Form 1(F-01s-02)

Product Environmental Aspects Declaration

EP and IJ printer (PCR-ID:AD-04)

No. AD-17-E938
Date of publication
Jun./30/2017

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SP 4510DN TE

【 Part # 407924 】

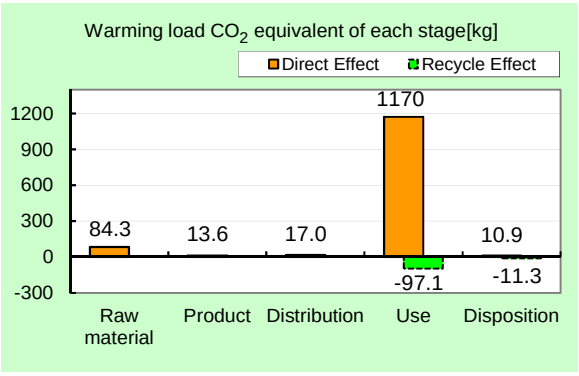
1.Printing Process : Electrophotography (EP)
2.Color : Monochrome
3.Print Speed : 42 prints/minute ($8^1/_2$ x 11)
4.Maximum Paper Size : $8^1/_2$ x 14
5.Functions included in LCA : Automatic Duplexing Unit

Use stage conditions:
Period of use : 5 years, Amount of use : 1,036,800 pages
※ The warming load of the use stage does not include environmental impact originated from printing paper, as specified in the PCR.

Environment Contact:
RICOH Company, Ltd.
Corporate Communication Center
email : envinfo@ricoh.co.jp

Consumption and discharge in a life cycle	All the stage sum totals
Global Warming (CO_2 equivalent)	1300kg 1190kg
Acidification (SO_2 equivalent)	2.23kg (2.04kg)
Energy resources (crude oil equivalent)	25.3GJ (22.5GJ)

※Figures in ( ) indicated environmental impact including recycle effect *note3



Notes:

1. Original LCA data is available on PEIDS: Product Environmental Information Declaration Sheet, and Product Data Sheet.
2. Unified rules and requirements for EcoLeaf LCA, for intended product category, are available as a PCR: Product Category Rule. Visit EcoLeaf website under JEMAI homepage at http://www.ecoleaf-jemai.jp/eng/ for details.
3. Recycle Effect illustrates an indirect influence to other products/services.
4. Basic Units used for calculations are based on Japan domestic data at this time, due to a lack of base data to establish localized Basic Unit for overseas locations adequately.
5. This declaration was produced using Product Category Rule intended for a product model sold in the Japanese market and using the qualitative and quantitative data collected in Japan.

[Supplemental environmental information]

・Certified regulations: International Energy Star Program, EU RoHS.
・This product and its main components such as photoreceptor and toner are produced in our factories certified to ISO14001 management system standard.

PCR review was conducted by: PCR Deliberation Committee, January 01, 2008, Name of representative: Youji Uchiyama, University of Tsukuba, Graduate School
Independent verification of the declaration and data, according to ISO14025 ☐internal ■external
Third party verifier * : Kazuo Naito, system certification auditor

Programme operator: Japan Environmental Management Association for Industry, ecoleaf@jemai.or.jp

* In the case of an business entity certified as an Ecoleaf-data-collection system, the names of certification auditors are written.

The EcoLeaf is an environmental labeling program that belongs to the ISO-Type Ⅲ category.

Form 2-B(F-02Bs-02)

Product Environmental Information Data Sheet (PEIDS)

Document control no.	F-02Bs-02
Product vendor	RICOH COMPANY, LTD.
EcoLeaf registration no.	AD-17-E938

Unit Function DB version	v2.1
Characterization Factor DB version	v2.1

PCR name	EP and IJ printer		Product type	SP 4510DN TE【 Part # 407924 】			
PCR code	AD-04	Product weight (kg)	15.7	Package (kg)	3.9	Weight total (kg)	19.6

In/Out items \ Life Cycle Stage					Unit	Production		Distribution	Use	Disposition	Recycle Effect
						Raw material	Product				
Energy Consumption					MJ	1.60E+03	2.52E+02	2.30E+02	2.32E+04	1.27E+01	-2.81E+03
					Mcal	3.82E+02	6.02E+01	5.50E+01	5.55E+03	3.03E+00	-6.71E+02
Inventory anaiyses	Impact by Resource Consumption	Exhaustible resources	Energy resources	Coal	kg	1.04E+01	1.56E+00	5.38E-04	8.09E+01	7.42E-02	-1.11E+01
				Crude oil (for fuel)	kg	1.54E+01	1.80E+00	5.03E+00	2.13E+02	1.40E-01	-1.71E+01
				LNG	kg	2.86E+00	1.15E+00	7.76E-02	6.13E+01	3.83E-02	-1.54E+00
				Uranium content of an ore	kg	2.57E-04	1.06E-04	3.64E-08	3.82E-03	5.01E-06	8.95E-06
			Mineral resources	Crude oil (for material)	kg	7.20E+00	0	0	1.07E+02	0	-3.57E+01
				Iron content of an ore	kg	6.27E+00	0	0	2.06E+01	0	-1.05E+01
				Cu content of an ore	kg	3.39E-01	0	0	8.66E-02	0	-2.42E-01
				Al content of an ore	kg	9.71E-02	0	0	2.93E+00	0	-1.16E+00
				Ni content of an ore	kg	7.85E-02	0	0	1.17E-01	0	-2.14E-04
				Cr content of an ore	kg	1.08E-01	0	0	1.66E-01	0	-3.91E-03
				Mn content of an ore	kg	4.59E-02	0	0	1.28E-01	0	-9.14E-03
				Pb content of an ore	kg	2.87E-02	0	0	7.49E-03	0	-1.97E-02
				Sn content of an ore	kg	5.52E-05	0	0	5.18E-04	0	0
				Zn content of an ore	kg	2.91E-01	0	0	7.65E-02	0	-1.93E-01
				Au content of an ore	kg	5.36E-07	0	0	1.80E-05	0	0
				Ag content of an ore	kg	1.99E-06	0	0	1.24E-04	0	0
				Silica Sand	kg	1.14E+00	0	0	3.87E-01	0	-1.90E-01
				Halite	kg	3.04E+00	2.70E-04	0	2.29E+01	5.01E-03	-1.31E-01
				Limestone	kg	1.68E+00	0	0	8.55E+00	1.03E-01	-1.80E+00
				Natural soda ash	kg	2.78E-02	0	0	1.39E-02	0	-6.14E-03
		Renewable resources		Wood	kg	6.79E+00	0	0	5.20E+01	0	0
				Water	kg	6.23E+03	1.21E+03	4.05E-01	6.56E+04	6.26E+01	-2.31E+03
	Impact by Emission/Discharge to the environment	to Atmosphere		CO_2	kg	8.22E+01	1.32E+01	1.63E+01	1.13E+03	1.09E+01	-1.04E+02
				SO_x	kg	5.84E-02	9.27E-03	1.10E-02	7.17E-01	5.72E-03	-7.94E-02
				NO_x	kg	1.08E-01	8.92E-03	9.51E-02	1.82E+00	1.26E-02	-1.55E-01
				N_2O	kg	7.71E-03	1.39E-03	2.49E-03	1.64E-01	1.73E-05	-1.82E-02
				CH_4	kg	6.84E-04	2.83E-04	9.74E-08	1.02E-02	1.34E-05	4.57E-05
				CO	kg	1.24E-02	1.97E-03	2.84E-02	2.88E-01	2.38E-03	4.63E-03
				NMVOC	kg	1.34E-03	5.53E-04	1.91E-07	1.99E-02	2.63E-05	8.89E-05
				C_xH_y	kg	3.63E-03	2.30E-04	2.61E-03	6.01E-02	5.04E-05	-7.31E-03
				Dust	kg	1.22E-02	4.01E-04	8.71E-03	1.60E-01	7.18E-04	-2.35E-02
		to Water system	to Water domain	BOD	kg	-	-	-	-	-	-
				COD	kg	-	-	-	-	-	-
				N total	kg	-	-	-	-	-	-
				P total	kg	-	-	-	-	-	-
				SS	kg	-	-	-	-	-	-
		to Soil system		Unspecified Solid Waste	kg	7.08E-01	6.72E-04	0	4.51E+01	6.69E+00	-3.19E-01
				Slag	kg	3.33E+00	0	0	6.53E+00	0	-3.40E+00
				Sludge	kg	2.08E-01	0	0	6.28E+00	0	-2.49E+00
				Low level radio-active waste	kg	1.81E-04	7.38E-05	2.55E-08	2.67E-03	3.50E-06	6.30E-06
Impact assessment	by Resource Consumption	Exhaustible resources		Energy resources (crude oil equivalent)	kg	2.77E+01	5.05E+00	5.12E+00	3.70E+02	2.74E-01	-2.60E+01
				Mineral resources (Iron ore equivalent)	kg	1.80E+02	0	0	2.53E+02	0	-1.06E+02
	by Emission/ Discharge to environment	to Atmosphere		Global Warming (CO_2 equivalent)	kg	8.43E+01	1.36E+01	1.70E+01	1.17E+03	1.09E+01	-1.08E+02
				Acidification (SO_2 equivalent)	kg	1.34E-01	1.55E-02	7.75E-02	1.99E+00	1.45E-02	-1.88E-01

[Notes for readers: EcoLeaf common rules]

I. Stage related

A. "Production" stage is intended for two sub-stages listed below.

(1) "Raw material" production: consists of mining, transportation and raw material production.

(2) "Product" production: consists of the parts processing, assembly and installation.

B. "Distribution" stage is intended for transportation of produced product. Transportation of consumables and maintenance goods (e.g. replacement parts) for use of the product are included into "Use" stage.

C. "Use" stage is intended for use of the product (active mode, standby mode, etc.) and production, transportation to disposal/recycle of consumables/maintenance goods (e.g. replacement parts).

D. "Disposition/Recycle" stage is intended for environmental impacts by product disposition/recycle, and deduction by recycling (e.g. impact reduction of raw material production).

E. "Recycle Effect" illustrates an indirect environmental influences to other products/services by use of reclaimed materials/parts, and/or by supply of used products to other businesses for material reclaim/parts reuse.

Case 1: Use of reclaimed materials/parts: Sum of increase of environmental impact by collection activities of used materials/parts, and decrease by volume reduction of used materials/parts.
Case 2: Supply of used products to other businesses for material reclaim/parts reuse: Sum of increase of environmental impact by materials/parts reclaiming process, and decrease by volume reduction of new materials/parts production.

II. Inventory analyses

A. Data of mineral ore on "Exhaustible resources" are presented in weight of pure ingredients (e.g. iron, aluminum) in the ore.

B. Data on energy resources are presented based on origin in calorific value. e.g. Data on uranium ore presents weight of uranium concentrate, which is available for use as an atomic fuel.

C. Data of discharge to water system are in actual figure (not calculated using unit function in inventory analyses).

III Impact analyses

Result of the "Impact analyses" is found in converting results of inventory analyses into total amount of a reference material (e.g. CO_2 in case of "Global Warming").

A. Impact "by resource consumption" represents magnitude of impacts to resource depletion.

B. Impact "by emission/discharge to environment" represents magnitude of impacts to Atmosphere, Water and Soil system.

IV Data entry format

A. Exponential notation, after the decimal point to two, should be used.

B. Indicate "0" instead exponential notation, if the result of calculation or estimation is considered as "zero" or negligible in comparison to related results.

C. Indicate " — " if calculation nor estimation can not be done, in order to differentiate to indicate "zero".

(BGD for material production are for production from mineral ore. Those data do not include reclaiming processes like recovery from scrap.)

[Notes for readers: Target product specific]

This declaration was produced using Product Category Rule intended for a product model sold in the Japanese market and using the qualitative and quantitative data collected in Japan.

Form 3(F-03s-02)

Product data sheet

(Input data and parameters for LCA)

Document control no.	F-03s-02
Product vendor	RICOH COMPANY, LTD.
EcoLEaf registration no.	AD-17-E938

PCR name	EP and IJ printer (PCR-ID : AD-04)	Product type	SP 4510DN TE 【 Part # 407924 】					
LCA/LCIA in units of:	1 product	Product weight (kg)	15.7	Package (kg)	3.9	Weight total (kg)	19.6	

1. Product information (per unit): parts etc. by material and by process/assembly method

Product	Breakdown of primary materials				Math breakdown of parts, which need to apply Processing / Assembly Base Units (Parts B, C)			
	Material name	Weight (kg)	Material name	Weight (kg)	Process name	Weight (kg)	Process name	Weight (kg)
	Stainless steel	4.96E-01	Lubricant	1.79E-03	Press molding: Iron (kg)	6.39E+00	Parts assembly (kg)	1.62E+01
	Thermoplastic resin	7.56E+00	Electronic circuit board	1.17E+00	Press molding: Nonferrous metal (kg)	7.73E-01		
	Aluminum	9.18E-02	Ordinary steel	5.78E+00	Injection molding (kg)	7.45E+00		
	Glass	2.07E-02			Glass molding (kg)	5.36E-01		
	Rubber	5.16E-01						
	Other metals	6.81E-01						
	Thermosetting resin	1.48E-01						
	Paper	3.15E+00						
	Subtotal	1.27E+01	Subtotal	6.95E+00				
	Total			1.96E+01	Subtotal	1.51E+01	Subtotal	1.62E+01

Note

2. Production site information (per unit): Consumption and discharge/emission for production/processing/assembly within the site.

SOx and NOx should be indicated in SO_2, NO_2 equivalent.

Consumption	Classification	Energy	Material	Energy	Material	Energy			
	Distribution	Electricity (kWh)	Clean water (kg)	Furnace LNG (kg)	Industrial water (kg)	Furnace urban gas (13A) (m^3)			
	Quantity	8.24E+00	1.55E+01	5.37E-02	1.11E+01	3.98E-01			
	Note								
Emission / Discharge	Classification	Water system							
	Distribution	Sewage processing (kg)							
	Quantity	4.66E+01							
	Note								

Note

3. Distribution stage information (per unit): means, distance, loading ratio, consumptions and emissions/discharges.

Distribution	Means of transportation	Diesel truck: 20 ton (kg･km)	Diesel truck: 20 ton (kg･km)	Diesel truck: 20 ton (kg･km)	Diesel truck: 20 ton (kg･km)	Freight by ship (kg･km)	Freight by ship (kg･km)	Freight by ship (kg･km)	Freight by ship (kg･km)
	Conditions	Mass(kg)	Distance （km）	Loading Ratio(%w)	Load(kg･km)	Mass(kg)	Distance （km）	Loading Ratio(%w)	Load(kg･km)
	Quantity	1.96E+01	1.28E+03	3.44E+01	7.29E+04	1.96E+01	1.16E+04	1.00E+02	2.27E+05
	Note								

Note

4. Use stage (per unit): use condition (mode, term) including active mode, standby mode and maintenance.

4.1 Product and accessories subject to this analysis

Product	Classification	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption
	Distribution	Stainless steel plate (kg)	Aluminum plate (kg)	Glass (kg)	Styrene-butadiene rubber (SBR) (kg)	Copper plate (kg)	Zinc (kg)	Gold (kg)	Silver (kg)
	Quantity	7.40E-01	2.77E+00	1.66E-01	9.37E+00	2.87E-01	6.10E-03	1.80E-05	1.24E-04
	Note								
	Classification	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Condition	Consumption
	Distribution	Tin (kg)	Corrugated cardboard (kg)	Lubricant (kg)	ABS (kg)	PA66 (Polyamide 66) (kg)	Polycarbonate (kg)	Diesel truck: 20 ton (kg･km)	Polycarbonate-ABS (70/30) (kg)
	Quantity	3.41E-04	2.44E+01	1.44E-02	2.96E+01	1.90E-02	5.00E-01	9.75E+04	1.23E+01
	Note								
	Classification	Consumption	Consumption	Consumption	Consumption	Condition	Consumption	Consumption	Consumption
	Distribution	High density polyethylene (kg)	Low density polyethylene (kg)	PET (kg)	POM (polyacetal) (kg)	Freight by ship (kg･km)	Polypropylene (kg)	Polystyrene (kg)	Epoxy resin (EP) (kg)
	Quantity	3.15E+00	8.25E-02	2.68E+01	2.92E+00	5.49E+05	1.09E-02	3.34E+01	7.23E-02
	Note								
	Classification	Consumption	Consumption	Consumption	Condition	Consumption	Consumption	Consumption	Consumption
	Distribution	Expandable hard polyurethane (Hard) (kg)	Expandable soft polyurethane (for automobile) (kg)	Assembled circuit board (kg)	Diesel truck: 20 ton (kg･km)	Electroplated steel Plate (kg)	Cold-Rolled steel plate (kg)	Press molding: Iron (kg)	Press molding: Nonferrous metal (kg)
	Quantity	1.79E-02	4.79E+00	5.32E-04	2.55E+05	7.95E+00	1.16E+01	2.03E+01	3.06E+00
	Note								

Product	Classification	Condition	Consumption	Consumption	Consumption	Energy	Energy	Material	Energy
	Distribution	Freight by ship (kg･km)	Injection molding (kg)	Glass molding (kg)	Parts assembly (kg)	Electricity (kWh)	Furnace LNG (kg)	Clean water (kg)	Furnace urban gas (13A) (m^3)
	Quantity	1.43E+06	9.08E+01	9.54E+00	1.24E+02	2.65E+02	4.62E+00	6.36E+02	2.21E+01
	Note								
	Classification	Water system	Consumption	Consumption					
	Distribution	Sewage processing (kg)	Electricity (kWh)	Gasoline as fuel (kg)					
	Quantity	1.66E+03	4.20E+02	5.86E+00					
	Note								

Note

4.2 Disposition/Recycle information on consumables and replacement parts

Consumables	Classification	Process	Process	Process	Process	Process	Process	Process	Process
	Distribution	Landfill: Industrial waste (kg)	Landfill: General waste (kg)	Incineration to landfill (as ash) (kg)	Diesel truck: 4 ton (kg･km)	Shredding (kg)	Sorting: Iron (by magnetic force) (kg)	Sorting: Nonferrous metal (by eddy current with wind force) (kg)	Sorting: Plastics (by relative density difference in water) (kg)
	Quantity	8.38E+00	1.55E+01	8.45E+01	9.68E+03	1.26E+02	5.03E+01	4.25E+01	4.14E+01
	Note								
	Classification	Process	Process	Process	Process	Process	Deduction	Deduction	Deduction
	Distribution	Recycle: to Glass (kg)	Recycle: to cold-rolled steel (kg)	Recycle: to Aluminum plate (kg)	Recycle: to copper plate (kg)	Recycle: to Thermoplastic pellet (kg)	Glass (kg)	Cold-Rolled steel plate (kg)	Aluminum plate (kg)
	Quantity	6.64E-02	7.81E+00	1.06E+00	1.13E-01	3.30E+01	6.51E-02	7.81E+00	1.06E+00
	Note								
	Classification	Deduction	Deduction	Process					
	Distribution	Copper plate (kg)	Polystyrene (kg)	Diesel truck: 10 ton (kg･km)					
	Quantity	1.13E-01	3.30E+01	4.03E+04					
	Note								

Note

5. Disposition/Recycle stage information (per product): process method and scenarios

Scenario	Classification	Process	Process	Process	Process	Process	Process	Process	Deduction
	Distribution	Landfill: Industrial waste (kg)	Shredding (kg)	Landfill: General waste (kg)	Incineration: Industrial waste (kg)	Incineration to landfill (as ash) (kg)	Diesel truck: 10 ton (kg･km)	Diesel truck: 4 ton (kg･km)	High density polyethylene (kg)
	Quantity	5.08E-01	1.64E+01	4.96E+00	5.90E-02	7.84E+00	5.26E+03	1.24E+03	1.38E-01
	Note								
	Classification	Process	Process	Process	Process	Process	Process	Process	Process
	Distribution	Sorting: Iron (by magnetic force) (kg)	Sorting: Nonferrous metal (by eddy current with wind force) (kg)	Sorting: Plastics (by relative density difference in water) (kg)	Recycle: to Glass (kg)	Recycle: to cold-rolled steel (kg)	Recycle: to Aluminum plate (kg)	Recycle: to copper plate (kg)	Recycle: to Thermoplastic pellet (kg)
	Quantity	6.37E+00	4.02E+00	3.73E+00	8.29E-03	2.34E+00	3.43E-02	6.90E-01	2.93E+00
	Note								
	Classification	Deduction	Deduction	Deduction	Deduction	Deduction			
	Distribution	Glass (kg)	Cold-Rolled steel plate (kg)	Aluminum plate (kg)	Copper plate (kg)	Polystyrene (kg)			
	Quantity	8.12E-03	2.34E+00	3.43E-02	6.90E-01	2.79E+00			
	Note								

Note

6. Others

This declaration was produced using Product Category Rule intended for a product model sold in the Japanese market and using the qualitative and quantitative data collected in Japan.