

Product Environmental Aspects Declaration



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

No. AD-15-E698

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

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WorkForce Pro WF-6590

■ Color Inkjet All-in-One Printer

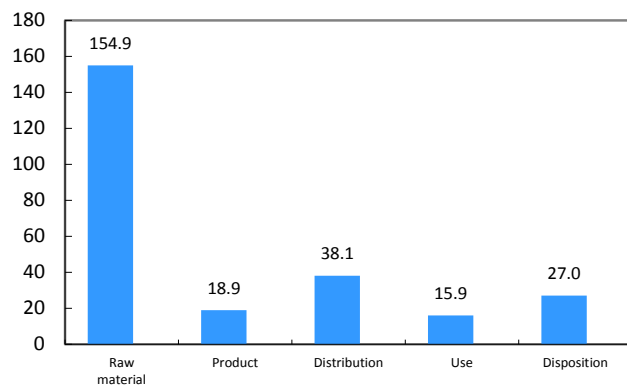
■ Maximum Paper Size (Standard cassette) : A4

■ Automatic Duplex Printing

Consumption and discharge in a life cycle	All the stage sum totals
Global Warming (CO ₂ equivalent)	254.834 kg
Acidification (SO ₂ equivalent)	0.411 kg
Energy resources (crude oil equivalent)	4,205 MJ



Warming load CO₂ equivalent of each stage[kg]



Environmental Impacts are calculated as follows:

- Use stage : Printing 7,200 sheets in 3 years
 - *Environmental impacts by printing sheets are not included in above data
- Distribution stage : Range from the manufacturing factory to North American market

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. 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.
4. 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]

- This product and main components are produced in our ISO 14001 certified factories.
- Conformed to the ENERGY STAR® program, 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 internal external
 Third party verifier: Eikyu Watanabe

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.

Product Environmental Information Data Sheet (PEIDS)



Document control no.	F-02As-02
Product vendor	Seiko Epson Corporation
EcoLeaf registration no.	AD-15-E698

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

PCR name	EP and IJ printer	Product type	WF-6590				
PCR code	AD-04	Product weight (kg)	30.92	Package (kg)	5.55	Weight total (kg)	36.47

In/Out items	Life Cycle Stage	Unit	Production		Distribution	Use	Disposition	Total				
			Raw material	Product								
Energy Consumption			MJ	3.00E+03	3.55E+02	5.16E+02	2.97E+02	3.35E+01	4.21E+03			
			Mcal	7.17E+02	8.48E+01	1.23E+02	7.10E+01	8.01E+00	1.00E+03			
Inventory analyses	Impact by Resource Consumption	Exhaustible resources	Energy resources	Coal	kg	1.94E+01	2.39E+00	1.82E-01	1.06E+00	1.95E-01	2.32E+01	
				Crude oil (for fuel)	kg	2.84E+01	2.90E+00	1.09E+01	2.71E+00	3.69E-01	4.54E+01	
				LNG	kg	5.04E+00	1.20E+00	2.54E-01	5.75E-01	1.01E-01	7.17E+00	
				Uranium content of an ore	kg	5.00E-04	1.62E-04	1.19E-05	7.17E-05	1.32E-05	7.58E-04	
				Crude oil (for material)	kg	1.46E+01	0	0	1.03E+00	0	1.57E+01	
				Iron content of an ore	kg	1.42E+01	0	0	0	0	1.42E+01	
				Cu content of an ore	kg	4.67E-01	0	0	4.14E-04	0	4.67E-01	
				Al content of an ore	kg	6.86E-02	0	0	0	0	6.86E-02	
				Ni content of an ore	kg	8.38E-02	0	0	0	0	8.38E-02	
		C content of an ore	kg	1.18E-01	0	0	0	0	1.18E-01			
		Mn content of an ore	kg	8.46E-02	0	0	0	0	8.46E-02			
		Pb content of an ore	kg	2.56E-02	0	0	3.36E-05	0	2.56E-02			
		Sn content of an ore	kg	-	-	-	-	-	-			
		Zn content of an ore	kg	2.52E-01	0	0	3.31E-04	0	2.52E-01			
		Au content of an ore	kg	-	-	-	-	-	-			
		Ag content of an ore	kg	-	-	-	-	-	-			
		Renewable resources	Mineral resources	Silica Sand	kg	1.25E+00	0	0	7.82E-04	0	1.25E+00	
				Halite	kg	1.40E+00	6.68E-04	0	1.46E-03	1.58E-02	1.42E+00	
	Limestone			kg	3.34E+00	0	0	2.25E-02	2.48E-01	3.61E+00		
	Natural soda ash			kg	1.05E-01	0	0	7.44E-05	0	1.06E-01		
	Wood			kg	7.71E+00	0	0	1.32E+00	0	9.04E+00		
	Water			kg	1.18E+04	1.93E+03	1.33E+02	9.43E+02	1.64E+02	1.50E+04		
	Impact by Emission/Discharge to the environment			to Atmosphere	CO2	kg	1.51E+02	1.88E+01	3.63E+01	1.57E+01	2.70E+01	2.49E+02
					Sox	kg	8.72E-02	1.43E-02	2.00E-02	9.69E-03	1.43E-02	1.45E-01
					Nox	kg	1.85E-01	1.20E-02	1.27E-01	2.34E-02	3.14E-02	3.79E-01
		N2O	kg		1.35E-02	2.59E-04	6.44E-03	9.92E-04	4.84E-05	2.12E-02		
		CH4	kg		1.34E-03	4.32E-04	3.19E-05	1.92E-04	3.53E-05	2.03E-03		
CO		kg	1.89E-02		2.85E-03	2.55E-02	3.91E-03	6.03E-03	5.72E-02			
NMVOG		kg	2.61E-03		8.46E-04	6.24E-05	3.75E-04	6.92E-05	3.96E-03			
CxHy		kg	6.64E-03		7.48E-05	4.38E-03	5.54E-04	1.34E-04	1.18E-02			
Dust		kg	2.09E-02		6.90E-04	1.31E-02	1.94E-03	1.82E-03	3.84E-02			
to Water system		to Water domain	BOD		kg	-	-	-	-	-	-	
			COD		kg	-	-	-	-	-	-	
			N total	kg	-	-	-	-	-	-		
			P total	kg	-	-	-	-	-	-		
		to Soil system	SS	kg	-	-	-	-	-	-		
			Unspecified Solid Waste	kg	2.11E+00	3.86E-03	0	2.81E-01	1.97E+01	2.21E+01		
			Slag	kg	4.92E+00	0	0	1.10E-03	0	4.92E+00		
			Sludge	kg	3.18E-03	0	0	0	0	3.18E-03		
Low level radio-active waste		kg	3.50E-04	1.13E-04	8.32E-06	5.00E-05	9.22E-06	5.30E-04				
Impact assessment		by Resource Consumption	Exhaustible resources	Energy resources (crude oil equivalent)	kg	5.11E+01	7.20E+00	1.15E+01	4.67E+00	7.24E-01	7.51E+01	
	Mineral resources (Iron ore equivalent)			kg	2.02E+02	0	0	6.90E-01	0	2.03E+02		
	by Emission/Discharge to	to Atmosphere	Global Warming (CO2 equivalent)	kg	1.55E+02	1.89E+01	3.81E+01	1.59E+01	2.70E+01	2.55E+02		
			Acidification (SO2 equivalent)	kg	2.17E-01	2.27E-02	1.09E-01	2.61E-02	3.62E-02	4.11E-01		
			Ozone Depletion (CFC-11 equivalent)	kg	-	-	-	-	-	-		
to Water system	Photochemical Oxidant	kg	-	-	-	-	-	-				
	Eutrophication (Phosphate equivalent)	kg	-	-	-	-	-	-				

[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 of consumables/maintenance goods (e.g. replacement parts).
 D. "Disposition" stage is intended for environmental impacts by product disposition.

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".
 D. Row total of the data is automatically calculated, excluding a row includes "-" 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 weight does not include appended ink cartridges and other appended goods.
- Production stage includes main product's manufacturing impacts and manufacturing/transport impacts for a print head and appended ink cartridges.
- Distribution stage includes transport impacts range from manufacturing factory to North American market, because this product is for overseas model.
- Use stage includes main product's electric consumption and material/production/transport/disposal impacts for consumable ink cartridges.
 According to PCR, printing 7,200 sheets in 3 years, printing mode equivalent to high-quality mode on plain paper.
- Disposal stage is calculated as following condition:
 -Collection rate of products is 0%
 -All products are crushed as general waste
 -Combustible materials are incinerated and non-combustible materials landfilled
- 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	Seiko Epson Corporation
EcoLeaf registration no.	AD-15-E698

PCR name	EP and IJ printer (PCR-ID: AD-04)	Product type	WF-6590				
LCA/LCIA in units of:	1 unit	Product weight (kg)	30.92	Package (kg)	5.55	Weight total (kg)	36.47

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)
	Metal	1.37E+01			Press molding:Iron (kg)	1.30E+01	Parts assembly (kg)	3.99E-01
Synthetic Resin	1.58E+01			Press molding:Nonferrous metal (kg)	9.43E-01			
Common Parts	2.21E+00			Injection molding (kg)	1.57E+01			
Water	2.32E-01			Glass molding (kg)	8.49E-01			
Paper and Wood	3.55E+00							
Inorganic chemistry	8.49E-01							
Rubber	1.75E-01							
Subtotal	3.65E+01	Subtotal						
Total		3.65E+01	Subtotal	3.05E+01	Subtotal		3.99E-01	

Note Plastic/metal materials which do not have the base unit are divided in proportion according to the mass ratio of the materials which have the base unit.

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	Energy	Energy	Energy	Material	Condition	Condition
	Distribution	Electricity (kWh)	Clean water (kg)	Urban gas (13A) (m3)	Kerosene (kg)	Heavy oil (kg)	Industrial water (kg)	Diesel truck:10 ton (kg·km)	Freight by ship (kg·km)
	Quantity	9.49E+00	2.29E+01	1.50E-04	1.23E-01	2.89E-03	9.24E+01	9.11E+01	6.82E+02
Note									
Emission/Discharge	Classification	Condition	Condition	Condition	Condition				
	Distribution	Diesel truck:10 ton (kg·km)	Diesel truck:10 ton (kg·km)	Freight by ship (kg·km)	Diesel truck:10 ton (kg·km)				
	Quantity	5.47E+00	5.28E+01	3.93E+03	3.17E+01				
Note									
Emission/Discharge	Classification	Water system							
	Distribution	Sewage processing (kg)							
	Quantity	1.15E+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	3.65E+01	3.00E+01	6.20E+01	1.76E+03	3.65E+01	1.64E+04	1.00E+02	6.00E+05
Note									
Distribution	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	3.65E+01	3.30E+03	1.00E+02	1.20E+05	3.65E+01	1.00E+03	6.20E+01	5.88E+04
Note									

Note Transportation impacts includes range from manufacturing factory to North American market. Loading rate of truck is 62%.

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	Polystyrene (kg)	PET (kg)	High density polyethylene (kg)	Assembled circuit board (kg)	Corrugated cardboard (kg)	Cardboard (kg)	Clean water (kg)	Injection molding (kg)
	Quantity	9.41E-01	6.03E-02	5.26E-02	3.00E-03	1.51E-01	4.38E-01	6.08E-01	1.05E+00
Note									
Product	Classification	Energy	Energy	Energy	Material	Material	Water system	Consumption	Condition
	Distribution	Electricity (kWh)	Urban gas (13A) (m3)	Heavy oil (kg)	Clean water (kg)	Industrial water (kg)	Sewage processing (kg)	Electricity (kWh)	Diesel truck:4 ton (kg·km)
	Quantity	4.08E-01	1.50E-04	7.58E-03	8.97E-01	9.99E-01	1.90E+00	1.65E+01	1.64E+02
Note									
Product	Classification	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition
	Distribution	Diesel truck:10 ton (kg·km)	Freight by ship (kg·km)	Freight by rail (kg·km)	Diesel truck:10 ton (kg·km)	Diesel truck:10 ton (kg·km)	Freight by ship (kg·km)	Diesel truck:10 ton (kg·km)	Diesel truck:10 ton (kg·km)
	Quantity	1.82E+02	3.41E+04	7.44E+03	3.64E+03	1.96E+02	1.59E+03	4.90E+01	7.48E+01
Note									
Product	Classification	Condition	Condition						
	Distribution	Freight by ship (kg·km)	Diesel truck:10 ton (kg·km)						
	Quantity	6.05E+02	1.87E+01						
Note									

Note According to PCR, electric consumption is calculated as following condition: printing images defined by ISO/IEC-24712, print 10 sheets/day, 8 hours/day, 20 days/month, 12 months/year, use 3 years, print by Default Mode (ISO/IEC-24711), Plug in time is 8 hours/day.

4.2 Disposition/Recycle information on consumables and replacement parts

Consumables	Classification	Discharge						
	Distribution	Incineration to landfill(as ash) (kg)						
	Quantity	1.69E+00						
Note								

Note

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

Scenario	Classification	Process	Discharge	Discharge	Condition	Condition		
	Distribution	Shredding (kg)	Incineration to landfill(as ash) (kg)	Landfill: General waste (kg)	Diesel truck:10 ton (kg·km)	Diesel truck:4 ton (kg·km)		
	Quantity	3.58E+01	1.96E+01	1.67E+01	3.51E+03	4.26E+01		
Note								

Note According to PCR, transportation of waste is calculated as following condition: distance is 60 km, use 4 ton truck, loading rate is 62%.

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.

Followings are the list of the basic units used in this LCA. The sources of these basic units are disclosed in the EcoLeaf Environmental Label LCI Common Basic Unit List (V2.1) (URL:http://www.ecoleaf-jemai.jp/application/data/basicunit_en20150601.pdf).

1. Product information Section

No	Basic Unit Name	Field	
2	Electroplated steel Plate	Material Production(Metal)	
5	Electromagnetic steel plate		
6	Stainless Steel Plate		
7	Copper plate		
8	Aluminum plate		
16	Glass		Material Production(Inorganic Chemistry)
27	Low density polyethylene		Material Production(Synthetic Resin)
28	Polypropylene		
29	Polystyrene		
30	PVC		
32	Polycarbonate		
34	POM (Polyacetal)		
36	ABS		
38	MMA Resin		
39	PA66 (Polyamide 66)		
40	PET		
43	Expandable softpolyurethane (forautomobile)		
45	Unsaturated Polyester (UP)		
48	Nitrile-butadiene rubber(NBR)	Material Production(Rubber)	
49	Styrene-butadiene rubber(SBR)		
67	Corrugated cardboard	Material Production(Wood and Paper)	
68	Cardboard		
69	Paper (Western style)		
71	Wood chip (imported)		
75	Multilayer substrate	Parts Production(General)	
76	Assembled circuit board		
85	Press molding: Iron	Processing	
86	Press molding: Nonferrousmetal		
87	Injection molding		
89	Glass molding		
90	Parts assembly	Assembly	

2. Production site information Section ~ 5. Disposition/Recycle stage information Section

No	Basic Unit Name	Field	
2	Electroplated steel Plate	Material Production(Metal)	
5	Electromagnetic steel plate		
6	Stainless Steel Plate		
7	Copper plate		
8	Aluminum plate		
16	Glass		Material Production(Inorganic Chemistry)
27	Low density polyethylene		Material Production(Synthetic Resin)
28	Polypropylene		
29	Polystyrene		
30	PVC		
32	Polycarbonate		
34	POM (Polyacetal)		
36	ABS		
38	MMA Resin		
39	PA66 (Polyamide 66)		
40	PET		
43	Expandable softpolyurethane (forautomobile)		
45	Unsaturated Polyester (UP)		
48	Nitrile-butadiene rubber(NBR)	Material Production(Rubber)	
49	Styrene-butadiene rubber(SBR)		
67	Corrugated cardboard	Material Production(Wood and Paper)	
68	Cardboard		
69	Paper (Western style)		
71	Wood chip (imported)		
75	Multilayer substrate	Parts Production(General)	
76	Assembled circuit board		
85	Press molding: Iron	Processing	
86	Press molding: Nonferrousmetal		
87	Injection molding		
89	Glass molding		
90	Parts assembly	Assembly	
92	Diesel truck:4 ton	Transportation	
93	Diesel truck:10 ton		
95	Diesel truck:20 ton		
96	Freight by rail		
97	Freight by ship		
99	Electricity		Electric Power and Fuel
100	Heavy oil as fuel		
101	Diesel oil as fuel		
102	Kerosene as fuel		
110	Heavy oil		
111	Diesel oil		
112	Kerosene		
117	Urban gas (13A)		
118	LPG		
119	LNG		
125	Industrial water	Utility(Water)	
126	Clean water (kg)		
127	Ultrapure water		
129	Shredding	Disposal and Recycling(Crushing and Sorting)	
133	Incineration to landfill(as ash)	Disposal and Recycling(Incineration and Landfill)	
134	Incineration: Industrial waste		
137	Landfill: Industrial waste		