Form 1 (F-01s-02)

Product Environmental Aspects Declaration

Paper Beverage Carton (PSC BD-01)

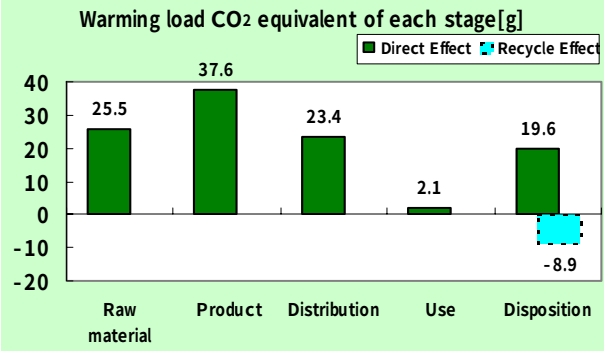
No. BD-07-014

Nihon Tetra Pak K.K.
http:/www.tetrapak.co.jp
Environment & Communication Division
Tel. 03-5211-2061

Product: Tetra Rex Offset Print
Application: Sealed Paper Beverage Carton for Chilled Distribution
Volume: 500 ml

Consumption and discharge in a life cycle	All the stage sum totals
Global Warming (CO_2 equivalent)	108g (99g)
Acidification (SO_2 equivalent)	0.429g (0.451g)
Energy resources (crude oil equivalent)	1.6MJ (1.4MJ)

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



Raw Materials/Product/Distribution/Use/Waste Management

1. The environmental burden reported for this label does not include the environmental burden related production of the packed product.
2. Energy consumption for the filling operation which is part of the beverage production system is included.
3. Environmental burden data for paperboard production included is for actual liquid paperboard production.
4. Distribution includes burden for refrigerated trucks.
5. Use stage includes refrigeration of display cases.
6. Recycle effect includes recycling from all stages including production waste, filler waste and consumer waste cartons.
7. Distribution stage includes includes the weight burden of packed product. 84.4% of the distribution burden is for packed product.

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. 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]

The pringing and lamination of this product is conducted at a factory that has an ISO14001 certified environmental management system.
The filling machine used to fill these cartons is assembled at a factory that has an ISO14001 certified environmental management system.
Nihon Tetra Pak K.K. has an ISO14001 certified environmental management system.

Form 2-B(F-02Bs-02)

Product Environmental Information Data Sheet (PEIDS)

Document control no.	F-02Bs-02
Product vendor	Nihon Tetra Pak K.K.
EcoLeaf registration no.	BD-07-014

Unit Function DB version	v2.0s
Characterization Factor DB version	v2.0s

PSC name	Paper Beverage Carton		Product type	Chilled Distribution Sealed Beverage Carton TR500			
PSC code	BD-01	Product weight (kg)	0.01933	Package (kg)		Weight total (kg)	0.01933

In/Out items \ Life Cycle Stage					Unit	Production		Distribution	Use	Disposition	Recycle Effect
						Raw material	Product				
Energy Consumption					MJ	5.97E-01	6.21E-01	3.30E-01	4.71E-02	1.62E-02	-1.92E-01
					Mcal	1.43E-01	1.48E-01	7.88E-02	1.12E-02	3.86E-03	-4.60E-02
Inventory anaiyses	Impact by Resource Consumption	Exhaustible resources	Energy resources	Coal	kg	3.10E-03	7.58E-04	7.72E-07	2.68E-04	1.15E-04	-1.60E-04
				Crude oil (for fuel)	kg	3.43E-03	1.01E-02	7.20E-03	3.03E-04	1.40E-04	-2.83E-03
				LNG	kg	2.82E-03	5.51E-04	1.11E-04	1.34E-04	5.83E-05	-1.20E-04
				Uranium content of an ore	kg	1.09E-07	5.13E-08	5.22E-11	1.81E-08	7.79E-09	-1.08E-08
			Mineral resources	Crude oil (for material)	kg	2.27E-03	1.42E-03	0	0	0	-1.09E-03
				Iron content of an ore	kg	0	0	0	0	0	0
				Cu content of an ore	kg	0	0	0	0	0	0
				Al content of an ore	kg	0	0	0	0	0	0
				Ni content of an ore	kg	0	0	0	0	0	0
				C content of an ore	kg	0	0	0	0	0	0
				Mn content of an ore	kg	0	0	0	0	0	0
				Pb content of an ore	kg	0	0	0	0	0	0
				Sn content of an ore	kg	0	0	0	0	0	0
				Zn content of an ore	kg	0	0	0	0	0	0
				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	0	0	0	0	0	0
				Halite	kg	8.70E-04	1.34E-06	0	0	1.81E-06	5.52E-07
				Limestone	kg	2.33E-04	1.49E-05	0	0	1.85E-04	3.58E-05
				Natural soda ash	kg	0	0	0	0	0	0
				Wood	kg	4.55E-02	5.33E-04	0	0	0	-1.52E-02
				Water	kg	1.32E+00	8.13E-01	5.75E-04	2.03E-01	9.91E-02	-4.63E-01
	Impact by Emission/Discharge to the environment	to Atmosphere		CO2	kg	2.34E-02	3.52E-02	2.33E-02	2.08E-03	1.96E-02	-8.70E-03
				Sox	kg	2.66E-05	1.11E-05	2.86E-05	1.59E-06	1.01E-05	-1.90E-06
				Nox	kg	7.52E-05	4.76E-05	3.59E-04	1.26E-06	1.90E-05	-1.73E-05
				N2O	kg	7.68E-06	9.17E-06	4.20E-07	2.27E-08	1.66E-08	-6.95E-07
				CH4	kg	2.90E-07	1.37E-07	1.40E-10	4.85E-08	2.08E-08	-2.91E-08
				CO	kg	4.33E-06	5.31E-06	1.41E-04	3.08E-07	2.76E-06	-4.28E-07
				NMVOC	kg	5.67E-07	4.91E-05	2.73E-10	9.49E-08	4.08E-08	-5.68E-08
				CxHy	kg	1.59E-06	2.47E-06	7.20E-06	4.96E-09	6.34E-09	-3.39E-07
				Dust	kg	1.65E-06	4.14E-06	2.85E-05	6.79E-08	1.01E-06	-5.72E-07
		to Water system	to Water domain	BOD	kg	1.36E-05	-	-	-	-	-
				COD	kg	-	-	-	-	-	-
				N total	kg	3.76E-06	-	-	-	-	-
				P total	kg	9.54E-06	-	-	-	-	-
				SS	kg	3.53E-05	-	-	-	-	-
		to Soil system		Unspecified Solid Waste	kg	2.36E-04	7.10E-05	0	0	2.26E-03	-9.37E-05
				Slag	kg	0	0	0	0	0	0
				Sludge	kg	0	0	0	0	0	0
				Low level radio-active waste	kg	7.63E-08	3.58E-08	3.66E-11	1.26E-08	5.44E-09	-7.59E-09
Impact assessment	by Res			Energy resources (crude oil equivalent)	kg	9.71E-03	1.17E-02	7.33E-03	7.84E-04	3.48E-04	-3.17E-03
				Mineral resources (Iron ore equivalent)	kg	1.25E-03	7.79E-04	0	0	0	-6.02E-04
	by Emission (Discharge to environment)	to Atmosphere		Global Warming (CO2 equivalent)	kg	2.55E-02	3.76E-02	2.34E-02	2.09E-03	1.96E-02	-8.89E-03
				Acidification (SO2 equivalent)	kg	7.92E-05	4.44E-05	2.80E-04	2.47E-06	2.34E-05	-1.40E-05
				Ozone Depletion (CFC-11 equivalent)	kg	0	0	0	0	0	0
				Photochemical Oxidant	kg	1.53E-06	2.31E-05	1.46E-05	7.00E-08	4.38E-07	-3.90E-07
				Eutrophication (Phosphate equivalent)	kg	3.08E-05	0	0	0	0	0

[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 harvesting of trees, mining, transportation and raw material production including paper.

(2)"Product" production: consists of the production of the packaging material and filling at the beverage plant.

* The energy for operation of the filling machine in the filling process is included.

* The energy for production of the packed product is not included in this label.

B. "Distribution" stage includes tranpsort from the beverage plant to the depot and from the depot to the market.

・3% added for refrigeration burden for 10 ton trucks and 5% for 2 ton trucks.

C. "Use" stage includes refrigerated display. Refrigeration period: 1 day Temperature: 5 degrees C, Usable Volume: 1627 liters, electricity consumption 423W/h

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).

*Recycling rate for post consumer cartons is from "2005 Paper Beverage Carton Recycling Status and Trends", COMCEI

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,

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]

* Environmental impact of the PE lamination process includes electricity consumption.

* Fuel consumption for refrigerated and insulated trucks calculated based on Ecoleaf common fuel consumption.

* Data for production of liquid paperboard is based on the data from a liquid paperboard producing plant.

Form 3(F-03s-02)

Product data sheet

(Input data and parameters for LCA)

Document control no.	F-03s-02
Product vendor	Nihon Tetra Pak K.K.
EcoLEaf registration no.	BD-07-014

PSC name	Paper Beverage Carton (PSC BD-01)		Product type	Chilled Distribution Sealed Beverage Carton TR500				
LCA/LCIA in units of:	1 pack		Product weight (kg)	0.01933	Package (kg)		Weight total (kg)	0.01933

1. Product information (per pack): 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	Paperboard	1.71E-02						
	PE	2.24E-03						
	Ink	4.00E-05						
	Subtotal	1.93E-02	Subtotal	0.00E+00				
	Total			1.93E-02	Subtotal	0.00E+00	Subtotal	0.00E+00

Note Chilled distribution paper beverage carton, offset printing. Ink is included in Others.

2. Production site information (per pack): 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	Consumption	Consumption	Consumption	Material	Material	Energy	Energy	Material
	Distribution	原紙	Low density polyethylene (kg)	Ink (kg)	water	Steam (kg)	Urban gas (13A) (m3)	Electricity (kwh)	Limestone
	Quantity	2.20E-03	2.88E-04	5.45E-06	1.96E+00	6.67E-04	1.05E-04	3.84E-02	2.33E-04
	Note								
	Classification	Material	Energy	Energy	Material	Material	Material	Material	Material
	Distribution	Industrial water (kg)	Furnace LPG (kg)	Heavy oil as fuel (kg)	Sodium hydrate (kg)	Methanol(CH3OH) (kg)	High density polyethylene (kg)	Oxygen (m3)	Cardboard (kg)
	Quantity	1.92E-01	5.02E-03	2.16E-04	9.17E-04	4.88E-05	1.10E-03	2.85E-04	2.33E-04
	Note								
	Classification	Material	Material	Energy	Energy	Material	Condition	Condition	Condition
	Distribution	Cl2 (kg)	Low density polyethylene (kg)	Furnace urban gas (13A) (m3)	Coal (kg)	Wood chip(Imported) (kg)	Diesel truck:10 ton (kg.km)	Freight by ship (kg.km)	Diesel truck:20 ton (kg.km)
	Quantity	2.08E-04	2.92E-05	2.40E-03	1.14E-03	4.55E-02	3.89E+00	2.10E+02	1.67E+00
	Note								
Emission / Discharge	Classification	Water system	Atmosphere	Atmosphere	Atmosphere	Soil system	Water system	Water system	Water system
	Distribution	Sewage processing (kg)	NMVOC	Sox	Nox	Incineration: Industrial waste (kg)	BOD	P total	SS
	Quantity	1.92E-01	4.88E-05	9.98E-06	4.81E-05	2.29E-04	1.36E-05	9.54E-06	3.53E-05
	Note								
	Classification	Water system	Soil system						
	Distribution	N total	Unspecified Solid Waste						
	Quantity	3.76E-06	1.89E-04						
	Note								

Note Transportation load of paper board from US west coast to Japan is included.

3. Distribution stage information (per pack): 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)	Diesel truck:10 ton (kg.km)	Diesel truck:10 ton (kg.km)	Diesel truck:10 ton (kg.km)	Diesel truck:10 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	6.42E-01	1.50E+02	9.72E+01	9.90E+01	1.62E-01	1.50E+02	2.00E+01	1.21E+02
	Note								
	Means of transportation	Diesel truck:2 ton (kg.km)	Diesel truck:2 ton (kg.km)	Diesel truck:2 ton (kg.km)	Diesel truck:2 ton (kg.km)	Diesel truck:2 ton (kg.km)	Diesel truck:2 ton (kg.km)	Diesel truck:2 ton (kg.km)	Diesel truck:2 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	6.15E-01	2.80E+01	9.37E+01	1.84E+01	6.60E-02	2.80E+01	1.02E+01	1.82E+01
	Note								

Note PSC BD-01 Life Cycle Scenario 2. Chilled Distribution Sealed Paper Beverage Carton. Weight of packed product included fro Beverage Plant -> Distribution Center -> Store transport stages. The energy burden for refrigerated/insulated truck used was 3% for 10 ton trucks and 5% for 2 ton trucks.

4. Use stage (per pack): use condition (mode, term) including active mode, standby mode and maintenance.

4.1 Product and accessories subject to this analysis

Product	Classification	Consumption							
	Distribution	Electricity (kwh)							
	Quantity	5.00E-03							
	Note								

Note Burden for display entered for refrigerated display case as specified in Scenario. Refrigeration period: 1 day Temperature: 5 degrees C, Usable Volume: 1627 liters, electricity consumption 423W/h

4.2 Disposition/Recycle information on consumables and replacement parts

Consumables	Classification								
	Distribution								
	Quantity								
	Note								

Note

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

Scenario	Classification	Process	Process	Deduction	Process	Process	Deduction		
	Distribution	Incineration to landfill(as ash) (kg)	Recycle:to Paper (kg)	Paper(Western style) (kg)	Incineration: Industrial waste (kg)	Recycle:to Thermoplastic pellet (kg)	High density polyethylene (kg)		
	Quantity	1.46E-02	6.63E-03	6.63E-03	5.52E-04	1.10E-03	1.10E-03		
	Note								

Note Recycling rate for post consumer cartons is from "2005 Paper Beverage Carton Recycling Status and Trends", COMCEI