Product Environmental Aspects Declaration

Facsimile (PCR number: AH-03)



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http://www.brother.co.jp/

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Laser Multi-Function Center MFC-8380DN Specifications:

- Electrophotographic dry process
- Business use
- Recording paper size: A4 (Max. 210 x 297mm)
- · Original sheet size: Max-width 216mm
- Modem speed: 33,600 bps (Automatic switchover)
- Duplex printing
- Product weight: 15.6 kg

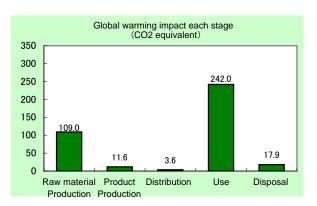
(Including accessories, not including packaging and printed matter)

The following data is calculated by assuming the product sends and receives both 48,000 sheets in 5-year usage period.

< Main environmental impact in the product lifecycle >

Energy consumption

- 7,590MJ
- Global warming impact (CO2 equivalent)
- 384kg 0.52kg
- Acidification impact (SO2 equivalent)



- Electric power consumption in 5 years of "Use stage" is 502kWh.
- The above data does not include the environmental impact of the paper that is 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 PCR: Product Category Rule. Visit EcoLeaf website under JEMAI homepage at http://www.jemai.or.jp/ecoleaf_e/ for details.
- 3. The units used for EcoLeaf calculations are based on Japanese domestic data. Overseas data has not been applied.

[Supplemental environmental information]

The product assembly and main parts of toner and photoconductor are produced at plants certified with ISO 14001. The product conforms to the International Energy Star Program and the Law on Promoting Green Purchasing in Japan. The product has obtained the ECO Mark certification (3R & Energy-Saving Design).

PCR review was conducted by: PCR Deliberation Committee, January 01, 2008, Name of representative: Hisashi Ishitani, KEIO University Independent verification of the label and data, according to ISO 14025:2006 ☐ internal ■ external Third party verifier *: Katsuo Naitou

Program operator: Japan Environmental Management Association for Industry Email: ecoleaf@jemai.or.jp

^{*} In the case of a 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-02As-02
Product vendor	Brother Industries,LTD.
EcoLeaf registration no.	AH-09-101

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

PCR name	Facsimile	Product type	MFC-8380DN				
PCR code	AH-03	Product weight (kg)	15.6	Package (kg)	5.0	Weight total (kg)	20.6

Life Cycle Stage				Produ	iction	· · · · ·		- ·			
In/C	ut iten	ns			Unit	Raw material	Product	Distribution	Use	Disposal	Total
		Fner	av Con	sumption	MJ	2.09E+03	2.00E+02	4.81E+01	5.23E+03	1.99E+01	7.59E+03
		Lilei		•	Mcal	4.99E+02	4.78E+01	1.15E+01	1.25E+03	4.75E+00	1.81E+03
			es ~	Coal	kg	1.01E+01	1.14E+00	1.12E-04	2.95E+01	1.20E-01	4.09E+01
			Energy resources	Crude oil (for fuel)	kg	2.11E+01	2.05E+00	1.05E+00	3.57E+01	2.13E-01	6.00E+01
			Sou	LNG	kg	4.53E+00	5.81E-01	1.62E-02	1.44E+01	6.15E-02	1.96E+01
			E E	Uranium content of an ore	kg	4.17E-04	7.70E-05	7.62E-09	1.90E-03	8.08E-06	2.40E-03
				Crude oil (for material)	kg	9.52E+00	0	0	2.19E+00	0	1.17E+01
	_	es		Iron content of an ore	kg	4.49E+00	0	0	1.32E+00	0	5.81E+00
	Impact by Resource Consumption	Exhaustible resources		Cu content of an ore	kg	3.33E-01	0	0	3.05E-04	0	3.33E-01
	n Jd			Al content of an ore	kg	2.22E-01	0	0	1.42E-01	0	3.64E-01
	Sur S	<u>re</u>	es	Ni content of an ore	kg	2.27E-02 3.20E-02	0	0	6.85E-03 9.73E-03	0	2.96E-02 4.17E-02
	Impact by ce Consu	ole	Mineral resources	Cr content of an ore Mn content of an ore	kg kg	3.20E-02 3.95E-02	0	0	8.10E-03	0	4.17E-02 4.76E-02
	Öğ	stil	SOI	Pb content of an ore	kg	1.37E-02	0	0	2.47E-05	0	1.38E-02
	E B	ıan	<u>e</u>	Sn content of an ore	kg	1.57 L-02	-	-	- -	-	1.50L-02
	ПО	×	ala	Zn content of an ore	kg	1.35E-01	0	0	2.43E-04	0	1.35E-01
	ses	ш	ine	Au content of an ore	kg	-	-	-	-	-	
	Œ		Σ	Ag content of an ore	kg	-	-	-	1	-	
Inventory analyses				Silica Sand	kg	8.31E-01	0	0	1.55E-02	0	8.47E-01
Š				Halite	kg	4.46E+00	1.05E-04	0	2.12E+00	6.69E-03	6.58E+00
na.				Limestone	kg	1.27E+00	6.80E-03	0	6.32E-01	1.66E-01	2.08E+00
ਲ		Bono	wable	Natural soda ash	kg	8.48E-02	0 2.23E-01	0	0 4.58E+00	0	8.48E-02 1.30E+01
<u>6</u>				Wood	kg	8.23E+00 1.02E+04	8.76E+02	8.50E-02	2.19E+04	1.01E+02	3.31E+04
Ĕ		resources Water CO2		kg	1.06E+02	1.15E+01	3.42E+00	2.41E+02	1.79E+01	3.80E+02	
Š	D >			SOx	kg kg	6.85E-02	7.91E-03	2.11E-03	1.81E-01	9.40E-03	2.69E-01
=		45		NOx	kg	1.42E-01	1.13E-02	1.67E-02	1.73E-01	2.01E-02	3.63E-01
	9			N2O	kg	9.86E-03	5.77E-04	5.67E-04	4.47E-03	2.62E-05	1.55E-02
	je.	t		CH4	kg	1.11E-03	2.06E-04	2.04E-08	5.07E-03	2.16E-05	6.42E-03
	arç	Atmos	sphere	CO	kg	1.31E-02	1.62E-03	4.46E-03	3.73E-02	3.70E-03	6.02E-02
	다 있			NMVOC	kg	2.17E-03	4.03E-04	3.99E-08	9.94E-03	4.24E-05	1.26E-02
	Dis			CxHy	kg	4.61E-03	2.68E-04	4.96E-04	1.64E-03	7.07E-05	7.09E-03
	on/			Dust	kg	1.42E-02	9.38E-04	1.59E-03	1.08E-02	1.15E-03	2.87E-02
	y Emission/Discharge to the environment			BOD	kg	-	-	-	-	-	
	e ii	t	0	COD N total	kg		-			-	
	/ E	Water	domain	P total	kg kg	-	-	-	-	-	
	Δ.			SS	kg			-			
	Impact			Unspecified Solid Waste	kg	1.04E+00	2.81E-03	0	3.21E+00	8.37E+00	1.26E+01
	dπ			Slag	kg	1.52E+00	0	0	4.04E-01	0	1.92E+00
	_	t t		Sludge	kg	3.05E-01	0	0	3.04E-01	0	6.10E-01
		Soil s	ystem	Low level			F 20F 0F	E 22E 00		E CEE 00	
				radio-active waste	kg	2.92E-04	5.38E-05	5.33E-09	1.32E-03	5.65E-06	1.68E-03
	e i			Energy resources		0.045.01	4.445 00	4.075.00	0.745 04	4.00= 04	4.005.00
	, and	Exhai	ustible	(crude oil equivalent)	kg	3.64E+01	4.11E+00	1.07E+00	8.74E+01	4.30E-01	1.29E+02
±	by Sou	resou		Mineral resources							
ner	By Resource Consumptio HX3			(Iron ore equivalent)	kg	9.84E+01	0	0	8.52E+00	0	1.07E+02
mpact assessment				Global Warming	l.a.	4.005.00	4.405.04	2.575 .00	2.425.02	4.705.04	2.045.02
sse	by Emission/Discharge to the environment			(CO2 equivalent)	kg	1.09E+02	1.16E+01	3.57E+00	2.42E+02	1.79E+01	3.84E+02
ä	sch	Atmos	o sphere	Acidification	kg	1.68E-01	1.58E-02	1.38E-02	3.02E-01	2.35E-02	5.23E-01
pac	ارة الآيان	Aunos	phileie	(SO2 equivalent)							
E	sion e er										
	th	t	0								
	ᄪᅌ	Water									

[Notes for readers: EcoLeaf common rules]

- 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.
- E. "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 in 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. "Disposal" stage in intended for environmental impacts by product disposal.

- 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).

Result of the "Impact analyses" is found in converting results of inventory analyses into total amount of a reference material (e.g. CQ 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.

- 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]

- 1. Product weight includes a toner cartridge, a drum unit and other accessories. Packaging weight includes packaging material and appended goods (e.g., user's manual, other printed matter).

 2. Production stage includes the production/distribution impact of the parts making up a machine and the initial set of a toner cartridge and a photo conductor, as well as the impact of product assembly.
- In the production impact of raw material, the impact of a Ni-MH battery is calculated using the basic impact rate of an alkaline-manganese battery.

 3. Distribution stage's impact is calculated according to the PCR. The transportation distance of a product from an overseas factory to the port of Japan is based on actual distance.
- The transportation distance in Japan uses 100 km as average distance.

 4. Use stage's impact is calculated according to the PCR. It includes the impact of fax transmitting 48000 sheets and printing 48000 sheets by receiving.

 This number is calculated by supposing a user use a machine for 5 years, sending 5 sheets an hour, receiving 5 an hour, operating a machine 8 hours a day, 20 days a month.

It also includes the electricity consumption of a machine calculated based on 5-year use, supposing a year consists of 365 days, not taking a leap year into consideration, supposing a machine is on standby all the time when it is not used.

The production, distribution, and disposal/recycle impact of the consumables used in those 5 years is also included. The distribution impact of consumables is calculated under the same condition of products:

The transportation distance of consumables from an overseas factory to the port of Japan is based on actual distance. The transportation distance in Japan uses 100 km as average distance Since we have no past record of consumables collection/recycle in Japan, they are assumed to be collected as general waste, crushed and separated as combustible/non-combustible material This stage includes the incineration impact of combustible materials and the landfill impact of non-combustible materials of consumables.

5. Disposal stage: Since we have not collected machines as a producer in Japan, they are assumed to be collected as general waste, crushed and separated as combustible/non-combustible material. This stage includes the incineration impact of combustible materials and the landfill impact of non-combustible materials of machines.

Product data sheet

(Input data and parameters for LCA)

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Document control no.	F-03s-02
Product vendor	Brother Industries,LTD.
EcoLEaf registration no.	AH-09-101



PCR name	Facsimile(PCR ID:AH-03)	Product type	MFC-8380DN					
LCA/LCIA in units of:	1	Product weight	15.6	Package (kg)	5.0	weight total	20.6	

1. Product information (per unit): parts etc. by material and by process/assembly method

		Breakdown of r	primary materials			Math breakd			
			minary materials		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	3.32E+00	Paper	3.84E+00	Press molding: Iron (kg)	3.47E+00	Parts assembly (kg)	2.86E+00	
*	sus	1.43E-01	Semiconductor substrate	1.11E+00	Press molding: Nonferrous metal (kg)	7.92E-02			
duct	Aluminum	1.35E-01	Wood	4.55E-04	injection molding (kg)	1.04E+01			
ĕ	Other metal	9.50E-04	Medium-sized motor	9.07E-01	Glass molding (kg)	6.83E-01			
_	Thermoplastic resin	1.01E+01	Batteries	3.40E-02					
	Thermosetting resin	0.00E+00	Lubricants	2.96E-03					
	Rubber	3.53E-01	Clean water						
	Glass	6.83E-01							
	Subtotal	1.48E+01	Subtotal	5.89E+00					
		Total		2.06E+01	Subtotal	1.46E+01	Subtotal	2.86E+00	

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.

OOX a	ox and nox should be indicated in 502, no2 equivalent.											
	Classification	Material	Energy	Energy	Energy	Energy	Energy	Energy	Energy			
ption	Distribution	Corrugated cardboard (kg)	Electricity (kwh)	Diesel truck: 10 ton (kg.km)	Gasoline as fuel (kg)	Freight by ship (kg.km)	Kerosene as fuel (kg)	Diesel truck: 20 ton (kg.km)	Heavy oil fuel (kg)			
ם	Quantity	1.05E-01	4.74E+00	1.81E+02	2.15E-04	2.21E+02	2.55E-05	5.29E+01	6.97E-01			
E	Note											
ısı	Classification											
ပိ	Distribution											
	Quantity											
	Note											
/ e	Classification	Energy										
ssion	Distribution	Incineration: Industrial waste (kg)										
Emis	Quantity	1.05E-01										
шО	Note											

Note

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

	transportatio	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)
ë	Quantity	2.06E+01	3.00E+01	2.85E+01	2.17E+03	2.06E+01	2.54E+03	1.00E+02	5.23E+04
ΙĦ	Note								
istri	transportatio	Diesel truck: 10 ton (kg.km)							
	Conditions	Mass (kg)	Distance (km)	Loading Ratio (%w)	Load (kg·km)				
	Quantity	2.06E+01	1.00E+02	2.85E+01	7.23E+03				
	Note								

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

		cessories subject							
	Classification	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption
	Distribution	Diesel truck:	Freight by	Diesel truck:	Cold-Rolled steel	Electroplated steel	Stainless steel	Copper plate	PP (kg)
	Distribution	20 ton (kg.km)	ship (kg.km)	10 ton (kg.km)	plate (kg)	Plate (kg)	plate (kg)	(kg)	FF (Kg)
	Quantity	7.86E+02	1.56E+04	2.62E+03	6.31E-05	1.26E+00	4.32E-02	1.01E-03	9.30E-02
		Distribution of	Distribution of	Distribution of					
	Note		consumables used in						
		5 years	5 years	5 years					
	Classification	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption
	Distribution	PS (kg)	Aluminum plate (kg)	Low density polyethylene (kg)	Polycarbonate (kg)	PC-ABS(70/30) (kg)	POM(polyacetal) (kg)	ABS (kg)	AS resin (kg)
	Quantity	1.65E-03	1.34E-01	2.20E-02	1.30E-01	1.07E+00	1.87E-01	1.48E-01	5.60E-01
	Note								
	Classification	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption
Product	Distribution	PET (kg)	Expandable soft polyurethane (for automobile) (kg)	Nitrile-butadiene rubber(NBR) (kg)	Corrugated cardboard (kg)	Paper (Western style)	injection molding (kg)	Press molding: Iron (kg)	Press molding: Nonferrous metal (kg)
ш.	Quantity	3.11E-02	4.29E-01	3.22E-02	1.13E+00	9.50E-01	1.99E+00	1.30E+00	9.10E-02
	Note								
	Classification	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	
	Distribution		Gasoline as fuel (kg)	Kerosene as fuel (kg)	Heavy oil fuel (kg)	Diesel oil as fuel (kg)	Electricity (kwh)	Electricity (kwh)	
	Quantity	1.17E+00	6.80E-05	8.10E-06	3.99E-01	3.04E-02	5.02E+02	3.83E+00	
	Note			Production of consumables used in			Electricity consumption for 5	Production of consumables used in	
			5 years	5 years	5 years	5 years	years	5 years	
	Classification								
	Distribution								
	Quantity								
	Note			-					

Note At "Use Stage", the product electricity consumption in 5 years usage period is 502 kWh.

4.2 Disposal/Recycle information on consumables and replacement parts

.Z DI3	bisposal/Recycle information on consumables and replacement parts												
les	Classification	Consumption	Process	Process	Process								
abl	Distribution	Diesel truck:	Shredding (kg)	Incineration to	Landfill:								
Ē		4 ton (kg.km)		landfill	General waste (kg)								
nsı	Quantity	4.46E+02	4.61E+00	5.48E+00	1.92E+00								
Ö	Note	Consumables not											
0	Note	collected											

Note

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

	,,		(рег. р. с шисту. р. с с				
	Classification	Consumption	Process	Process	Process		
.0	Distribution	Diesel truck:	Shredding (kg)	Incineration to	Landfill:		
ᅙ	Distribution	4 ton (kg.km)	Shredding (kg)	landfill	General waste (kg)		
i e	Quantity	1.88E+03	1.44E+01	1.31E+01	6.34E+00		
ഗ്	Note	Machines not					
	Note	collected					

Note