Product Environmental Aspects Declaration

No. AD-12-E213
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EP and IJ printer (PCR-ID:AD-04)

RICOH
imagine. change.

Aficio MP 4002

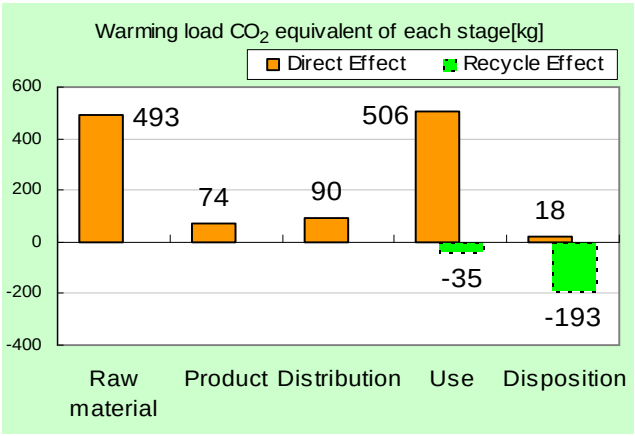
Printing process : Twin Laser Beam Scanning & Electrophotographic Printing
Toner : Dry, Dual Component
Multi-Copy Speed : 40 copies/minute (Letter LEF)
Copy/Print size : 5.5" x 8.5" to 11" x 17"

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

The warming load of the Use stage is based on the supposition that the product prints 960,000 images for five years.

Consumption and discharge in a life cycle	All the stage sum totals
Global Warming (CO_2 equivalent) / t	1.18 (0.95)
Acidification (SO_2 equivalent) / kg	1.79 (1.50)
Energy resources (crude oil equivalent) / GJ	22.9 (18.6)

※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: Energy Star Version 1.1
・This product and its main components such as photoreceptor, toner, carrier are produced in our factories certified to ISO14001 management system standard.

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

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（F-02B-03）

Product Environmental Information Data Sheet（PEIDS）

Document control no.	**F-02B-03**
Product vendor	RICOH COMPANY, LTD.
EcoLeaf registration no.	AD-12-E213

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

PCR name	**EP and IJ printer**		Product type	**Aficio MP 4002**			
PCR ID	**AD-04**	Product weight (kg)	**97**	Package (kg)	**16**	Weight total (kg)	**113**

In/Out items \ Life Cycle Stage					Unit	Production		Distribution	Use	Disposition	Recycle effect
						Raw material	Product				
Energy Consumption					MJ	8.63E+03	1.38E+03	1.23E+03	1.17E+04	2.72E+01	-4.27E+03
					Mcal	2.06E+03	3.29E+02	2.94E+02	2.78E+03	6.49E+00	-1.02E+03
Inventory analyses	Resource Consumption from the environment	Exhaustible resources	Energy	Coal	kg	7.57E+01	9.37E+00	8.47E-01	5.95E+01	1.04E-01	-5.62E+01
				Crude oil (for fuel)	kg	7.87E+01	1.06E+01	2.53E+01	9.28E+01	4.02E-01	-1.78E+01
				LNG	kg	1.46E+01	4.86E+00	7.87E-01	2.93E+01	5.69E-02	-2.21E+00
				Uranium content of an ore	kg	1.48E-03	6.34E-04	5.55E-05	3.41E-03	7.03E-06	4.84E-05
			Material	Crude oil (for material)	kg	2.99E+01	0	0	1.81E+01	0	-3.58E+01
				Iron content of an ore	kg	6.01E+01	0	0	7.15E+00	0	-6.29E+01
				Cu content of an ore	kg	8.01E-01	0	0	3.47E-03	0	-1.45E+00
				Al content of an ore	kg	1.34E+00	0	0	1.32E+00	0	-2.52E+00
				Ni content of an ore	kg	2.10E-01	0	0	1.46E-04	0	-1.28E-03
				C content of an ore	kg	3.06E-01	0	0	2.66E-03	0	-2.34E-02
				Mn content of an ore	kg	3.53E-01	0	0	3.80E-02	0	-5.46E-02
				Pb content of an ore	kg	1.24E-01	0	0	3.79E-02	0	-1.18E-01
				Sn content of an ore	kg	0	0	0	0	0	0
				Zn content of an ore	kg	7.72E-01	0	0	6.19E-01	0	-1.16E+00
				Au content of an ore	kg	0	0	0	0	0	0
				Ag content of an ore	kg	0	0	0	0	0	0
				Silica Sand	kg	2.36E+00	0	0	8.84E-02	0	-1.47E+00
				Halite	kg	2.01E+01	0	0	1.81E+00	1.76E-03	-4.43E-01
				Limestone	kg	1.34E+01	0	0	1.45E+00	1.67E-01	-1.09E+01
				Natural soda ash	kg	1.62E-01	0	0	1.45E-07	0	-7.52E-02
					kg						
		Renewable resources		Wood	kg	2.81E+01	0	0	4.34E+00	0	0.00E+00
				Water	kg	3.57E+04	7.23E+03	6.21E+02	5.03E+04	8.95E+01	-4.79E+03
	Emission/Discharge to the environment	to Atmosphere		CO_2	kg	4.82E+02	7.33E+01	8.59E+01	5.00E+02	1.85E+01	-2.22E+02
				SO_x	kg	3.03E-01	5.55E-02	4.86E-02	3.91E-01	1.01E-02	-1.58E-01
				NO_x	kg	5.53E-01	4.48E-02	3.01E-01	4.74E-01	3.07E-02	-1.85E-01
				N_2O	kg	3.81E-02	1.40E-03	1.45E-02	2.28E-02	3.26E-05	-2.27E-02
				CH_4	kg	3.93E-03	1.69E-03	1.49E-04	9.08E-03	1.88E-05	1.77E-04
				CO	kg	7.06E-02	1.08E-02	6.29E-02	9.18E-02	7.86E-03	-1.14E-03
				NMVOC	kg	7.67E-03	3.32E-03	2.91E-04	1.78E-02	3.69E-05	3.47E-04
				C_xH_y	kg	1.90E-02	2.70E-04	1.01E-02	9.86E-03	2.79E-04	-9.49E-03
				Dust	kg	6.50E-02	2.38E-03	3.05E-02	3.93E-02	1.98E-03	-3.76E-02
		to Water system		BOD	kg	-	-	-	-	-	-
				COD	kg	-	-	-	-	-	-
				N total	kg	-	-	-	-	-	-
				P total	kg	-	-	-	-	-	-
				SS	kg	-	-	-	-	-	-
		to Soil system		Unspecified Solid Waste	kg	3.79E+00	0	0	5.77E+00	7.66E+00	-7.28E-01
				Slag	kg	2.06E+01	0	0	2.90E+00	0	-2.03E+01
				Sludge	kg	2.88E+00	0	0	2.83E+00	0	-5.40E+00
				Low level radio-active waste	kg	1.03E-03	4.43E-04	3.88E-05	2.37E-03	4.91E-06	3.39E-05
Impact assessment	by Resource Consumption	Exhaustible resources		Energy resources (crude oil equivalent)	kg	1.57E+02	2.76E+01	2.73E+01	1.94E+02	5.94E-01	-5.61E+01
				Mineral resources (Iron ore equivalent)	kg	5.47E+02	0	0	1.49E+02	0	-5.26E+02
	by Emission/ Discharge to the environment	to Atmosphere		Global Warming (CO_2 equivalent)	kg	4.93E+02	7.37E+01	8.98E+01	5.06E+02	1.85E+01	-2.28E+02
				Acidification (SO_2 equivalent)	kg	6.90E-01	8.69E-02	2.59E-01	7.23E-01	3.16E-02	-2.88E-01
				Ozone Depletion (CFC-11 equivalent)	kg	0	0	0	0	0	0
				Photochemical Oxidant	kg	3.74E-02	2.49E-03	1.66E-02	2.75E-02	9.46E-04	-1.91E-02
		to Water system		Eutrophication (Phosphate equivalent)	kg	0	0	0	0	0	0

[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-03-03)

Product data sheet

(Input data and parameters for LCA)

Document control no.	F-03-03
Product vendor	RICOH COMPANY, LTD.
EcoLEaf registration no.	AD-12-E213

PCR name	EP and IJ printer (PCR-ID : AD-04)	Product type	Aficio MP 4002					
LCA/LCIA in units of:	1 product	Product weight (kg)	97	Package (kg)	16	Weight total (kg)	113	

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

	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)
Product	SUS	1.32E+00	PCB	3.42E+00	Press molding: Iron (kg)	5.84E+01	Parts assembly (kg)	9.51E+01
	Alminum	1.27E+00	Steel	5.76E+01	Press molding: Nonferrous metal (kg)	2.51E+00		
	Glass	9.15E-01	Wood	1.23E-01	Injection molding (kg)	3.28E+01		
	Rubber	4.95E-01			Glass molding (kg)	1.41E+00		
	Other metals	1.24E+00						
	Paper	1.32E+01						
	Thermoplastic	3.27E+01						
	Thermosetting	6.86E-01						
	Subtotal	5.18E+01	Subtotal	6.11E+01				
	Total			1.13E+02	Subtotal	9.51E+01	Subtotal	9.51E+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				
	Distribution	Electricity (kWh)	Clean water (kg)	Furnace urban gas (13A) (m^3)	Industrial water (kg)				
	Quantity	4.24E+01	8.43E+01	2.23E-01	4.98E+01				
	Note								
Emission / Discharge	Classification	Water system							
	Distribution	Sewage processing (kg)							
	Quantity	1.34E+02							
	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	1.13E+02	2.53E+01	4.72E+01	6.05E+03	1.13E+02	1.20E+04	1.00E+02	1.35E+06
	Note								
	Means of transportation	Freight by rail (kg･km)	Freight by rail (kg･km)	Freight by rail (kg･km)	Freight by rail (kg･km)	Diesel truck: 20 ton (kg･km)	Diesel truck: 20 ton (kg･km)	Diesel truck: 20 ton (kg･km)	Diesel truck: 20 ton (kg･km)
	Conditions	Mass(kg)	Distance （km）	Loading Ratio(%w)	Load(kg･km)	Mass(kg)	Distance （km）	Loading Ratio(%w)	Load(kg･km)
	Quantity	1.13E+02	4.99E+03	1.00E+02	5.63E+05	1.13E+02	6.00E+02	4.72E+01	1.44E+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	Aluminum plate (kg)	Glass (kg)	Styrene-butadiene rubber (SBR) (kg)	Copper plate (kg)	Zinc (kg)	PA66 (Polyamide 66) (kg)	Polycarbonate (kg)	Polycarbonate-ABS (70/30) (kg)
	Quantity	1.25E+00	1.72E-06	9.55E-01	1.15E-02	5.13E-01	2.64E-03	8.96E-02	9.64E-01
	Note								
	Classification	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption
	Distribution	Low density polyethylene (kg)	PET (kg)	POM (polyacetal) (kg)	Polypropylene (kg)	Epoxy resin (EP) (kg)	Expandable hard polyurethane (Hard) (kg)	Cold-Rolled steel plate (kg)	Press molding: Iron (kg)
	Quantity	2.90E+00	1.95E+01	5.37E-03	5.58E-05	5.43E-01	4.03E-03	6.90E+00	5.90E+00
	Note								
	Classification	Consumption	Consumption	Consumption	Consumption	Energy	Energy	Material	Water system
	Distribution	Press molding: Nonferrous metal (kg)	Injection molding (kg)	Glass molding (kg)	Parts assembly (kg)	Electricity (kWh)	Furnace urban gas (13A) (m^3)	Industrial water (kg)	Sewage processing (kg)
	Quantity	1.77E+00	4.50E+00	9.55E-01	1.31E+01	1.77E+02	4.46E-01	3.68E+01	3.68E+01
	Note								

	Classification	Consumption	Condition	Consumption	Consumption	Condition	Condition	Condition	Condition
	Distribution	Electricity (kWh)	Diesel truck: 10 ton (kg･km)	Gasoline (kg)	Corrugated cardboard (kg)	Freight by ship (kg･km)	Freight by rail (kg･km)	Diesel truck: 20 ton (kg･km)	Diesel truck: 10 ton (kg･km)
	Quantity	6.94E+02	4.07E+03	4.40E+00	2.04E+00	1.94E+05	1.08E+05	2.09E+04	1.89E+02
	Note								
	Classification	Condition	Condition	Condition	Condition	Condition	Condition	Condition	
	Distribution	Freight by ship (kg･km)	Freight by rail (kg･km)	Diesel truck: 20 ton (kg･km)	Diesel truck: 20 ton (kg･km)	Freight by ship (kg･km)	Freight by rail (kg･km)	Diesel truck: 20 ton (kg･km)	
	Quantity	9.02E+03	4.99E+03	9.68E+02	5.36E+02	1.57E+05	6.55E+04	1.27E+04	
	Note								

Note

4.2 Disposition/Recycle information on consumables and replacement parts

Consumables	Classification	Process	Process	Process	Process	Process	Process	Process	Process
	Distribution	Diesel truck: 4 ton (kg･km)	Landfill: Industrial waste (kg)	Incineration to landfill (as ash) (kg)	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)	Recycle: to Glass (kg)
	Quantity	1.97E+02	4.92E+00	2.04E+00	1.61E+01	1.61E+01	1.04E+01	8.72E+00	1.72E-06
	Note								
	Classification	Process	Process	Process	Process	Deduction	Deduction	Deduction	Deduction
	Distribution	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)	Copper plate (kg)
	Quantity	5.66E+00	1.20E+00	5.04E-01	3.80E+00	1.55E-06	5.66E+00	1.20E+00	5.04E-01
	Note								
	Classification	Deduction	Process						
	Distribution	Polystyrene (kg)	Diesel truck: 10 ton (kg･km)						
	Quantity	3.80E+00	1.29E+04						
	Note								

Note

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

Scenario	Classification	Process	Process	Process	Process	Process	Deduction	Process	Process
	Distribution	Landfill: Industrial waste (kg)	Shredding (kg)	Incineration: Industrial waste (kg)	Incineration to landfill (as ash) (kg)	Diesel truck: 10 ton (kg･km)	High density polyethylene (kg)	Sorting: Iron (by magnetic force) (kg)	Sorting: Nonferrous metal (by eddy current with wind force) (kg)
	Quantity	5.64E+00	9.92E+01	1.49E-02	1.31E+01	8.98E+04	1.10E+00	9.72E+01	4.21E+01
	Note								
	Classification	Process	Process	Process	Process	Process	Process	Deduction	Deduction
	Distribution	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)	Glass (kg)	Cold-Rolled steel plate (kg)
	Quantity	3.98E+01	9.15E-01	5.50E+01	1.19E+00	4.30E+00	3.21E+01	8.97E-01	5.50E+01
	Note								
	Classification	Deduction	Deduction	Deduction					
	Distribution	Aluminum plate (kg)	Polystyrene (kg)	Copper plate (kg)					
	Quantity	1.19E+00	3.10E+01	4.30E+00					
	Note								

Note

6. Others

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