

Product Environmental Aspects Declaration



Digital Printer-Duplicator (PCR-ID:AF-04)

No. AF-15-E014
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<http://www.riso.co.jp/>
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- Print Speed : 60~130ppm
 - Maximum Paper Size : 12 3/16" × 17" (Legal)
 - Resolution :
 - Scanning 300dpi x 600dpi
 - Print image 300dpi x 300dpi
- The amount of Global Warming (CO₂ equivalent) per paper is 0.302g.

Life Cycle Impact

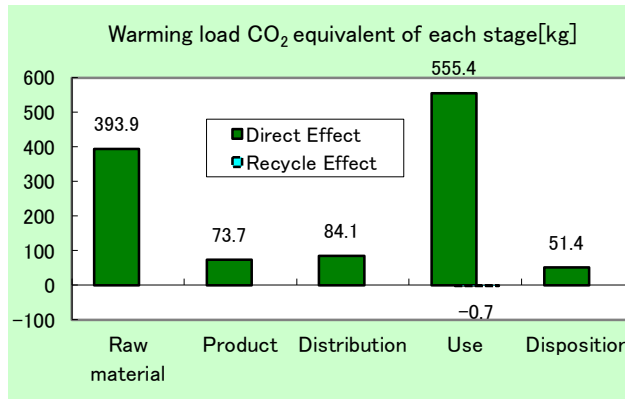


Consumption and discharge in a life cycle	All the stage sum totals	Per Paper
Global Warming (CO ₂ equivalent)	1158.49kg (1157.81kg)	0.302g (0.302g)
Acidification (SO ₂ equivalent)	1.768kg (1.767kg)	0.460mg (0.460mg)
Energy resources (crude oil equivalent)	20,140MJ (20,139MJ)	5.24KJ (5.24KJ)

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

※The environmental load per paper is calculated, based on 3.84million prints for 5 years.

※The above data does not include the environmental impact of the stand shown above and paper.



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 PSC: Product Specification Criteria. Visit EcoLeaf website under JEMAI homepage at http://www.jemai.or.jp/ecoleaf_e/ 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]

- The product and its consumables such as tonners and masters are designed, developed and manufactured under the environmental management system satandard certified to ISO14001.
- The product complies with International Energy Star Program and EU RoHS.

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 ISO14025:2006 <input type="checkbox"/> internal <input checked="" type="checkbox"/> external Third party verifier: The third party verifier * Keiichi Aramaki Programme operator: Japan Environmental Management Association for Industry, ecoleaf@jemai.or.jp
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* 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.

Product Environmental Information Data Sheet (PEIDS)



Document control no.	F-02Bs-02
Product vendor	RISO KAGAKU CORPORATION
EcoLeaf registration no.	AF-15-E014

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

PCR name	Digital Duplicators		Product type	RISO E Z 221 U			
PCR code	AF-04	Product weight (kg)	104	Package (kg)	18	Weight total (kg)	122

In/Out items	Life Cycle Stage	Unit	Production		Distribution	Use	Disposition	Recycle Effect			
			Raw material	Product							
Energy Consumption			MJ	6.20E+03	1.32E+03	1.13E+03	1.14E+04	9.65E+01	-8.54E-01		
			Mcal	1.48E+03	3.16E+02	2.70E+02	2.72E+03	2.30E+01	-2.04E-01		
Inventory analyses	Impact by Resource Consumption	Energy resources	Coal	kg	8.31E+01	9.46E+00	2.85E-01	2.71E+01	5.46E-01	-4.84E-03	
			Crude oil (for fuel)	kg	4.63E+01	1.07E+01	2.42E+01	1.13E+02	1.09E+00	-9.67E-03	
			LNG	kg	9.95E+00	4.75E+00	5.06E-01	1.65E+01	2.81E-01	-2.51E-03	
		Exhaustible resources	Mineral resources	Uranium content of an ore	kg	8.26E-04	6.40E-04	1.87E-05	1.79E-03	3.69E-05	-3.28E-07
				Crude oil (for material)	kg	1.64E+01	0	0	7.67E+01	0	0
				Iron content of an ore	kg	7.95E+01	0	0	7.38E-01	0	0
				Cu content of an ore	kg	1.87E+00	0	0	1.10E-01	0	0
				Al content of an ore	kg	2.31E+00	0	0	4.39E-02	0	0
				Ni content of an ore	kg	5.51E-01	0	0	4.11E-02	0	0
				C content of an ore	kg	7.72E-01	0	0	5.57E-02	0	0
				Mn content of an ore	kg	4.84E-01	0	0	7.66E-03	0	0
				Pb content of an ore	kg	7.44E-02	0	0	9.07E-04	0	0
				Sn content of an ore	kg	4.56E-03	0	0	0	0	0
	Zn content of an ore			kg	7.32E-01	0	0	8.91E-03	0	0	
	Au content of an ore			kg	0	0	0	0	0	0	
	Ag content of an ore			kg	0	0	0	0	0	0	
	Renewable resources	Silica Sand	kg	2.86E+00	0	0	5.00E-03	0	0		
		Halite	kg	8.22E+00	0	0	6.17E-02	7.34E-02	-4.32E-04		
		Limestone	kg	1.60E+01	0	0	9.07E-01	4.52E-01	-2.80E-02		
		Natural soda ash	kg	1.94E-01	0	0	0	0	0		
		Wood	kg	2.47E+01	0	0	7.39E+01	0	0		
		Water	kg	2.18E+04	7.16E+03	2.09E+02	3.34E+04	4.42E+02	-4.10E+00		
		Groundwater	kg	-	-	-	7.68E+01	-	-		
	Impact by Emission/Discharge to the environment	to Atmosphere	CO2	kg	3.87E+02	7.35E+01	7.99E+01	5.43E+02	5.13E+01	-6.82E-01	
			Sox	kg	2.75E-01	5.61E-02	3.92E-02	3.00E-01	2.78E-02	-3.57E-04	
			Nox	kg	4.02E-01	4.45E-02	2.03E-01	8.12E-01	6.67E-02	-8.64E-04	
N2O			kg	2.64E-02	8.11E-04	1.54E-02	4.46E-02	1.40E-04	-1.56E-06		
CH4			kg	2.17E-03	1.71E-03	4.99E-05	4.78E-03	9.87E-05	-8.77E-07		
CO			kg	6.65E-02	1.09E-02	2.03E-02	8.61E-02	1.46E-02	-8.77E-05		
NM VOC			kg	4.24E-03	3.35E-03	9.77E-05	9.37E-03	1.93E-04	-1.72E-06		
CxHy			kg	1.36E-02	1.76E-04	8.50E-03	2.27E-02	4.35E-04	-7.34E-07		
Dust			kg	5.28E-02	2.40E-03	2.33E-02	6.90E-02	4.04E-03	-1.33E-06		
CH4OH			kg	-	3.14E-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	2.90E+00	0	0	1.28E+01	9.19E+01	-1.41E-05
Slag			kg	2.52E+01	0	0	1.16E-01	0	0		
Sludge			kg	4.06E+00	0	0	0	0	0		
Low level radio-active waste			kg	5.78E-04	4.47E-04	1.30E-05	1.25E-03	2.58E-05	-2.29E-07		
Impact assessment	by Resource	Exhaustible resources	Energy resources (crude oil equivalent)	kg	1.18E+02	2.77E+01	2.52E+01	1.65E+02	2.08E+00	-1.85E-02	
			Mineral resources (Iron ore equivalent)	kg	9.51E+02	0	0	9.03E+01	0	0	
	by Emission/Discharge to Atmosphere	Global Warming (CO2 equivalent)	kg	3.94E+02	7.37E+01	8.41E+01	5.55E+02	5.14E+01	-6.82E-01		
		Acidification (SO2 equivalent)	kg	5.57E-01	8.72E-02	1.81E-01	8.68E-01	7.45E-02	-9.62E-04		

[Notes for readers: EcoLeaf common rules]

I. Stage related

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

- "Raw material" production: consists of mining, transportation and raw material production.
- "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. CO₂ 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]

- A. Product weight does not include consumables: inks and masters. Packaging weight includes packaging material and appended goods (e.g., user' s manual, polyethylene bags) .
 - B. Production stage includes the production impact of processing material for parts and assembling the parts as well as the impact of product assembly.
 - C. Distribution stage includes the transport impact based on the distance from overseas factories to major distribution centers in the US.
The total distance of the transportation in the US of 100km is used, based on PCR.
 - 4. Use stage is calculated, based on 3.84 million prints during the use period of 5 years, according to PCR.
Condition: The product is supposed to be used for 20 days a month with 5% paper coverage at the speed of 100 prints per minute on its default. During the 5 years, 19,200 master plates are made.
The impacts of production, distribution and disposal are included for consumable parts and consumables used during the use period of 5 years.
Recycled plastic is used for ink containers.
The transport impact of consumables is included from domestic factories to major distribution centers in the US. The total distance of the transportation in the US of 100km is used.
With no records of consumables recycle, they are assumed to be collected as a general waste and then burned or landfilled.
 - D. With no records of product recycle, disposal stage is calculated, based on the condition that the product is collected as a general waste, crushed and separated as combustible/non-combustible material.
- 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.

Product data sheet

(Input data and parameters for LCA)



Document control no.	F-03s-02
Product vendor	RISO KAGAKU CORPORATION
EcoLeaf registration no.	AF-15-E014

PCR name	Digital Duplicators	Product type	RISO E Z221 U					
LCA/LCIA in units of:	1unit	Product weight (kg)	104	Package (kg)	18	Weight total (kg)	122	

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)
	Normal Steel	7.05E+01	Rubber	6.64E-01	Press molding: Iron	7.40E+01	Parts assembly	5.46E+01
	Stainless Steel	3.48E+00	Paper	6.68E+00	Press molding: Nonferrous metal	2.03E+01		
	Other Metals	2.26E+00	Wood	1.04E+01	Injection molding	1.91E+01		
	Aluminum	1.79E+00	Semiconductor Substrates	1.69E+00	Glass molding	1.81E+00		
	Glass	1.81E+00	Medium-sized motor	4.81E+00				
	Inorganic Calcium hydroxide	5.90E-02	Alkaline-Manganese dry battery	3.10E-03				
	Thermoplastic Resins	1.75E+01	Ink	2.50E-01				
	Thermosetting Resins	1.14E-02	Lubricant	2.61E-02				
	Subtotal	9.75E+01	Subtotal	2.45E+01				
	Total			1.22E+02	Subtotal	1.15E+02	Subtotal	5.46E+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 SO₂, NO₂ equivalent.

Consumption	Classification	Energy	Material						
	Distribution	Electricity (kWh)		Methanol(CH3OH) (kg)					
Quantity		1.46E+01	3.14E-02						
Note									
Emission/Discharge	Classification	Atmosphere							
	Distribution	CH ₃ OH							
Quantity		3.14E-02							
Note									

Note The product is assembled in Thailand.

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 rail (kg·km)	Freight by rail (kg·km)	Freight by rail (kg·km)	Freight by rail (kg·km)
	Conditions	Mass(kg)	Distance (km)	Loading Ratio(%w)	Load(kg·km)	Mass(kg)	Distance (km)	Loading Ratio(%w)	Load(kg·km)
Quantity		1.22E+02	1.26E+02	4.57E+01	3.38E+04	1.22E+02	1.49E+03	1.00E+02	1.81E+05
Note		Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
Distribution	Means of transportation	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)				
Quantity		1.22E+02	1.18E+04	1.00E+02	1.45E+06				
Note		Note 1	Note 1	Note 1	Note 1				
Distribution	Means of transportation	Diesel truck:2 ton (kg·km)	Diesel truck:2 ton (kg·km)	Diesel truck:2 ton (kg·km)	Diesel truck:2 ton (kg·km)	Diesel truck:10 ton (kg·km)	Diesel truck:10 ton (kg·km)	Diesel truck:10 ton (kg·km)	Diesel truck:10 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		1.22E+02	1.53E-01	3.93E+01	4.74E+01	1.22E+02	5.69E+00	3.93E+01	1.76E+03
Note		Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2
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 rail (kg·km)	Freight by rail (kg·km)	Freight by rail (kg·km)	Freight by rail (kg·km)
	Conditions	Mass(kg)	Distance (km)	Loading Ratio(%w)	Load(kg·km)	Mass(kg)	Distance (km)	Loading Ratio(%w)	Load(kg·km)
Quantity		1.22E+02	4.53E+00	4.99E+01	1.11E+03	1.22E+02	5.40E+01	1.00E+02	6.59E+03
Note		Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2
Distribution	Means of transportation	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)				
Quantity		1.22E+02	3.56E+01	1.00E+02	4.34E+03				
Note		Note 2	Note 2	Note 2	Note 2				

Note 1: Distribution stage includes the transport impact based on the distance from overseas factories to major distribution centers in the US.

2: The total distance of the transportation in the US of 100km is used, based on PCR.

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

Classification	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	
Distribution	Normal Steel(kg)	Other Metals (kg)	Thermoplastic Resins (kg)	Thermosetting Resins (kg)	Rubber (kg)	Paper(kg)	Medium-sized motor (kg)	Ink (kg)	
Quantity		3.66E-01	3.70E-02	3.01E+01	3.35E-02	7.08E-01	3.35E+01	4.98E-01	5.12E+01
Note		Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
Classification	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	
Distribution	Groundwater (kg)	Opened Recycling plastic (kg)	Closed recycling plastic(kg)	Press molding: Iron (kg)	Press molding: Nonferrous metal (kg)	Injection molding (kg)	Parts assembly (kg)	Electricity (kWh)	

Product	Quantity	7.68E+01	4.32E-01	2.21E+00	3.66E-01	1.80E+01	3.78E+01	1.58E+01	5.20E+01
	Note	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
	Classification	Energy	Material	Consumption					
	Distribution	Heavy oil as fuel (kg)	Clean water (kg)	Electricity (kWh)					
	Quantity	4.84E-01	5.86E+01	1.29E+02					
	Note	Note 1	Note 1	Note 2					
	Classification	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition
	Distribution	Diesel truck: 20 ton (kg·km)	Freight by rail (kg·km)	Freight by ship (kg·km)	Diesel truck: 2 ton (kg·km)	Diesel truck: 10 ton (kg·km)	Diesel truck: 20 ton (kg·km)	Freight by rail (kg·km)	Freight by ship (kg·km)
	Quantity	5.43E+04	2.91E+05	2.32E+06	7.61E+01	2.83E+03	1.78E+03	1.06E+04	6.97E+03
Note	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	

Note 1: Use stage includes manufacture and transport impacts for inks and masters during the use period of 5 years.
 2: Use stage includes main product's electric consumption during the use period of 5 years.

4.2 Disposition/Recycle information on consumables and replacement parts

Consumables	Classification	Process	Process	Process	Process	Process	Process	Deduction	Process
	Distribution	Shredding (kg)	Sorting:Iron (by magnetic force) (kg)	Sorting: Nonferrous metal (by eddy current with wind force) (kg)	Incineration to landfill (as ash) (kg)	Landfill: General waste (kg)	Diesel truck: 4 ton (kg·km)	Incineration: Industrial waste (kg)	Recycle: to Thermoplastic pellet (kg)
	Quantity	4.15E+00	1.52E+00	6.51E-01	6.70E+01	9.01E-01	6.57E+03	4.32E-01	2.64E+00
	Note	Note 1							

Note 1: This information includes crushing for producing recycled plastic and for separating the disposal.

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

Scenario	Classification	Process	Process	Process	Process	Process	Process		
	Distribution	Shredding (kg)	Sorting:Iron (by magnetic force) (kg)	Nonferrous metal (by eddy current with wind force) (kg)	Incineration to landfill (as ash) (kg)	Landfill: General waste (kg)	Diesel truck: 4 ton (kg·km)		
	Quantity	1.05E+02	1.05E+02	2.57E+01	3.56E+01	8.64E+01	1.18E+04		
	Note	Note 1							

Note 1: The total distance of transportation of 60km, with a 4-ton truck, with 62% loading ratio is used, based on PCR.

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.

The basic units below are used to get a eco-leaf label for this product.

Cold-Rolled steel plate	Electroplated steel Plate	Electromagnetic steel	Stainless steel plate	Copper plate	Aluminum plate
Tin	Glass	Calcium hydroxide	High density	Low density polyethylene	Polypropylene
Polystyrene	PBT	Polycarbonate	Polycarbonate-ABS	POM (polyacetal)	ABS
PA66 (Polyamide 66)	PET	Epoxy resin (EP)	Expandable hard polyurethane (Hard)	Expandable soft polyurethane	Unsaturated polyester (UP)
Nitrile-butadiene rubber (NBR)	Styrene-butadiene rubber (SBR)	Methanol (CH3OH)	Corrugated cardboard	Cardboard	Paper (Western style)
Raw wood (imported)	Assembled circuit board	Medium-sized motor	Alkaline-Manganese dry	Ink	Lubricant
Press molding: Iron	Press molding:	Injection molding	Glass molding	Parts assembly	Diesel truck: 2 ton
Diesel truck: 4 ton	Diesel truck: 10 ton	Diesel truck: 20 ton	Freight by rail	Freight by ship	Electricity
Heavy oil as fuel	Clean water	Shredding	Sorting: Iron (by magnetic force)	Sorting: Nonferrous metal (by eddy current with	Incineration to landfill (as ash)
Incineration: Industrial waste	Landfill: General waste	Landfill: Industrial waste	Recycle: to Thermoplastic pellet		

Note: LCI basic units for Eco-Leaf environment labels are used for LCA calculation. For further details of the units, refer to the website below.

URL: http://www.ecoleaf-jemai.jp/application/data/basicunit_en20150601.pdf