

**CANON LASER PRINTER
TONER CARTRIDGES FOR RUSSIA
(CRG-718)
PRINTS COMPARISON TEST
SUMMARY REPORT**



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Canon Laser Printer, Toner Cartridges for Russia (CRG-718) Prints Comparison Test Summary Report

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1 Forward

Allion Japan Inc. (hereafter “Allion” for short) conducted its first gas resistance comparison test in June 2007, in which genuine toner and third party refill ink for inkjet printers were compared in a triple mixed gas fastness test. Then, ink cartridges sold in Japan and in overseas markets were compared over the years from 2007 through 2014 in a series of various tests, including toner cartridge yield tests, actual environment exposure tests, and usability tests, all conducted from the viewpoint of users and in user conditions.

This time, focusing again on laser printer toner cartridges for the Russian market, which were tested for the first time in 2014, Allion used genuine and non-genuine black toner cartridges different from those used in 2014 to verify, from various angles, what kinds of effect those toner cartridges give on the printer main body or printed matter over the period from unpacking and installation until two toner cartridges run out of toner. The objective of this test, which was conducted in a fair manner by a third party verification organization, is to confirm to what extent the reliability of the genuine and non-genuine toner cartridges is assured.

In the following text, genuine toner cartridges are designated as Canon toner cartridges or abbreviated to Canon genuine, and non-genuine toner cartridges are designated as non-genuine toner cartridges or abbreviated to non-genuine. For explicitly describing differences in brand, Cactus brand toner cartridges are designated as “Cactus,” and NV Print brand toner cartridges are designated as “NV Print.”

2 Findings

The results of this prints comparison tests are as given in the table below:

Assessment Item	Canon Genuine	Cactus	NV Print
Packing/Unpacking condition assessment	No problem	No problem	Toner is scattered
Initial assessment	No problem	No problem	Printing is judged unable to continue
Toner cartridge yield assessment	Refer to the ratio of numbers of printed sheets on page 7.		
Printed character quality assessment	No problem	No problem	Stain is recognized on the print
Printed image quality assessment	No problem	Highly reddish overall; color hue deviates	Color is light; streaks are recognized on the print
End of life indication	Indicated	No indication	No indication

In the case of the Canon genuine, no defects were detected in any item. In the case of the Cactus and the NV Print, some defects were found in some items. A summary of the detected defects is given below:

- (1) Scattered toner was found when the toner cartridge was unpacked (NV Print).
- (2) At the time of initial printing immediately after unpacking, toner was found scattered to the housing, stain was found on the printed image, and toner was found on the surface of paper ejection roller (NV Print).
- (3) Since the initial period, defective images were recognized (NV Print).
- (4) The printer stopped running with the indication of a paper jam error (NV Print).
- (5) Stain on the print to the extent recognizable for ordinary business documents (NV Print).
- (6) Color hue reproducibility and stability are poor (Cactus and NV Print).
- (7) Because of no indication of end of life, fade of printing may be unnoticed, causing loss of printing (Cactus and NV Print).

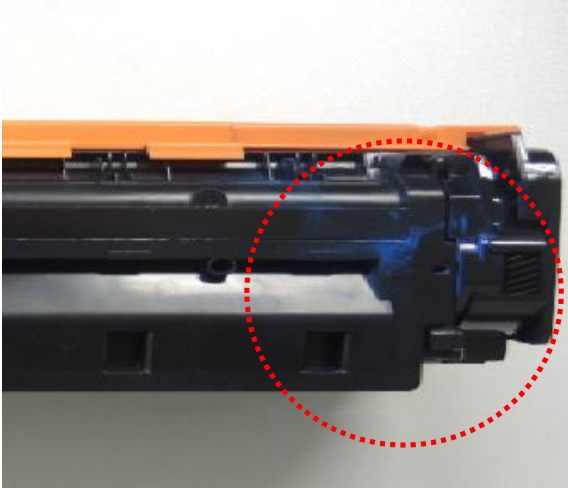

These defects are detailed in the test results given below.

3 Test Results

3.1 Packing/Unpacking Condition Assessment

The toner cartridges of Canon genuine, Cactus, and NV Print were checked for packing condition and the condition on unpacking. No defective conditions of packing, including the outer box, were found for any of the toner cartridges. When the toner cartridges were unpacked, scattered toner was found on one NV Print toner cartridge (cyan). Scattered toner was not found on the other toner cartridges, including those of Canon genuine and Cactus.

Given below are the images of the scattered toner when the toner cartridges of NV Print were unpacked.

Cartridge	Cyan	
NV PRINT No. 1	 <p data-bbox="277 1137 823 1198">Scattered toner was recognized on the upper right side</p>	 <p data-bbox="871 1137 1497 1198">Scattered toner was also recognized in the inside of protective bag</p>

3.2 Initial Assessment (Assessment upon Installation)

When toner cartridges of each brand were used with a Canon Color Laser Printer LBP7200C, a stain present at equally spaced intervals in the horizontal direction, as shown in attached Figure (1), was recognized on the printed matter with an NV Print toner cartridge. Moreover, scattered toner contaminated the inside of the printer; printing was judged unable to continue, and the printer was replaced.

Similar defects were not found for Canon genuine and Cactus. In addition, when installing the toner cartridges of each brand in the printer, no defects (unable to install, unusual sound, etc.) were found.

Figures (1) and (2): Stain on the printed image, Figure (3): Stain on the CRG mounting position, Figure (4): Stain on the printer rear roller, Figure (5): Stain in the inside of the printer, Figure (6): Overall image with remaining sheets

Figure (1): Stain on the printed image

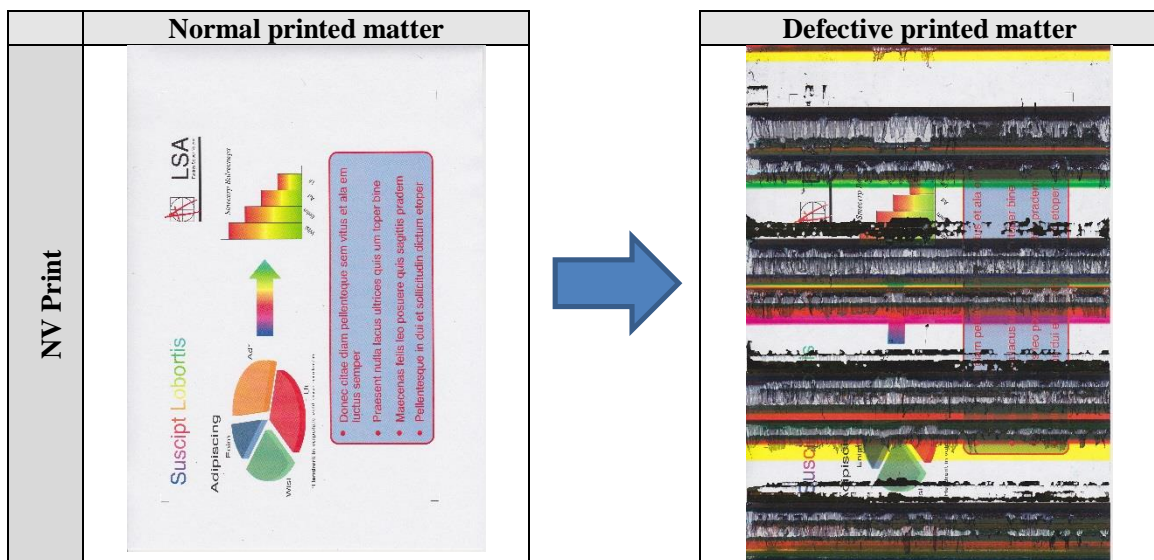


Figure (2): Stain on the printed image

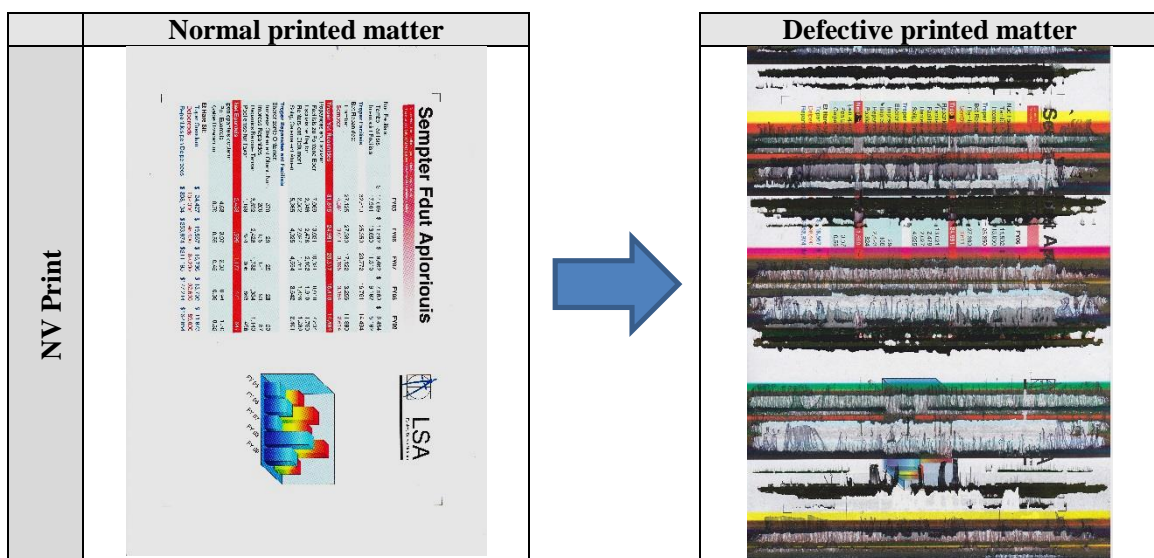


Figure (3): Stain on the CRG mounting position

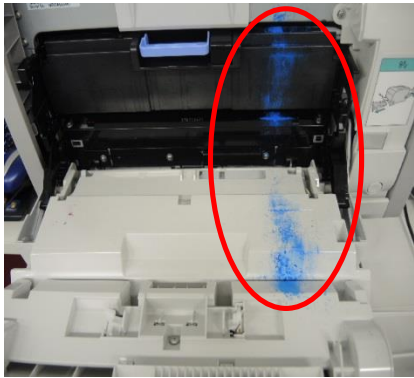


Stain on the CRG mounting position			
NV Print	CRG mounting position	CRG fitting position	View when CRG is detached
			

Figure (4): Stain on the printer rear roller

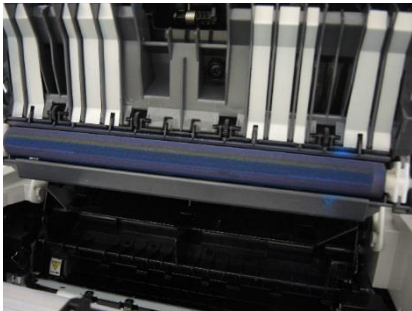
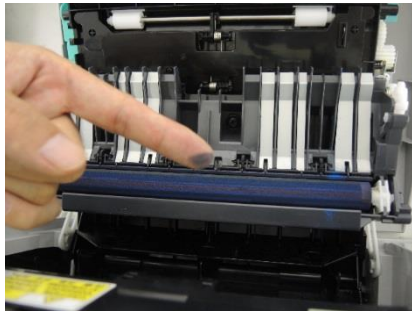
Stain on the printer rear roller		
NV Print		
		

Figure (5): Stain in the inside of the printer



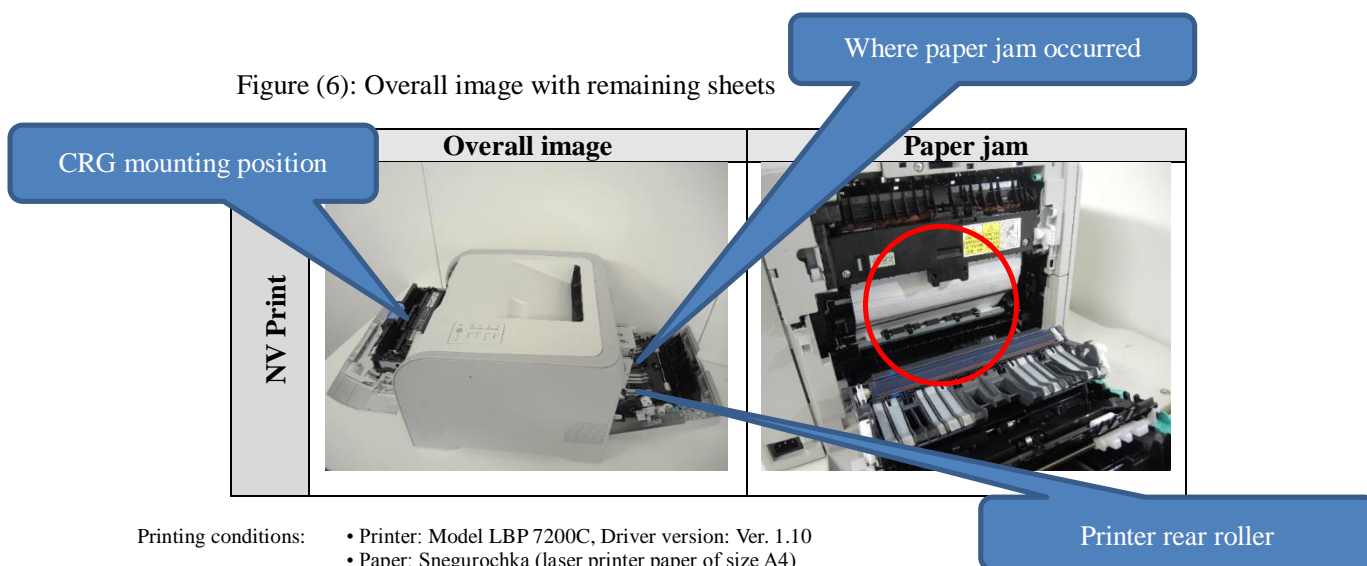
Stain in the inside of the printer		
NV Print		
		

Figure (6): Overall image with remaining sheets



Printing conditions:

- Printer: Model LBP 7200C, Driver version: Ver. 1.10
- Paper: Snegurochka (laser printer paper of size A4)
- Test data: ISO/IEC 24711:2007 test page suite
- Print settings: Paper: plain paper, Print quality: normal, Color and density: normal, Page layout: one page per sheet (normal)

3.3 Toner Cartridge Yield Assessment

The toner cartridge yield until two black toner cartridges run out of toner was compared between Canon genuine and non-genuine toner cartridges under the following printing conditions. In this test, two printers were used for each brand of toner cartridges by taking into account dispersion in test results due to individual differences in printers. The table given below shows the average ratio of non-genuine toner cartridge yield of each color of black, yellow, magenta, and cyan with respect to Canon genuine toner cartridge yield of each color, between two printers until two black toner cartridges run out of toner.

In addition, when the printer indicates an error message for toner replacement, the toner cartridge in question was taken out, shaken, fitted again, and checked for fade; if no fade or the like occurred, the subsequent printing was continued until the second error message for toner replacement was indicated. At that time, once more the toner cartridge in question was taken out, shaken, and then fitted again; if fade or the like occurred in the subsequent printing, then the toner cartridge in question was judged out of toner, and replaced.

Ratio of non-genuine toner cartridge yield with respect to Canon genuine toner cartridge yield (100%) (units in %)

	Canon	Cactus First	Cactus Second	NV Print First	NV Print Second
Black	100%	82%	69%	0%	84%
Yellow	100%	87%	79%	0%	89%
Magenta	100%	88%	74%	0%	92%
Cyan	100%	88%	81%	0%	89%

Printing conditions:

- Printer: Model LBP 7200C, Driver version: Ver. 1.10
- Paper: Snegurochka (laser printer paper of size A4)
- Test data: ISO/IEC 24711:2007 test page suite
- Print settings: Paper: plain paper, Print quality: normal, Color and density: normal, Page layout: one page per sheet (normal)

The comparison of toner cartridge yield is summarized as follows:









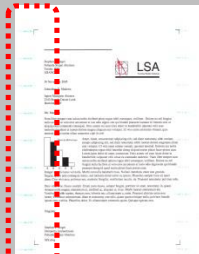
In the comparison between the Cactus and the Canon genuine, the toner cartridge yield of the Cactus was less than that of the Canon genuine by 12% to 31%, for all colors.

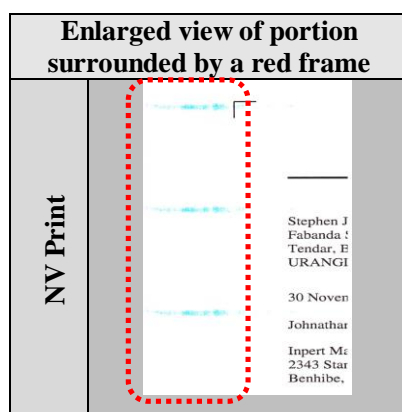
In the comparison between the NV Print and the Canon genuine, the toner cartridge yield of the NV Print was less than that of the Canon genuine by 8% to 15% for all colors, for the second printing, although the toner cartridge yield in the first printing was null, because printing was impossible.













In addition, in the case of Canon genuine toner cartridges, the “Replacement Needed Soon” message is indicated when the volume of toner decreases to a certain level, and the “Replace Cartridge” message is indicated when the end of life is reached during a toner cartridge yield test. In the case of non-genuine toner cartridges, however, the message for replacement is not indicated even if the volume of toner decreases, and there were occasions in which fade suddenly appeared on the printed matter. If this defect occurs, out-of-toner messages are not indicated when toner cartridges have run out. For this reason, printing may be continued without noticing fade on the printed matter, causing loss of printing.



















3.4 Printed Character Quality Assessment

The prescribed document (ISO/IEC 24711:2007 test page suite) was printed when every 500 sheets were printed, and the printed matter was checked; this was repeated until two black toner cartridges ran out of toner in the toner cartridge yield tests under the following printing conditions. The printed matter was inspected for defects, such as stain and fade. Stain on the printed matter was recognized when NV Print toner cartridges were used. No defects were found when the Canon genuine and the Cactus were used.

Printer	Number of sheets	Canon	Cactus	NV Print
LBP7200C	After 500 sheets were printed	 After 500 sheets were printed	 After 500 sheets were printed	 After 500 sheets were printed
	After 2,500 sheets were printed	 After 2,500 sheets were printed	 After 2,500 sheets were printed	 After 2,500 sheets were printed
	After 4,500 sheets were printed	 After 4,500 sheets were printed	 After 4,500 sheets were printed	 After 4,500 sheets were printed
	Result	No stain on the printed matter	No stain on the printed matter	Stain appeared after 1,000 sheets were printed













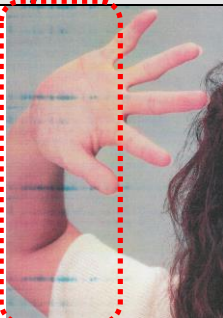
Printer	Cycle	Number of sheets	Canon	Cactus	NV Print
LBP7200C	1	After 500 sheets were printed			No printed sample because of initial failure
		After 1,500 sheets were printed			
		After 2,500 sheets were printed			
		After 3,500 sheets were printed			
		After 4,500 sheets were printed			
		After 5,500 sheets were printed			
		After 6,500 sheets were printed			
		Result	No stain on the printed matter	No stain on the printed matter	












Printer	Cycle	Number of sheets	Canon	Cactus	NV Print
LBP7200C	2	After 500 sheets were printed			
		After 1,500 sheets were printed			
		After 2,500 sheets were printed			
		After 3,500 sheets were printed			
		After 4,500 sheets were printed			
		After 5,500 sheets were printed			
		After 6,500 sheets were printed			
		Result	No stain on the printed matter	No stain on the printed matter	Stain appeared after 1,000 sheets were printed

















3.5 Printed Image Quality Assessment

The prescribed image (SCID image N1A) was printed when every 500 sheets were printed, and the print image quality was checked; this was repeated until two black toner cartridges ran out of toner in the toner cartridge yield tests under the following printing conditions. When non-genuine toner cartridges were used, color hue deviations accompanied by unstable tints over the course of printing or streaks on the printed matter were recognized. The timing of color hue deviations was mostly at the time of replacement of toner cartridge, suggesting that non-genuine toner cartridges may change in color hue depending on individual toner cartridges. When Canon genuine toner cartridges were used, no defects were found.

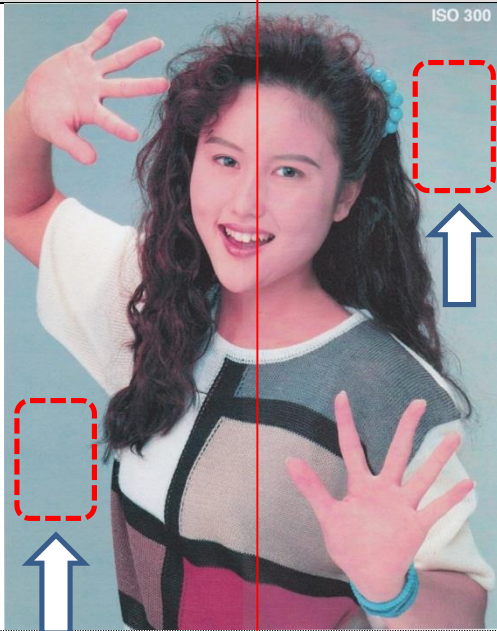
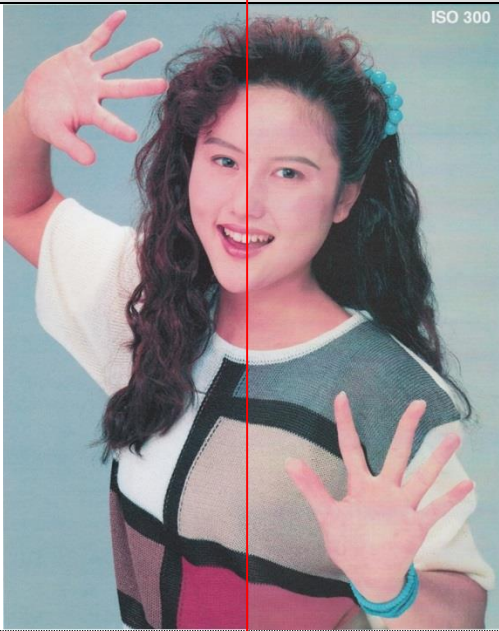
Printer	Number of sheets	Canon	Cactus	NV Print
LBP7200C	After 500 sheets were printed	 After 500 sheets were printed	 After 500 sheets were printed	 After 500 sheets were printed
	After 2,500 sheets were printed	 After 2,500 sheets were printed	 After 2,500 sheets were printed	 After 2,500 sheets were printed
	After 4,500 sheets were printed	 After 4,500 sheets were printed	 After 4,500 sheets were printed	 After 4,500 sheets were printed
	Result	No deviation of color hue is observed	Color is light overall; streaks were continually recognized after 500 sheets were printed	Color hue is unstable overall; stain appeared after 1,000 sheets were printed

Enlarged view of portion surrounded by a red frame			
Cactus		NV Print	

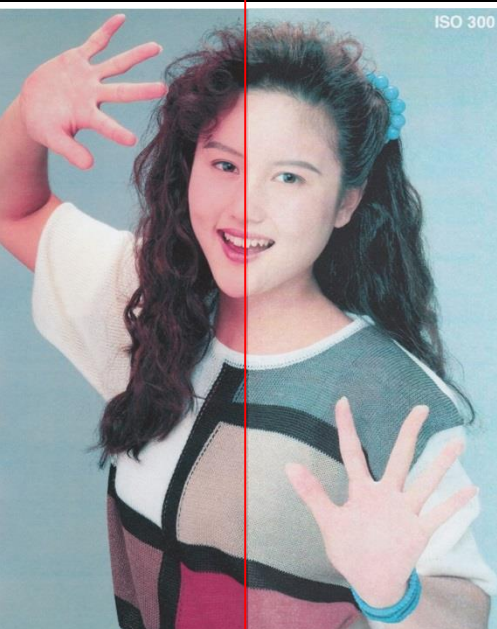
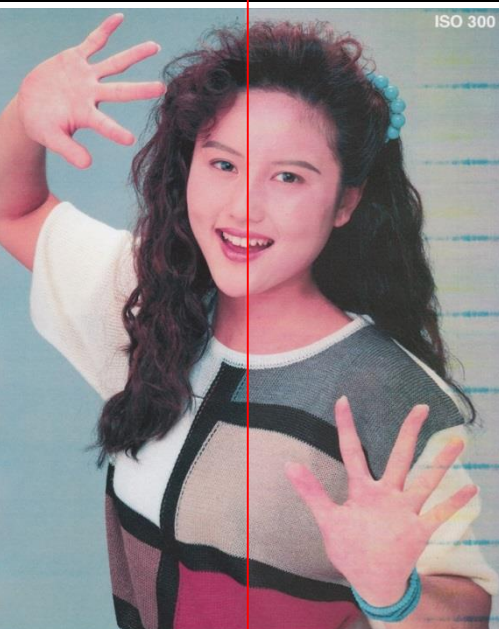
Printer	Cycle	Number of sheets	Canon	Cactus	NV Print
LBP7200C	1	After 500 sheets were printed			No printed sample because of initial failure
		After 1,500 sheets were printed			
		After 2,500 sheets were printed			
		After 3,500 sheets were printed			
		After 4,500 sheets were printed			
		After 5,500 sheets were printed			
		After 6,500 sheets were printed			
		Result	Color hue is stable	Color is light overall	

Printer	Cycle	Number of sheets	Canon	Cactus	NV Print
LBP7200C	2	After 500 sheets were printed			
		After 1,500 sheets were printed			
		After 2,500 sheets were printed			
		After 3,500 sheets were printed			
		After 4,500 sheets were printed			
		After 5,500 sheets were printed			
		After 6,500 sheets were printed			
		Result	Color hue is stable	Color hue deviated after 4,500 sheets were printed; color was light overall	Stain appeared after 1,000 sheets were printed; color was yellowish after 2,500 sheets were printed

Color hue comparison after 500 sheets were printed; the left half Canon genuine image is combined with the right half non-genuine image.

Printer	Canon vs Cactus	Canon vs NV Print
LBP7200C	 <p>Color is light compared with Canon genuine (red frame)</p>	 <p>Color is pale compared with Canon genuine</p>

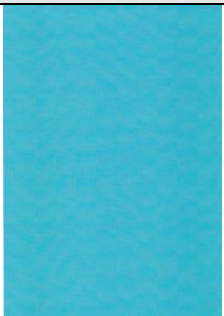
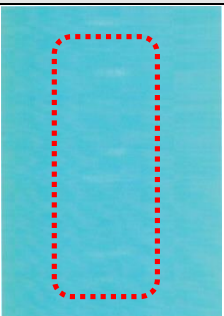





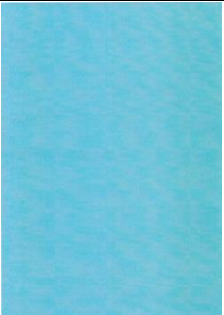
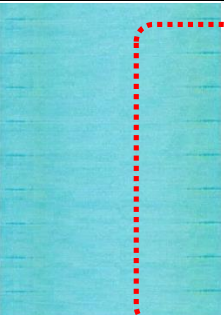
Color hue comparison after 4,500 sheets were printed; the left half Canon genuine image is combined with the right half non-genuine image.

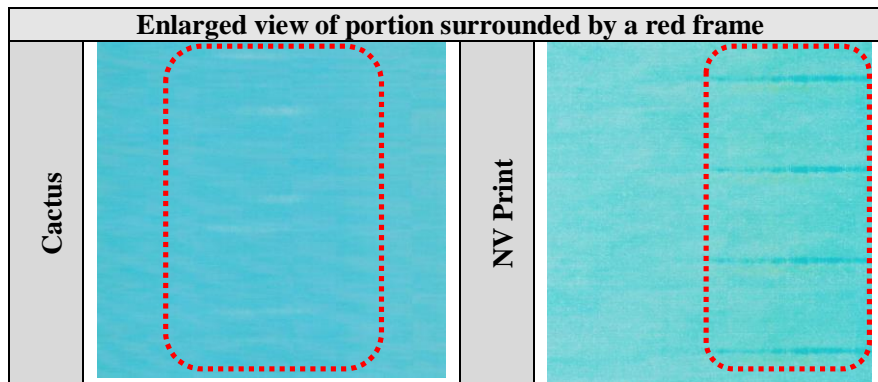
Printer	Canon vs Cactus	Canon vs NV Print
LBP7200C	 <p>Color hue is distinctly unusual compared with Canon genuine</p>	 <p>Color is yellowish compared with Canon genuine, and stains are recognized</p>

Printing conditions:

- Printer: Model LBP 7200C, Driver version: Ver. 1.10
- Paper: Snegurochka (laser printer paper of size A4)
- Test data: SCID image N1A
- Print settings: Paper: plain paper, Print quality: normal, Color and density: normal, Page layout: one page per sheet (normal)

The prescribed image (SCID image N1A) was printed when every 500 sheets were printed, and then the prescribed image (solid image) was printed to check the color stability on the printed matter; this was repeated until two black toner cartridges ran out of toner in the toner cartridge yield tests under the following printing conditions. When non-genuine toner cartridges were used, color mixing or color irregularity was recognized, and tint was not stable. When Canon genuine toner cartridges were used, no such defects were found.

Printer	Number of sheets	Canon	Cactus	NV Print
LBP7200C	After 500 sheets were printed	 After 500 sheets were printed	 After 500 sheets were printed	 After 500 sheets were printed
	After 2,500 sheets were printed	 After 2,500 sheets were printed	 After 2,500 sheets were printed	 After 2,500 sheets were printed
	After 4,500 sheets were printed	 After 4,500 sheets were printed	 After 4,500 sheets were printed	 After 4,500 sheets were printed
	Result	No deviation of color hue was observed	Color irregularity was recognized after 500 sheets were printed; color hue deviated after 4,500 sheets were printed	Color hue was unstable overall; stain appeared after 1,000 sheets were printed



Printing conditions:

- Printer: Model LBP 7200C, Driver version: Ver. 1.10
- Paper: Snegurochka (laser printer paper of size A4)
- Test data: Solid image
- Print settings: Paper: plain paper, Print quality: normal, Color and density: normal, Page layout: one page per sheet (normal)

4 Overview of the Test

4.1 Equipment Used

In this prints comparison test, each printer (three printers in total) tested toner cartridges of the three brands until two black CRG cartridges ran out of toner for each brand. During the initial assessment, however, one printer (Unit No. 2) was judged unable to continue printing because of contamination in the inside of the printer when NV Print toner cartridges were used, and consequently, the two remaining printers were used thereafter.




- Printer: Canon Satera LBP7200C (Driver version: Ver. 1.10)

Manufacturer	Printer ID	Printer Serial Number
Canon genuine	Unit No. 1	MBQA503614
	Unit No. 2	MBQA503607
	Unit No. 3	MBQA503723

- Toner cartridges for Canon Satera LBP7200C (procured in Russian market)

Manufacturer	Color	Model Number
Canon genuine	Black	CARTRIDGE 718 BK
	Yellow	CARTRIDGE 718 Y
	Magenta	CARTRIDGE 718 M
	Cyan	CARTRIDGE 718 C
Cactus	Black	CS-C718BK
	Yellow	CS-C718Y
	Magenta	CS-C718M
	Cyan	CS-C718C
NV Print	Black	CB530A
	Yellow	CB532A
	Magenta	CB533A
	Cyan	CB531A

- Photographs of sample toner box

Canon Genuine Black	Cactus Black	NV Print Black
		

➤ Test sequence

Printer ID	Test Sequence
Unit No. 1	Cactus ⇒ NV Print ⇒ Canon genuine
Unit No. 2	NV Print
Unit No. 3	Canon genuine ⇒ Cactus

➤ Numbers of Canon genuine toner cartridges used

Toner Type	Unit No. 1	Unit No. 3
BK	2	2
Y	3	3
M	3	3
C	3	3

➤ Numbers of Cactus toner cartridges used

Toner Type	Unit No. 1	Unit No. 3
BK	2	2
Y	3	2
M	3	3
C	3	2

➤ Numbers of NV Print toner cartridges used

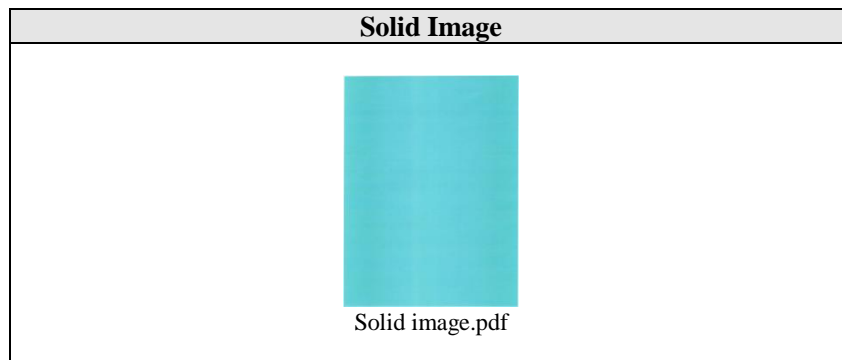
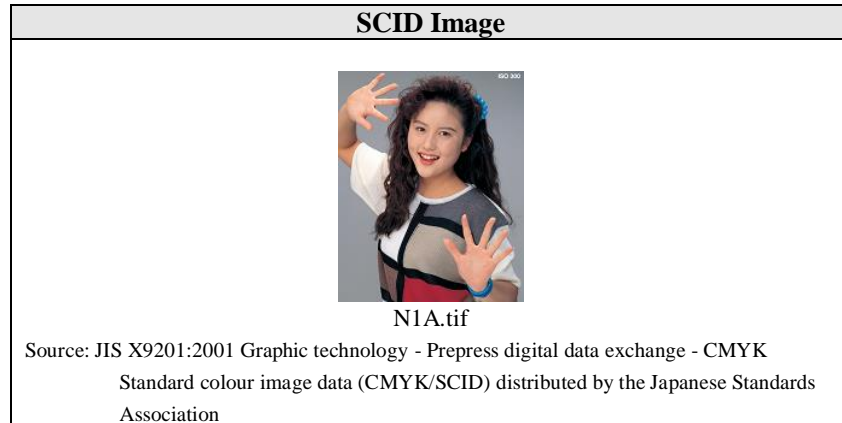
Toner Type	Unit No. 1	Unit No. 2
BK	2	1
Y	2	1
M	3	1
C	3	1

Note: Unit No. 2 printer became contaminated, and its use was discontinued.

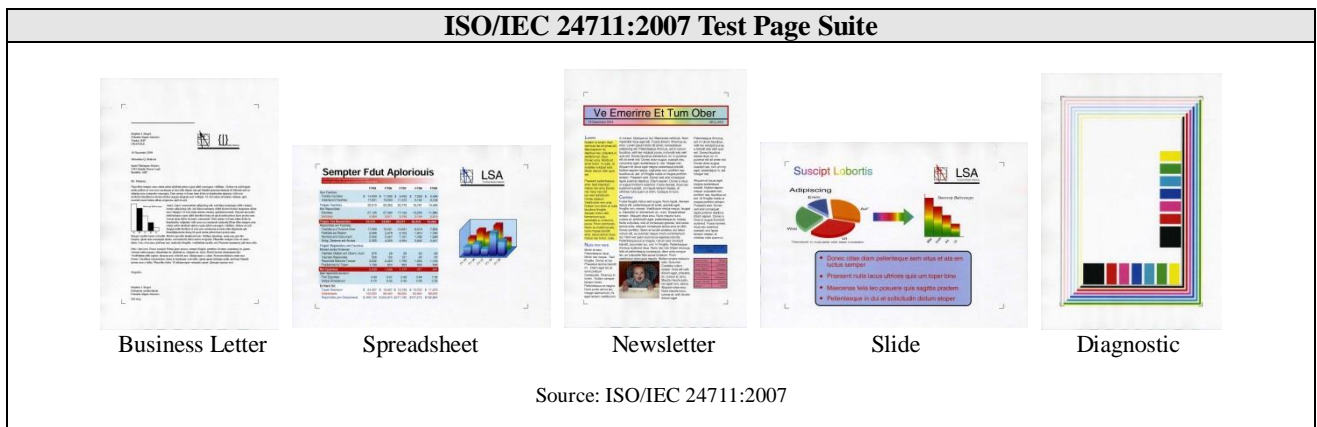
➤ Paper used for assessment (procured in Russian market)

Manufacturer	Paper Description
Snegurochka	Plain paper of size A4

- Print image data: SCID image N1A and solid image (for print assessment of print image quality)



- Print document data: ISO/IEC 24711 test page suite (for print assessment of toner cartridge yield), Business Letter (for print assessment of document quality)



4.2 Printing Conditions

- Printer: Canon Satera LBP7200C
- Software and setting conditions

Item	Standard Values/ Details
Type and version of OS	Microsoft Windows 7 Home Premium (Japanese version)
Type and version of application programs	Adobe Acrobat Reader 10 → Toner cartridge yield assessment and document quality assessment Windows Photo Viewer (packaged with the Windows OS given above) → Image quality assessment
Printer driver version	Ver. 1.10
Setting conditions for the printer driver and application programs	<p><For toner cartridge yield assessment and document quality assessment> Paper: Plain paper Print quality: Normal Color/ density: Normal Paper size: A4 Page layout: One page per sheet (normal) Printing application: Adobe Acrobat Reader 10</p> <p><For image printing assessment> Paper: Plain paper Print quality: Normal Color/ density: Normal Paper size: A4 Page layout: 20.3 × 25.4 Printing application: Windows Photo Viewer (packaged with the Windows OS given above)</p>

4.3 Test Procedures

4.3.1 Packing/Unpacking Condition Assessment

- (1) Check the condition of the wrapping of the toner box.
- (2) Take out the toner from the box, and take photographs of the front, rear, upper, lower, right, and left sides of the toner cartridge.
- (3) Check whether or not scattered toner is present at the time of unpacking.

4.3.2 Assessment during Installation of Toner Cartridge

- (1) Confirm that the insertion of toner cartridge is satisfactory.
- (2) Confirm the absence of unusual sound during printing.
- (3) Confirm the absence of scattered toner.
- (4) Confirm the fusion bonding of toner in the fuser.
- (5) Confirm the absence of any irregularities caused by toner cartridge.
- (6) Confirm the absence of abnormal operation of the printer, such as error signals, during printing.

4.3.3 Toner Cartridge Yield Assessment

- (1) Install the toner cartridges of all the colors (black, cyan, magenta, and yellow) in the printer.
- (2) Print the ISO/IEC 24711:2007 test page suite before the toner of each color runs out of toner (*fade image).
- (3) When fade appears, stop the printing, and execute the recovery operation in accordance with the instruction manual provided with the printer.
- (4) If the recovery operation is unsuccessful, replace the toner cartridge with a new one.
- (5) Continue the above procedure until two black toner cartridges run out (the aim of toner cartridge yield is 6,800 sheets).

Note: Fade image is judged on the basis of the "Example of fade (fade of 3 mm or more)" shown in ISO/IEC 19752:2004 "Information technology - Method for the determination of toner cartridge yield for monochromatic electrophotographic printers and multi-function devices that may contain printer components."

4.3.4 Printed Character Quality Assessment

- (1) This assessment is conducted during the printing until two black toner cartridges run out (the aim of toner cartridge yield is 6,800 sheets).
- (2) Print the prescribed document when every 500 sheets are printed.

4.3.5 Printed Image Quality Assessment

- (1) This assessment is conducted during the printing operation until two black toner cartridges run out (the aim of toner cartridge yield is 6,800 sheets).
- (2) Print the prescribed images when every 500 sheets are printed.

5 Important: Notes on This Report

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