Product Environmental Aspects Declaration

No. AD-15-E667
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Aug./21/2015

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

RICOH
imagine. change.

RICOH MP 5054

1.Printing Process : Electrophotographic (EP) Printing
2.Color : Monochrome
3.Print Speed : 50 pages/minute (A4)
4.Maximum Paper Size : 297 x 420 mm (A3)
5.Included Units in Assessment : Automatic Duplexing Unit, Printer Option

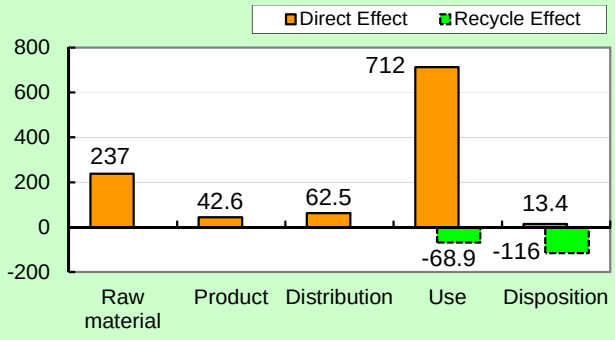
The warming load of the Use stage is based on the supposition that the product prints 1,497,600 images for five years.

Consumption and discharge in a life cycle	All the stage sum totals
Global Warming (CO_2 equivalent)	1.07t (883kg)
Acidification (SO_2 equivalent)	2.13kg (1.90kg)
Energy resources (crude oil equivalent)	22.2GJ (18.2GJ)

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

Environment Contact:
RICOH Company, Ltd.
Corporate Communication Center
email : envinfo@ricoh.co.jp

The photo shows the product with the optional units (※) attached. The environmental loads of these optional units are not included in the results.



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. 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]

・Certified regulations: International Energy Star Program, EU RoHS.
・This product and its main components such as photoreceptor, toner, carrier are produced in our factories certified to ISO14001 management system standard.

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: 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.

The EcoLeaf is an environmental labeling program that belongs to the ISO-Type Ⅲ category.

Form 2（F−02B−03）

Product Environmental Information Data Sheet（PEIDS）

Document control no.	**F-02B-03**
Product vendor	RICOH COMPANY, LTD.
EcoLeaf registration no.	AD-15-E667

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

PCR name	**EP and IJ printer**		Product type	**RICOH MP 5054**			
PCR ID	**AD-04**	Product weight (kg)	**60.2**	Package (kg)	**11.2**	Weight total (kg)	**71.4**

In/Out items \ Life Cycle Stage					Unit	Production		Distribution	Use	Disposition	Recycle effect
						Raw material	Product				
Energy Consumption					MJ	4.43E+03	7.84E+02	8.59E+02	1.61E+04	1.32E+01	-4.08E+03
					Mcal	1.06E+03	1.87E+02	2.05E+02	3.86E+03	3.15E+00	-9.74E+02
Inventory analyses	Resource Consumption from the environment	Exhaustible resources	Energy	Coal	kg	3.75E+01	5.42E+00	2.01E-03	6.73E+01	7.87E-02	-3.42E+01
				Crude oil (for fuel)	kg	3.87E+01	6.24E+00	1.88E+01	1.45E+02	1.42E-01	-2.08E+01
				LNG	kg	6.05E+00	2.72E+00	2.90E-01	3.58E+01	4.06E-02	-1.60E+00
				Uranium content of an ore	kg	5.15E-04	3.66E-04	1.36E-07	3.71E-03	5.32E-06	3.69E-05
			Material	Crude oil (for material)	kg	2.19E+01	0	0	4.87E+01	0	-4.44E+01
				Iron content of an ore	kg	3.10E+01	0	0	1.31E+01	0	-3.93E+01
				Cu content of an ore	kg	6.61E-01	0	0	1.55E-01	0	-9.50E-01
				Al content of an ore	kg	6.11E-01	0	0	6.82E-01	0	-1.23E+00
				Ni content of an ore	kg	2.14E-01	0	0	8.73E-03	0	-7.99E-04
				Cr content of an ore	kg	3.00E-01	0	0	1.63E-02	0	-1.46E-02
				Mn content of an ore	kg	1.99E-01	0	0	7.11E-02	0	-3.41E-02
				Pb content of an ore	kg	5.61E-02	0	0	1.27E-02	0	-7.72E-02
				Sn content of an ore	kg	0	0	0	0	0	0
				Zn content of an ore	kg	5.67E-01	0	0	1.25E-01	0	-7.59E-01
				Au content of an ore	kg	0	0	0	0	0	0
				Ag content of an ore	kg	0	0	0	0	0	0
				Silica Sand	kg	3.71E+00	0	0	1.99E-01	0	-1.77E+00
				Halite	kg	1.73E+01	0	0	1.42E+00	1.38E-03	-4.91E-01
				Limestone	kg	6.70E+00	0	0	2.75E+00	1.31E-01	-7.04E+00
				Natural soda ash	kg	1.57E-01	0	0	8.52E-05	0	-1.43E-01
		Renewable resources		Wood	kg	2.17E+01	0	0	2.40E+01	0	0.00E+00
				Water	kg	1.17E+04	4.44E+03	1.50E+00	6.44E+04	6.77E+01	-2.36E+03
	Emission/Discharge to the environment	to Atmosphere		CO_2	kg	2.32E+02	4.25E+01	6.08E+01	7.00E+02	1.34E+01	-1.78E+02
				SO_x	kg	1.59E-01	3.21E-02	5.35E-02	4.72E-01	7.02E-03	-1.03E-01
				NO_x	kg	2.92E-01	2.64E-02	5.69E-01	1.11E+00	1.51E-02	-1.83E-01
				N_2O	kg	2.06E-02	5.03E-04	6.24E-03	4.21E-02	1.51E-05	-2.37E-02
				CH_4	kg	1.36E-03	9.79E-04	3.64E-07	9.92E-03	1.42E-05	1.23E-04
				CO	kg	3.71E-02	6.22E-03	2.05E-01	2.47E-01	2.75E-03	9.65E-03
				NMVOC	kg	2.66E-03	1.92E-03	7.12E-07	1.94E-02	2.79E-05	2.40E-04
				C_xH_y	kg	1.02E-02	1.07E-04	1.31E-02	2.61E-02	4.96E-05	-9.81E-03
				Dust	kg	3.56E-02	1.38E-03	4.81E-02	9.18E-02	8.51E-04	-3.36E-02
		to Water system		BOD	kg	-	-	-	-	-	-
				COD	kg	-	-	-	-	-	-
				N total	kg	-	-	-	-	-	-
				P total	kg	-	-	-	-	-	-
				SS	kg	-	-	-	-	-	-
		to Soil system		Unspecified Solid Waste	kg	2.13E+00	0	0	1.21E+01	4.69E+00	-3.58E-01
				Slag	kg	1.24E+01	0	0	4.38E+00	0	-1.27E+01
				Sludge	kg	1.31E+00	0	0	1.46E+00	0	-2.63E+00
				Low level radio-active waste	kg	3.62E-04	2.56E-04	9.50E-08	2.59E-03	3.72E-06	2.59E-05
Impact assessment	by Resource Consumption	Exhaustible resources		Energy resources (crude oil equivalent)	kg	7.43E+01	1.60E+01	1.91E+01	2.62E+02	2.85E-01	-4.43E+01
				Mineral resources (Iron ore equivalent)	kg	1.85E+03	0	0	9.67E+01	0	-3.53E+02
	by Emission/ Discharge to the environment	to Atmosphere		Global Warming (CO_2 equivalent)	kg	2.37E+02	4.26E+01	6.25E+01	7.12E+02	1.34E+01	-1.85E+02
				Acidification (SO_2 equivalent)	kg	3.64E-01	5.06E-02	4.52E-01	1.25E+00	1.76E-02	-2.31E-01

[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_2 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]

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.

Form 3(F-03-03)

Product data sheet

(Input data and parameters for LCA)

Document control no.	F-03-03
Product vendor	RICOH COMPANY, LTD.
EcoLEaf registration no.	AD-15-E667

PCR name	EP and IJ printer (PCR-ID : AD-04)	Product type	RICOH MP 5054					
LCA/LCIA in units of:	1 product	Product weight (kg)	60.2	Package (kg)	11.2	Weight total (kg)	71.4	

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)
Product	Stainless steel	1.35E+00	Electronic circuit board	8.28E-01	Press molding: Iron (kg)	3.05E+01	Parts assembly (kg)	6.00E+01
	Aluminum	5.78E-01	Ordinary steel	2.91E+01	Press molding: Nonferrous metal (kg)	2.60E+00		
	Glass	1.74E+00			Injection molding (kg)	2.46E+01		
	Rubber	1.65E-01			Glass molding (kg)	1.91E+00		
	Other metals	2.02E+00						
	Paper	9.98E+00						
	Thermoplastic resin	2.51E+01						
	Thermosetting resin	5.22E-01						
	Subtotal	4.15E+01	Subtotal	2.99E+01				
	Total			7.14E+01	Subtotal	5.96E+01	Subtotal	6.00E+01

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 SO_2, NO_2 equivalent.

Consumption	Classification	Energy	Material	Energy	Material	Energy			
	Distribution	Electricity (kWh)	Clean water (kg)	Kerosene as fuel (kg)	Industrial water (kg)	Furnace LNG (kg)			
	Quantity	1.88E+01	6.95E+01	1.23E-01	2.64E+02	1.05E-02			
	Note								
Emission / Discharge	Classification	Water system							
	Distribution	Sewage processing (kg)							
	Quantity	3.33E+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	7.14E+01	6.40E+01	3.41E+01	1.34E+04	7.14E+01	7.46E+03	1.00E+02	5.32E+05
	Note								
	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)				
	Conditions	Mass(kg)	Distance (km)	Loading Ratio(%w)	Load(kg･km)				
	Quantity	7.14E+01	2.50E+03	3.41E+01	5.23E+05				
	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

Product	Classification	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption
	Distribution	Stainless steel plate (kg)	Aluminum plate (kg)	Glass (kg)	Styrene-butadiene rubber (SBR) (kg)	Copper plate (kg)	Zinc (kg)	Corrugated cardboard (kg)	ABS (kg)
	Quantity	5.36E-02	6.45E-01	1.02E-03	3.84E-01	5.13E-01	1.35E-03	1.13E+01	3.57E-01
	Note								
	Classification	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption	Consumption
	Distribution	PA66 (Polyamide 66) (kg)	Polycarbonate (kg)	Polycarbonate-ABS (70/30) (kg)	High density polyethylene (kg)	Low density polyethylene (kg)	PET (kg)	POM (polyacetal) (kg)	Polypropylene (kg)
	Quantity	2.86E-03	1.74E-01	1.06E+00	1.02E+01	2.92E-01	4.19E+01	1.17E+00	3.22E-03
	Note								
	Classification	Consumption	Consumption	Consumption	Condition	Consumption	Consumption	Consumption	Consumption
	Distribution	Polystyrene (kg)	Epoxy resin (EP) (kg)	Expandable hard polyurethane (Hard) (kg)	Diesel truck: 10 ton (kg･km)	Expandable soft polyurethane (for automobile) (kg)	Electroplated steel Plate (kg)	Cold-Rolled steel plate (kg)	Press molding: Iron (kg)
	Quantity	8.10E+00	1.12E-02	5.64E-03	4.54E+04	1.77E-02	1.90E+00	1.08E+01	9.87E+00
	Note								

Product									
	Classification	Consumption	Consumption	Condition	Consumption	Consumption	Energy	Energy	Condition
	Distribution	Press molding: Nonferrous metal (kg)	Injection molding (kg)	Freight by ship (kg･km)	Glass molding (kg)	Parts assembly (kg)	Electricity (kWh)	Kerosene as fuel (kg)	Diesel truck: 20 ton (kg･km)
	Quantity	1.16E+00	2.14E+01	4.25E+05	3.85E-01	3.28E+01	2.35E+02	1.11E+00	2.14E+05
	Note								
	Classification	Energy	Material	Water system	Consumption	Consumption	Condition	Condition	Condition
	Distribution	Furnace LNG (kg)	Industrial water (kg)	Sewage processing (kg)	Electricity (kWh)	Gasoline as fuel (kg)	Diesel truck: 10 ton (kg･km)	Freight by ship (kg･km)	Diesel truck: 20 ton (kg･km)
	Quantity	4.18E-01	4.65E+01	4.65E+01	6.52E+02	6.60E+00	2.42E+03	2.27E+04	1.14E+04
	Note								
	Classification	Condition	Condition	Condition					
	Distribution	Diesel truck: 20 ton (kg･km)	Freight by ship (kg･km)	Diesel truck: 20 ton (kg･km)					
	Quantity	3.39E+03	2.45E+05	1.32E+05					
	Note								

Note

4.2 Disposition/Recycle information on consumables and replacement parts

Consumables									
	Classification	Process	Process	Process	Process	Process	Process	Process	Process
	Distribution	Landfill: Industrial waste (kg)	Diesel truck: 4 ton (kg･km)	Incineration to landfill (as ash) (kg)	Shredding (kg)	Sorting: Iron (by magnetic force) (kg)	Sorting: Nonferrous metal (by eddy current with wind force) (kg)	Sorting: Plastics (by relative density difference in water) (kg)	Recycle: to Glass (kg)
	Quantity	8.74E+00	1.09E+03	1.13E+01	3.99E+01	3.99E+01	3.04E+01	2.93E+01	1.02E-03
	Note								
	Classification	Process	Process	Process	Process	Deduction	Deduction	Deduction	Deduction
	Distribution	Recycle: to cold-rolled steel (kg)	Recycle: to Aluminum plate (kg)	Recycle: to copper plate (kg)	Recycle: to Thermoplastic pellet (kg)	Glass (kg)	Cold-Rolled steel plate (kg)	Aluminum plate (kg)	Copper plate (kg)
	Quantity	9.48E+00	6.19E-01	4.94E-01	2.05E+01	9.94E-04	9.48E+00	6.19E-01	4.94E-01
	Note								
	Classification	Deduction	Process						
	Distribution	Polystyrene (kg)	Diesel truck: 10 ton (kg･km)						
	Quantity	2.05E+01	3.19E+04						
	Note								

Note

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

Scenario									
	Classification	Process	Process	Process	Process	Process	Process	Deduction	Process
	Distribution	Landfill: Industrial waste (kg)	Shredding (kg)	Incineration: Industrial waste (kg)	Incineration to landfill (as ash) (kg)	Diesel truck: 10 ton (kg･km)	Diesel truck: 4 ton (kg･km)	High density polyethylene (kg)	Sorting: Iron (by magnetic force) (kg)
	Quantity	3.17E+00	6.07E+01	1.02E-01	9.77E+00	4.85E+04	9.46E+02	6.26E-01	5.82E+01
	Note								
	Classification	Process	Process	Process	Process	Process	Process	Process	Deduction
	Distribution	Sorting: Nonferrous metal (by eddy current with wind force) (kg)	Sorting: Plastics (by relative density difference in water) (kg)	Recycle: to Glass (kg)	Recycle: to cold-rolled steel (kg)	Recycle: to Aluminum plate (kg)	Recycle: to copper plate (kg)	Recycle: to Thermoplastic pellet (kg)	Glass (kg)
	Quantity	2.98E+01	2.74E+01	1.74E+00	2.84E+01	5.39E-01	2.66E+00	2.41E+01	1.71E+00
	Note								
	Classification	Deduction	Deduction	Deduction	Deduction				
	Distribution	Cold-Rolled steel plate (kg)	Aluminum plate (kg)	Copper plate (kg)	Polystyrene (kg)				
	Quantity	2.84E+01	5.39E-01	2.66E+00	2.35E+01				
	Note								

Note

6. Others

6-1. 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.

6-2. 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

Material Name	No	Basic Unit Name	Field
Stainless steel	6	Stainless steel plate	Material Production (Metal)
Aluminum	8	Aluminum plate	
Ordinary steel	1	Cold-Rolled steel plate	
	2	Electroplated steel Plate	
Glass	16	Glass	Material Production (Inorganic Chemistry)
Rubber	49	Styrene-butadiene rubber (SBR)	Material Production (Rubber)
	48	Nitrile-butadiene rubber (NBR)	
Other metals	7	Copper plate	Material Production (Metal)
	9	Zinc	
	10	Tin	
	14	Gold	
	15	Silver	
Paper	67	Corrugated cardboard	Material Production (Wood and Paper)
Thermoplastic resin	26	High density polyethylene	Material Production (Synthetic Resin)
	27	Low density polyethylene	
	28	Polypropylene	
	29	Polystyrene	
	30	PVC	
	31	PBT	
	32	Polycarbonate	
	33	Polycarbonate-ABS (70/30)	
	34	POM (polyacetal)	
	36	ABS	
	38	MMA resin	
	39	PA66 (Polyamide 66)	
	40	PET	
Thermosetting resin	41	Epoxy resin (EP)	Material Production (Synthetic Resin)
	42	Expandable hard polyurethane (Hard)	
	43	Expandable soft polyurethane (for automobile)	
	45	Unsaturated polyester (UP)	
Electronic circuit board	74	Semiconductor circuit unit	Parts Production (General)
	75	Multilayer substrate	
	76	Assembled circuit board	
	85	Press molding : Iron	Processing
	86	Press molding : Nonferrous metal	
	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
1	Cold-Rolled steel plate	Material Production (Metal)
2	Electroplated steel Plate	
6	Stainless steel plate	
7	Copper plate	
8	Aluminum plate	
9	Zinc	
16	Glass	Material Production (Inorganic Chemistry)
26	High density polyethylene	Material Production (Synthetic Resin)
27	Low density polyethylene	
28	Polypropylene	
29	Polystyrene	
32	Polycarbonate	
33	Polycarbonate-ABS (70/30)	
34	POM (polyacetal)	
36	ABS	
39	PA66 (Polyamide 66)	
40	PET	
41	Epoxy resin (EP)	
42	Expandable hard polyurethane (Hard)	
43	Expandable soft polyurethane (for automobile)	
49	Styrene-butadiene rubber (SBR)	Material Production (Rubber)
67	Corrugated cardboard	Material Production (Wood and Paper)
85	Press molding : Iron	Processing
86	Press molding : Nonferrous metal	
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	
97	Freight by ship	
99	Electricity	Electric Power and Fuel
102	Kerosene as fuel	
103	Gasoline as fuel	
109	Furnace LNG	
125	Industrial water	Utility (Water)
126	Clean water	
129	Shredding	Disposal and Recycling (Crushing and Sorting)
130	Sorting : Iron (by magnetic force)	
131	Sorting : Nonferrous metal (by eddy current with wind force)	
132	Sorting : Plastics (by relative density difference in water)	
133	Incineration to landfill (as ash)	Disposal and Recycling (Incineration and Landfill)
134	Incineration : Industrial waste	
137	Landfill : Industrial waste	
138	Recycle : to cold-rolled steel	Disposal and Recycling (Regeneration)
139	Recycle : to copper plate	
140	Recycle : to Aluminum plate	
141	Recycle : to Thermoplastic pellet	
145	Recycle : to Glass	
146	Sewage processing	Disposal and Recycling (Other)