

Product Environmental Aspects Declaration



No. CA-15-023-A

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Flat-bed / Sheet-fed scanner (PCR-ID: CA-01)

N7100/N7100A/N7100E/N7100EA



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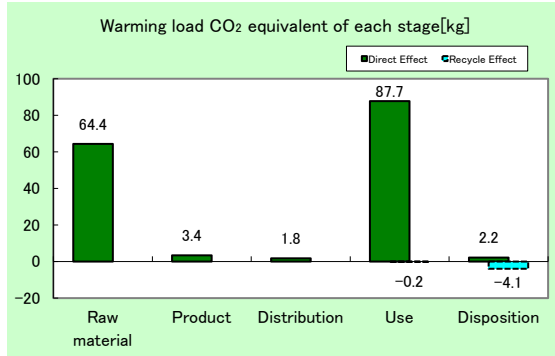
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Product Name	N7100/N7100A/N7100E/N7100EA
Product Category	Sheet-fed scanner (Flatbed: None) For Business
Scanning Speed	Simplex or Duplex, 25 ppm (50 ipm)
Scanning Size	216mm X 356mm
Optical Resolution	600 X 600 dpi (dots per inch)
Scanning Method	Color Contact Image Sensor X2(Front/Back) Image Sensor: CMOS

Consumption and discharge in a life cycle	All the stage sum totals
Global Warming (CO ₂ equivalent)	159.4kg (155.2kg)
Acidification (SO ₂ equivalent)	0.213kg (0.208kg)
Energy resources (crude oil equivalent)	3,171MJ (3,085MJ)

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



The burdens have been calculated with 25 scans per day, a monthly use of 20 days, and 5 years of use, for the number of scans of 30,000 times (600,000 pages) overall.

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. The electricity consumption during power-off is entered into the calculation, presuming that the products remain plugged even if not in use.

[Supplemental environmental information]

- Certified regulations: ENERGY STAR(R) Program
- This product is produced in our factories certified to ISO14001 management system standard.
- Conformance with RoHS Directive (2011/65/EU).

PCR review was conducted by : PCR Deliberation Committee, June 07, 2006, 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: Hiroyuki Takenouchi *

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.

Product Environmental Information Data Sheet (PEIDS)



Document control no.	F-02Bs-02
Product vendor	PFU LIMITED
EcoLeaf registration no.	CA-15-023-A

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

PCR name	Flat-bed / Sheet-fed scanner		Product type	N7100/N7100A/N7100E/N7100EA			
PCR code	CA-01	Product weight (kg)	5.27	Package (kg)	1.7	Weight total (kg)	6.97

In/Out items	Life Cycle Stage	Unit	Production		Distribution	Use	Disposition	Recycle Effect		
			Raw material	Product						
Energy Consumption			MJ	1.11E+03	6.04E+01	2.38E+01	1.97E+03	3.71E+00	-8.61E+01	
			Mcal	2.65E+02	1.44E+01	5.69E+00	4.71E+02	8.87E-01	-2.06E+01	
Inventory analyses	Impact by Resource Consumption	Energy resources	kg	6.41E+00	4.29E-01	5.57E-05	1.12E+01	1.74E-02	-6.76E-01	
			kg	1.23E+01	4.95E-01	5.20E-01	1.27E+01	4.86E-02	-5.97E-01	
			kg	2.52E+00	2.15E-01	8.04E-03	5.64E+00	9.23E-03	-3.42E-02	
			kg	3.00E-04	2.90E-05	3.77E-09	7.57E-04	1.18E-06	1.23E-06	
			kg	2.26E+00	0	0	6.38E-02	0	-8.45E-01	
		Exhaustible resources	Mineral resources	kg	2.32E+00	0	0	6.58E-02	0	-8.53E-01
				kg	2.63E-01	0	0	0	0	-2.80E-02
				kg	2.51E-02	0	0	0	0	-3.17E-05
				kg	1.28E-02	0	0	1.34E-06	0	-1.74E-05
				kg	1.80E-02	0	0	2.44E-05	0	-3.17E-04
	kg			1.27E-02	0	0	3.49E-04	0	-7.41E-04	
	kg			1.67E-02	0	0	0	0	-2.27E-03	
	kg			0	0	0	0	0	0	
	kg			1.65E-01	0	0	0	0	-2.23E-02	
	kg			0	0	0	0	0	0	
	kg			0	0	0	0	0	0	
	kg			3.39E-01	0	0	7.74E-04	0	-2.90E-02	
	kg			6.39E-01	0	0	1.04E-05	1.92E-03	-4.59E-03	
	kg			7.52E-01	0	0	1.40E-02	1.94E-02	-1.49E-01	
	kg			2.88E-02	0	0	0	0	-1.79E-03	
Renewable resources	kg	2.47E+00	0	0	3.09E-01	0	-1.39E+00			
	kg	7.48E+03	3.33E+02	4.21E-02	8.50E+03	1.44E+01	-4.44E+01			
Impact by Emission/Discharge to the environment	to Atmosphere	kg	6.30E+01	3.37E+00	1.69E+00	8.74E+01	2.19E+00	-4.09E+00		
		kg	4.04E-02	2.56E-03	1.24E-03	6.65E-02	1.19E-03	-1.35E-03		
		kg	7.44E-02	2.05E-03	1.16E-02	5.38E-02	3.27E-03	-6.13E-03		
		kg	5.00E-03	4.35E-05	2.32E-04	9.85E-04	5.76E-06	-4.59E-04		
		kg	8.03E-04	7.76E-05	1.01E-08	2.02E-03	3.15E-06	3.31E-06		
		kg	7.83E-03	4.99E-04	3.76E-03	1.31E-02	7.77E-04	-4.18E-04		
		kg	1.57E-03	1.52E-04	1.98E-08	3.96E-03	6.18E-06	6.49E-06		
		kg	2.36E-03	1.23E-05	2.98E-04	2.33E-04	2.73E-05	-2.35E-04		
		kg	7.43E-03	1.09E-04	1.03E-03	2.92E-03	2.07E-04	-7.53E-04		
		to Water system	kg	-	-	-	-	-	-	
	kg		-	-	-	-	-	-		
	kg		-	-	-	-	-	-		
	kg		-	-	-	-	-	-		
	kg		-	-	-	-	-	-		
	to Soil system	kg	4.03E-01	2.78E-04	0	4.58E-02	2.40E+00	1.02E+00		
kg		1.16E+00	0	0	1.99E-02	0	-2.83E-01			
kg		1.81E-04	0	0	0	0	-6.81E-05			
kg		2.10E-04	2.03E-05	2.64E-09	5.27E-04	8.23E-07	8.57E-07			
Impact assessment	by Resource Consumption	Exhaustible resources	kg	2.19E+01	1.27E+00	5.30E-01	3.29E+01	8.05E-02	-1.06E+00	
		Mineral resources (Iron ore equivalent)	kg	8.20E+01	0	0	1.11E-01	0	-9.73E+00	
by Emission/Discharge to environment	to Atmosphere	Global Warming (CO2 equivalent)	kg	6.44E+01	3.38E+00	1.75E+00	8.77E+01	2.19E+00	-4.21E+00	
		Acidification (SO2 equivalent)	kg	9.25E-02	3.99E-03	9.38E-03	1.04E-01	3.48E-03	-5.65E-03	
		-	-	-	-	-	-	-		
		Photochemical Oxidant	kg	4.64E-03	1.14E-04	5.42E-04	2.96E-03	9.89E-05	-3.99E-04	
to Water 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) 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]

1. Regarding the "Raw material" production, the environmental burdens of resource mining, transportation and raw material production for the main unit, accessories and packaging materials are calculated using the EcoLeaf basic unit.
2. In "Product" production, for parts processing, the environmental burden is calculated using the EcoLeaf basic unit and production site data.
For Parts/material C assembled at other than the main unit assembly site, the burden is calculated using the EcoLeaf basic unit (Assembly).
3. The "Distribution" stage basic conditions and basic unit are in accordance with the provisions of PCR.
The burdens are calculated with 500km for the total domestic transportation distance.
For transportation from China, the burdens of transporting by truck and sea are entered into the calculation.
4. The "Use" stage basic conditions and basic unit are in accordance with the provisions of PCR.
The burdens of electricity consumption, consumables production and transportation are calculated with the total scanning number of 600,000 sheets in the customer use period of 5 years.
The electricity consumption during power-off is entered into the calculation, presuming that the products remain plugged even if not in use.
Based on the recycling scenario established at our company, the recycling burden is calculated with the 40 % part recovery rate for the consumables that the customer uses.
For the 60% non-recovery rate, the burden is calculated by using the General Waste Disposal Scenario.
For the manual and packaging box for consumables, the recycling burden is calculated by setting up the Open Recycling Scenario.
5. At the "Disposition/Recycle" stage, in accordance with the provisions of PCR, the recycling scenario is established at our company.
The recycling burden is calculated with the 40% product recovery rate from the customer. For the 60% non-recovery rate, the burden is calculated by using the General Waste Disposal Scenario.
For manuals, packaging boxes and cushioning materials, the recycling burden is calculated by setting up the Open Recycling Scenario.
6. Regarding "Recycle Effect", the burdens accompanying the production of raw materials using the materials recycled from the parts are deducted.
Deduction regarding recycled materials used in products, accessories and packaging materials is not entered into the calculation.

Product data sheet

(Input data and parameters for LCA)



Document control no.	F-03s-02
Product vendor	PFU LIMITED
EcoLEaf registration no.	CA-15-023-A

PCR name	Flat-bed / Sheet-fed scanner (PCR-ID: CA-01)	Product type	N7100/N7100A/N7100E/N7100EA				
LCA/LCIA in units of:	1 unit	Product weight (kg)	5.27	Package (kg)	1.7	Weight total (kg)	6.97

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)
	Ordinary steel	1.91E+00	Rubber	2.38E-02	Press molding:Iron (kg)	2.28E+00	Parts assembly (kg)	1.58E+00
	Stainless steel	8.05E-02	Paper	1.15E+00	Press molding: Nonferrous metal (kg)	4.69E-01		
	Aluminum	8.00E-05			Injection molding (kg)	3.06E+00		
	Other metals	2.34E-01						
	Glass	5.32E-02						
	Semiconductor circuit board	9.83E-01						
	Medium-sized motor	2.84E-01						
	Thermoplastic resin	2.25E+00						
	Subtotal	5.79E+00	Subtotal	1.18E+00				
	Total		6.97E+00		Subtotal	5.81E+00	Subtotal	1.58E+00

Note Regarding the "Raw material" production, the environmental burdens of resource mining, transportation and raw material production for the main unit, accessories and packaging materials are calculated using the EcoLeaf basic unit.

2. Production site information (per unit): Consumption and discharge/emission for production/processing/assembly within the site.

SO_x and NO_x should be indicated in SO₂, NO₂ equivalent.

Consumption	Classification	Energy	Energy	Material				
	Distribution	Electricity (kWh)	Diesel oil as fuel (kg)	Industrial water (kg)				
	Quantity	6.71E-01	1.02E-02	7.38E+00				
	Note							
Emission/Discharge	Classification							
	Distribution							
	Quantity							
	Note							

Note The burdens of mounting parts on printed circuit boards, air conditioners, electric lights, electric tools and test equipment at the product production site are included.

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

Distribution	Means of transportation	Diesel truck: 10 ton (kg·km)	Diesel truck: 10 ton (kg·km)	Diesel truck: 10 ton (kg·km)	Diesel truck: 10 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	6.97E+00	9.00E+01	7.67E+01	8.18E+02	6.97E+00	3.00E+03	1.00E+02	2.09E+04
	Note								
Distribution	Means of transportation	Diesel truck: 10 ton (kg·km)	Diesel truck: 10 ton (kg·km)	Diesel truck: 10 ton (kg·km)	Diesel truck: 10 ton (kg·km)	Diesel truck: 4 ton (kg·km)	Diesel truck: 4 ton (kg·km)	Diesel truck: 4 ton (kg·km)	Diesel truck: 4 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	6.97E+00	2.20E+01	7.67E+01	2.00E+02	6.97E+00	5.00E+02	6.97E+01	5.00E+03
	Note								

Note The "Distribution" stage basic conditions and basic unit are in accordance with the provisions of PCR. The burdens are calculated with 500km for the total domestic transportation distance. For transportation from China, the burdens of transporting by truck and sea are entered into the calculation.

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	Electroplated steel Plate (kg)	POM (polyacetal) (kg)	Nitrile-butadiene rubber (NBR) (kg)	Corrugated cardboard (kg)	Cardboard (kg)	Paper (Western style) (kg)	Press molding: Iron (kg)	Injection molding (kg)
	Quantity	6.35E-02	5.74E-02	3.16E-02	1.60E-02	1.16E-01	4.00E-03	1.23E-01	2.91E-02
	Note								
Product	Classification	Consumption	Consumption	Condition	Condition	Condition	Condition	Condition	Condition
	Distribution	Parts assembly (kg)	Electricity (kWh)	Diesel truck: 10 ton (kg·km)	Freight by ship (kg·km)	Diesel truck: 10 ton (kg·km)	Diesel truck: 4 ton (kg·km)	Diesel truck: 2 ton (kg·km)	Diesel truck: 2 ton (kg·km)
	Quantity	8.54E-02	2.08E+02	3.39E+01	8.65E+02	8.27E+00	2.07E+02	1.05E+01	9.32E+00
	Note								

Note The "Use" stage basic conditions and basic unit are in accordance with the provisions of PCR. The burdens of electricity consumption, consumables production and transportation are calculated with the total scanning number of 600,000 sheets in the customer use period of 5 years. The electricity consumption during power-off is entered into the calculation, presuming that the products remain plugged even if not in use.

4.2 Disposition/Recycle information on consumables and replacement parts

Consumables	Classification	Process	Process	Consumption	Consumption	Process	Deduction	Process	Deduction
	Distribution	Shredding (kg)	Incineration to landfill (as ash) (kg)	Electricity (kWh)	Diesel oil as fuel (kg)	Recycle: to cold-rolled steel (kg)	Cold-Rolled steel plate (kg)	Recycle: to Thermoplastic pellet (kg)	POM (polyacetal) (kg)
	Quantity	3.36E-01	8.40E-02	4.60E-02	1.50E-04	2.54E-02	2.54E-02	2.08E-02	2.08E-02
	Note								
	Classification	Process	Process	Process	Deduction				
	Distribution	Landfill: Industrial waste (kg)	Sorting: Nonferrous metal (by eddy current with wind force) (kg)	Recycle: to corrugated cardboard (kg)	Corrugated cardboard (kg)				
	Quantity	7.95E-02	1.08E-01	6.90E-02	6.90E-02				
	Note								

Note Based on the recycling scenario established at our company, the recycling burden is calculated with the 40 % part recovery rate for the consumables that the customer uses. For the 60% non-recovery rate, the burden is calculated by using the General Waste Disposal Scenario. For the manual and packaging box for consumables, the recycling burden is calculated by setting up the Open Recycling Scenario.

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

Scenario	Classification	Process	Process	Process	Consumption	Consumption	Process	Deduction	Process
	Distribution	Shredding (kg)	Landfill: General waste (kg)	Incineration to landfill (as ash) (kg)	Electricity (kWh)	Diesel oil as fuel (kg)	Recycle: to cold-rolled steel (kg)	Cold-Rolled steel plate (kg)	Recycle: to copper plate (kg)
	Quantity	5.78E+00	2.16E+00	1.53E+00	5.07E-01	1.68E-03	7.98E-01	7.98E-01	9.27E-02
	Note								
	Classification	Deduction	Process	Deduction	Process	Deduction	Process	Deduction	Process
	Distribution	Copper plate (kg)	Recycle: to Aluminum plate (kg)	Aluminum plate (kg)	Recycle: to Glass (kg)	Glass (kg)	Recycle: to Thermoplastic pellet (kg)	Polystyrene (kg)	Sorting: Nonferrous metal (by eddy current with wind force) (kg)
	Quantity	9.27E-02	3.00E-05	3.00E-05	2.13E-02	2.13E-02	8.38E-01	8.38E-01	9.18E-01
	Note								
	Classification	Process	Deduction	Process	Process	Condition	Condition	Condition	
	Distribution	Recycle: to corrugated cardboard (kg)	Corrugated cardboard (kg)	Sorting: Plastics (by relative density difference in water) (kg)	Landfill: Industrial waste (kg)	Diesel truck: 2 ton (kg·km)	Diesel truck: 2 ton (kg·km)	Diesel truck: 2 ton (kg·km)	
	Quantity	5.86E-01	5.86E-01	1.43E-01	9.52E-01	3.88E+02	7.91E+01	1.23E+01	
	Note								

Note At the "Disposition/Recycle" stage, in accordance with the provisions of PCR, the recycling scenario is established at our company. The recycling burden is calculated with the 40% product recovery rate from the customer. For the 60% non-recovery rate, the burden is calculated by using the General Waste Disposal Scenario. For manuals, packaging boxes and cushioning materials, the recycling burden is calculated by setting up the Open Recycling Scenario.

6. Others

Regarding "Recycle Effect", the burdens accompanying the production of raw materials using the materials recycled from the parts are deducted. Deduction regarding recycled materials used in products, accessories and packaging materials is not entered into the calculation.