"/> Not applicable because there is no replacement part or applicable part	<p>The marking of plastics shall enable all recycling companies to sort plastics by type.</p> <p>[No.155V1 Appendix1 B10]</p>
<b>C: Longevity</b>					
C1	Can cartridges for colourants be replaced separately for each colour?	toner cartridge, ink cartridge Not applied to portable equipment	M	<input type="checkbox"/> Yes/ <input type="checkbox"/> No/ <input type="checkbox"/> Not applicable due to the single-color cartridge, portable equipment	<p>The separate replacement by color contributes to saving of materials. Portable devices mean small and light-weight printers, etc. which include mobile printers.</p> <p>[No.155V1 Appendix1 C3]</p>
C2	Can cartridges be reused?	toner cartridge, ink cartridge	M	<input type="checkbox"/> Yes/ <input type="checkbox"/> No	<p>Constructive measures shall not prevent reuse. Specifically, any IC chip or other device for preventing reuse of a cartridge must not be attached to the cartridge.</p> <p>[No.155V1 Appendix1 C5]</p>
Are all "M" requirements satisfied and "Yes" answers given to them?			M	<input type="checkbox"/> Yes/ <input type="checkbox"/> No	

## Appendix 2 Packaging material checklist

### ■List of packaging material used for the product.

Indicate a name, weight, ratio of recycled materials in use of packaging materials that are used per cartridge.

No.	Packaging material used for the product	weight[g]	Ratio of recycled material in product
1			%
2			%
3			%
<b>Total</b>			

Entry examples of the packaging materials in use: cardboard, polyethylene, foamed polystyrene, pulp mold.

### ■Packaging material checklist

It is determined that the product conforms to the criteria if it implements (“Yes”) all requirements (excluding Should items).

No.	Requirement	Compliance	Remarks						
1	Is the product designed giving consideration to weight reduction/volume reduction?	<input type="checkbox"/> Yes/ <input type="checkbox"/> No	<div>Comparison with packaging materials used for conventional machine</div> <table><tr><td>Name of conventional machine</td><td></td></tr><tr><td>Rate of weight reduction</td><td></td></tr><tr><td>Rate of volume reduction</td><td></td></tr></table> <div>You may enter any of the weight reduction rate or volume reduction rate. <input type="checkbox"/> No conventional machine of the same type is present.</div>	Name of conventional machine		Rate of weight reduction		Rate of volume reduction	
	Name of conventional machine								
Rate of weight reduction									
Rate of volume reduction									
	Specifically, whether a comparison of weight reduction or volume reduction, etc. with the packaging materials used for conventional (or standard) machine of the same type (the same size/volume)								
2	Is the product designed giving consideration to use of recycled materials? (Waste paper, recycled plastic, etc.)	<input type="checkbox"/> Yes/ <input type="checkbox"/> No	If any recycled material is used, indicate it in the above list.						
3	Is the product such designed that sharing of materials is promoted?	<input type="checkbox"/> Yes/ <input type="checkbox"/> No	It is desirable to share materials by products of a same company or standardize packaging materials used for a same product.						
4	Is the product designed giving consideration to selection of a material that is easy to recycle or reuse?	<input type="checkbox"/> Yes/ <input type="checkbox"/> No	It is desirable to select a material that consumers can easily send to recycling, etc.						
5	If dissimilar materials are used in combination, is the product such designed that separation of parts is easy?	<input type="checkbox"/> Yes/ <input type="checkbox"/> No <input type="checkbox"/> No combined use of dissimilar materials	Dissimilar materials herein stated refer to metals and plastics, paper and plastics, etc., and do not mean a difference by a type of plastic.						
6	Whether materials are indicated according to the regulations or JIS standard, etc., so that the product can be easily recycled or reused.	<input type="checkbox"/> Yes/ <input type="checkbox"/> No	It is necessary to provide an appropriate indication so that consumers can send the product to recycling, etc.						
7	Are materials to be used in packaging selected so that use of any chemical substances which affect the environment is avoided or reduced? (Non-use of polymers containing halogens, CFC, HCFC, etc. (Appendix 3))	<input type="checkbox"/> Yes/ <input type="checkbox"/> No	If any chemical substance that affects the environment is used, it will be a problem when the product is recycled or disposed of.						
8	Is there a system for collection and reuse or recycling of packaging materials?	[Should] <input type="checkbox"/> Yes/ <input type="checkbox"/> No	As stated in the considerations of Act for Promoting Green Purchasing, it is desirable that the product has a collection/recycling system.						

**Appendix 3 Substances Specified in “Packaging material checklist” No.7**

CFC5s	Group I, Annex A of Montreal Protocol	Trichlorofluoromethane	Dichlorotetrafluoroethane
		Dichlorodifluoromethane	Chloropentafluoroethane
		Trichlorotrifluoroethane	
Other CFCs	Group I, Annex B of the same Protocol	Chlorotrifluoromethane	Pentachlorotrifluoropropane
		Pentachlorofluoromethane	Tetrachlorotetrafluoropropane
		Tetrachlorodifluoroethane	Trichloropentafluoropropane
		Heptachlorofluoropropane	Dichlorohexafluoropropane
		Hexachlorodifluoropropane	Chloroheptafluoropropane
	Group II, Annex B of the same Protocol	Carbon Tetrachloride	
	Group III, Annex B of the same Protocol	1,1,1-Trichloroethane	
HCFC	Group I, Annex C of the same Protocol	Dichlorofluoromethane	Dichloropentafluoropropane
		Chlorodifluoromethane	Chlorohexafluoropropane
		Chlorofluoromethane	Pentachlorofluoropropane
		Tetrachlorofluoroethane	Tetrachlorodifluoropropane
		Trichlorodifluoroethane	Trichlorotrifluoropropane
		Dichlorotrifluoroethane	Dichlorotetrafluoropropane
		Chlorotetrafluoroethane	Chloropentafluoropropane
		Trichlorofluoroethane	Tetrachlorofluoropropane
		Dichlorodifluoroethane	Trichlorodifluoropropane
		Chlorotrifluoroethane	Dichlorotrifluoropropane
		Dichlorofluoroethane	Chlorotetrafluoropropane
		Chlorodifluoroethane	Trichlorofluoropropane
		Chlorofluoroethane	Dichlorodifluoropropane
		Hexachlorofluoropropane	Chlorotrifluoropropane
		Pentachlorodifluoropropane	Dichlorofluoropropane
		Tetrachlorotrifluoropropane	Chlorodifluoropropane
		Trichlorotetrafluoropropane	Chlorofluoropropane