Environmental Product Declaration

Zenith

In accordance with ISO 14025 for:

Rumba Workstation (R2CJ)



AUSTRALASIA EPD®
ENVIRONMENTAL PRODUCT DECLARATION

Environmental Product Declaration (EPD)
in accordance with ISO 14025
EPD Registration No. S-P-04646 | Version 1.0
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Zenith Interiors designs, manufactures, and distributes leading-edge products for corporate and commercial environments that inspire people and organisations to excel. 13 showrooms across Asia Pacific.
www.Zenithinteriors.com

Product-related or management system-related certifications:

ISO 9001 – Quality management systems

ISO 14001 – Environmental Management Systems

AS 4801 Health and Safety

Name and location of production site: Zenith Interiors, Manukau, Auckland, New Zealand.

Rumba workstation (R2CJ)

Rumba employs a clean, simple design language, creating a strong, bold style, further underlined by its firmly grounded stance. Rumba workstation showcases exceptional stability, rigidity, and strength without compromising on visual resolution. With a high focus on enhancing the end user's feeling of wellbeing.

UN CPC code: 3812/3813/3814 (EPD International, 2019).

Geographical scope: Final product produced in Manukau, Auckland for the New Zealand market.

LCA Information

Functional unit / declared unit: 1 R2CJ workstation with four variations in the product; tabletop dimensions: 1.8 m * 0.8 m * 0.025 m; adjustable leg height: 0.61 m to 1.23 m (sit to stand).

Scope: Cradle to grave life cycle of one Rumba workstation

Reference service life: 15 years (EPD International, 2019)

Databases and LCA software used: AusLCI 2.2, ecoinvent 3.6, Industry Data 2.0 databases; SimaPro 9.1.0.11 software

Data collection period: July 2019 – February 2020

An Environmental Product Declaration, or EPD, is a standardised and verified way of quantifying the environmental impacts of a product that is based on a consistent set of rules known as Product Category Rules (PCR). EPDs within the same product category from different programs may not be comparable. This EPD is for a specific furniture product and follows the Product Category Rules 'Furniture, except seats and mattresses v2.01'.

Declaration Owner:

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PCR Information

PCR:
Product Category Rules 'Furniture, except seats and mattresses v2.01'.

PCR review conducted by:
by GECA Australia; According to product category rules (PCR): Furniture, except seats and mattresses 2012:19 VERSION 2.01 UN CPC 3812/3813/3814

Independant verification of the declaration and data, according to ISO 14025:

☐ EPD process certification (Internal)

☐ EPD verification (External)

Third party verifier

Third Party Review (by Edge Environment)

Accredited or approved by: The Australasian EPD® Programme

Product Information

The Rumba workstation consists of three parts: a 25 mm tabletop, electric adjust legs and a beam which connects the legs and the tabletop. The legs have a height range of 610 to 900 mm (sit to sit) and 620 to 1230 mm (sit to stand). The worktops are made of particle board or medium density fibreboard, while the legs come with or without a steel bracket. All four options are analysed in this EPD: particle board / medium density fibreboard; with / without bracket.

All the components required for the legs are transported from Shanghai, China via sea freight, and so are the aluminium and steel sheet components required for the middle beam. The rest of the components are sourced from within Australia.

Background Data

Australian inputs were primarily modelled with the AusLCI database; the ecoinvent v3 database was used where suppliers were from overseas. All background data used was less than ten years old.

System Boundaries and Life Cycle Stages

Life Cycle Stages

This Environmental Product Declaration analyses the production of a Rumba workstation, including the raw material extraction, the manufacture of components from suppliers, the assembly of the workstation as well as the end of its service life. The different Rumba components are transported to Sandringham, Victoria where metal components are being powder coated and the workstation is assembled. The product is then packed in cardboard boxes and supplied to showrooms as well as clients in Australia.

Electricity use is required for the adjustable legs. Product testing quantifies a performance life of 15 years. Maintenance of the product involves cleaning and dusting.

Table 1: Life cycle stages of Rumba workstation

Process	**Module**	**Description**	**Life cycle stages**	**Declared modules**
Upstream process	A1	Raw materials supply	A1-A3: Manufacturing stage	X
	A2	Components/raw materials manufacture		X
Core process	A3	Components transport to Zenith factory		X
	A4	Manufacturing of final products		X
Downstream process	B1	Transport of final product	B1: Final product transport	X
	B2	Maintenance	B2-B4: Usage stage	X
	B3	Replacement		X
	B4	Operational energy use		X
	C1	Transport	C1-C3: End-of-life	X
	C2	Manual dismantling		X
	C3	Waste disposal		X
Other Environmental Stage	D	Recycling	Other Environmental Stage	X

System Diagram

An ‘upstream – core – downstream’ flow is adopted in this study. The upstream processes include the flows of raw materials. The core processes include all activities which the manufacturing organisation is in control of, i.e.

transportation of the components to the manufacturing factory and the actual process of manufacturing. The downstream processes include the steps that are controlled by the user and the disposal or recycling options of the products.

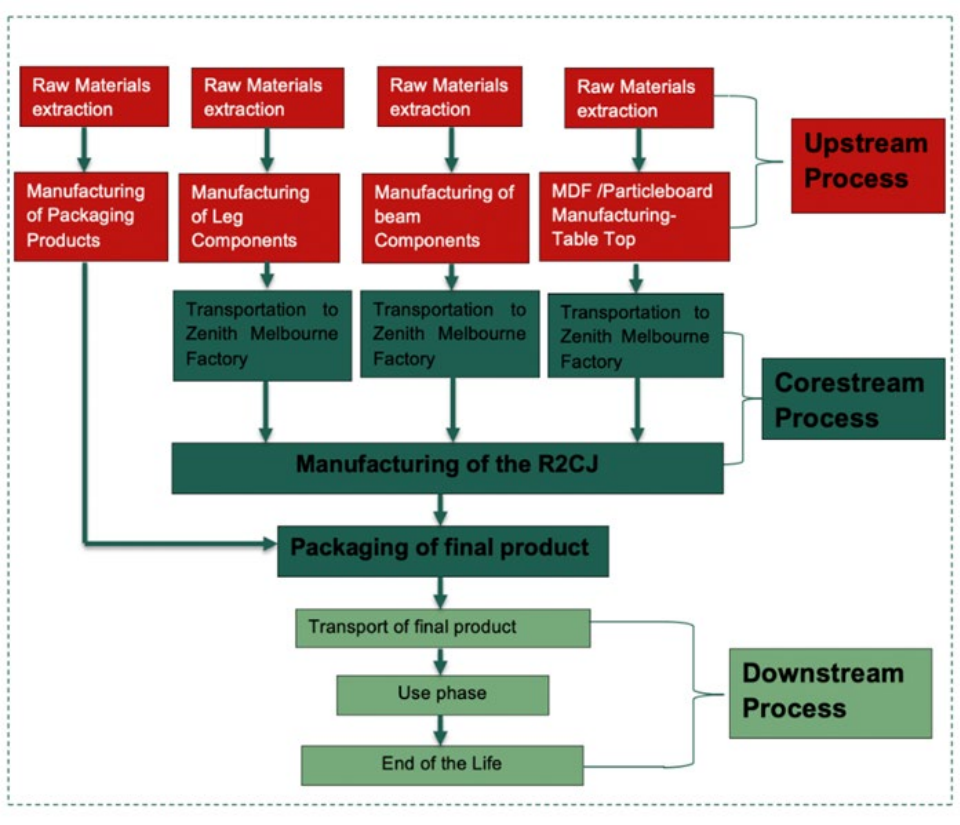


Figure 1: Process diagram Rumba workstation

End-of-life Scenarios

Zenith Interiors operates a take-back scheme for its furniture. Likewise, furniture owners resell or donate the furniture by themselves to extend its lifetime. In the end-of life for other environmental stages (represented as modules D), all aluminium and steel parts of the product are recycled after being manually dismantled. This is noted separately due to Polluter pays principle (PPP).

Data Quality, Temporal Scope and Geographical Scope

The modelling of Zenith products is of high quality as detailed company specific data about the product components, component suppliers, the annual energy consumption and the annual production rate was provided for this study. Data for upstream and downstream processes are retrieved from suitable averages in the AusLCI and ecoinvent databases.

The temporal scope of the study is the period for which the data was collected. The data collection process started with the visit to Zenith's Melbourne factory in July 2019. The energy consumption data taken into consideration range from September 2018 to 2019. The production volume data is for 2019. For the background data, temporal scope for AUSLCI V1.33, a shadow database of modified ecoinvent 2.2 processes is July 2020. For ecoinvent 3.6 the temporal scope is September 2019.

Table 2: Data sources, geographical scope and data quality

Materials/fuels		**Module**	**Data source**	**Geographical scope**	**Data quality**
Raw materials supply, components / raw materials manufacture, packaging	Components for beam	A1, A2	Information provided by Zenith Interiors	China	High quality
	Components for legs			China	
	Particle board/ Medium Density Fibreboard for tabletop			New Zealand	
	Packaging of final product				
	Packaging from suppliers				
Components transport to Zenith factory, manufacturing of final products	Transportation of steel/ aluminum components for beam (Shanghai, China & Auckland, New Zealand)	A3, A4	Information provided by Zenith Interiors	New Zealand	High quality
	Transportation of components for legs (Shanghai, China)				
	Transportation of Medium Density fibreboard/ particle board for tabletop (Auckland, New Zealand)				
	Electricity consumption				
	Natural gas consumption				
Transportation of final product	Zenith Auckland factory to client	B1	Assumption of average distance of 1,000 km according to Product Category Rules	New Zealand	Medium quality
Usage stage	Maintenance	B2	Regular cleaning and dusting and motor replacement are recommended.	New Zealand	Medium quality
	Replacement	B3	Motor life span: 5 years		

	Operational energy use	B4	Electricity to operate adjustable leg motor and stand-by energy are considered.		
End-of-life without recycling	Transport	C1	Assumption of average distance of 1,000 km	New Zealand	Medium quality
	Manual dismantling	C2	No impacts observed for manual dismantling		
	Waste disposal	C3	Complete product along with packaging ends up in landfill.		
Other Life Cycle stages	Recycling	D	100% of aluminium and steel parts are recycled.	New Zealand	Medium quality

Allocations

No allocation between co-products in the core module was necessary as there were no co-products created during manufacturing.

The methodological choices for allocation for reuse, recycling and recovery have been set according to the polluter pays principle (PPP). This means that the generator of the waste shall carry the full environmental impact until the point in the product's life cycle at which the waste is transported to a scrapyard or the gate of a waste processing plant (collection site). The subsequent user of the waste shall carry the environmental impact from the processing and refinement of the waste, but not the environmental impact caused in the earlier life cycles. The cut-off system model from ecoinvent was used. Any allocations in the AusLCI unit system and Industry Data 2.0 were adopted.

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Table 3: Materials used for Rumba workstation

Materials	**Quantity**	**Unit**
Medium Density Fibreboard or particle board	0.036	m^3
Steel alloyed type 1	11.44/11.94	kg
Steel alloyed type 2	2.25	kg
Steel alloyed type 3	0.022	kg
Polyoxymethylene	0.07	kg
Acrylonitrile butadiene styrene	0.084	kg
Electric components	0.01	kg
Aluminium extruded	2.4816	kg
Aluminium die cast	8.156	kg
Alloyed Steel	16.554	kg
Steel sheet	11.76	kg
Packaging materials from suppliers – plastic films	0.0827	kg
Packaging materials from suppliers – cardboard boxes	0.33	kg
Packaging for final product	0.33	kg

Table 4: Energy consumption per product

Energy consumption	**Quantity**	**Unit**
Energy during manufacturing – electricity	7.434	kWh
Energy during manufacturing – gas	43.81	MJ
Energy usage during use stage – electricity	3.045	kWh

Environmental Performance

Environmental Impact Assessment Methods

Table 5: Overview of environmental impact assessment methods used in the study

Impact category		**Unit**	**Assessment method**
Global warming potential (GWP)	Fossil	kg CO_2 eq.	Greenhouse Gas Protocol V1.02
	Biogenic	kg CO_2 eq.	
	CO_2 eq. from land transformation	kg CO_2 eq.	
	Total	kg CO_2 eq.	
Abiotic depletion		kg Sb eq.	CML-IA baseline V3.6
Abiotic depletion (fossil fuels)		MJ	
Ozone layer depletion (ODP)		kg CFC-11 eq.	
Photochemical oxidation		kg C_2H_4 eq.	Recipe 2008 Midpoint
Acidification		kg SO_2 eq.	CML-IA baseline V3.6
Eutrophication		kg PO_4^{3-} eq.	
Water use		m^3	AWARE V1.01
Land use		species.yr	Recipe 2016 Endpoint V1.04
Human toxicity, cancer		CTUh	USEtox 2
Human toxicity, non-cancer		CTUh	
Freshwater ecotoxicity		CTUe	
Radioactive waste		kg	EDIP 2003 method
Hazardous waste		kg	EDIP 2003 method
Non-hazardous waste		kg	EDIP 2003 method (Sum of Bulk waste and Slag waste)
Primary energy resources Renewable	Use as energy carrier	MJ	Cumulative Energy Demand V1.11 method: calculated as sum of renewable – biomass, renewable – wind, solar, geothermal, and renewable – water.
	Use as raw materials	MJ	Manual calculation
Primary energy resources Non-renewable	Use as energy carrier	MJ	Cumulative Energy Demand V1.11 method: calculated as sum of non-renewable – fossil, non-renewable – nuclear, and non-renewable – biomass.
	Use as raw materials	MJ	Manual calculation

Secondary material resources	kg	Manual calculation
Renewable secondary fuels	MJ	0
Non-renewable secondary fuels	MJ	0
Net use of fresh water	m^3	Recipe 2016 Midpoint V1.04

The following tables show the environmental impacts of the Rumba workstation with respect to upstream, core and downstream processes, including all processes listed in Table 1. The downstream processes are divided into the two end-of-life scenarios described in chapter 0.

Environmental Impacts

Particle board tabletop and legs with bracket

Table 6: Life cycle impacts – R2CJ (particle board top and legs with bracket)

Impact category		Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
			A1-A2	A3-A4	B1-C4		D
Global warming potential (GWP)	Fossil	kg CO_2 eq.	4.42E+02	4.04E+01	1.23E+02	6.05E+02	-2.55E+02
	Biogenic	kg CO_2 eq.	-3.59E+01	2.36E-02	9.05E+01	5.46E+01	-2.23E-01
	CO_2 eq. from land transformation	kg CO_2 eq.	2.59E-01	7.17E-05	4.04E-04	2.60E-01	-9.41E-04
	Total	kg CO_2 eq.	4.06E+02	4.04E+01	2.13E+02	6.60E+02	-2.55E+02
Abiotic depletion		kg Sb eq.	1.06E-02	2.30E-05	9.82E-05	1.07E-02	-7.05E-05
Abiotic depletion (fossil fuels)		MJ	3.68E+03	3.66E+02	1.62E+03	5.67E+03	-1.51E+03
Ozone layer depletion (ODP)		kg CFC-11 eq.	1.71E-05	2.64E-06	1.79E-05	3.77E-05	-5.51E-06
Photochemical oxidation		kg NMVOC	1.42E+00	3.46E-01	2.62E+00	4.38E+00	-7.85E-01
Acidification		kg SO_2 eq.	1.34E+00	1.96E-01	5.68E-01	2.10E+00	-6.37E-01
Eutrophication		kg PO_4^{3-} eq.	5.52E-01	4.66E-02	1.26E-01	7.24E-01	-1.11E-01
Water use		m^3	5.79E+03	2.98E+02	3.00E+02	6.39E+03	-5.13E+03

Table 7 Resource use – R2CJ (particle board top and legs with bracket)

Impact category		Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
			A1-A2	A3-A4	B1-C4		D
Primary energy resources Renewable	Use as energy carrier	MJ	9.07E+02	9.83E+00	5.23E+00	9.22E+02	-1.32E+02
	Use as raw materials	MJ	0	0	0	0	0
	Total	MJ	9.07E+02	9.83E+00	5.23E+00	9.22E+02	-1.32E+02

Primary energy resources Non-renewable	Use as energy carrier	MJ	4.16E+03	3.92E+02	1.71E+03	6.26E+03	-1.60E+03
	Use as raw materials	MJ	3.26E+00	0	0	3.26E+00	0
	Total	MJ	4.16E+03	3.92E+02	1.71E+03	6.26E+03	-1.60E+03
Secondary material resources		kg	0	0	0	0	0
Renewable secondary fuels		MJ	0	0	0	0	0
Non-renewable secondary fuels		MJ	0	0	0	0	0
Net use of fresh water		m^3	1.35E+02	6.91E+00	6.92E+00	1.49E+02	-1.19E+02

Table 8: Other impacts – R2CJ (particle board top and legs with bracket)

Impact category	Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
		A1-A2	A3-A4	B1-C4		D
Land use	species.yr	1.76E-07	1.33E-08	1.01E-08	1.99E-07	-6.32E-08
Human toxicity, cancer	CTUh	9.93E-08	1.02E-09	3.29E-09	1.04E-07	-2.11E-08
Human toxicity, non-cancer	CTUh	2.16E-08	1.81E-10	1.72E-09	2.35E-08	-7.38E-09
Freshwater ecotoxicity	CTUe	6.99E-01	4.47E-02	1.59E-01	9.03E-01	-1.73E-01

Table 9: Waste flow categories – R2CJ (particle board top and legs with bracket)

Impact category	Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
		A1-A2	A3-A4	B1-C4		D
Radioactive waste	kg	3.49E-02	5.57E-06	2.53E-06	3.49E-02	-1.30E-05
Hazardous waste	kg	8.43E-01	3.68E-04	6.99E-04	8.44E-01	9.20E-04
Non-hazardous waste	kg	1.86E+02	1.18E+00	5.16E+01	2.39E+02	-2.66E+01

Table 10: Output flow categories – R2CJ (particle board top and legs with bracket)

Impact category	Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
		A1-A2	A3-A4	B1-C4		D
Reuse	kg	0	0	0	0	0
Materials for recycling	kg	0	0	0	0	0
Energy recovered	MJ	0	0	0	0	0
Energy exported	MJ	0	0	0	0	0
Energy exported, thermal	MJ	0	0	0	0	0

R2CJ with Medium Density Fibreboard tabletop and legs with bracket

Table 11: Life cycle impacts – R2CJ (MDF top and legs with bracket)

Impact category		Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
			A1-A2	A3-A4	B1-C4		D
Global warming potential (GWP)	Fossil	kg CO_2 eq.	4.54E+02	3.99E+01	1.21E+02	6.15E+02	-2.55E+02
	Biogenic	kg CO_2 eq.	-4.55E+01	2.36E-02	8.95E+01	4.40E+01	-2.23E-01
	CO_2 eq. from land transformation	kg CO_2 eq.	2.59E-01	6.99E-05	3.99E-04	2.60E-01	-9.41E-04
	Total	kg CO_2 eq.	4.09E+02	4.00E+01	2.11E+02	6.59E+02	-2.56E+02
Abiotic depletion		kg Sb eq.	1.06E-02	2.30E-05	9.70E-05	1.07E-02	-7.05E-05
Abiotic depletion (fossil fuels)		MJ	3.79E+03	3.66E+02	1.61E+03	5.76E+03	-1.51E+03
Ozone layer depletion (ODP)		kg CFC-11 eq.	1.71E-05	2.64E-06	1.77E-05	3.75E-05	-5.51E-06
Photochemical oxidation		kg NMVOC	1.46E+00	3.46E-01	2.65E+00	4.45E+00	-7.91E-02
Acidification		kg SO_2 eq.	1.36E+00	1.96E-01	5.61E-01	2.12E+00	-6.37E-01
Eutrophication		kg PO_4^{3-} eq.	5.59E-01	4.66E-02	1.25E-01	7.30E-01	-1.11E-01
Water use		m^3	6.08E+03	2.98E+02	2.97E+02	6.68E+03	-5.13E+03

Table 12: Resource use – R2CJ (MDF top and legs with bracket)

Impact category		Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
			A1-A2	A3-A4	B1-C4		D
Primary energy resources Renewable	Use as energy carrier	MJ	1.09E+03	9.83E+00	5.28E+00	1.10E+03	-1.32E+02
	Use as raw materials	MJ	0	0	0	0	0
	Total	MJ	1.09E+03	9.83E+00	5.28E+00	1.10E+03	-1.32E+02
Primary energy resources Non-renewable	Use as energy carrier	MJ	4.28E+03	3.92E+02	1.73E+03	6.40E+03	-1.60E+03
	Use as raw materials	MJ	3.26E+00	0	0	3.26E+00	0
	Total	MJ	4.28E+03	3.92E+02	1.73E+03	6.40E+03	-1.60E+03
Secondary material resources		kg	0	0	0	0	0

Renewable secondary fuels	MJ	0	0	0	0	0
Non-renewable secondary fuels	MJ	0	0	0	0	0
Net use of fresh water	m^3	1.42E+02	6.91E+00	6.98E+00	1.56E+02	-1.19E+02

Table 13: Other Impacts – R2CJ (MDF top and legs with bracket)

Impact category	Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
		A1-A2	A3-A4	B1-C4		D
Land use	species.yr	1.98E-07	1.33E-08	1.06E-08	2.22E-07	-6.32E-08
Human toxicity, cancer	CTUh	1.01E-07	1.02E-09	3.33E-09	1.06E-07	-2.11E-08
Human toxicity, non-cancer	CTUh	2.17E-08	1.81E-10	1.74E-09	2.37E-08	-7.39E-09
Freshwater ecotoxicity	CTUe	7.08E-01	4.47E-02	1.61E-01	9.13E-01	-1.73E-01

Table 14: Waste flow categories – R2CJ (MDF top and legs with bracket)

Impact category	Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
		A1-A2	A3-A4	B1-C4		D
Radioactive waste	kg	6.28E-03	5.53E-06	2.53E-06	6.29E-03	-1.30E-05
Hazardous waste	kg	9.68E-03	3.64E-04	7.00E-04	1.07E-02	9.27E-04
Non-hazardous waste	kg	7.24E+01	1.16E+00	5.15E+01	1.25E+02	-2.67E+01

Table 15: Output flow categories – R2CJ (MDF top and legs with bracket)

Impact category	Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
		A1-A2	A3-A4	B1-C4		D
Reuse	kg	0	0	0	0	0
Materials for recycling	kg	0	0	0	0	0
Energy recovered	MJ	0	0	0	0	0
Energy exported	MJ	0	0	0	0	0
Energy exported, thermal	MJ	0	0	0	0	0

Particle board top and leg without bracket

Table 16: Life cycle impacts – R2CJ (particle board top and legs without bracket)

Impact category		Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
			A1-A2	A3-A4	B1-C4		D
Global warming potential (GWP)	Fossil	kg CO_2 eq.	4.40E+02	3.99E+01	1.21E+02	6.01E+02	-2.36E+02
	Biogenic	kg CO_2 eq.	-3.59E+01	2.36E-02	8.89E+01	5.30E+01	-2.52E-01
	CO_2 eq. from land transformation	kg CO_2 eq.	2.57E-01	6.99E-05	3.97E-04	2.58E-01	-9.29E-04
	Total	kg CO_2 eq.	4.05E+02	4.00E+01	2.09E+02	6.54E+02	-2.37E+02
Abiotic depletion		kg Sb eq.	1.05E-02	2.25E-05	9.66E-05	1.06E-02	-7.05E-05
Abiotic depletion (fossil fuels)		MJ	3.66E+03	3.61E+02	1.60E+03	5.62E+03	-1.37E+03
Ozone layer depletion (ODP)		kg CFC-11 eq.	1.70E-05	2.59E-06	1.76E-05	3.73E-05	-5.22E-06
Photochemical oxidation		kg NMVOC	1.42E+00	3.46E-01	2.60E+00	4.36E+00	-7.17E-01
Acidification		kg SO_2 eq.	1.33E+00	1.93E-01	5.58E-01	2.08E+00	-5.64E-01
Eutrophication		kg PO_4^{3-} eq.	5.47E-01	4.61E-02	1.24E-01	7.17E-01	-1.04E-01
Water use		m^3	5.79E+03	2.94E+02	2.97E+02	6.38E+03	-5.09E+03

Table 17 Resource use – R2CJ (particle board top and legs without bracket)

Impact category		Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
			A1-A2	A3-A4	B1-C4		D
Primary energy resources Renewable	Use as energy carrier	MJ	9.07E+02	9.83E+00	5.23E+00	9.22E+02	-1.32E+02
	Use as raw materials	MJ	0	0	0	0	0
	Total	MJ	9.07E+02	9.83E+00	5.23E+00	9.22E+02	-1.32E+02
Primary energy resources Non-renewable	Use as energy carrier	MJ	4.14E+03	3.87E+02	1.70E+03	6.22E+03	-1.46E+03
	Use as raw materials	MJ	3.26E+00	0	0	3.26E+00	0
	Total	MJ	4.14E+03	3.87E+02	1.70E+03	6.22E+03	-1.46E+03
Secondary material resources		kg	0	0	0	0	0
Renewable secondary fuels		MJ	0	0	0	0	0
Non-renewable secondary fuels		MJ	0	0	0	0	0
Net use of fresh water		m^3	1.35E+02	6.84E+00	6.90E+00	1.49E+02	-1.18E+02

Table 18: Other impacts – R2CJ (particle board top and legs without bracket)

Impact category	Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
		A1-A2	A3-A4	B1-C4		D
Land use	species.yr	1.75E-07	1.32E-08	1.04E-08	1.99E-07	-6.11E-08
Human toxicity, cancer	CTUh	9.89E-08	1.01E-09	3.28E-09	1.03E-07	-1.71E-08
Human toxicity, non-cancer	CTUh	2.14E-08	1.78E-10	1.71E-09	2.33E-08	-7.42E-09
Freshwater ecotoxicity	CTUe	6.93E-01	4.41E-02	1.59E-01	8.95E-01	-1.64E-01

Table 19 Waste flow categories – R2CJ (particle board top and legs without bracket)

Impact category	Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
		A1-A2	A3-A4	B1-C4		D
Radioactive waste	kg	3.49E-02	5.53E-06	2.52E-06	3.49E-02	-1.28E-05
Hazardous waste	kg	8.43E-01	3.64E-04	6.96E-04	8.44E-01	3.78E-03
Non-hazardous waste	kg	1.86E+02	1.16E+00	5.12E+01	2.38E+02	-2.61E+01

Table 20: Output flow categories – R2CJ (particle board top and legs without bracket)

Impact category	Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
		A1-A2	A3-A4	B1-C4		D
Reuse	kg	0	0	0	0	0
Materials for recycling	kg	0	0	0	0	0
Energy recovered	MJ	0	0	0	0	0
Energy exported	MJ	0	0	0	0	0
Energy exported, thermal	MJ	0	0	0	0	0

R2CJ with Medium Density Fibreboard tabletop and legs without bracket

Table 21: Life cycle impacts – R2CJ (MDF top and legs without bracket)

Impact category		Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
			A1-A2	A3-A4	B1-C4		D
Global warming potential (GWP)	Fossil	kg CO_2 eq.	4.52E+02	3.99E+01	1.22E+02	6.14E+02	-2.37E+02
	Biogenic	kg CO_2 eq.	-4.56E+01	2.36E-02	8.99E+01	4.44E+01	-2.51E-01
	CO_2 eq. from land transformation	kg CO_2 eq.	2.57E-01	6.99E-05	4.01E-04	2.58E-01	-9.30E-04
	Total	kg CO_2 eq.	4.07E+02	4.00E+01	2.12E+02	6.58E+02	-2.38E+02
Abiotic depletion		kg Sb eq.	1.05E-02	2.25E-05	9.76E-05	1.06E-02	-7.05E-05
Abiotic depletion (fossil fuels)		MJ	3.77E+03	3.61E+02	1.61E+03	5.75E+03	-1.38E+03
Ozone layer depletion (ODP)		kg CFC-11 eq.	1.70E-05	2.59E-06	1.78E-05	3.74E-05	-5.24E-06
Photochemical oxidation		kg NMVOC	2.06E-01	3.58E-03	3.61E-02	2.45E-01	-7.17E-01
Acidification		kg SO_2 eq.	1.46E+00	3.46E-01	2.60E+00	4.40E+00	-5.68E-01
Eutrophication		kg PO_4^{3-} eq.	5.54E-01	4.61E-02	1.25E-01	7.26E-01	-1.05E-01
Water use		m^3	6.08E+03	2.94E+02	2.99E+02	6.68E+03	-5.09E+03

Table 22: Resource use – R2CJ (MDF top and legs without bracket)

Impact category		Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
			A1-A2	A3-A4	B1-C4		D
Primary energy resources Renewable	Use as energy carrier	MJ	9.04E+02	9.77E+00	5.22E+00	9.19E+02	-1.32E+02
	Use as raw materials	MJ	0	0	0	0	0
	Total	MJ	9.04E+02	9.77E+00	5.22E+00	9.19E+02	-1.32E+02
Primary energy resources Non-renewable	Use as energy carrier	MJ	4.26E+03	3.87E+02	1.72E+03	6.36E+03	-1.46E+03
	Use as raw materials	MJ	3.26E+00	0	0	3.26E+00	0
	Total	MJ	4.26E+03	3.87E+02	1.72E+03	6.36E+03	-1.46E+03
Secondary material resources		kg	0	0	0	0	0
Renewable secondary fuels		MJ	0	0	0	0	0
Non-renewable secondary fuels		MJ	0	0	0	0	0
Net use of fresh water		m^3	1.42E+02	6.84E+00	6.95E+00	1.56E+02	-1.18E+02

Table 23: Other impacts – R2CJ (MDF top and legs without bracket)

Impact category	Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
		A1-A2	A3-A4	B1-C4		D
Land use	species.yr	1.97E-07	1.32E-08	1.02E-08	2.21E-07	-6.32E-08
Human toxicity, cancer	CTUh	1.01E-07	1.01E-09	3.31E-09	1.05E-07	-1.73E-08
Human toxicity, non-cancer	CTUh	2.16E-08	1.78E-10	1.73E-09	2.35E-08	-7.42E-09
Freshwater ecotoxicity	CTUe	7.05E-01	4.41E-02	1.60E-01	9.09E-01	-1.65E-01

Table 24: Waste flow categories – R2CJ (MDF top and legs without bracket)

Impact category	Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
		A1-A2	A3-A4	B1-C4		D
Radioactive waste	kg	3.49E-02	5.53E-06	2.54E-06	3.49E-02	-1.28E-05
Hazardous waste	kg	8.43E-01	3.64E-04	7.03E-04	8.44E-01	3.63E-03
Non-hazardous waste	kg	1.86E+02	1.16E+00	5.18E+01	2.39E+02	-2.62E+01

Table 25: Output flow categories – R2CJ (MDF top and legs without bracket)

Impact category	Unit	Upstream processes	Core processes	Downstream processes with landfill	Total	Other environmental stage-Recycling
		A1-A2	A3-A4	B1-C4		D
Reuse	kg	0	0	0	0	0
Materials for recycling	kg	0	0	0	0	0
Energy recovered	MJ	0	0	0	0	0
Energy exported	MJ	0	0	0	0	0
Energy exported, thermal	MJ	0	0	0	0	0



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