

Environmental Product Declaration



In accordance with ISO 14025 and Product Category Rules 2009:02 version 3.0.2 Seats for:

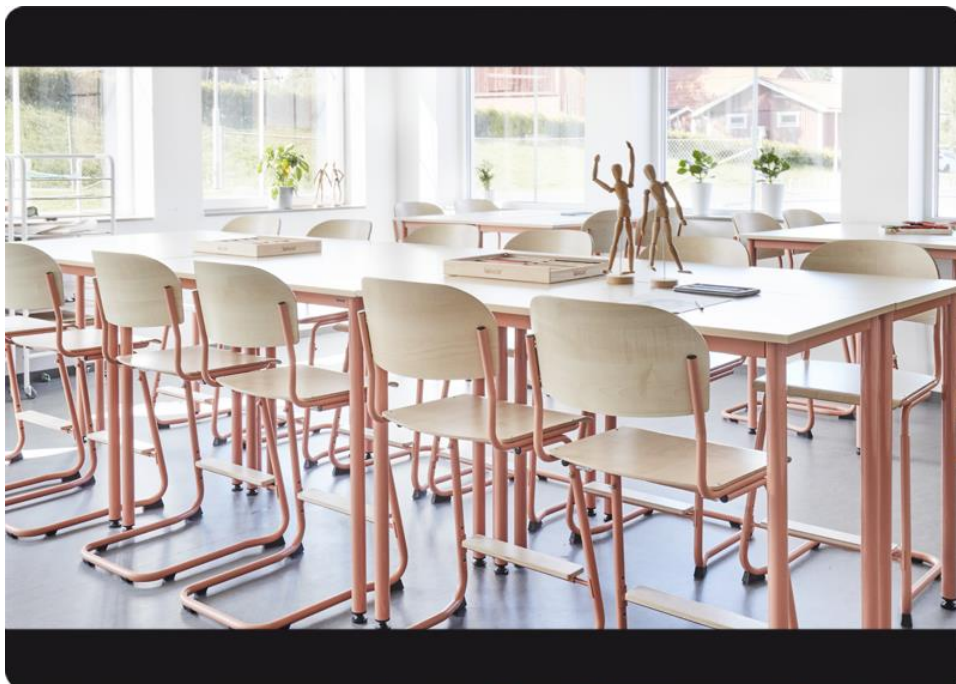
Chair Matte series

from





Lekolar AB

Lekolar®

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	
Publication date:	2023-02-06
Valid until:	2028-02-05



EPD Profile

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	<p>Third party Verifier</p> <p>Vladimír Kočí, LCA studio Approved by: The International EPD® System</p>

Product category rules (PCR): The International EPD System PCR for seats, 2009:02 version 3.0.2
UN CPC 3811

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

EPD process certification EPD verification

Third party verifier: Vladimír Kočí, LCA studio

Approved by: The International EPD® System Technical Committee, supported by the Secretariat

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes No

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable.

Company information

Description of the organization

Lekolar is one of the largest suppliers of school furniture and toys to the Nordic market. Our headquarters are located at Osby, with the production site and warehouse in Osby in Skåne county. Lekolar is ISO certified according to ISO 9001/14001 and 45001, focusing on providing a circular and environmentally sustainable range.

For more information regarding the products or the organization, see EPD owner's website: www.lekolar.se

Name and location of production sites

Chair Matte series is produced and assembled in Osby, Sweden. Wooden parts are made from FSC certified layerglued wood. Some of the items in the Matte range are Möbelfakta certified.

EPD Product information

Product name: Chair Matte.

Product identification:

This EPD covers all the chairs within the chair Matte series with the results presented for the smallest and the largest chair. To calculate the impacts from all the other chairs in the chair Matte series, results for 1 kg average of chair Matte are presented.

Product description:

Lekolar's products are developed to facilitate a positive and educational environment for school children chair Matte consist of a frame, back and seat. Additionally, the large chair has a footrest and footplate. The frame consists of a powder painted steel base with four legs. The footrest consists of a powder painted steel rod which supports the footplate. The back and seat are made from beech and laminate veneer and the footplate is made of beech veneer. The two components are produced and packaged at the suppliers and then transported to Lekolar for assembly and repackaging. The finished chair Matte is distributed by truck to end-customers on the Nordic market. For the maintenance, cleaning consumables are used. After its lifetime, the vast majority of steel is assumed to be recycled, while the powder paint and veneer are assumed to be incinerated.



Figure 1 A picture of one of the products in the chair Matte series.

This EPD is valid for all products in the chair Matte series. Specifications for each product can be found at www.lekolar.se

LCA Information

UN CFC code: 3811

Functional unit: 1 unit of Chair Matte, small and large.

Reference service life: A default reference service life of 15 years has been assumed, in line with the PCR for Seats. Lekolar product warrants, the products manufactured by it to be free from defects in material and workmanship for a period of 10 years. Service life is expected to be considerably longer than this.

Time representativeness: The data and information collected and modelled refers to the production year of 2020. The general datasets from databases are all representative and valid for the year 2020.

Geographical scope: Sweden

The geographical coverage of this LCA is scenario adapted, i.e. set to Sweden for the manufacturing and to region specifics, when possible, for the raw material extraction and production. This means that the data used for raw material extraction and production is adapted to the geographical region it is extracted from and produced in. The geographical coverage for transports is set to Europe.

Database(s) and LCA software used:

The LCA software SimaPro 9.3.0.3 was used in the assessment, with data from databases Ecoinvent 3.8, Environmental footprint (EF) database 2.0 and Industry data 2.0

Description of system boundaries:

Cradle-to-grave, i.e. life cycle stages upstream processes, core processes, and downstream processes.

Excluded lifecycle stages:

In core processes life cycle stage of maintenance are neither considered nor declared.

Allocation methodology:

The cut-off method has been applied within the product system. For allocations between product systems, the Polluter-pays allocation method has been used.

Cut-off: All raw materials according to the product formula, including their respective energy demands during extraction and production have been considered, as well as the main packaging materials used to prepare the final product for distribution. Some packaging materials & production solvents that constitute less than 1% of the product weight have been excluded. This cut-off rule does not apply for hazardous material and substances.

More information:

Since the Chair Matte series consist of a number of chairs in different sizes and models an average was compiled to calculate the impacts from any chair in this Chair Matte series. The average is compiled using data for the smallest and the largest chair included in the series. The results are expressed for 1 kg average of Chair Matte and presented in Tables 10-14.

For more information about the EPD owner, visit www.lekolar.se

For more information about the EPD producer, visit www.dge.se.

For more information about the underlying LCA study, contact the LCA practitioner Sayali Bhalekar (Sayali.Bhalekar@dge.se).

System diagram

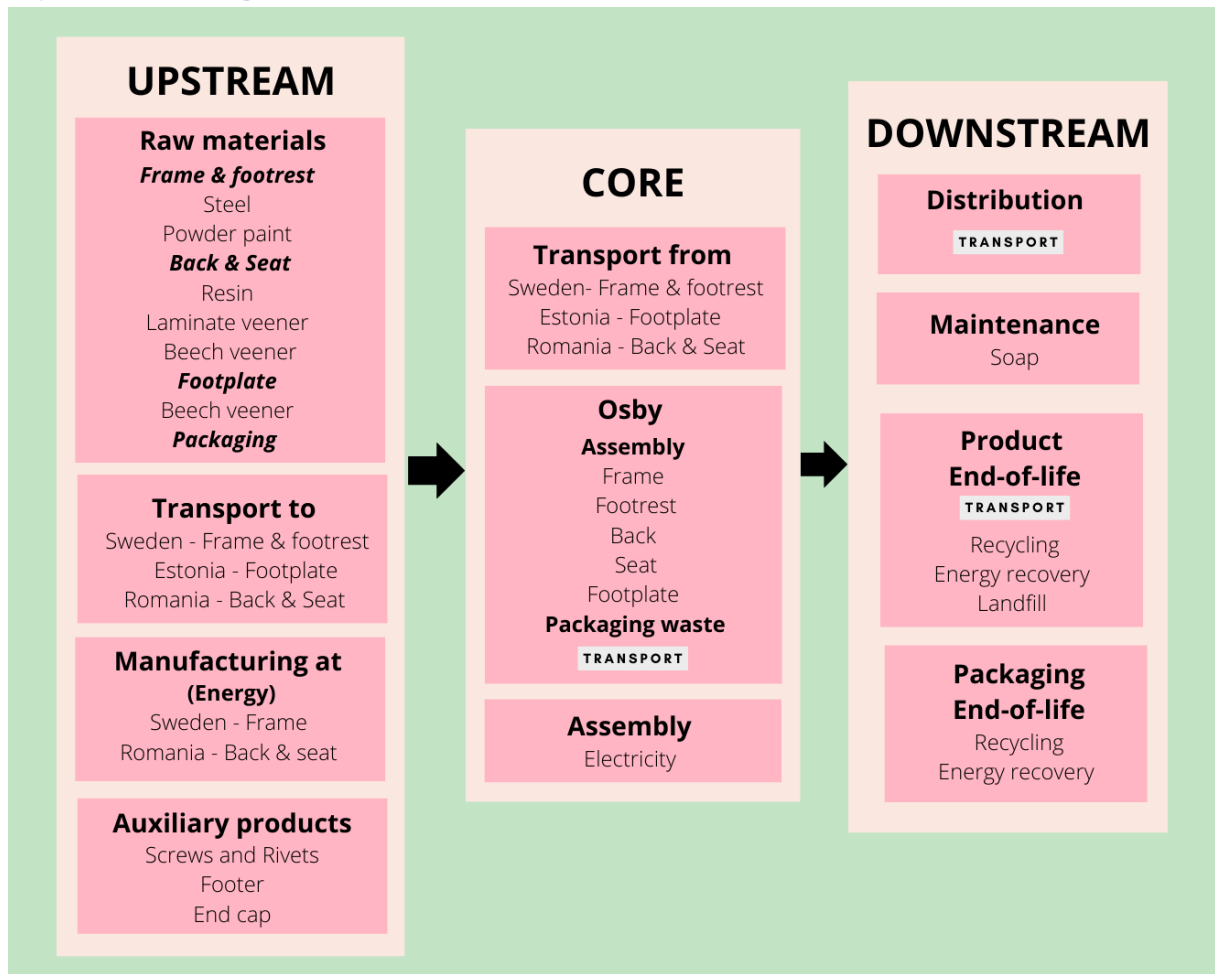


Figure 2. An illustration of the processes within the system boundary.

Description of life cycle stages upstream processes, core processes and downstream processes

Table 1 The life cycle stages included in this EPD and a description of each stage.

Stage	Description
Upstream processes	Extraction and processing of all raw materials used in production of the components, powder painted steel in Sweden, beech, laminate, glue, and hardener for back and seat in Romania and footplate in Estonia, occurring upstream. Inbound transportation of raw materials to the supplier site where the manufacturing takes place. The manufacturing of the components, the energy use and the waste generated in these processes. This stage also includes the packaging of the all the components.
Core processes	This stage includes the inbound transportation of the finished components of chair Matte to the manufacturing site in Osby. The modelling includes transportation on road and/or water, with processes for each component with packaging. In Osby these components are assembled to produce chair Matte small and large. It includes the electricity used for the assembly and the waste generated from the upstream packaging and assembly process.
Downstream processes	Finished chair Matte is packaged and distributed to the end customers on the Nordic market. Maintenance by cleaning is recommended. This stage also includes the end of life of chair Matte and its packaging.

Table 2 An overview of the life cycle stages declared for in this LCA.

	Upstream processes						Core processes					Downstream processes				
	Raw materials	Transport	Manufacturing	Energy use	Auxiliary products	Waste treatment	Transport	Assembly / Manufacturing	Maintenance	Waste treatment	Electricity and Fuels	Distribution transport	Maintenance	Use of product	Product end of life	Packaging end of life
Modules declared	X	X	X	X	X	X	X	X	MND	X	X	X	X	X	X	X
Geography	EU						SE					SE				

*SE Sweden *EU European union *N/R Not Relevant *N/A Not Applicable MND Module Not Declared

Content declaration

Table 3 Content declaration for the functional unit. None of the substances are regarded as SVHCs (Substances of very high concern) as defined in the REACH legislation.

Raw materials	Weight, kg/unit small chair Matte	Weight, kg/unit large chair Matte	Post-consumer material, weight-%
Steel	4	7,2	20%
Beech Veneer	0,304	1,004	-
Laminate Veneer	0,271	0,271	-
Glue	0,963	0,963	-
Hardener	0,212	0,212	-
Auxiliary Rivets – Steel	0,008	0,058	-
Auxiliary Covers – Plastic	0,01	0,012	-

Table 4 Declaration for distribution packaging materials.

Distribution Packaging materials	Weight, g	Weight-% (versus the product)	Weight, g	Weight-% (versus the product)	Post- consumer material, weight-%
	Small		Large		
					-
Plastic	200	3,50%	200	2,06%	-
Cardboard	500	8,77%	500	5,15%	-

The content declaration shall list substances contained in the products that are listed in the “Candidate List of Substances of Very High Concern for Authorization” when their content exceeds the limits for registration with the European Chemicals Agency: i.e. >0.1 % of the weight of the product. **No such substances are used in the products covered in this EPD.**

Environmental performance

Environmental impacts

The results are presented for each environmental impact category for 1 unit of small and large chair Matte in Table 5. The bar diagram visualises the relative results within each impact category for all the life cycle stages.

Table 5 Results for each impact category of all the life cycle stages.

1 unit of chair Matte		Small				Large				
Impact category	Unit	Upstream	Core	Downstream	Total	Upstream	Core	Downstream	Total	
Acidification (AP)	Kg SO ₂ eq.	4,77E-02	6,64E-03	3,27E-03	5,76E-02	7,80E-02	7,66E-03	5,09E-03	9,07E-02	
Eutrophication (EP)	kg PO ₄ ³⁻ eq.	2,22E-02	2,29E-03	1,59E-03	2,61E-02	3,66E-02	2,42E-03	2,24E-03	4,13E-02	
Global warming potential (GWP)	Fossil	kg CO ₂ eq.	1,27E+01	1,54E+00	1,68E+00	1,59E+01	2,05E+01	1,66E+00	2,43E+00	2,45E+01
	Biogenic	kg CO ₂ eq.	1,47E+00	2,32E+00	1,38E+00	5,17E+00	2,02E+00	2,32E+00	1,92E+00	6,26E+00
	LULT	kg CO ₂ eq.	1,64E-02	1,21E-02	7,51E-02	1,04E-01	2,74E-02	1,21E-02	7,54E-02	1,15E-01
	Total	kg CO ₂ eq.	1,42E+01	3,87E+00	3,13E+00	2,12E+01	2,25E+01	3,99E+00	4,42E+00	3,09E+01
Photochemical oxidation (POCP)	kg C ₂ H ₂ eq.	5,73E-03	5,53E-04	1,82E-04	6,64E-03	9,43E-03	5,84E-04	2,57E-04	1,03E-02	
Abiotic depletion, Elements	kg Sb eq.	1,97E-04	9,10E-06	1,39E-05	2,20E-04	3,08E-04	9,45E-06	2,38E-05	3,42E-04	
Abiotic depletion, fossil fuels	MJ, net calorific value	1,68E+02	2,84E+01	9,68E+00	2,06E+02	2,49E+02	3,01E+01	1,54E+01	2,95E+02	
Water scarcity	m ³ eq.	5,89E+00	7,55E-01	7,35E-01	7,38E+00	7,73E+00	7,59E-01	8,07E-01	9,30E+00	

LULT* Land use and land transformation

Other environmental indicators

Table 6 Results for other mandatory impact categories for all the life cycle stages.

1 unit of chair Matte		Small				Large			
Impact category	Unit	Upstream	Core	Downstream	Total	Upstream	Core	Downstream	Total
Human toxicity, cancer impacts	Cases	9,55E-06	1,13E-07	1,99E-07	9,86E-06	1,69E-05	1,19E-07	2,61E-07	1,73E-05
Human toxicity, non-cancer impacts	Cases.	3,01E-06	3,73E-07	6,48E-07	4,03E-06	4,89E-06	3,86E-07	9,34E-07	6,21E-06
Fresh water ecotoxicity	PAF.m3.day	1,82E+05	1,38E+04	8,56E+04	2,81E+05	2,84E+05	1,41E+04	1,24E+05	4,22E+05
Land use	Species. yr	1,72E-08	1,05E-8	1,13E-09	2,88E-08	3,19E-08	1,06E-8	1,31E-09	4,37E-08

Use of resources

The results for resource use for 1 unit of small and large chair Matte are presented in Table 7.

Table 7 Results for resource use for all the life cycle stages.

1 unit of chair Matte			Small				Large			
Parameter	Unit		Upstream	Core	Downstream	Total	Upstream	Core	Downstream	Total
Primary energy resources - Renewable	Use as energy carrier	MJ*	5,42E+01	3,15E+01	3,34E+00	8,90E+01	9,94E+01	3,15E+01	3,57E+00	1,34E+02
	Used as raw materials	MJ*	1,02E+01	1,05E+01	0	2,07E+01	2,16E+01	1,05E+01	0	3,21E+01
	TOTAL	MJ*	6,44E+01	4,20E+01	3,34E+00	1,10E+02	1,21E+02	4,20E+01	3,57E+00	1,66E+02
Primary energy resources - Non-renewable	Use as energy carrier	MJ*	1,92E+02	4,23E+01	1,03E+01	2,44E+02	2,88E+02	4,40E+01	1,62E+01	3,48E+02
	Used as raw materials	MJ*	2,83E+01	7,00E+00	0	3,53E+01	4,17E+02	7,00E+00	0	4,24E+02
	TOTAL	MJ*	2,20E+02	4,93E+01	1,03E+01	2,79E+02	7,05E+02	5,10E+01	1,62E+01	7,72E+02
Secondary material	kg		8,00E-01	0	0	8,00E-01	1,24E+00	0	0	1,24E+00
Renewable secondary fuels	MJ*		0	0	0	0	0	0	0	0
Non-renewable secondary fuels	MJ*		0	0	0	0	0	0	0	0
Net use fresh water	m ³		5,89E+00	7,55E-01	7,35E-01	7,38E+00	7,73E+00	7,59E-01	8,07E-01	9,30E+00

*Net calorific value

Waste production and output flows

The results for waste production and output flows for 1 unit of small and large Chair Matte are presented in Table 8 and Table 9.

Waste production

Table 8 Results for waste production from all the life cycle stages.

1 unit of chair Matte		Small				Large			
Parameter	Unit	Upstream	Core	Downstream	Total	Upstream	Core	Downstream	Total
Hazardous waste disposed	kg	9,75E-05	1,73E-07	0	9,77E-05	7,71E-04	1,73E-07	0	7,71E-04
Non-hazardous waste disposed	kg	5,14E-01	8,65E-04	7,61E-02	5,91E-01	9,33E-01	8,65E-04	9,17E-02	1,03E+00
Radioactive waste disposed	kg	2,32E-09	0	5,00E-05	5,00E-05	1,68E-08	0	5,00E-05	5,00E-05

Output flows

Table 9 Outflows from all the life cycle stages.

1 unit of chair Matte		Small				Large			
Parameter	Unit	Upstream	Core	Downstream	Total	Upstream	Core	Downstream	Total
Materials for reuse	kg	0	0	0	0	0	0	0	0
Materials for recycling	kg	4,15E-02	4,85E-03	4,80E+00	4,84E+00	7,95E-02	4,89E-03	7,84E+00	7,92E+00
Materials for energy recovery	kg	5,22E-04	7,53E-02	2,00E+00	2,08E+00	7,02E-04	7,53E-02	2,70E+00	2,78E+00
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0

Results for 1 kg average of chair Matte

Results for 1 kg average of chair Matte to calculate the impacts for all the chairs in the Chair Matte series.

Environmental performances

The results are presented for each environmental impact category for 1 kg average of Chair Matte in Table 10. The bar diagram visualises the relative results within each impact category for all the life cycle stages. The column deviation represents the percentage of deviation in the results for 1 kg small and 1 kg large of Chair Matte for all the impact categories.

Table 10 Results for each impact category of the life cycle stages.

1 kg average Chair Matte		Upstream	Core	Downstream	Total	Deviation	
Impact category	Unit						
Acidification (AP)	Kg SO ₂ eq.	8,15E-03	9,70E-04	5,45E-04	9,66E-03	±3%	
Eutrophication (EP)	kg PO ₄ ³⁻ eq.	3,81E-03	3,23E-04	2,54E-04	4,38E-03	±3%	
Global warming potential (GWP)	Fossil	kg CO ₂ eq.	2,15E+00	2,19E-01	2,70E-01	2,64E+00	±4%
	Biogenic	kg CO ₂ eq.	2,31E-01	3,21E-01	2,18E-01	7,70E-01	±16%
	Land use and land transformation	kg CO ₂ eq.	2,84E-03	1,67E-03	1,04E-02	1,49E-02	±21%
	Total	kg CO ₂ eq.	2,38E+00	5,41E-01	4,99E-01	3,42E+00	±7%
Photochemical oxidation (POCP)	kg C ₂ H ₂ eq.	9,82E-04	7,80E-05	2,90E-05	1,09E-03	±3%	
Abiotic depletion, Elements	kg Sb eq.	3,29E-05	1,27E-06	2,42E-06	3,66E-05	±4%	
Abiotic depletion, fossil fuels	MJ, net calorific value	2,74E+01	4,01E+00	1,63E+00	3,30E+01	±8%	
Water scarcity	m ³ eq.	9,09E-01	1,04E-01	1,05E-01	1,12E+00	±14%	

Other environmental impact indicators

The column deviation represents the percentage of deviation in the results for 1 kg small and 1 kg large of Chair Matte for all the other impact categories.

Table 11 Results for other mandatory impact categories for all the life cycle stages.

1 kg average Chair Matte		Upstream	Core	Downstream	Total	Deviation
Impact category	Unit					
Human toxicity, cancer impacts	Cases	1,70E-06	1,59E-08	3,07E-08	1,74E-06	±2%
Human toxicity, non-cancer impacts	Cases.	5,12E-07	5,22E-08	1,04E-07	6,69E-07	±4%
Fresh water ecotoxicity	PAF.m3.day	3,04E+04	1,92E+03	1,38E+04	4,61E+04	±6%
Land use	Species.yr	3,13E-09	1,45E-09	1,65E-10	4,75E-09	±5%

Resource use

Table 12 Results for resource use for all the life cycle stages.

1 kg average Chair Matte			Upstream	Core	Downstream	TOTAL
Parameter	Unit					
Primary energy resources - Renewable	Use as energy carrier	MJ, net calorific value	9,81E+00	4,35E+00	4,73E-01	1,46E+01
	Used as raw materials	MJ, net calorific value	2,00E+00	1,45E+00	0	3,45E+00
	TOTAL	MJ, net calorific value	1,81E+01	5,80E+00	4,73E-01	1,80E+01
Primary energy resources -Non-renewable	Use as energy carrier	MJ, net calorific value	3,14E+01	5,93E+00	1,72E+00	3,91E+01
	Used as raw materials	MJ, net calorific value	2,39E+01	9,67E-01	0	2,49E+01
	TOTAL	MJ, net calorific value	5,53E+01	6,90E+00	1,72E+00	6,40E+01
Secondary material	kg		1,33E-01	0	0	1,33E-01
Renewable secondary fuels	MJ, net calorific value		0	0	0	0
Non-renewable secondary fuels	MJ, net calorific value		0	0	0	0
Net use fresh water	m ³		9,09E-01	1,04E-01	1,05E-01	1,12E+00

Waste production and output flows

The results for waste production and output flows for 1 kg average of chair Matte are presented in Table 13 and Table 14.

Waste production

Table 13 Results for waste production from all the life cycle stages.

1 kg average Chair Matte		Upstream	Core	Downstream	TOTAL
Parameter	Unit				
Hazardous waste disposed	kg	4,81E-05	2,39E-08	0	4,81E-05
Non-hazardous waste disposed	kg	9,26E-02	1,19E-04	1,13E-02	1,04E-01
Radioactive waste disposed	kg	1,07E-09	0	6,90E-06	6,90E-06

Output flows

Table 14 Outflows from all the life cycle stages.

1 kg average Chair Matte		Upstream	Core	Downstream	TOTAL
Parameter	Unit				
Materials for reuse	kg	0	0	0	0
Materials for recycling	kg	7,69E-03	6,72E-04	8,19E-01	8,27E-01
Materials for energy recovery	kg	8,14E-05	1,04E-02	3,12E-01	3,23E-01
Exported energy, electricity	MJ	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0

References

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