# Product Environmental Aspects Declaration

## EP and IJ printer（PCR-ID:AD-04）

No. AD-12-189
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KONICA MINOLTA

**http://konicaminolta.jp**

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bizhub C454

Marking technologies　Electrophotographic Printer (EP)
Printing speed　45 prints-per-minute(B/W), 45 prints-per-minute(color)
Maximum copy paper　A3
Duplex copying　Non-stack ADU equipped
Document feeding　ADF with Auto-document reversing function equipped

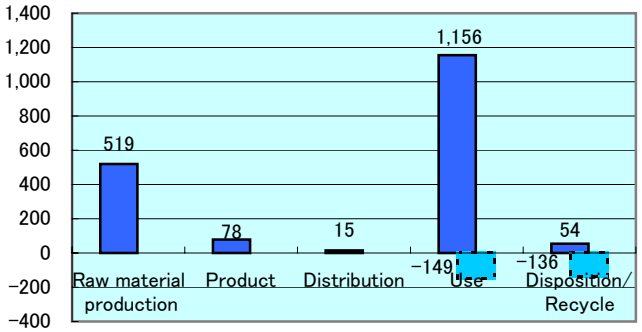
Total of 1,215,000 sheets on the assumption of five years usage.
Environmental impact by copypaper is not included

Life Cycle Impact

| Consumption and discharge in a life cycle | All the stage sum totals |
|---|---|
| Global warming($CO_2$equivalent):kg | 1,823 (1,538) |
| Acidification($SO_2$equivalent):kg | 2.8 (2.4) |
| Energy resources(crude oil equivalent):MJ | 34,970 (28,771) |

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

Warming load $CO_2$ equivalent of each stage（kg）




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.

## 【Supplemental environmental information】

●Certified Environmental Standards
- Japan Eco Mark
- International Energy Star Program

●Conforming to Japanese Law on Promoting Green Purchasing

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: The third party verifier * : Shozo Nakamuta

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.

Form 2（F-02B-03）

# Product Environmental Information Data Sheet（PEIDS）

| | | | |
|---|---|---|---|
| Document control no. | F-02B-03 | Unit Function DB version | 2.1 |
| Product vendor | KONICA MINOLTA, INC. | Characterization Factor DB version | 2.1 |
| EcoLeaf registration no. | AD−12−189 | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| PCR name | EP and IJ printer | Product type | bizhub C454 | | | | |
| PCR−ID | AD−04 | Product weight[kg] | 101.0 | Package[kg] | 24.0 | Weight total[kg] | 125.0 |

| In/Out items \ Life Cycle Stage | | | | | Unit | Production | | Distribution | Use | Disposal | Recycle |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Raw material | Product | | | | |
| Energy Consumption | | | | | MJ | 9.24E+03 | 1.53E+03 | 2.03E+02 | 2.39E+04 | 9.87E+01 | −6.20E+03 |
| | | | | | Mcal | 2.21E+03 | 3.66E+02 | 4.85E+01 | 5.71E+03 | 2.36E+01 | −1.48E+03 |
| Inventory analyses | Resource Consumption from the environment | Exhaustible resources | Energy | Coal | kg | 7.23E+01 | 9.98E+00 | 4.74E−04 | 1.15E+02 | 5.13E−01 | −4.04E+01 |
| | | | | Crude oil (as a fuel) | kg | 8.64E+01 | 1.13E+01 | 4.43E+00 | 1.77E+02 | 1.05E+00 | −4.75E+01 |
| | | | | Natural Gas | kg | 1.66E+01 | 5.09E+00 | 6.84E−02 | 4.35E+01 | 2.65E−01 | −5.73E+00 |
| | | | | Uranium ore | mg | 1.68E−03 | 6.76E−04 | 3.21E−08 | 4.88E−03 | 3.47E−05 | −3.51E−04 |
| | | | Material | Crude oil (as an ingredients) | kg | 3.58E+01 | 0 | 0 | 1.29E+02 | 0 | −5.30E+01 |
| | | | | Iron ore | kg | 5.63E+01 | 0 | 0 | 3.89E+01 | 0 | −3.80E+01 |
| | | | | Copper ore | kg | 2.03E+00 | 0 | 0 | 2.11E−04 | 0 | −6.55E−01 |
| | | | | Bauxite | kg | 1.20E+00 | 0 | 0 | 2.65E+00 | 0 | −1.53E+00 |
| | | | | Nickel ore | kg | 1.82E−01 | 0 | 0 | 9.70E−01 | 0 | −4.61E−01 |
| | | | | Chromium ore | kg | 2.64E−01 | 0 | 0 | 1.33E+00 | 0 | −6.36E−01 |
| | | | | Manganese ore | kg | 2.98E−01 | 0 | 0 | 3.63E−01 | 0 | −8.69E−02 |
| | | | | Plumbous ore | kg | 8.17E−02 | 0 | 0 | 0 | 0 | −2.10E−02 |
| | | | | Tin ore | kg | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | Zinc ore | kg | 8.04E−01 | 0 | 0 | 0 | 0 | −2.06E−01 |
| | | | | Gold ore | kg | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | Silver ore | kg | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | Silica sand | kg | 3.59E+00 | 0 | 0 | 4.77E−01 | 0 | −1.14E+00 |
| | | | | Rock salt | kg | 2.63E+01 | 1.78E−03 | 0 | 4.60E+00 | 3.57E−02 | −1.18E+01 |
| | | | | Limestone | kg | 1.19E+01 | 0 | 0 | 8.78E+00 | 5.48E−01 | −6.35E+00 |
| | | | | Natural soda ash | kg | 3.09E−01 | 0 | 0 | 3.36E−03 | 0 | −9.89E−02 |
| | | Renewable resources | | Wood | kg | 3.53E+01 | 0 | 0 | 5.76E+01 | 0 | −3.72E+01 |
| | | | | Water | kg | 3.91E+04 | 8.12E+03 | 3.58E−01 | 6.46E+04 | 4.20E+02 | −1.07E+04 |
| | Emission/Discharge to the environment | to Atmosphere | | CO2 | kg | 5.08E+02 | 7.79E+01 | 1.44E+01 | 1.13E+03 | 5.45E+01 | −2.76E+02 |
| | | | | SOx | kg | 3.15E−01 | 5.92E−02 | 9.19E−03 | 7.93E−01 | 2.93E−02 | −1.81E−01 |
| | | | | NOx | kg | 5.98E−01 | 4.73E−02 | 7.55E−02 | 1.55E+00 | 7.06E−02 | −4.14E−01 |
| | | | | N2O | kg | 4.12E−02 | 1.19E−03 | 2.31E−03 | 8.17E−02 | 9.69E−05 | −3.15E−02 |
| | | | | CH4 | kg | 4.49E−03 | 1.81E−03 | 8.59E−08 | 1.30E−02 | 9.29E−05 | −9.11E−04 |
| | | | | CO | kg | 6.77E−02 | 1.15E−02 | 2.12E−02 | 2.59E−01 | 1.50E−02 | −4.13E−02 |
| | | | | NMVOC | kg | 8.77E−03 | 3.54E−03 | 1.68E−07 | 2.54E−02 | 1.82E−04 | −1.78E−03 |
| | | | | CxHy | kg | 2.04E−02 | 2.40E−04 | 2.17E−03 | 3.96E−02 | 4.06E−04 | −1.55E−02 |
| | | | | dust | kg | 6.71E−02 | 2.54E−03 | 7.08E−03 | 1.45E−01 | 4.11E−03 | −5.15E−02 |
| | | to Water system | | BOD | kg | − | − | − | − | − | − |
| | | | | COD | kg | − | − | − | − | − | − |
| | | | | N total | kg | − | − | − | − | − | − |
| | | | | P total | kg | − | − | − | − | − | − |
| | | | | SS | kg | − | − | − | − | − | − |
| | | to Soil system | | Unspecified solid waste | kg | 3.47E+00 | 1.20E−02 | 0 | 4.32E+01 | 4.35E+01 | −2.42E+00 |
| | | | | Slag | kg | 1.81E+01 | 0 | 0 | 1.24E+01 | 0 | −1.12E+01 |
| | | | | Sludge | kg | 1.59E+00 | 0 | 0 | 5.69E+00 | 0 | −2.91E+00 |
| | | | | Low emission radioactive waste | kg | 1.18E−03 | 4.72E−04 | 2.24E−08 | 3.40E−03 | 2.42E−05 | −2.46E−04 |
| Impact assesment | by Resource Consumption | Exhaustible resources | | Energy resources (crude oil equivalent) | kg | 1.67E+02 | 2.94E+01 | 4.51E+00 | 3.43E+02 | 1.98E+00 | −8.32E+01 |
| | | | | Mineral resources (Iron ore equivalent) | kg | 6.49E+02 | 0 | 0 | 8.86E+02 | 0 | −5.60E+02 |
| | | | | | | | | | | | |
| | by Emision Consumption | to Atmosphere | | Global warming (CO2 equivalent) | kg | 5.19E+02 | 7.82E+01 | 1.50E+01 | 1.16E+03 | 5.45E+01 | −2.85E+02 |
| | | | | Acidification (SO2 equivalent) | kg | 7.34E−01 | 9.23E−02 | 6.20E−02 | 1.88E+00 | 7.87E−02 | −4.72E−01 |
| | | | | | | | | | | | |
| | | to Water system | | | | | | | | | |
| | | to Soil system | | | | | | | | | |

**[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)**

**C. "Use" stage is intended for use of the product (active mode, standby mode, etc.) and production, transportation to disposal/recycle of consumables**

**D. "Disposition/Recycle" stage is intended for environmental impacts by product disposition/recycle, and deduction by recycling**

**E. "Recycle Effect" illustrates an indirect environmental influences to other products/services by use of reclaimed materials/parts, and/or by supply of**
**Case 1: Use of reclaimed materials/parts: Sum of increase of environmental impact by collection activities of used materials/parts, and decrease**
**Case 2: Supply of used products to other businesses for material reclaim/parts reuse: Sum of increase of environmental impact by materials/parts**

**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,**

**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."Raw material" in "Production" includes environmental impacts generated during mining - transportation - material production phases of the main body**

**B. " Product" in "production" includes environmental impacts of processing of the parts (injection, blow-, press- and glass-molding).**

**C. Regarding the basis and the basic units for calculations during distribution stages**

**D. Regarding the basis and the basic units for calculations during use and consumption stage**

**E. The recycling impacts are calculated assuming that 40% of the end-of-life printers are recovered from users according to PCR (AD-04).**

**F. The impacts of materilal production of recycled materials are included in the values with minus as a recycling effect.**

Form3 （F-03-03）

# Product data sheet

（Input data and parameters for LCA）

| | |
|---|---|
| Document control no. | F-03-03 |
| Product vendor | KONICA MINOLTA, INC. |
| EcoLeaf registration no. | AD−12−189 |

| PCR name | EP and IJ printer(PCR-ID:AD-04) | | Product type | bizhub C454 | | | |
|---|---|---|---|---|---|---|---|
| LCA/LCIA in units of: | 1 | Product weight[kg] | 101.0 | Package[kg] | 24.0 | Weight total[kg] | 125.0 |

**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) |
| Ordinary steel | 5.37E+01 | Rubber | 6.19E−01 | Press molding:Iron | 4.94E+01 | Parts assembly | 1.19E+00 |
| Stainless steel | 1.14E+00 | Semiconductor circuit board | 3.97E+00 | Press molding:Nonferrous metal | 2.22E+00 | | |
| Aluminium | 7.00E−01 | | | Injection molding | 3.73E+01 | | |
| Other metals | 1.52E+00 | | | Blow molding | 6.80E−01 | | |
| Glass | 2.51E+00 | | | Glass molding | 2.51E+00 | | |
| Thermoplastic resin | 3.98E+01 | | | | | | |
| Wood | 8.43E+00 | | | | | | |
| Paper | 1.26E+01 | | | | | | |
| Subtotal | 1.20E+02 | Subtotal | 4.59E+00 | | | | |
| Total | | | 1.25E+02 | Subtotal | 9.21E+01 | Subtotal | 1.19E+00 |

**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 | Energy | Material | Material | | | | |
| | Distribution | Electricity (kWh) | Furnace urban gas ($m^3$) | Industrial water(kg) | Groundwater (kg) | | | | |
| | Quantity | 7.90E+01 | 1.27E−01 | 3.17E+02 | 2.36E+02 | | | | |
| | Note | | | | | | | | |
| Emission/ Discharge | Classification | To Water system | | | | | | | |
| | Distribution | Sewage(kg) | | | | | | | |
| | Quantity | 3.08E+02 | | | | | | | |
| | Note | | | | | | | | |

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

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Distribution | Means of transportation | Freight by ship | Diesel truck :20ton | Diesel truck :2ton | | | | | |
| | Conditions | Load(kg･km) | Load(kg･km) | Load(kg･km) | | | | | |
| | Quantity | 2.13E+05 | 4.98E+04 | 1.50E+03 | | | | | |
| | 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 | Electricity (kWh) | Gasoline as fuel(kg) | Furnace urban gas ($m^3$) | Industrial water(kg) | Groundwater (kg) | Ordinary steel (kg) | Stainless steel (kg) | Aluminium (kg) |
| | Quantity | 1.04E+03 | 3.12E+00 | 2.51E+00 | 2.38E+02 | 4.73E+03 | 3.56E+01 | 6.13E+00 | 2.51E+00 |
| | Note | | | | | | | | |
| Product | Classification | Consumption | Consumption | Consumption | Consumption | Consumption | Consumption | Processing | Processing |
| | Distribution | Copper(kg) | Glass(kg) | Thermoplastic resin(kg) | Wood(kg) | Paper(kg) | Rubber(kg) | Press:Iron(kg) | Press: Nonferrous(kg) |
| | Quantity | 7.00E−04 | 4.00E−02 | 1.28E+02 | 4.73E+00 | 2.49E+01 | 3.20E+00 | 6.30E+01 | 2.50E+00 |
| | Note | | | | | | | | |
| Product | Classification | Processing | Processing | Assembly | To Water system | | | | |
| | Distribution | Injection molding(kg) | Blow molding (kg) | Parts assembly (kg) | Sewage(kg) | | | | |
| | Quantity | 1.29E+01 | 3.47E+01 | 3.47E+01 | 1.49E+03 | | | | |
| | Note | | | | | | | | |
| Product | Classification | Distribution | Distribution | Distribution | | | | | |
| | Distribution | Freight by ship (kg･km) | Diesel truck: 20ton (kg･km) | Diesel truck: 10ton (kg･km) | | | | | |
| | Quantity | 3.46E+05 | 2.03E+05 | 2.45E+04 | | | | | |
| | Note | | | | | | | | |

**4.2 Disposition/Recycle information on consumables and replacement parts**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Consumables | Classification | Consumption | Consumption | Treatment | Treatment | Treatment | Treatment | Treatment | Treatment |
| | Distribution | Electricity (kWh) | Kerosene(kg) | Recycle: to iron(kg) | Recycle: to Aluminum(kg) | Recycle: to copper(kg) | Recycle: to Glass(kg) | Recycle: to plastics(kg) | Recycle: to Paper(kg) |
| | Quantity | 4.88E+00 | 6.36E−02 | 1.67E+01 | 1.00E+00 | 2.80E−04 | 1.60E−02 | 4.02E+01 | 1.18E+01 |
| | Note | | | | | | | | |
| Consumables | Classification | Treatment | Treatment | Treatment | Treatment | Deduction | Deduction | Deduction | Deduction |
| | Distribution | Industrial waste destruction by fire(kg) | Industrial waste inning(kg) | Waste destruction by fire(kg) | Waste inning(kg) | Iron(kg) | Aluminum(kg) | Copper(kg) | Glass(kg) |
| | Quantity | 1.28E+00 | 4.06E−01 | 8.06E+01 | 2.66E+01 | −1.67E+01 | −1.00E+00 | −2.80E−04 | −1.60E−02 |
| | Note | | | | | | | | |
| Consumables | Classification | Deduction | Deduction | Distribution | Distribution | | | | |
| | Distribution | Plastics(kg) | Paper(kg) | Diesel truck: 10ton (kg･km) | Diesel truck: 4ton (kg･km) | | | | |
| | Quantity | −4.02E+01 | −1.18E+01 | 8.57E+03 | 1.04E+04 | | | | |
| | Note | | | | | | | | |

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

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Consumables | Classification | Consumption | Consumption | Treatment | Treatment | Treatment | Treatment | Treatment | Treatment |
| | Distribution | Electricity (kWh) | Kerosene(kg) | Recycle: to iron(kg) | Recycle: to Aluminum(kg) | Recycle: to copper(kg) | Recycle: to Glass(kg) | Recycle: to plastics(kg) | Recycle: to Paper(kg) |
| | Quantity | 3.42E+00 | 4.45E−02 | 2.19E+01 | 2.80E−01 | 1.15E+00 | 1.00E+00 | 1.58E+01 | 8.97E+00 |
| | Note | | | | | | | | |
| Consumables | Classification | Treatment | Treatment | Treatment | Treatment | Treatment | Deduction | Deduction | Deduction |
| | Distribution | Recycle: to Assembled circuit board(kg) | Incineration: Industrial waste(kg) | Landfill: Industrial waste(kg) | Incineration to landfill (as ash)(kg) | Landfill: General waste(kg) | Iron(kg) | Aluminium (kg) | copper(kg) |
| | Quantity | 5.40E−01 | 1.22E+00 | 3.01E−01 | 3.69E+01 | 3.74E+01 | −2.19E+01 | −2.80E−01 | −1.15E+00 |
| | Note | | | | | | | | |
| Consumables | Classification | Deduction | Deduction | Deduction | Deduction | Distribution | Distribution | | |
| | Distribution | Glass(kg) | Plastics(kg) | Paper(kg) | Recycle: to Assembled circuit board(kg) | Diesel truck: 10ton (kg･km) | Diesel truck: 4ton (kg･km) | | |
| | Quantity | −1.00E+00 | −1.58E+01 | −8.97E+00 | −5.40E−01 | 6.00E+03 | 7.26E+03 | | |
| | Note | | | | | | | | |

## 6. Others

**A.Product information:**

All the parts mass per unit sorted by materials and by processes/assembly are included. The motor mass is included in ordinary steel.

**B.Production site information:**

The energy consumption & material use during the main body assemby and cartridge & toner shipment are included.
The environmental impacts that are exhausted from the production site in the atmosphere and the water system are included.

**C.Distribution stage information:**

The total distance of the transportation in Japan of 100km is used according to PCR (AD-04) and the transportation overseas includes the transportation by track in China and by ship between China and Japan.

**D. Product and accessories subject to this analysis:**

The power consumption is calculated assuming the use period of five years and 1,215,000 sheets printed during the use period according to the PCR (AD-04).
The toner consumption is summed up over the five years from the toner consumption data per sheet using our print pattern with 5% coverage.
The production impacts of the cartridges and toner used during the use period of five years are included.
The impacts of the maintenance parts used and the transportation impacts of the maintenace during the use period of five years are included in this stage.

**E. Disposal/Recycle information on the consumables and the maintenance parts during use stage:**

The recycling information of the toner, the developer, the drums and the maintainance parts used during the use period of five years are included .
The recycling processing impacts are included as plus and the production impacts of the recycled materials are included as minus.

**F.Disposal/Recycle stage information:**

The information on the products recovered from users is included.
The recycling processing impacts are included as plus and the production impacts of the recycled materials are included as minus.