EL104. Toner Cartridges

[EL104-1997/7/2012-36]

1. Scope

The criteria shall apply to toner cartridges used in laser or electrophotographic output devices (printers, facsimile machines, copiers and multifunctional devices).

2. Definitions

2.1

“Original toner cartridges” refer to the toner cartridges manufactured by output device manufacturers or manufactured on consignment by output device manufactures for the purpose of being used in a certain model of output devices.

2.2

“Regenerated toner cartridges” refer to the toner cartridges which are collected, disassembled, cleaned, repaired, replaced with a certain part and refilled with toner powder after being used by users. It can be classified into ‘refilled toner cartridges’ and ‘remanufactured toner cartridges’. However, ‘toner containers’, which have easily refillable structure by users, shall be excluded.

2.3

"Refilled toner cartridges" refer to the toner cartridges which are collected, disassembled, cleaned, repaired and refilled with toner powder.

2.4

"Remanufactured toner cartridges" refer to the toner cartridges which are collected, disassembled, cleaned, repaired, replaced with drum and wiper blades, and refilled with toner powder.

2.5

“Uniformity of printing density” refers to the uniformity for the density of the printed part with standard color.

2.6

“Standard color” refers to the print color equipped in toner cartridges. Black is applied for black toner cartridges, and cyan, magenta, yellow and black for color toner cartridges.

2.7
“Background” refers to the rest of surface after excluding the intended printing pattern on the hard copy output.

2.8
“Tainted point (or tainted line)” refers to the unintended point (or unintended line) on the hard copy output.

2.9
“Lost point (or lost line)” refers to the unprinted point (or unprinted line) which is needed to be printed out.

2.10
“Ozone depletion potential (ODP)” refers to the value indicating the relative impact of ozone depleting substances when the ozone depletion impact of CFC-11 is set to be 1.

3. Certification Criteria

3.1 Environmental Criteria

3.1.1 Original toner cartridge

3.1.1.1
With respect to resource consumption and pollutant emission at use stage, when printing out on recycled paper, the print quality shall be equivalent to that of regular printing paper. Exempted from this criterion are the cartridges used in the printers for roll type paper and large size printers.

3.1.1.2
With respect to use of chemical substances in manufacturing process, the product shall comply with the following requirements.

a) In washing process, CFCs or organic chlorinated compounds shall not be used as cleaning agents.

b) Halogenated plastics such as PVC shall not be used for the plastic case parts weighing 25g or more, and also halogenated compounds shall not be contained in the plastic parts. Exempted from this criterion are the fluorogranic additives with less than 0.5 wt% (e.g. anti-dripping).

c) Plastics which contain lead compounds and cadmium compounds shall not be used for plastic case parts weighing 25g or more.

d) Flame-retardants, which contain PBBs (polybrominated biphenyls), PBDEs (polybromodiphenyl ethers) and short-chain chlorinated paraffins (C= 10~13) whose chlorine concentration is 50% or more, shall not be used for plastic parts weighing 25g or more.

e) Lead, cadmium, mercury or compound of these materials, chromate compounds or organotin compounds should not be used as the toner component.

f) The azo compound, which can be decomposed by arylamine as stipulated in EU Directive 2002/61/EC should not be used, as toner coloring.

g) Following substances shall not be used in toner.

▪ Chemicals belonging to the following H code class according to the UN Globally Harmonized System of Classification and Labeling of Chemicals.

Note) The EU Regulation (EC) No. 1272/2008 Appendix VI. Part 3 (Harmonized Classification and Labelling Tables) will be temporarily used as a list of substances.

H330 : fatal inhaled.

H310 : fatal in contact with skin

H317 : may cause allergic skin reaction

H351 : suspected of causing cancer

H334 : may cause allergy or asthma symptoms or breathing difficulties if inhaled

H350 : may cause cancer

H340 : may cause genetic defects

H350i : may cause cancer by inhalation

H360D : may damage the unborn child

H360F : may damage fertility

H360FD : may damage fertility, may damage the unborn child

H361d : suspected of damaging the unborn child

H361f : suspected of damaging fertility

H360Fd : may damage fertility, suspected of damaging the unborn child

▪ Substances classified as carcinogenicity (‘Group 1’, ‘Group 2A’ and ‘Group 2B’) in the recommendation on allowable concentration by IARC (International Agency for Research on Cancer). However, the carbon black and TiO_2 shall be excluded.
▪ Substances required labeling of the entire product with the danger symbols in accordance with Annex II to EU Directive 67/548/EEC.

h) Photo sensitive layers shall not use cadmium, lead, mercury, selenium and their compounds.

3.1.1.3
With respect to recycling in manufacturing process and recyclability of the product at disposal stage, the product shall comply with the following requirements.

a) Separable plastic parts (weighing 25g or more and covering a flat surface of 200mm^2 or more) shall be visibly marked with material identification to facilitate separation and collection in disposal.

b) Plastic case parts weighing 25g or more shall be made of maximum four different polymer or polymer blends (polymer alloys) in easy separable way.

c) Each plastic case part weighing 25g or more shall be made of a single polymer (homo- / copolymer) or recyclable polymer blends (polymer alloys). In addition, labels, markings and stickers, not easy to separate shall be made of the same material as the plastic parts to which they are affixed or shall not cause inconvenience to recycle.

d) Halogenated compounds such as PVC shall not be used for plastic packaging parts weighing 25g or more.

e) Shock-absorbing materials in packaging shall be made of recycled pulp or paper such as pulp mold. However, following materials are regarded as equivalent.
▪ Shock-absorbing materials certified according to 'EL 606. Packaging Materials'
▪ Shock-absorbing materials manufactured by using more than 50wt% of recycled plastics
▪ EPS (expanded polystyrene), EPE (expanded polyethylene) and EPP (expanded polypropylene) whose foaming agent has zero ODP
▪ Air cell packing bubble wrap that injects air into synthetic resins.

f) The applicant shall have take-back and recycling system for waste products. In case the applicant assigns a company to take-back and recycle waste products and submits the relevant result, it is regarded as equivalent.

g) The following requirements to be fulfilled to ensure that the product is easy to disassemble.
▪ Module must be easily separable.
▪ There must be sufficient space to insert tools at fixing points/dismantling points.
▪ Joints between different materials must be easy to find.
▪ Non-separable joints such as glued or welded joints between different materials may not be used.
▪ Any devices preventing dismantlement and reuse shall not be used.

3.1.2 Regenerated toner cartridges (except toner container)

3.1.2.1
With respect to resource consumption and pollutant emission in manufacturing process, the product shall comply with the following requirements.

a) The manufacturer shall have a facility which prevents the toner dispersion to the air during production and disposal process.

b) The limit parts, waste toner, waste drum, packing materials, etc. generated as solid wastes shall be treated properly or recycled.

3.1.2.2
With respect to use of chemical substances in manufacturing process, the product shall comply with the following requirements.

a) In washing process, CFCs or organic chlorinated compounds shall not be used as cleaning agents.

b) Toner using mercury, lead, cadmium and their compounds, hexavalent chromium compounds, and organotin compounds shall not be refilled.

c) The toner that uses the azo compound, which can be decomposed by arylamine as stipulated in EU Directive 2002/61/EC, as toner coloring should not be recharged.

3.1.2.3
With respect to recycling in manufacturing process and recyclability of the product at disposal stage, the product shall comply with the following requirements.

a) Halogenated compounds such as PVC shall not be used for plastic packaging parts weighing 25g or more.

b) Shock-absorbing materials in packaging shall be made of recycled pulp or paper such as pulp mold. However, following materials are regarded as equivalent.
▪ Shock-absorbing materials certified according to 'EL 606. Packaging Materials'
▪ Shock-absorbing materials manufactured by using more than 50wt% of recycled plastics
▪ EPS (expanded polystyrene), EPE (expanded polyethylene) and EPP (expanded polypropylene) whose foaming agent has zero ODP
▪ Air cell packing bubble wrap that injects air into synthetic resins.

c) The applicant shall have take-back system for waste products and post-sale consumer service system. In case the applicant assigns a company to take-back waste product and to provide post-sale consumer service, and submits the relevant result, it is regarded as equivalent.

3.2 Quality Criteria

3.2.1
The print capacity of the product shall comply with the following requirements in comparison with that of the toner cartridges supplied by applicable output device manufacturers.

	Original toner cartridges	Regenerated toner cartridges
Printing capacity [%]	≥ 95	≥ 85

Note) If the original toner cartridges are the same models of the cartridges supplied with the output devices, the test for print capacity will be omitted.

3.2.2

Print quality of the product shall comply with the following requirements.

3.2.2.1

Appearance and structure: Abnormality shall not be detected.

3.2.2.2

Resolution of factor: Abnormality shall not be detected.

3.2.2.3

Uniformity of printing density: Density difference in values measured on the same printout shall not exceed 3%.

3.2.2.4

Background density: Density difference between two values measured on unprinted paper and printed paper shall not exceed 2%.

3.2.2.5

Tainted point: No tainted spot shall exceed 0.5mm in diameter, and those with 0.3 ~ 0.5mm in diameter shall be 8 or less.

3.2.2.6

Lost point: No lost spot shall exceed 0.5mm in diameter, and those with 0.3 ~ 0.5mm in diameter shall be 5 or less.

3.2.2.7

Tainted line & Lost line: No tainted or lost line shall exceed 0.3mm in width or 1mm in length, and those with 0.1 ~ 0.3mm in width or 1mm or less in length shall be 2 or less.

3.2.2.8
Fixation of toner: There shall not be any scrap of toner powder on the paper

3.2.2.9
Cleanness of printed side of paper: There shall not be any spot, scratch or contaminant on the printing side of paper.

3.3 Information for Consumers

3.3.1 Types of applicable output devices (model number, etc.) and information on the proper handling

3.3.2 Noticeable indication that informs the product is recycled one

3.3.3 Information on the take back service for waste product

3.3.4 Contact numbers for post-sale service and inquiry into the product

4. Test Methods

Certification Criteria			Verification and Test Methods
Environmental Criteria	3.1.1	3.1.1.1	Test report by an accredited testing laboratory in accordance with the test method specified in 4.1 and 4.2
		3.1.1.2 ~ 3.1.1.3	Verification of submitted documents and production site inspection
	3.1.2		Verification of submitted documents
Quality Criteria	3.2.1		Test report by an accredited testing laboratory in accordance with the test method specified in 4.1 and 4.3
	3.2.2		Test report by an accredited testing laboratory in accordance with the test method specified in 4.1 and 4.4
Information for Consumer			Verification of submitted documents

4.1 General Matters

4.1.1

Two test samples for each applied product are required. For color toner cartridges, select two standard colors in the order of the large print capacity. In case the print capacity of each standard color is the same, black shall be taken preferentially.

4.1.2

Test samples shall be collected at random by eco-label certification body from products on the market or those in storage at the production site.

4.1.3

Test results of both two samples shall comply with the requirements.

4.1.4

As printing paper, A4-sized paper complying with the quality requirements of KS M 7212 shall be used. Printing shall be performed in the vertical direction of the paper.

4.1.5 ISO/IEC 19752 (Black and white toner cartridge) and IOS/IEC 19798 (Color toner cartridge) will be applied to the test method and conditions that are not specified in this standard.

4.1.6

The test for quality criteria of 3.2.2.2 ~ 3.2.2.9 shall be performed using the same test sample. However, if the number of printable sheets according to the test method stipulated in ISO/IEC 19752 and ISO/IEC 19798 is less than 5,000, it can be checked whether the quality criteria requirement can be satisfied by changing the “3,500 sheet printing” condition to “printing 70% of printable sheets.”

4.1.7

The test result shall be numerically set according to KS Q 5002 (Statistical interpretation method of the data – Part 1: Statistical description of the data).

4.2 Test method for compatibility of recycled paper use

4.2.1

Use the recycled paper of A4-sized complying with the relevant Korea Eco-Label certification criteria for copying paper under the product group, "Stationary paper".

4.2.2

The test method and condition that is not suggested in this criteria, shall be followed by ISO/IEC 19752(Black Toner Cartridge), ISO/IEC 19798(Color Toner Cartridge)

4.2.3
Set the initial setting for the printing conditions and print 100 sheets continuously. Then, print each 10 copies on regular copying paper satisfied with the relevant KS and on recycled paper. For the comparison of the print quality, take 2 copies at random (one from regular copying paper and the other from recycled paper).

4.2.4
Regarding the print quality, it shall be equivalent to the print quality of the regular copying paper, which satisfies the relevant KS, by visual detection or a magnifier. Any spot, scratch or contaminant shall not be visible on the printed side of the printouts.

4.2.5
There shall not be any scrap of toner powder on the paper when rubbing gently two printed paper, whose printed sides face each other.

4.3 Test method for print capacity

4.3.1
Print capacity shall be indicated as the average value of the test results.

4.3.2
Measure the mass of the toner cartridge (M_1) prior to the test.

4.3.3 Print 1,000 sheets of the image described in ISO/IEC 19752 and ISO/IEC 24712 and weigh the toner cartridge (M_3).

4.3.4 Then, print the image until all the toner is used, according to the procedure as described in ISO/IEC 19752 and ISO/IEC 19798.
Note: Implement with the quality test of the printed matter, and the printed matter in Appendix 1 should be regarded as one sheet, and that of Appendix 3 should be regarded as 20 sheets.

4.3.5
Measure the mass of toner cartridge (M_2) after the test is completed.

4.3.6

Print capacity is calculated by the following equation.

Print Capacity [sheets] = $\frac{\mathrm{M1-M2}}{\mathrm{M1-M3}}\ X\ 1000$

4.4 Test method for the print quality

4.4.1 Appearance and structure

4.4.1.1

Check the product shape, defects such as crack on the assembly parts, packing and sealing condition by visual detection.

4.4.1.2

Check the assembled parts such as screw, spring, gear, etc., damage on the drum, toner hopper, operating behavior of the product by visual detection.

4.4.2 Resolution: Print 3,500 sheets of the image described in ISO/IEC 19752 and ISO/IEC 24712 and check the visibility of the printed characters with the naked eye.

4.4.3 Uniformity of printing density

4.4.3.1

During the test for resolution, print out the image in Appendix 1 with standard color at the time 100 copies and 3500 copies are made.

4.3.3.2

Measure the density of 5 points on the printout by measuring instrument for reflexibility. Calculate the density difference among the measured values.

4.4.4 Background density

4.4.4.1

This test shall be performed after the test for uniformity of printing density (4.4.3) during the test for resolution.

4.4.4.2

Measure the density of 5 points on the surface of a paper prior to the printing by measuring instrument for reflexibility and calculate the average value of them. Print out the image in Appendix 3 with standard color, measure the density of 5 points and calculate the average value of them. Calculate the density difference between two average values.

Note) When measuring the reflexibility, in case the permeability difference affects the test results, measure the reflexibility after overlapping the unprinted paper behind of the paper to measure.

4.4.5 Dirty dots and lines

4.4.5.1

This test shall be performed after test for background density (4.4.4) during the test for resolution.

4.4.5.2

Print out the image in Appendix 2 with standard color and inspect the dirty dots and lines on the printout.

4.4.6 Missing dots and lines

4.4.6.1

This test shall be performed after test for tainted point (4.4.5) during the test for resolution.

4.4.6.2

Print out the image in Appendix 3 with standard color and inspect the missing dots and lines on printout.

4.4.7 Fixation of toner

4.4.7.1

This test shall be performed after the test for missing dots and lines (4.4.6) during the test for resolution.

4.4.7.2
Print two sheets of the image described in ISO/IEC 19752 and ISO/IEC 24712, hold the printed surfaces facing each other, and rub them together gently.

4.4.8 Cleanness of printed side of paper

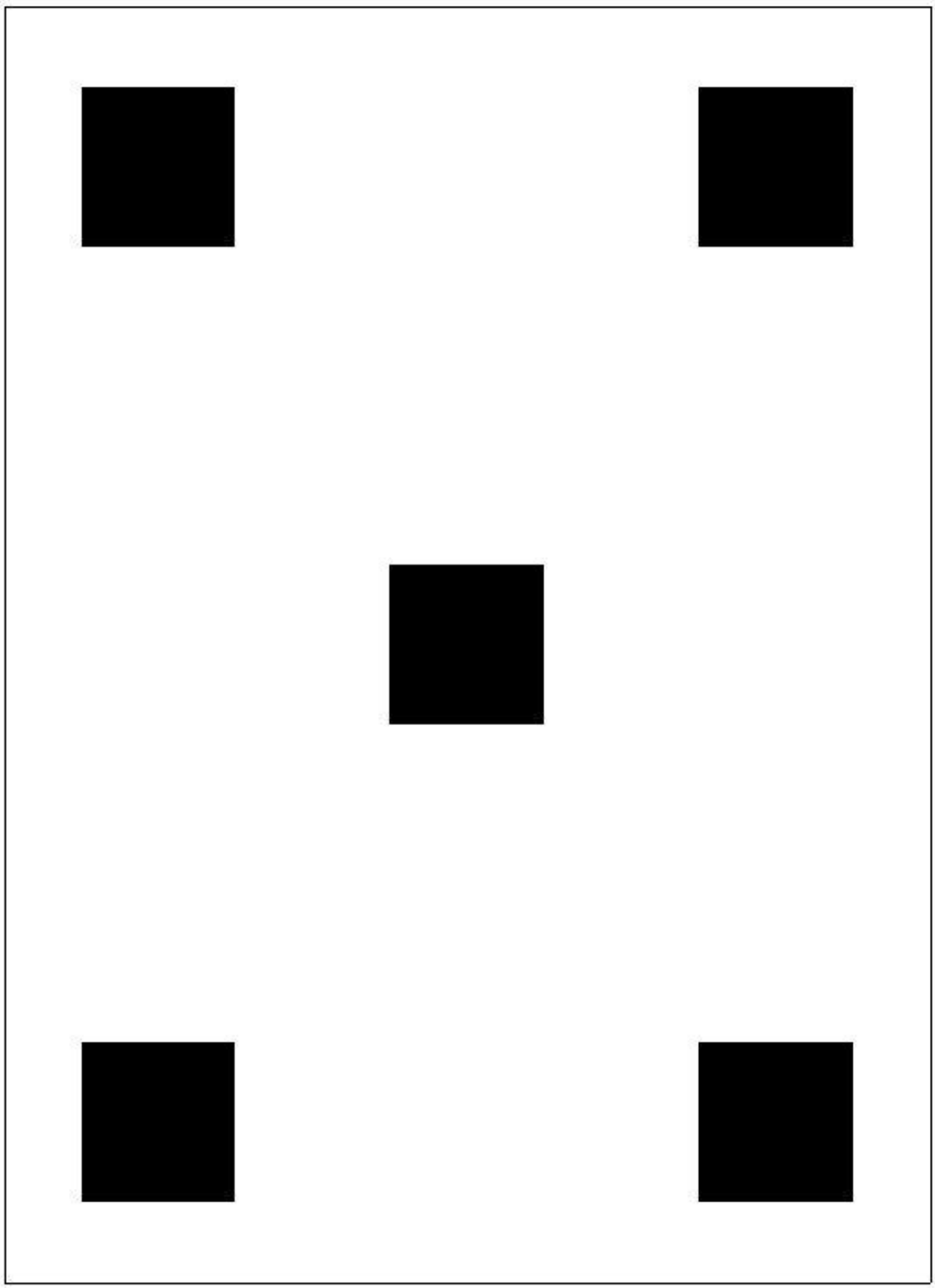
4.5.8.1
This test shall be performed after the test for fixation of toner (4.4.7) during the test for resolution.

4.4.8.2
Print one sheet of the image described in ISO/IEC 19752 and ISO/IEC 24712, and check the cleanness of the printed characters with the naked eye.

5. Reasons for Certification

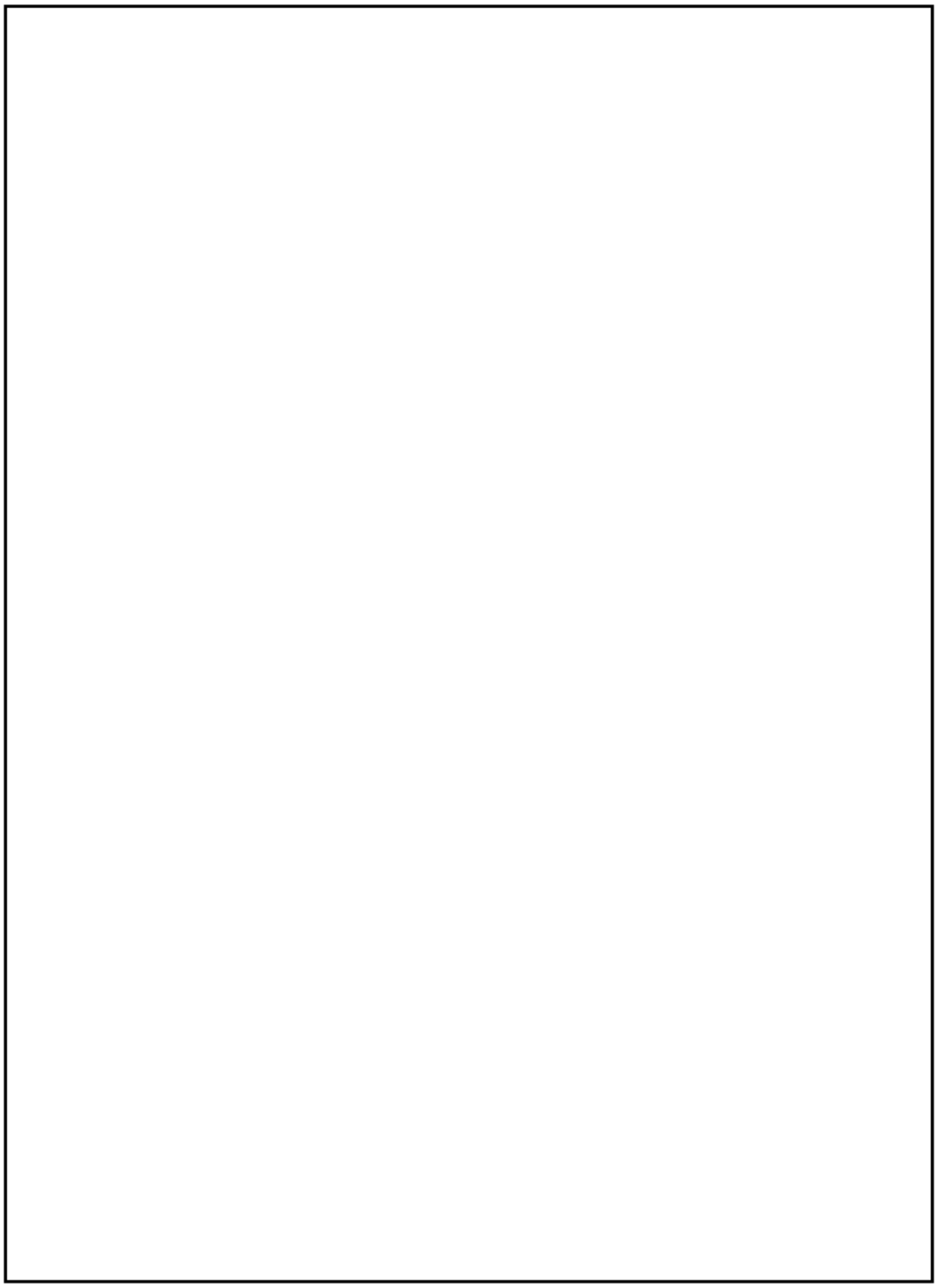
“Less waste, Less harmful substances, Readily recyclable (confined to products using waste paper)”

<Appendix 1> Printing pattern for checking concentration [Test method 4.4]



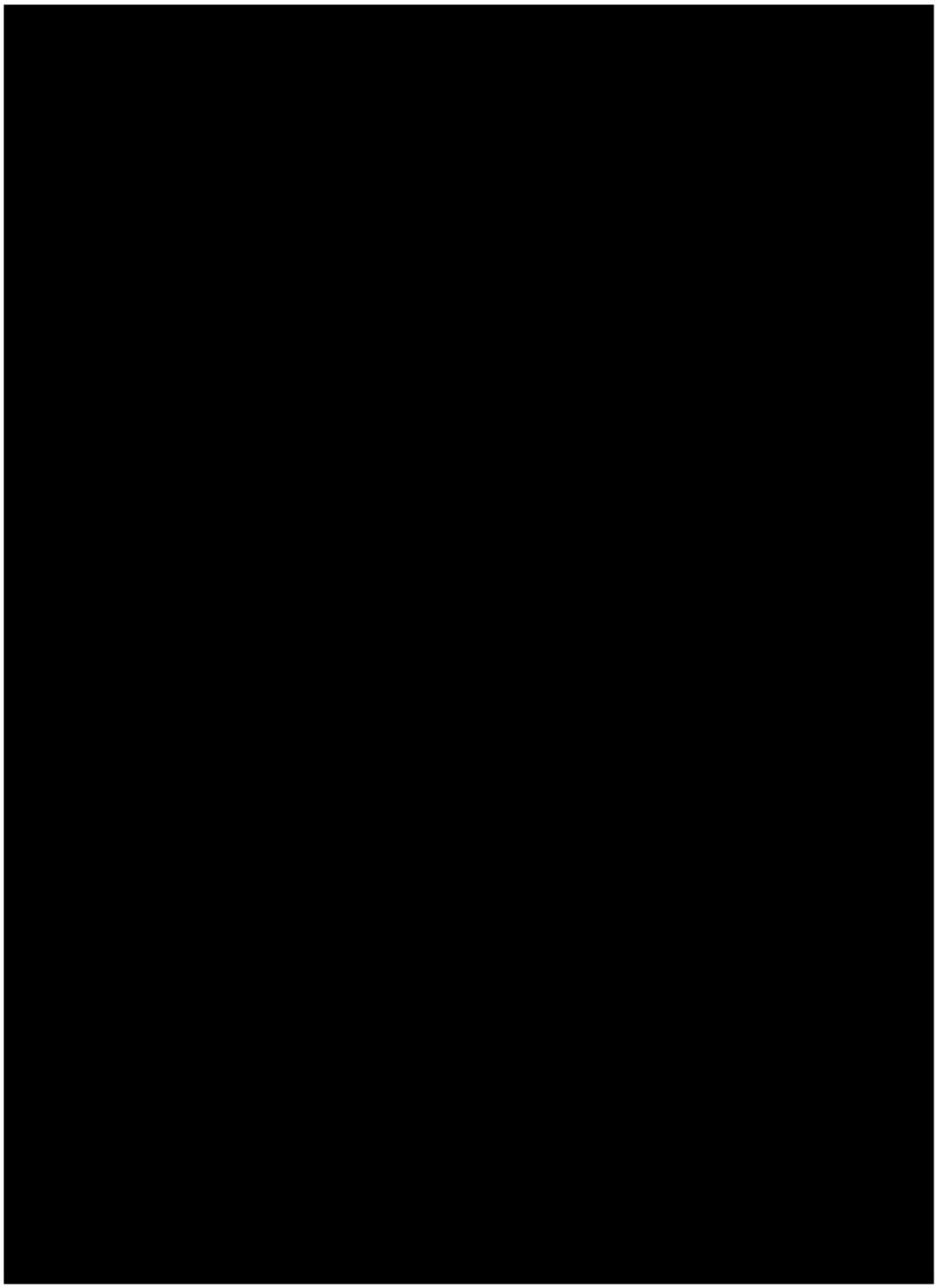
Note) The color of the image is in accordance with the corresponding color among the standard color of the toner cartridge. 198mm×270mm.

<Appendix 2> Printing pattern: 0% image (white) [Test method 4.4]



Note) The color of the image is in accordance with the corresponding color among the standard color of the toner cartridge. 198mm×270mm.

<Appendix 3> Printing pattern: 100% image [Test method 4.4]



Note) The color of the image is in accordance with the corresponding color among the standard color of the toner cartridge. 198mm×270mm.

Common Criteria, Notice No. 2012-36, the Ministry of Environment

1. Eco-label products must follow the following provisions with regard to the proper treatment of environmental pollution substances, such as air and water wastes and noxious chemical substances emitted in the process of manufacturing or service operation.

A. When first applying for certification, the product manufacturer should observe the environment related laws and agreements pertaining to the region where the production factory or the place of service operation is located for a period of one year prior to the date of application. Any case of violation of the penalty clause will be verified by confirming documents involved during a period of one year to the date of application. Regarding any violation not related to the penalty clause, confirmation will be made on the completion of appropriate measures.

B. A person who has received a certification of eco-labeling shall observe the environment related laws and agreements pertaining to the region where the production factory or the place of service operation is located during the period of certification. However, regarding any violation besides a penalty, confirmation will be made on the completion of appropriate measures.

2. As a general rule, information for consumers shall be indicated on the surface of the product in such a way not to be easily erased. However, in case that indication on the surface of the product is impossible or undesirable, it can be indicated on the appropriate part such as product packaging, product guidebook and user's manual that consumers can recognize. However, the service information should be indicated inside and outside of the place of service operation. In case that indication inside and outside of the place of service operation is impossible or undesirable, it can be indicated on the appropriate part such as an agreement, letter of delivery, letter of guarantee, and PR materials that consumers can recognize.

3. In order to establish fair trade and to protect consumer, the applicant for eco-label and the holder of eco-label license shall observe the Act on the Fairness of

Indication and Advertisement with respect to the environmental aspects of the product.

4. For Various standards referred in the certification criteria by target product, the latest revised edition applies at the date of application, if not specified otherwise.

5. In applying the quality related criteria for each target product, if no standard is available that can be applied as the quality criteria, the president of Korea Environmental Industry & Technology Institute (KEITI) (hereafter referred to as "president of KEITI") may establish and operate the quality criteria for the product involved after review by a competent committee.