

# Product Environmental Aspects Declaration



EP(Electrophotographic Printer) and IJ (Ink Jet) printer (PSC-ID:AD-03)

NO.AD-06-080



## PM-G4500

■ Maximum paper size: A3+

■ Ink Jet printer

### SEIKO EPSON CORPORATION

<http://www.epson.jp/>

Enquires:

Global Environment Policy Department

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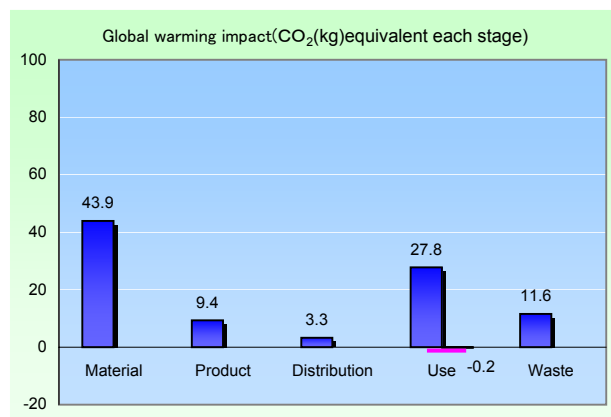
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<http://www.epson.jp/misc/form.html>



Main environmental impact	Total,allstage
Global warming impact (CO <sub>2</sub> equivalent)	95.9 kg ( 95.7 kg )
Acidification impact (SO <sub>2</sub> equivalent)	0.135 kg ( 0.135 kg )
Energy consumption	1,694 MJ ( 1,685 MJ )

\*Figures in ( ) indicated environmental impact,including effect<sup>Notes3</sup>



Negative direction is for recycling<sup>Notes3</sup>

Environmental impact during use is calculated on a 3-year period of use and 7200 ordinary paper prints.

• It doesn't include the environmental impact of paper used for printing.

#### 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 [http://www.jemai.or.jp/english/ecoleaf/pub\\_label.cfm](http://www.jemai.or.jp/english/ecoleaf/pub_label.cfm) 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]

- Complied with International Energy Star standard.
- This is the Eco-Mark product approved by the Japan Environment Association.
- Conforms to Green Purchasing Law criteria
- Assembly factory and main parts, head and ink factories are certified by ISO14001.

## Product Environmental Information Data Sheet (PEIDS)



Document control no.		F-02B-02		Unit Function DB version		2.0					
Product vendor		Seiko Epson Corporation		Characterization Factor DB version		2.0					
EcoLeaf registration no.		AD-06-080									
PSC name		EP and IJ printer		Product type		PM-G4500					
PSC code		AD-O3		Product weight (kg)		11.6	Package (kg)	2.3	Weight total (kg)	13.8	
Life Cycle Stage			Unit	Production		Distribution	Use	Disposition	Recycle		
In/Out items				Raw material	Product						
Energy Consumption			MJ	8.80E+02	1.77E+02	4.96E+01	5.76E+02	1.20E+01	-9.39E+00		
			Mcal	2.10E+02	4.23E+01	1.18E+01	1.37E+02	2.85E+00	-2.24E+00		
Inventory analyses	Resource Consumption from the environment	Exhaustible resources	Material	Coal	kg	6.15E+00	1.14E+00	3.05E-02	2.10E+00	8.28E-02	-1.72E-03
				Crude oil (for fuel)	kg	7.50E+00	1.42E+00	9.35E-01	4.37E+00	1.07E-01	-5.30E-02
				LNG	kg	1.35E+00	5.77E-01	2.91E-02	1.17E+00	4.20E-02	-1.56E-03
				Uranium content of an ore	kg	9.43E-05	7.74E-05	2.06E-06	1.36E-04	5.60E-06	-1.16E-07
				Crude oil (for material)	kg	5.51E+00	0	9.33E-02	3.05E+00	0	-1.51E-01
				Iron content of an ore	kg	5.60E+00	0	0	2.47E-02	0	0
				Cu content of an ore	kg	1.71E-01	0	0	3.35E-03	0	0
				Al content of an ore	kg	1.17E-01	0	0	0	0	0
				Ni content of an ore	kg	1.19E-02	0	0	1.20E-02	0	0
		Cr content of an ore	kg	1.79E-02	0	0	1.62E-02	0	0		
		Mn content of an ore	kg	2.87E-02	0	0	2.06E-03	0	0		
		Pb content of an ore	kg	5.61E-03	0	0	2.72E-04	0	0		
		Sn content of an ore	kg	0	0	0	0	0	0		
		Zn content of an ore	kg	5.52E-02	0	0	2.67E-03	0	0		
		Au content of an ore	kg	0	0	0	0	0	0		
		Ag content of an ore	kg	6.07E-06	0	0	1.47E-04	0	0		
		Silica Sand	kg	2.24E-01	0	0	5.36E-03	0	0		
		Halite	kg	4.55E-01	3.12E-04	0	9.38E-03	5.57E-03	2.58E-06		
	Limestone	kg	1.11E+00	0	0	6.72E-02	1.08E-01	0			
	Natural soda ash	kg	4.68E-03	0	0	4.74E-04	0	0			
	Renewable resources	wood	kg	4.08E+00	0	7.12E-01	2.52E+00	0	0		
		water	kg	2.37E+03	9.21E+02	7.48E+01	2.16E+03	6.97E+01	-7.63E+00		
	Emission/Discharge to the environment	to Atmosphere	CO <sub>2</sub>	kg	4.28E+01	9.30E+00	3.15E+00	2.74E+01	1.16E+01	-1.62E-01	
			SO <sub>x</sub>	kg	2.53E-02	6.95E-03	1.47E-03	1.75E-02	6.00E-03	-7.89E-05	
			NO <sub>x</sub>	kg	5.63E-02	6.14E-03	8.77E-03	2.96E-02	1.12E-02	-3.38E-04	
			N <sub>2</sub> O	kg	4.06E-03	1.88E-04	4.88E-04	1.14E-03	1.71E-05	-3.06E-05	
			CH <sub>4</sub>	kg	2.50E-04	2.07E-04	5.52E-06	3.65E-04	1.50E-05	-3.11E-07	
CO			kg	5.61E-03	1.36E-03	1.24E-03	4.16E-03	1.63E-03	-1.37E-05		
NMVOG			kg	4.90E-04	4.05E-04	1.08E-05	7.14E-04	2.93E-05	-6.10E-07		
C <sub>x</sub> H <sub>y</sub>			kg	2.00E-03	6.69E-05	2.95E-04	5.36E-04	7.78E-06	-1.54E-05		
dust			kg	6.44E-03	3.63E-04	8.32E-04	2.11E-03	5.92E-04	-4.09E-05		
BOD			kg	NA	NA	NA	NA	NA	NA		
COD			kg	NA	NA	NA	NA	NA	NA		
to Water system		N total	kg	NA	NA	NA	NA	NA	NA		
		P total	kg	NA	NA	NA	NA	NA	NA		
		SS	kg	NA	NA	NA	NA	NA	NA		
to Soil system		Unspecified Solid Waste	kg	7.27E-01	6.76E-04	1.07E-02	9.61E-01	6.97E+00	1.10E-01		
		Slag	kg	1.78E+00	0	0	2.44E-02	0	0		
		Sludge	kg	1.54E-01	0	0	0	0	0		
		Low level radio-active waste	kg	6.60E-05	5.40E-05	1.44E-06	9.52E-05	3.91E-06	-8.16E-08		
Impact assessment		by Resource Consumption from the environment	Exhaustible resources	Energy resources (crude oil equivalent)	kg	1.39E+01	3.48E+00	1.01E+00	8.24E+00	2.57E-01	-5.69E-02
	Mineral resources (Iron ore equivalent)			kg	5.15E+01	0	5.13E-02	1.22E+01	0	-8.33E-02	
	to Atmosphere	Global Warming (CO <sub>2</sub> equivalent)	kg	4.39E+01	9.35E+00	3.28E+00	2.78E+01	1.16E+01	-1.71E-01		
			Acidification (SO <sub>2</sub> equivalent)	kg	6.47E-02	1.12E-02	7.61E-03	3.82E-02	1.38E-02	-3.16E-04	

[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<sub>2</sub> 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 "NA" if calculation nor estimation can not be done, in order to differentiate to indicate "zero".  
 D. Row total of the data is automatically calculated, excluding a row includes "NA" item. Row total of such is presented as a blank (no data)  
 (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]

# Product data sheet

(Input data and parameters for LCA)



Document control no.	F-03-02
Product vendor	Seiko Epson Corporation
EcolEaf registration no.	AD-06-080

PSC name	EP and IJ printer (AD-03)		Product type	PM-G4500			
LCA/LCIA in units of:	1	Product weight (kg)	11.6	Package (kg)	2.3	Weight total (kg)	13.8

## 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)
	Steel	4.84E+00	Paper	1.88E+00	Press molding: Iron	4.94E+00	Parts assembly	5.01E+00
	Stainless steel	7.49E-02	Semiconductor substrate	1.83E-01	Press molding: Nonferrous metal	1.73E-01		
	Aluminum	6.80E-02	Wood	4.10E-04	Injection molding	6.10E+00		
	Other metals	1.46E-01	Water	5.72E-02				
	Thermoplastic resin	5.93E+00	Medium-sized motor	5.13E-01				
	Thermosetting resin	7.95E-02						
	Rubber	3.70E-02						
	Glass	2.10E-03						
	Subtotal	1.12E+01	Subtotal	2.63E+00				
	Total			1.38E+01	Subtotal	1.12E+01	Subtotal	5.01E+00

Note The mass of the material which can be classified in every material and have no Basic Units is proportionally distributed by the mass of each material group.

Ink is calculated as water following PSC regulations.

## 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<sub>2</sub>, NO<sub>2</sub> equivalent.

Consumption	Classification	Energy	Energy	Energy	Energy	Energy	Resources	Resources	Resources
	Distribution	Electricity (kWh)	Heavy oil (kg)	Diesel oil (kg)	Kerosene (kg)	Urban gas (m <sup>3</sup> )	Urban water (kg)	Industrial water(kg)	Ground water (kg)
	Quantity	7.23E+00	7.95E-02	3.93E-02	4.94E-03	3.63E-03	3.61E+01	2.18E+00	1.56E+01
	Note								
Discharge	Classification	Exhaust							
	Distribution	Waste water (kg)							
	Quantity	5.39E+01							
	Note								

Notes:

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

Distribution	Classification	Diesel truck: 10 ton		Freight by ship		Materials	Materials	Processing	Disposal
	Conditions	loading Ratio (%W)	Road (kg·km)	loading Ratio (%W)	Road (kg·km)	Thermoplastic resin (kg)	Paper (kg)	Injection molding (kg)	Shredding (kg)
	Quantity	65%	2.14E+03	-	4.14E+04	9.38E-02	3.11E-01	9.38E-02	4.05E-01
	Note	Distance= 100km		Distance= 3000km					
Distribution	Classification	Disposal							
	Conditions	Incineration to landfill (as ash) (kg)							
	Quantity	4.05E-01							
	Note								

Notes: The domestic transportation distance is calculated as 100km following PSC regulations.

The marine transportation distance from an overseas manufacture to Japan is calculated by using the actual value following PSC regulations.

## 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/Accessories	Classification	Energy	Energy	Resources	Resources	Exhaust	Materials	Materials	Materials
	Distribution	Electricity (kWh)	Heavy oil (kg)	Urban water (kg)	Ground water (kg)	Waste water (kg)	Stainless steel(kg)	Other metals(kg)	Thermoplastic resin (kg)
	Quantity	2.75E+01	2.25E-03	7.00E+01	9.36E+00	7.93E+01	7.59E-02	2.50E-03	3.28E+00
	Note	Electric power for product using, and consumables ink cartridge manufacturing	Energy for consumables ink cartridge manufacturing	Resources for consumables ink cartridge manufacturing	Resources for consumables ink cartridge manufacturing	Waste water for consumables ink cartridge manufacturing	Materials for consumables ink cartridge manufacturing	Materials for consumables ink cartridge manufacturing	Materials for consumables ink cartridge manufacturing
Accessories	Classification	Materials	Materials	Materials	Processing	Processing	Diesel truck: 10 ton		
	Distribution	Paper (kg)	Semiconductor substrate (kg)	water (kg)	Iron press (kg)	Injection processing (kg)	loading Ratio (%W)	Road (kg·km)	
	Quantity	1.14E+00	1.91E-02	1.79E+00	7.59E-02	3.23E+00	52%	1.22E+03	
	Note	Materials for consumables ink cartridge manufacturing	Materials for consumables ink cartridge manufacturing	Materials for consumables ink cartridge manufacturing	Processing for consumables ink cartridge manufacturing	Processing for consumables ink cartridge manufacturing	Distance= 100km		

Notes Electric energy is calculated on the following conditions according to PSC regulations.

Usable years of the printer is three years by customer. Color printing value is 3600 sheets for three years. Monochrome printing value is 3600 sheets for Total printing value is 7200 sheets for three years.

(Power consumption is calculated under the condition that the state of energizing is 8 hours a day and the state of non-energizing is 16 hours a day.)

We calculate the environmental burden at the manufacturing stage and the distribution stage of all the ink cartridges used in three years.

The transportation distance of the ink cartridge is calculated as 100km following PSC regulations.

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

Consumables	Classification	Disposal	Disposal	Disposal	Disposal	Disposal	Disposal	Disposal
	Distribution	Shredding (kg)	Sorting: Plastics(kg)	Recycle: to Thermoplastic pellet (kg)	Landfill: Industrial waste (kg)	Thermoplastic (kg)	Incineration to landfill (as ash) (kg)	Landfill: General waste (kg)
	Quantity	4.72E+00	2.67E-01	1.52E-01	1.15E-01	-1.52E-01	4.38E+00	7.14E-02
	Note							

Notes We opened-loop-recycle a used ink cartridge.

An indirect influence is shown from a part of shredding to the deduction.

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

Scenario	Classification	Disposal	Disposal	Disposal
	Distribution	Shredding (kg)	Incineration to landfill (as ash) (kg)	Landfill: General waste (kg)
	Quantity	1.38E+01	8.12E+00	5.65E+00
	Note			

Notes: These figures in this table mean the environmental burden when products are disposed.

The ink residual quantity is considered.

## 6. Others