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The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Glava AS
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-1696-683-EN
Registration number:	NEPD-1696-683-EN
ECO Platform reference number:	-
Issue date:	28.01.2019
Valid to:	28.01.2024 (validity extended to 31.12.2024)

Glava glass wool

Glava AS

www.epd-norge.no

General information

Product:
Glava glass wool

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Declaration number:
NEPD-1696-683-EN

Place of production:
Askim, Norway

ECO Platform reference number:

Management system:
ISO 9001:2008 and ISO 14001

This declaration is based on Product Category Rules:
CEN Standard EN 15804 serves as core PCR
NPCR Construction products and services - Part A and NPCR 012 version 2 PCR-Part B for Thermal insulation products

Organisation no:
912008754

Statement of liability:
The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Issue date:
28.01.2019

Valid to:
28.01.2024 (validity extended to 31.12.2024

Scope:
Cradle to Grave

Year of study:
2017-2018

Declared unit:
1 m^2 of 34 mm thick Glava glass wool insulation material with a density of 17.5 kg/m^3 and a thermal resistance of 1.0 Km^2W^{-1}.

Comparability:
EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

Functional unit:
1 m^2 of 34 mm thick Glava glass wool insulation material with a density of 17.5 kg/m^3, thermal resistance of 1.0 Km^2W^{-1} and a reference service lifetime of 60 years.

The EPD has been worked out by:
Selamawit Mamo Fufa

Selamawit M. Fufa

Verification:

The CEN Norm EN 15804 serves as the core PCR.
Independent verification of the declaration and data, according to ISO14025:2010

☐ internal ☑ external

Third party verifier:

sign

Marti Reenaas

(Independent verifier approved by EPD Norway)

Approved

Håkon Hauan

Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:
Glava glass wool insulation materials are mainly manufactured from recycled glass (52%). The products are used to insulate against cold, heat, fire and sound. They can be used in buildings, industrial installations, road, rail and marine constructions.

Product specification:
The calculations are based on the 1 m^2 of of 34 mm thick Glava glass wool insulation material with a density of 17.5 kg/m^3 and a thermal resistance of 1.0 Km^2W^{-1} (Table 1).

Table 1. Composition of the final product

Materials	kg	%
Sand and other minerals	0,214	36
Recycled resources	0,312	52
Binders	0,061	10
Dust binding oil	0,008	1
Sum of materials	***0,595***	***100***
Wood packaging	0,026	
Plastic packaging	0,012	
Total with packaging	***0,74***	

Technical data:
The mass of the declared unit is 0,595 kg, without including the packaging, a thickness of 34 mm, and a density of 17.5 kg/m^3.For information on technical data, see www.glava.no

Market
Norway

Reference service life, product:
The Reference service life of the product is 60 years.

Reference service life, building:
The Reference service life of the building is 60 years.

Glava glass wool insulation products are produced in different thicknesses and densities. The environmental impact of each product can be estimated by multiplying with the factors give in Table 2. For Glava glass wool products with cover facing materials, products marked with an asterisk (*) under Table 2 below, the impact from the cover facing materials shall be added in the final result using the following formula:

E*nvironmental impact per m2 of product with cover facing*= Environmental impact of reference product x scaling factor + Environmental impact of cover facing material*

Environmental impact of the cover facing material is demonstrated in Appendix 1.

Table 2. Factors used to estimate the environmental impact for each glass wool products

Thickness (mm)	12 kg	17 kg	25 kg	28 kg	35 kg	48 kg	60 kg	80 kg	90 kg	116 kg	130 kg
20	0,4	0,6	0,9	1,0	1,2	1,7	2,1	2,9	3,2	4,1	4,6
25	0,5	0,8	1,1	1,2	1,6	2,1	2,7	3,6	4,0	5,2	5,8
30	0,6	0,9	1,3	1,5	1,9	2,6	3,2	4,3	4,8	6,2	7,0
40	0,9	1,2	1,8	2,0	2,5	3,4	4,3	5,7	6,4	8,3	9,3
50	1,1	1,5	2,2	2,5	3,1	4,3	5,3	7,1	8,0	10,3	11,6
60	1,3	1,8	2,7	3,0	3,7	5,1	6,4	8,6	9,6	12,4	13,9
70	1,5	2,1	3,1	3,5	4,4	6,0	7,5	10,0	11,2	14,5	16,2
75	1,6	2,3	3,3	3,7	4,7	6,4	8,0	10,7	12,0	15,5	17,4
80	1,7	2,4	3,6	4,0	5,0	6,8	8,6	11,4	12,8	16,5	18,5
100	2,1	3	4,5	5,0	6,2	8,6	10,7	14,3	16,0	20,7	23,2
120	2,6	3,6	5,3	6,0	7,5	10,3	12,8	17,1	19,3	24,8	27,8
125	2,7	3,8	5,6	6,2	7,8	10,7	13,4	17,8	20,1	25,8	29,0
140	3	4,2	6,2	7,0	8,7	12,0	15,0	20,0	22,5	28,9	32,4
150	3,2	4,5	6,7	7,5	9,4	12,8	16,0	21,4	24,1	31,0	34,8
170	3,6	5,2	7,6	8,5	10,6	14,5	18,2	24,2	27,3	35,2	39,4
175	3,7	5,3	7,8	8,7	10,9	15,0	18,7	25,0	28,1	36,2	40,6
180	3,9	5,5	8	9,0	11,2	15,4	19,3	25,7	28,9	37,2	41,7
200	4,3	6,1	8,9	10,0	12,5	17,1	21,4	28,5	32,1	41,4	46,3
220	4,7	6,7	9,8	11,0	13,7	18,8	23,5	31,4	35,3	45,5	51,0
240	5,1	7,3	10,7	12,0	15,0	20,5	25,7	34,2	38,5	49,6	55,6
250	5,3	7,6	11,1	12,5	15,6	21,4	26,7	35,7	40,1	51,7	57,9
280	6	8,5	12,5	14,0	17,5	24,0	29,9	39,9	44,9	57,9	64,9
300	6,4	9,1	13,4	15,0	18,7	25,7	32,1	42,8	48,1	62,0	69,5
340	7,3	10,3	15,2	17,0	21,2	29,1	36,4	48,5	54,5	70,3	78,8
350	7,5	10,6	15,6	17,5	21,8	29,9	37,4	49,9	56,1	72,4	81,1
380	8,1	11,5	16,9	19,0	23,7	32,5	40,6	54,2	61,0	78,6	88,1
390	8,3	11,8	17,4	19,5	24,3	33,4	41,7	55,6	62,6	80,6	90,4
410	8,8	12,4	18,3	20,5	25,6	35,1	43,9	58,5	65,8	84,8	95,0

Category 12 kg:	Økonomi 38 Products	Category 48 kg:	Veggplate 31, blåseull (lukket hulrom), GLAVA Akuduk Products*
Category 17 kg:	Proff 34 products, Marine wire mat alu*, Marine roll 16, Marine slab 16, Vintermatte*, Dyttestrimmel, Sydd matte*	Category 60 kg:	Glava Robust Lamell, Lydstopplate
		Category 80 kg:	Glava Venus A*, Glava Super Nova*
Category 25 kg:	Extrem 32 products, Laftestrimmel, Blåseull (åpent blåst), Plussplate	Category 116 kg:	Glava Venus E*, Trinnlydplate
Category 28 kg:	Murplate 32 and Lamellmatte*		
Category 35 kg:	Ventilasjonsplate, Lydfelleplate 2000*		

LCA: Calculation rules

Declared unit:
1 m^2 of 34 mm thick Glava glass wool insulation material with a density of 17.5 kg/m^3 and a thermal resistance of 1.0 Km^2W^{-1}, from raw material extraction (A1) to the factory gate (A3).

System boundary:
Modules A1-A5, B1-B5, C1-C4 and D are included in the analysis. Module B6 and B7 are not relevant in accordance with NPCR 012 version 2. Figure 1 shows the system boundary considered in the analysis.

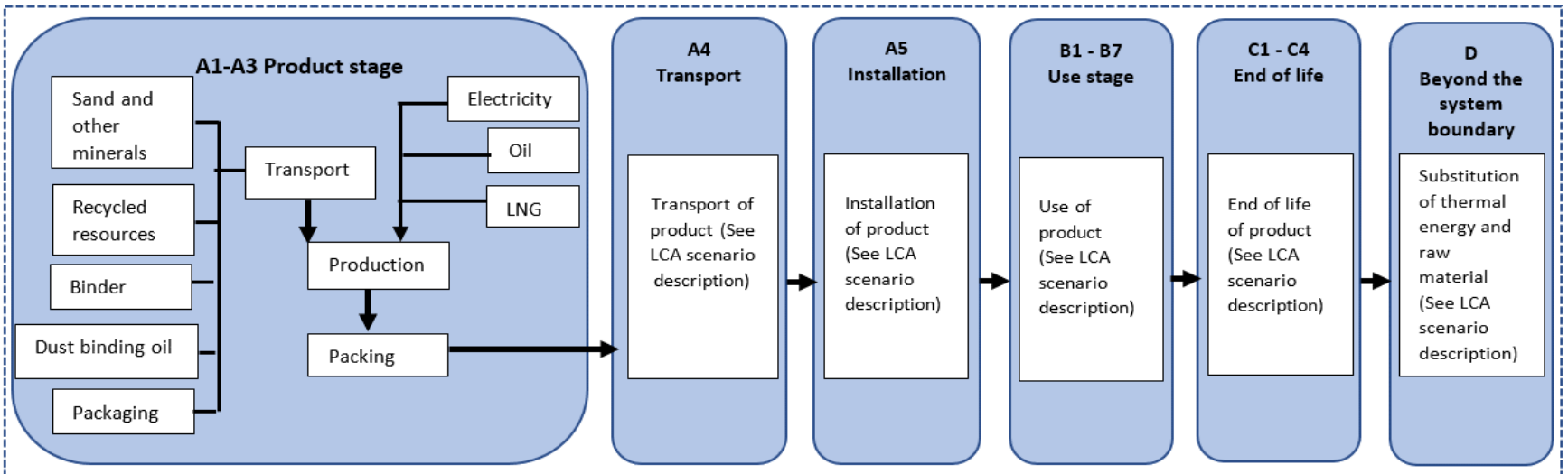

Figure 1: System boundary

Data quality:
The data quality requirements are according to EN 15804:2012+A1:2013 clause 6.3.6. Specific data collected from manufacturer is applied for the most important raw materials in A1. Specific data from the 2016 production at the manufacturing site is applied in A3. The production data of Glava insulation material is from one production site, Aksim in Norway, so no average data has been used for different locations. Missing data were susbtituted with generic data from Ecoinvent v.3.3. No data are more than 5 years old.

Cut-off criteria:
General cut-off criteria are given in standard EN 15804:2012+A1:2013 clause 6.3.5. In compliance with these criteria, all major raw materials and all the essential energy are included. The production process for raw materials and energy flows with very small amounts (<1%) are not included. This includes infrastructure of the manufacturing site and some de-dusting mateials. This cut-off rule does not apply for hazardous materials and substances.

Allocation:
The allocation is made in accordance to EN 15804:2012+A1:2013. Energy, water and waste consumption in the factory is allocated to the FU by mass allocation. Effects of primary production of recycled materials are allocated to the main product in which the material was used.

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Transport from production place to user (A4)

Type	Destination	Capacity utilisation (incl. return) %**	Type of vehicle	Distance km	Fuel/Energy consumption	Unit
Truck	Norway	85% capacity in volume (40% empty return)	Lorry 16-32 tons, EURO6	230	0,04	l/tkm

An average transport distance of 230km is considered. This is a representative transport distance to the building site in Norway.

Assembly (A5)

	Unit	Value
Auxiliary materials	kg	0
Water consumption	m^3	0
Electricity consumption	kWh	0
Other energy carriers	kWh	0
Material loss	kg	0
Output materials from waste treatment	kg	0,02
Dust in the air	kg	0

The Energy usage and loss of material during installation (A5) is assumed to be negligible. The packaging waste treatment is considered in the calculation. The benefits from energy generation and recycling from the end-of-waste state of packaging are reported under Module D.

Maintenance (B2)/Repair (B3)

	Unit	Value
Maintenance cycle*	kg	0
Auxiliary	kg	0
Other resources	kg	0
Water consumption	m^3	0
Electricity consumption	kWh	0
Other energy carriers	MJ	0
Material loss	kg	0

Operational energy (B6) and water consumption (B7)

	Unit	Value
Water consumption	m^3	
Electricity consumption	kWh	
Other energy carriers	MJ	
Power output of equipment	kW	

Insulation materials require no energy (B6) or water (B7) to operate.

Use (B1)

	Unit	Value
No LCA-related environmetal impacts		0

There is no environmental related impact (B1) by the insulation material during the service life.

Replacement (B4)/Refurbishment (B5)

	Unit	Value
Replacement cycle*	Yr	60

* Number or RSL (Reference Service Life)

In normal use scenario, it is assumed that there is no maintenance (B2), repair (B3), replacement (B4) and refubrishment (B5) is needed.

End of Life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	kg	0
Collected as mixed construction waste	kg	0,595
Reuse	kg	0
Recycling	kg	0
Energy recovery	kg	0
To landfill	kg	0,595

End-of-life life scenario, C1, C3 and C4, is based on materials being separated on site. Energy use for deconstruction in C1 is considered insignificant. The mineral wool is assumed to be 100% landfilled (C4).

Transport to waste processing (C2)

Type	Destination	Capacity utilisation (incl. return) %**	Type of vehicle	Distance km	Fuel/Energy consumption	Unit
Truck	To landfill	53	Lorry >32 tons, EURO5	25	0,02	l/tkm

The transport in C2 represents transport to disposal site in Norway.

Benefits/loads beyond the system boundary (D)

	Unit	Value
Substitution of thermal energy	kWh	0,15
Substitution of plastic material	kg	0,01

Loads and benefits from packaging waste treatment in A5 are reported in module D. The benefits are calculated using current average substitution solutions.

** The capacity utilization factors for truck are calculated from Ecoinvent v3.1. Capacity utilisation factors for boat are from Ecoinvent v2.2 report 14: Transport Services (Kolle et al., 1991) (Knørr et al., 2000)

LCA: Results

Life cycle impact assessment results represent the environmental impacts of Glava glass wool insulation with 34mm thickness.

System boundaries (X=included, MND= module not declared, MNR=module not relevant)

Product stage			Assemby stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	MNR	MNR	X	X	X	X	X

Environmental impact

Parameter	Unit	A1-A3	A4	A5	B1-B5	C1	C2	C3	C4	D
GWP	kg CO_2 -eqv	4,30E-01	6,27E-02	9,34E-04	0,00E+00	0,00E+00	1,34E-03	0,00E+00	3,23E-03	-1,68E-02
ODP	kg CFC11-eqv	2,37E-08	1,15E-08	7,82E-11	0,00E+00	0,00E+00	2,57E-10	0,00E+00	1,07E-09	1,87E-10
POCP	kg C_2H_4 -eqv	1,70E-04	9,89E-06	4,51E-07	0,00E+00	0,00E+00	2,25E-07	0,00E+00	1,18E-06	-3,70E-06
AP	kg SO_2 -eqv	1,38E-03	1,57E-04	9,40E-06	0,00E+00	0,00E+00	4,55E-06	0,00E+00	2,46E-05	-5,28E-05
EP	kg PO_4^{3-}-eqv	4,23E-04	3,26E-05	1,01E-05	0,00E+00	0,00E+00	9,92E-07	0,00E+00	5,42E-06	-3,99E-06
ADPM	kg Sb-eqv	7,25E-07	1,89E-07	1,23E-09	0,00E+00	0,00E+00	2,52E-09	0,00E+00	3,36E-09	6,65E-09
ADPE	MJ	4,42E+00	9,41E-01	6,42E-03	0,00E+00	0,00E+00	2,09E-02	0,00E+00	9,03E-02	-6,34E-01

GWP Global warming potential; ODP Depletion potential of the stratospheric ozone layer; POCP Formation potential of tropospheric photochemical oxidants; AP Acidification potential of land and water; EP Eutrophication potential; ADPM Abiotic depletion potential for non fossil resources; ADPE Abiotic depletion potential for fossil resources

Resource use

Parameter	Unit	A1-A3	A4	A5	B1-B5	C1	C2	C3	C4	D
RPEE	MJ	5,25E+00	1,23E-02	4,88E-04	0,00E+00	0,00E+00	3,05E-04	0,00E+00	2,18E-03	2,16E-01
RPEM	MJ	5,06E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-5,06E-01
TPE	MJ	5,76E+00	1,23E-02	4,88E-04	0,00E+00	0,00E+00	3,05E-04	0,00E+00	2,18E-03	-2,90E-01
NRPE	MJ	4,51E+00	9,58E-01	8,18E-03	0,00E+00	0,00E+00	2,13E-02	0,00E+00	9,18E-02	-6,35E-01
NRPM	MJ	3,56E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,11E-02
TRPE	MJ	4,86E+00	9,58E-01	8,18E-03	0,00E+00	0,00E+00	2,13E-02	0,00E+00	9,18E-02	-6,66E-01
SM	kg	3,12E-01	INA	INA	INA	INA	INA	INA	INA	INA
RSF	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA
NRSF	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA
W	m3	2,16E+00	4,52E-02	2,59E-03	0,00E+00	0,00E+00	1,13E-03	0,00E+00	2,89E-03	7,51E-02

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE Total use of non renewable primary energy resources; SM Use of secondary materials; RSF Use of renewable secondary fuels; NRSF Use of non renewable secondary fuels; W Use of net fresh water

INA = Indicator not assessed

End of life - Waste

Parameter	Unit	A1-A3	A4	A5	B1-B5	C1	C2	C3	C4	D
HW	kg	5,00E-05	INA	INA	INA	INA	INA	INA	INA	0,00E+00
NHW	kg	2,94E-02	INA	3,78E-02	INA	INA	INA	INA	5,95E-01	0,00E+00
RW	kg	INA	INA	INA	INA	INA	INA	INA	INA	0,00E+00

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

End of life - Output flow

Parameter	Unit	A1-A3	A4	A5	B1-B5	C1	C2	C3	C4	D
CR	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA
MR	kg	INA	INA	9,00E-03	INA	INA	INA	INA	INA	INA
MER	kg	INA	INA	2,70E-02	INA	INA	INA	INA	INA	5,66E-02
EEE	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA
ETE	MJ	INA	INA	INA	INA	INA	INA	INA	INA	1,02E-01

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Reading example: 9,0 E-03 = $9{,}0*10^{-3}$ = 0,009

Additional Norwegian requirements

Greenhous gas emission from the use of electricity in the manufacturing phase
Norwegian production mix from import, high Voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing prosess (A3).

Data source	Amount	Unit
Econinvent v3.3 (2016)	29,2	gCO_2-eqv/kWh

Dangerous substances

- ☑ The product contains no substances given by the REACH Candidate list or the Norwegian priority list
- ☐ The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.
- ☐ The product contain dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.
- ☐ The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskiften, Annex III), see table.

Indoor environment
The product meets the requirements for low emissions (class II) of formaldehyde, TVOC and CMR according to EN15251: 2007 National Appendix NA 4.

Carbon footprint
Carbon footprint has not been worked out for the product.

Bibliography

ISO 14020:2000	*Environmental labels and declarations - General principles*
ISO 14025:2010	*Environmental labels and declarations - Type III environmental declarations - Principles and procedures*
ISO 14044:2006	*Environmental management - Life cycle assessment - Requirements and guidelines*
EN 15804:2012+A1:2013	*Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products*
ISO 21930:2007	*Sustainability in building construction - Environmental declaration of building products*
EN 15251:2007	*Indoor environmental input parameters for design and assessment of energy performance of buildings*
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EN 16485:2014	*Round and sawn timber - Environmental Product Declarations - Product category rules for wood and wood-based products for use in construction*
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Appendix 1 Environmental impact of cover facing materials

The environmental impact assessment of products with cover facing options is performed in accordance with the general methodology, background data and assumptions described and verified in Glava Glass wool EPD and LCA report. This annex is a supplementary file to the verified Glava glass wool EPD (NEPD-1696-683).

The impact assessment of the cover facing materials per $1m^2$ for each Glava glass wool products with cover facing materials, products marked with an asterisk (*), is given below.

Thus, the environmental impact from cover facing materials is calculated using the following formula given in the EPD:

Environmental impact per m^2 of product with cover facing= Environmental impact of reference product x Scaling factor + Environmental impact of cover facing material.*

The packaging and biogenic carbon is considered below cut-off criteria. In addition, the end-of-life scenarios for cover facing materials is assumed to landfilled.

Impact assessment result for $1m^2$ of cover facing material used in Marine Wire Mat Alu* products.

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - Global warming potential	kg CO2 -eqv	0.912	0.013	0.000	0.000	0.001	0.000	0.002	0.000
ODP - Depletion potential of the stratosph	kg CFC11-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
POCP - Formation potential of troposphericning	kg C2H4 -eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AP - Acidification potential of land and water	kg SO2 -eqv	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EP - Eutrophication potential	kg PO43--eqv	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPM - Abiotic dep pot for non-fossil res	kg Sb-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPE - Abiotic dep pot for fossil res	MJ	11.165	0.199	0.000	0.000	0.012	0.000	0.053	0.000
RPEE - Ren pri energy res used as energy	MJ	2.542	0.003	0.000	0.000	0.000	0.000	0.001	0.000
RPEM - Ren pri energy res used as material	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TPE - Total use of ren prim energy	MJ	2.542	0.003	0.000	0.000	0.000	0.000	0.001	0.000
NRPE - Non ren pri en used as energy	MJ	13.202	0.202	0.000	0.000	0.013	0.000	0.054	0.000
NRPM - Non ren pri energy used as material	MJ	0.747	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TRPE - Total use of non ren pri energy	MJ	13.949	0.202	0.000	0.000	0.013	0.000	0.054	0.000
SM - Use of secondary materials	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RSF - Use of renewable secondary fuels	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NRSF - Use of non renewable secondary fuel	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W - Use of net fresh water	m3	7.721	0.010	0.000	0.000	0.001	0.000	0.002	0.000
HW - Hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NHW - Non hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.351	0.000
RW - Radioactive waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CR - Components for reuse	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MR - Materials for recycling	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MER - Materials for energy recovery	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EEE - Exported electric energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ETE - Exported thermal energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Impact assessment result for 1m^2 of cover facing material used in Vintermatte* products.

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - Global warming potential	kg CO2 -eqv	0.439	0.007	0.000	0.000	0.000	0.000	0.001	0.000
ODP - Depletion potential of the stratosph	kg CFC11-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
POCP - Formation potential of tropospherícning	kg C2H4 -eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AP - Acidification potential of land and water	kg SO2 -eqv	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EP - Eutrophication potential	kg PO43--eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPM - Abiotic dep pot for non-fossil res	kg Sb-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPE - Abiotic dep pot for fossil res	MJ	18.932	0.109	0.000	0.000	0.007	0.000	0.029	0.000
RPEE - Ren pri energy res used as energy	MJ	0.262	0.001	0.000	0.000	0.000	0.000	0.001	0.000
RPEM - Ren pri energy res used as material	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TPE - Total use of ren prim energy	MJ	0.262	0.001	0.000	0.000	0.000	0.000	0.001	0.000
NRPE - Non ren pri en used as energy	MJ	14.656	0.111	0.000	0.000	0.007	0.000	0.030	0.000
NRPM - Non ren pri energy used as material	MJ	5.737	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TRPE - Total use of non ren pri energy	MJ	20.393	0.111	0.000	0.000	0.007	0.000	0.030	0.000
SM - Use of secondary materials	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RSF - Use of renewable secondary fuels	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NRSF - Use of non renewable secondary fuel	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W - Use of net fresh water	m3	0.049	0.005	0.000	0.000	0.000	0.000	0.001	0.000
HW - Hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NHW - Non hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.192	0.000
RW - Radioactive waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CR - Components for reuse	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MR - Materials for recycling	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MER - Materials for energy recovery	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EEE - Exported electric energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ETE - Exported thermal energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Impact assessment result for 1m^2 of cover facing material used in Sydd matte* products.

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - Global warming potential	kg CO2 -eqv	0.352	0.009	0.000	0.000	0.001	0.000	0.001	0.000
ODP - Depletion potential of the stratosph	kg CFC11-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
POCP - Formation potential of tropospherícning	kg C2H4 -eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AP - Acidification potential of land and water	kg SO2 -eqv	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EP - Eutrophication potential	kg PO43--eqv	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPM - Abiotic dep pot for non-fossil res	kg Sb-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPE - Abiotic dep pot for fossil res	MJ	4.541	0.136	0.000	0.000	0.008	0.000	0.036	0.000
RPEE - Ren pri energy res used as energy	MJ	10.546	0.002	0.000	0.000	0.000	0.000	0.001	0.000
RPEM - Ren pri energy res used as material	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TPE - Total use of ren prim energy	MJ	10.546	0.002	0.000	0.000	0.000	0.000	0.001	0.000
NRPE - Non ren pri en used as energy	MJ	5.589	0.138	0.000	0.000	0.009	0.000	0.037	0.000
NRPM - Non ren pri energy used as material	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TRPE - Total use of non ren pri energy	MJ	5.589	0.138	0.000	0.000	0.009	0.000	0.037	0.000
SM - Use of secondary materials	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RSF - Use of renewable secondary fuels	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NRSF - Use of non renewable secondary fuel	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W - Use of net fresh water	m3	1.564	0.007	0.000	0.000	0.000	0.000	0.001	0.000
HW - Hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NHW - Non hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.240	0.000
RW - Radioactive waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CR - Components for reuse	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MR - Materials for recycling	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MER - Materials for energy recovery	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EEE - Exported electric energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ETE - Exported thermal energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Impact assessment result for 1m^2 of cover facing material used in Lamellmatte* products.

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - Global warming potential	kg CO2 -eqv	0.534	0.004	0.000	0.000	0.000	0.000	0.001	0.000
ODP - Depletion potential of the stratosph	kg CFC11-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
POCP - Formation potential of tropospherícning	kg C2H4 -eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AP - Acidification potential of land and water	kg SO2 -eqv	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EP - Eutrophication potential	kg PO43--eqv	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPM - Abiotic dep pot for non-fossil res	kg Sb-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPE - Abiotic dep pot for fossil res	MJ	6.778	0.053	0.000	0.000	0.003	0.000	0.015	0.000
RPEE - Ren pri energy res used as energy	MJ	2.255	0.001	0.000	0.000	0.000	0.000	0.000	0.000
RPEM - Ren pri energy res used as material	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TPE - Total use of ren prim energy	MJ	2.255	0.001	0.000	0.000	0.000	0.000	0.000	0.000
NRPE - Non ren pri en used as energy	MJ	8.640	0.054	0.000	0.000	0.003	0.000	0.015	0.000
NRPM - Non ren pri energy used as material	MJ	0.448	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TRPE - Total use of non ren pri energy	MJ	9.088	0.054	0.000	0.000	0.003	0.000	0.015	0.000
SM - Use of secondary materials	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RSF - Use of renewable secondary fuels	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NRSF - Use of non renewable secondary fuel	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W - Use of net fresh water	m3	4.891	0.003	0.000	0.000	0.000	0.000	0.000	0.000
HW - Hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NHW - Non hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.096	0.000
RW - Radioactive waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CR - Components for reuse	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MR - Materials for recycling	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MER - Materials for energy recovery	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EEE - Exported electric energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ETE - Exported thermal energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Impact assessment result for 1m^2 of cover facing material used in Glava Venus A* and Glava Venus E* products.

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - Global warming potential	kg CO2 -eqv	0.453	0.008	0.000	0.000	0.000	0.000	0.001	0.000
ODP - Depletion potential of the stratosph	kg CFC11-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
POCP - Formation potential of tropospherícning	kg C2H4 -eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AP - Acidification potential of land and water	kg SO2 -eqv	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EP - Eutrophication potential	kg PO43--eqv	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPM - Abiotic dep pot for non-fossil res	kg Sb-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPE - Abiotic dep pot for fossil res	MJ	5.657	0.119	0.000	0.000	0.007	0.000	0.032	0.000
RPEE - Ren pri energy res used as energy	MJ	0.544	0.002	0.000	0.000	0.000	0.000	0.001	0.000
RPEM - Ren pri energy res used as material	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TPE - Total use of ren prim energy	MJ	0.544	0.002	0.000	0.000	0.000	0.000	0.001	0.000
NRPE - Non ren pri en used as energy	MJ	7.144	0.121	0.000	0.000	0.008	0.000	0.032	0.000
NRPM - Non ren pri energy used as material	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TRPE - Total use of non ren pri energy	MJ	7.144	0.121	0.000	0.000	0.008	0.000	0.032	0.000
SM - Use of secondary materials	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RSF - Use of renewable secondary fuels	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NRSF - Use of non renewable secondary fuel	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W - Use of net fresh water	m3	1.793	0.006	0.000	0.000	0.000	0.000	0.001	0.000
HW - Hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NHW - Non hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.210	0.000
RW - Radioactive waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CR - Components for reuse	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MR - Materials for recycling	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MER - Materials for energy recovery	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EEE - Exported electric energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ETE - Exported thermal energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Impact assessment result for 1m^2 of cover facing material used in Glava Akuduk* and Glava Super Nova* products.

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - Global warming potential	kg CO2 -eqv	0.248	0.004	0.000	0.000	0.000	0.000	0.001	0.000
ODP - Depletion potential of the stratosph	kg CFC11-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
POCP - Formation potential of troposphericning	kg C2H4 -eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AP - Acidification potential of land and water	kg SO2 -eqv	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EP - Eutrophication potential	kg PO43--eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPM - Abiotic dep pot for non-fossil res	kg Sb-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPE - Abiotic dep pot for fossil res	MJ	3.072	0.067	0.000	0.000	0.004	0.000	0.018	0.000
RPEE - Ren pri energy res used as energy	MJ	0.304	0.001	0.000	0.000	0.000	0.000	0.000	0.000
RPEM - Ren pri energy res used as material	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TPE - Total use of ren prim energy	MJ	0.304	0.001	0.000	0.000	0.000	0.000	0.000	0.000
NRPE - Non ren pri en used as energy	MJ	3.906	0.068	0.000	0.000	0.004	0.000	0.018	0.000
NRPM - Non ren pri energy used as material	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TRPE - Total use of non ren pri energy	MJ	3.906	0.068	0.000	0.000	0.004	0.000	0.018	0.000
SM - Use of secondary materials	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RSF - Use of renewable secondary fuels	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NRSF - Use of non renewable secondary fuel	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W - Use of net fresh water	m3	1.002	0.003	0.000	0.000	0.000	0.000	0.001	0.000
HW - Hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NHW - Non hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.118	0.000
RW - Radioactive waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CR - Components for reuse	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MR - Materials for recycling	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MER - Materials for energy recovery	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EEE - Exported electric energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ETE - Exported thermal energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Impact assessment result for 1m^2 of cover facing material used in Lydfelleplate 2000* products.

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - Global warming potential	kg CO2 -eqv	0.287	0.005	0.000	0.000	0.000	0.000	0.001	0.000
ODP - Depletion potential of the stratosph	kg CFC11-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
POCP - Formation potential of troposphericning	kg C2H4 -eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AP - Acidification potential of land and water	kg SO2 -eqv	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EP - Eutrophication potential	kg PO43--eqv	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPM - Abiotic dep pot for non-fossil res	kg Sb-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPE - Abiotic dep pot for fossil res	MJ	3.620	0.069	0.000	0.000	0.004	0.000	0.019	0.000
RPEE - Ren pri energy res used as energy	MJ	0.327	0.001	0.000	0.000	0.000	0.000	0.000	0.000
RPEM - Ren pri energy res used as material	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TPE - Total use of ren prim energy	MJ	0.327	0.001	0.000	0.000	0.000	0.000	0.000	0.000
NRPE - Non ren pri en used as energy	MJ	4.510	0.070	0.000	0.000	0.004	0.000	0.019	0.000
NRPM - Non ren pri energy used as material	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TRPE - Total use of non ren pri energy	MJ	4.510	0.070	0.000	0.000	0.004	0.000	0.019	0.000
SM - Use of secondary materials	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RSF - Use of renewable secondary fuels	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NRSF - Use of non renewable secondary fuel	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W - Use of net fresh water	m3	1.079	0.003	0.000	0.000	0.000	0.000	0.001	0.000
HW - Hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NHW - Non hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000
RW - Radioactive waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CR - Components for reuse	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MR - Materials for recycling	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MER - Materials for energy recovery	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EEE - Exported electric energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ETE - Exported thermal energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Impact assessment result for 1m^2 of cover facing material used in Proff 34* and Proff 34 Takstolplate* products.

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - Global warming potential	kg CO2 -eqv	0.084	0.003	0.000	0.000	0.000	0.000	0.000	0.000
ODP - Depletion potential of the stratosph	kg CFC11-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
POCP - Formation potential of troposphericning	kg C2H4 -eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AP - Acidification potential of land and water	kg SO2 -eqv	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EP - Eutrophication potential	kg PO43--eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPM - Abiotic dep pot for non-fossil res	kg Sb-eqv	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ADPE - Abiotic dep pot for fossil res	MJ	1.056	0.046	0.000	0.000	0.003	0.000	0.012	0.000
RPEE - Ren pri energy res used as energy	MJ	3.391	0.001	0.000	0.000	0.000	0.000	0.000	0.000
RPEM - Ren pri energy res used as material	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TPE - Total use of ren prim energy	MJ	3.391	0.001	0.000	0.000	0.000	0.000	0.000	0.000
NRPE - Non ren pri en used as energy	MJ	1.387	0.047	0.000	0.000	0.003	0.000	0.013	0.000
NRPM - Non ren pri energy used as material	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TRPE - Total use of non ren pri energy	MJ	1.387	0.047	0.000	0.000	0.003	0.000	0.013	0.000
SM - Use of secondary materials	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RSF - Use of renewable secondary fuels	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NRSF - Use of non renewable secondary fuel	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W - Use of net fresh water	m3	0.397	0.002	0.000	0.000	0.000	0.000	0.000	0.000
HW - Hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NHW - Non hazardous waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.082	0.000
RW - Radioactive waste disposed	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CR - Components for reuse	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MR - Materials for recycling	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MER - Materials for energy recovery	kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EEE - Exported electric energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ETE - Exported thermal energy	MJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000