

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

CLIMECON OY

VISIBLE SUPPLY AND EXHAUST AIR DIFFUSERS



Registration number in RTS EPD:

RTS EPD 196_22

EcoPlatform reference number:

Handwritten signature of Jukka Seppänen in blue ink.

Jukka Seppänen
Committee Secretary

Handwritten signature of Laura Apilo in blue ink.

Laura Apilo
RTS General Director

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	Climecon Oy
Address	Lämmittäjänkatu 4 A, 00880 Helsinki
Website	https://climeconair.com/en-en/

PRODUCT IDENTIFICATION

Product name	Visible supply and exhaust air diffusers
Declared unit	1 unit
Specific product name	NOT, RUX, ROX, ROX S
Place(s) of production	Kausala, Finland

EPD INFORMATION

Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	Building Information Foundation, RTS, Malminkatu 16 A 00100 Helsinki
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804 serves as the core PCR. RTS PCR 2020
EPD author	Granlund Oy, Malminkaari 21 00701 Helsinki
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal certification <input checked="" type="checkbox"/> External verification
Verification date	23.09.2022
EPD verifier	Heini Koutonen
RTS EPD number	RTS_196_22
ECO Platform nr.	-
Publishing date	27.10.2022
EPD valid until	27.10.2027

**Yleissääntönä on noudatettu eurooppalaisen standardin EN 15804:2012 +
A2:2019 vaatimuksia ja RTS tuoteryhmäsääntöjä**

Kansainvälisen standardin EN ISO 14025:2010 mukainen
riippumaton varmentava taho on

Sisäinen

Ulkoinen

Kolmannen osapuolen varmentamisen on suorittanut:

Heini Koutonen



Ramboll Finland Oy

PRODUCT INFORMATION

PRODUCT DESCRIPTION

This environmental declaration covers the environmental impacts of visible supply and exhaust air diffusers manufactured by Climecon Oy in Kausala Finland. The EPD contains four different products with different sizes:

NOT

- 125 mm
- 160 mm
- 200 mm
- 250 mm
- 315 mm

RUX

- 160 mm
- 200 mm
- 250 mm
- 315 mm
- 400 mm

ROX

- 160 mm
- 200 mm
- 250 mm
- 315 mm
- 400 mm
- 500 mm

ROX S

- 160 mm
- 200 mm
- 250 mm
- 315 mm

PRODUCT APPLICATION

NOT air diffusers are used on various building types.

RUX air diffusers are used on shopping centres, grocery stores and other spaces with frequent layout changes.

ROX and ROX S air diffusers are used on various building types such as schools, kindergartens, canteens, restaurants, museums, lecture halls, laboratories, and industrial premises.

PRODUCT RAW MATERIAL COMPOSITION AND TECHNICAL INFORMATION

Product	Material	Product size (mm)	Amount (kg)
NOT	Steel	125 / 160 / 200 / 250 / 315	4,4 / 6,0 / 8,6 / 11,3 / 13,5
	Powder coating		0,1 / 0,1 / 0,2 / 0,3 / 0,3
	Foam		0,01 / 0,01 / 0,01 / 0,01 / 0,01
	PES		0,1 / 0,2 / 0,3 / 0,4 / 0,5
	Polyethylene (PE)		0,01 / 0,01 / 0,01 / 0,01 / 0,01
	Polypropylene (PP)		0,2 / 0,4 / 0,6 / 0,7 / 0,7
	Aluminium		0,1 / 0,1 / 0,2 / 0,2 / 0,3
	Polyamide (PA)		0,1 / 0,1 / 0,1 / 0,1 / 0,1
RUX	Steel	160 / 200 / 250 / 315 / 400	1,1 / 1,8 / 2,7 / 3,1 / 4,8
	Powder coating		0,03 / 0,04 / 0,07 / 0,08 / 0,11
	Polypropylene (PP)		0,1 / 0,1 / 0,1 / 0,2 / 0,3
ROX	Steel	160 / 200 / 250 / 315 / 400 / 500	6,0 / 7,0 / 8,2 / 9,5 / 12,1 / 14,3
	Powder coating		0,1 / 0,1 / 0,1 / 0,1 / 0,2 / 0,2
	Polypropylene (PP)		0,2 / 0,2 / 0,4 / 1,0 / 1,2 / 1,5
ROX S	Steel	160 / 200 / 250 / 315	5,2 / 6,9 / 8,5 / 10,8
	Powder coating		0,1 / 0,1 / 0,1 / 0,1
	Polyurethane foam		0,7 / 0,7 / 1,0 / 1,2
	Aluminium		0,1 / 0,2 / 0,2 / 0,3
	Polyamide (PA)		0,1 / 0,1 / 0,1 / 0,1

PACKAGING MATERIAL COMPOSITION AND TECHNICAL INFORMATION

Product	Material	Product size (mm)	Amount (kg)
NOT	Cardboard	125 / 160 / 200 / 250 / 315	0,06 / 0,06 / 0,1 / 0,1 / 0,2
	LLDE-Polyethylene		0,01 / 0,01 / 0,01 / 0,01 / 0,02
	Polyethylene (PE)		0,1 / 0,1 / 0,1 / 0,1 / 0,1
	Polypropylene (PP)		0,01 / 0,01 / 0,01 / 0,01 / 0,01
RUX	Cardboard	160 / 200 / 250 / 315 / 400	0,2 / 0,2 / 0,2 / 0,2 / 0,2
	LLDE-Polyethylene		0,005 / 0,005 / 0,005 / 0,005 / 0,005
	Polypropylene (PP)		0,004 / 0,004 / 0,004 / 0,004 / 0,004
ROX	Cardboard	160 / 200 / 250 / 315 / 400 / 500	0,06 / 0,1 / 0,2 / 0,2 / 0,5
	LLDE-Polyethylene		0,005 / 0,008 / 0,013 / 0,019 / 0,038
	Polypropylene (PP)		0,003 / 0,005 / 0,007 / 0,01 / 0,02
ROX S	Cardboard	160 / 200 / 250 / 315	0,06 / 0,1 / 0,2 / 0,2
	LLDE-Polyethylene		0,005 / 0,008 / 0,013 / 0,019
	Polypropylene (PP)		0,003 / 0,005 / 0,007 / 0,01

GLOBAL WARMING POTENTIAL, GWP

Product	Product size mm	GWP Total kg CO2e (A1-3)
NOT	125	15,30
NOT	160	21,42
NOT	200	30,60
NOT	250	39,78

NOT	315	47,43
ROX	160	18,77
ROX	200	22,52
ROX	250	26,28
ROX	315	31,91
ROX	400	39,42
ROX	500	46,93
ROX S	160	20,73
ROX S	200	26,95
ROX S	250	33,17
ROX S	315	41,46
RUX	160	4,03
RUX	200	5,99
RUX	250	8,84
RUX	315	10,23
RUX	400	15,99

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

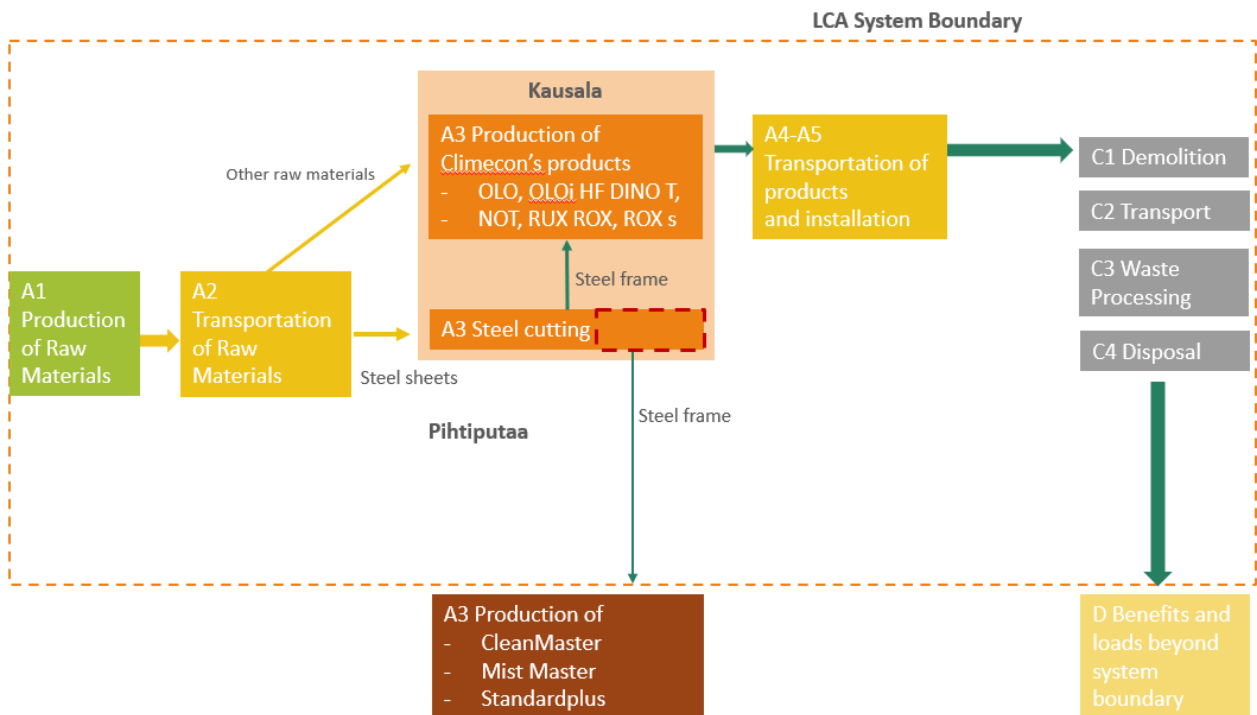
Period for data	1 year, 2021
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DECLARED UNIT

Declared unit	1 item
Mass per declared unit	NOT 5,0 / 6,9 / 9,9 / 13,0 / 15,4 kg RUX 1,2 / 1,9 / 2,9 / 3,4 / 5,2 kg ROX 6,3 / 7,3 / 8,7 / 10,6 / 13,5 / 16 kg ROX S 6,2 / 8,0 / 9,9 / 12,5 kg

SYSTEM BOUNDARY

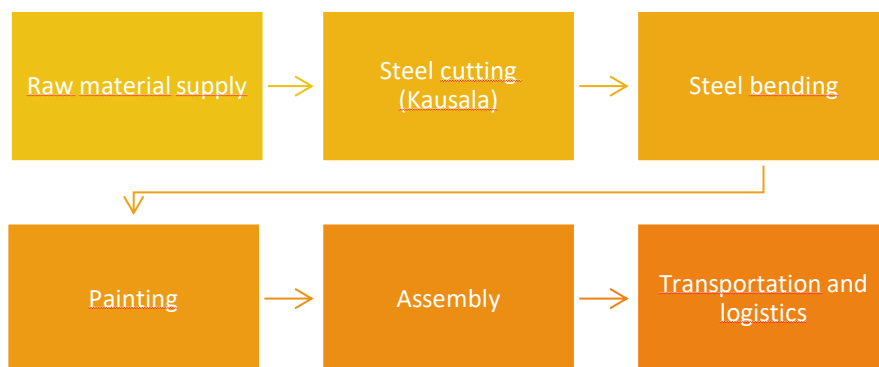
Studied system covers the following steps of life cycle according to EN 15804: **A1** Raw material supply, **A2** Transport, **A3** Manufacturing, **A4** Transportation of the product to construction site, **A5** Installation to building, **C1** Deconstruction, **C2** Transportation of end-of-life **C3** Waste processing and **C4** Disposal. In addition, the benefits and loads beyond the system boundary of stage **D** consist of product reuse, recovery and recycling. System boundary describing the system boundary and the input and output flows is shown below:



The end of waste point of the recycled steel raw material was assumed to be after scrap steel collection, sorting and preparation. Processing of scrap steel to be used in raw material in Climecon products was

considered to be part of this life cycle and thus was included to the system boundaries. End of waste point of the studied product is the step when material is used as fuel in an incineration plant or recycled material is handled in the collection and sorting plant.

Production stage (A3) on the Climecon’s production sites cover following manufacturing processes; raw material supply (steel, plastics, and insulations), steel cutting, steel bending, painting, assembly and packaging. After that, products will be transported to the client. The production processes of supply air diffusers are presented in following Figure.



Studied system covers the following steps of life cycle according to EN 15804:

	Product Stage			Construction Process Stage		Use Stage							End-of-Life Stage				Benefits and loads beyond the system boundary		
	Raw material supply	Transport	Manufacturing	Transport to building	Installation to building	Use/applications	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/demoli	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
Included	X	X	X	X	X								X	X	X	X	X	X	X
Relevancy	R	R	R	R	R	NR	NR	NR	NR	NR	NR	NR	R	R	R	R	R	R	R

	Mandatory
	Mandatory as per the RTS PCR section 6.2.1 rules and terms
	Optional modules based on scenarios

The study does not omit any life cycle stages, processes or data needs that are mandatory according to EN 15804 and RTS PCR. The study excludes following life cycle stages which are optional according to EN 15804 and RTS PCR.

- B1 Use
- B2 Maintenance
- B3 Repairs
- B4 Replacement
- B5 Refurbishment
- B6 Operational energy use
- B7 Operational water use

CUT-OFF CRITERIA

This study follows the cut-off criteria stated in RTS PCR and EN 15804 -standard. This study does not exclude any modules or processes which represent more than 1 % of the emissions of studied life cycle stage. The study does not exclude any hazardous materials or substances.

Excluded processes and the criteria for exclusion are given in following table. Machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

Process excluded from study	Cut-off criteria	Quantified contribution from process
A1-A3 screws	emission effect	< 0.1 % mass of unit process
A3 EURO-pallets	emission effect	< 1 % mass of unit process
B1-B5, B7 use	Not mandatory according to the RTS instructions	-

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation rules used are made according to the ISO14044:2006. Allocation is avoided when possible and when necessary, allocation is made based on physical shares and also avoiding double calculations. Allocation is required if the production process produces more than one product and the flows of materials, energy and waste cannot be separately measured for the studied product. Allocation used in generic data sources follow the requirements of the EN 15804 -standard. It should be noticed that the allocation method 'allocation, cut-off by classification' has been used for Ecoinvent 3.6 data, which complies with EN 15804.

In the Kausala Production site, various products are produced, and some allocations were needed. Avoiding allocation could not be avoided for following inputs as the information was only measured on factory or production process level.

- Electricity and heat consumption: only measured on factory level
- Energy wood and plastic waste, only measured on factory level
- Water use, only measured on factory level

The inputs were allocated to studied product based on production volume (mass).

According to EN 15804, flows leaving the system at the end-of-waste boundary of the product stage (A1-A3) are allocated as co-products. In this study, the recyclable metal scrap from cutting process is considered as a co-product. Scrap metal collected from the steel cutting process is sent for recycling, and environmental impacts from the waste processing in A3 module are allocated for this co-product based on mass (kg).

KEY ASSUMPTIONS

A1: Recycled content in steel raw materials: 20 % based on industry estimations.

A3 Manufacturing: Production of metal scrap in steel cutting process was considered in the study based on manufacturer's long-term estimations and measures.

C1 Deconstruction/demolition: According to waste handling companies, HVAC products are collected separately for recycling in the end-of-life stage. It can be assumed that there are no significant environmental impacts caused by demolition phase and hence it is not declared.

C2 Transportation: Transportation distance 75 km road driving by lorry (SYKE 2021)

C3-4 Waste Treatment and disposal: It was assumed that air diffuser is collected, and the materials are separated. Steel including powder coating are going to material recycling and plastics to energy recovery.

Module D: This module covers the net benefits and loads arising from the recycling and recovery of energy from end-of-waste state materials.

- Recovery: when a product is incinerated at its end-of-life and the produced heat is recovered, the benefits can include avoiding the production of energy. Net calorific value as received of the construction waste was assumed to be 9,8 MJ/kg and efficiency of heat and power co-generation was 90 %.
- Recycling: Benefits from avoided primary steel production due to the recycling of steel at end of life was included. Only share of virgin raw materials in the product composition were included to the module D.

VALIDATION OF DATA

The quality requirements for the life cycle assessment were set according to the EN ISO 14044 standard (4.2.3.6) and EN 15804 standard (6.3.7).

This LCA study follows the standard EN 15804:2012+A2:2019 and RTS PCR and no decisions are made based on the values.

PROCEDURE FOR COLLECTION PROCESS SPECIFIC DATA

Production specific data was collected directly from manufacturer's production plant. The data represents the production of the studied product at the plant from the materials transported to the facility and represents 1 year average. The data represents year 2021, which was the latest year with full year data. All gathered data was used without excluding categories in advance following the system boundaries set in earlier chapters.

CRITERIA FOR CHOOSING THE GENERIC DATA

Generic data that was used for upstream and downstream processes represents complementary data from Ecoinvent 3.6 database.

The datasets were chosen to represent the studied system as closely as possible. When available supplier specific information was used for instance in form of EN 15804 EPDs or emissions profile of local energy supplier. When supplier specific information was not available the information sources were chosen based on their technical and geographical representativeness. Only when country specific or European data has not been available has global level data been used (concerns mainly data fromecoinvent 3.6)

As up-to-date data as possible was chosen and no more than five-year-old for producer specific data and ten years for generic data was used.

ENVIRONMENTAL IMPACT DATA

SCALING FACTORS TO OTHER PRODUCT SIZES

This EPD provides environmental impact assessment results for following products and product sizes:

- **NOT 125**
- **ROX 160**
- **ROX S 160**
- **RUX (All sizes: 160, 200, 250, 315, 400)**

The results are presented according to the smallest size of the products. A scaling factor in the following table can be used to calculate results of the life cycle assessment in a situation where the size of concerned product is different. The results of other product sizes can be scaled accordingly with the help of the table.

Product	Product size mm	The total mass of the product kg	Scaling factors*	Scaling factors	
				- for the use of net freshwater	- for the use of non-renewable energy resources as raw material if necessary
NOT	125	5	1	-	-
NOT	160	6,9	1,4	-	-
NOT	200	9,9	2,0	-	-
NOT	250	13	2,6	-	-
NOT	315	15,4	3,1	-	-
ROX	160	6,3	1	1	1
ROX	200	7,3	1,2	1	1
ROX	250	8,7	1,4	2,0	2,0
ROX	315	10,6	1,7	5,0	5,0
ROX	400	13,5	2,1	6,0	6,0
ROX	500	16,0	2,5	7,5	7,5
ROX S	160	6,2	1	-	-
ROX S	200	8,0	1,3	-	-
ROX S	250	9,9	1,6	-	-
ROX S	315	12,5	2,0	-	-

* **NOT:** These scaling factors are suitable for all environmental impact categories

***ROX:** These scaling factors are suitable for all environmental impact categories than the use of Net freshwater and the use of non-renewable energy resources as raw material

NOT 125

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e	1,28E1	5,06E-1	2,01E0	1,53E1	5,86E-2	1,87E-1	0E0	3,41E-2	6,41E-1	0E0	-7,46E0
GWP – fossil	kg CO ₂ e	1,27E1	5,06E-1	9,82E-1	1,42E1	5,91E-2	1,73E-1	0E0	3,41E-2	3,32E-1	0E0	-7,48E0
GWP – biogenic	kg CO ₂ e	1,05E-1	3,67E-4	1,03E0	1,13E0	4,29E-5	1,44E-2	0E0	2,48E-5	3,09E-1	0E0	2,22E-2
GWP – LULUC	kg CO ₂ e	1,09E-2	1,52E-4	6,48E-4	1,17E-2	1,78E-5	1,33E-4	0E0	1,03E-5	1,32E-4	0E0	-1,85E-3
Ozone depletion	kg CFC ₁₁ e	9,65E-7	1,19E-7	3,15E-8	1,12E-6	1,39E-8	1,42E-8	0E0	8,01E-9	1,81E-8	0E0	-2,96E-7
Acidification potential	mol H ⁺ e	1,74E-1	2,12E-3	3,04E-3	1,8E-1	2,48E-4	1,9E-3	0E0	1,43E-4	1,51E-3	0E0	-4,09E-2
EP-freshwater ³⁾	kg Pe	9,98E-4	4,12E-6	7,73E-5	1,08E-3	4,81E-7	1,13E-5	0E0	2,77E-7	8,07E-6	0E0	-4,29E-4
EP-marine	kg Ne	1,75E-2	6,4E-4	1,58E-3	1,97E-2	7,48E-5	2,31E-4	0E0	4,31E-5	3,6E-4	0E0	-8,41E-3
EP-terrestrial	mol Ne	6,15E-1	7,07E-3	7,4E-3	6,3E-1	8,26E-4	6,65E-3	0E0	4,76E-4	4,1E-3	0E0	-9,63E-2
POCP (“smog”)	kg NMVOCe	6,17E-2	2,27E-3	2,42E-3	6,64E-2	2,66E-4	7,82E-4	0E0	1,53E-4	1,11E-3	0E0	-4,14E-2
ADP-minerals & metals	kg Sbe	1,64E-2	8,63E-6	6,4E-6	1,65E-2	1,01E-6	1,65E-4	0E0	5,82E-7	6,42E-6	0E0	-1,3E-4
ADP-fossil resources	MJ	1,75E2	7,87E0	1,26E1	1,96E2	9,19E-1	2,28E0	0E0	5,3E-1	1,71E0	0E0	-6,37E1
Water use ²⁾	m ³ e depr.	6,95E0	2,93E-2	4,24E-1	7,4E0	3,42E-3	7,94E-2	0E0	1,97E-3	5,15E-2	0E0	-3,34E0

1)GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO₄e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	2,91E1	9,91E-2	7,28E-1	3E1	1,16E-2	3,13E-1	0E0	6,67E-3	2,51E-1	0E0	-5,93E0
Renew. PER as material	MJ	3,48E-2	0E0	0E0	3,48E-2	0E0	3,48E-4	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	2,92E1	9,91E-2	7,28E-1	3E1	1,16E-2	3,14E-1	0E0	6,67E-3	2,51E-1	0E0	-5,93E0
Non-re. PER as energy	MJ	1,61E2	7,87E0	6,35E0	1,76E2	9,19E-1	2,08E0	0E0	5,3E-1	1,71E0	0E0	-6,37E1
Non-re. PER as material	MJ	1,71E1	0E0	5,26E0	2,23E1	0E0	2,23E-1	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	1,78E2	7,87E0	1,16E1	1,98E2	9,19E-1	2,3E0	0E0	5,3E-1	1,71E0	0E0	-6,37E1
Secondary materials	kg	1,5E0	0E0	1,77E-3	1,5E0	0E0	1,5E-2	0E0	0E0	0E0	0E0	2,81E0
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m ³	5,89E0	1,64E-3	5,21E-2	5,95E0	1,91E-4	5,95E-2	0E0	1,1E-4	1,32E-3	0E0	-5,5E-2

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	3,52E0	7,65E-3	5,93E-2	3,58E0	8,93E-4	3,73E-2	0E0	5,15E-4	0E0	0E0	-2,74E0
Non-hazardous waste	kg	3,98E1	8,46E-1	1,92E0	4,25E1	9,88E-2	4,67E-1	0E0	5,7E-2	0E0	0E0	-2,33E1
Radioactive waste	kg	3,85E-4	5,4E-5	1,84E-5	4,58E-4	6,31E-6	6,09E-6	0E0	3,64E-6	0E0	0E0	-3,89E-5

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	4,9E-2	0E0	9,24E-1	9,73E-1	0E0	3,7E-1	0E0	0E0	4,6E0	0E0	0E0
Materials for energy rec	kg	1,03E-3	0E0	1,12E0	1,12E0	0E0	1,12E-2	0E0	0E0	4,2E-1	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content	Unit (expressed per functional unit or per declared unit)
Biogenic carbon content in product	0 kg
Biogenic carbon content in accompanying packaging	-2,93E-04 kg

NOTE 1 kg biogenic carbon is equivalent to 44/12 kg of CO₂.

RUX 160

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e	3,28E0	1,28E-1	6,24E-1	4,03E0	1,29E-2	6,26E-2	0E0	7,51E-3	1,54E-1	0E0	-1,77E0
GWP – fossil	kg CO ₂ e	3,26E0	1,28E-1	3,34E-1	3,72E0	1,3E-2	5,43E-2	0E0	7,5E-3	7,99E-2	0E0	-1,78E0
GWP – biogenic	kg CO ₂ e	1,92E-2	9,26E-5	2,88E-1	3,08E-1	9,44E-6	8,29E-3	0E0	5,45E-6	7,36E-2	0E0	5,28E-3
GWP – LULUC	kg CO ₂ e	2,13E-3	3,84E-5	9,47E-4	3,12E-3	3,91E-6	3,72E-5	0E0	2,26E-6	3,25E-5	0E0	-4,4E-4
Ozone depletion pot.	kg CFC ₁₁ e	3,2E-7	3E-8	2,3E-8	3,73E-7	3,06E-9	6,04E-9	0E0	1,76E-9	4,42E-9	0E0	-7,03E-8
Acidification potential	mol H ⁺ e	4,36E-2	5,36E-4	1,33E-3	4,55E-2	5,46E-5	5,33E-4	0E0	3,15E-5	3,69E-4	0E0	-9,73E-3
EP-freshwater ³⁾	kg Pe	1,88E-4	1,04E-6	3,24E-5	2,21E-4	1,06E-7	2,47E-6	0E0	6,1E-8	1,98E-6	0E0	-1,02E-4
EP-marine	kg Ne	4,31E-3	1,61E-4	5,18E-4	4,99E-3	1,64E-5	7,7E-5	0E0	9,49E-6	8,79E-5	0E0	-2E-3
EP-terrestrial	mol Ne	1,54E-1	1,78E-3	3,12E-3	1,59E-1	1,82E-4	1,87E-3	0E0	1,05E-4	1E-3	0E0	-2,29E-2
POCP (“smog”)	kg NMVOCe	1,59E-2	5,73E-4	7,87E-4	1,72E-2	5,84E-5	2,7E-4	0E0	3,37E-5	2,7E-4	0E0	-9,86E-3
ADP-minerals & metals	kg Sbe	4,08E-3	2,18E-6	2,3E-6	4,09E-3	2,22E-7	4,13E-5	0E0	1,28E-7	1,58E-6	0E0	-3,1E-5
ADP-fossil resources	MJ	4,9E1	1,98E0	3,98E0	5,49E1	2,02E-1	7,35E-1	0E0	1,17E-1	4,19E-1	0E0	-1,52E1
Water use ²⁾	m ³ e depr.	1,94E0	7,38E-3	1,21E-1	2,07E0	7,52E-4	2,25E-2	0E0	4,34E-4	1,24E-2	0E0	-7,94E-1

1)GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO₄e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	6,89E0	2,5E-2	7,31E-1	7,64E0	2,54E-3	8,31E-2	0E0	1,47E-3	6,17E-2	0E0	-1,41E0
Renew. PER as material	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	6,89E0	2,5E-2	7,31E-1	7,64E0	2,54E-3	8,31E-2	0E0	1,47E-3	6,17E-2	0E0	-1,41E0
Non-re. PER as energy	MJ	3,95E1	1,98E0	3,35E0	4,48E1	2,02E-1	6,34E-1	0E0	1,17E-1	4,19E-1	0E0	-1,52E1
Non-re. PER as material	MJ	9,48E0	0E0	2,39E-1	9,72E0	0E0	9,72E-2	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	4,9E1	1,98E0	3,59E0	5,45E1	2,02E-1	7,31E-1	0E0	1,17E-1	4,19E-1	0E0	-1,52E1
Secondary materials	kg	3,26E-1	0E0	8,06E-5	3,26E-1	0E0	3,26E-3	0E0	0E0	0E0	0E0	6,68E-1
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m ³	5,56E0	4,13E-4	1,54E-2	5,58E0	4,21E-5	5,58E-2	0E0	2,43E-5	3,19E-4	0E0	-1,31E-2

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	8,86E-1	1,93E-3	1,7E-2	9,05E-1	1,96E-4	9,76E-3	0E0	1,13E-4	0E0	0E0	-6,51E-1
Non-hazardous waste	kg	1E1	2,13E-1	7,18E-1	1,1E1	2,17E-2	1,31E-1	0E0	1,25E-2	0E0	0E0	-5,53E0
Radioactive waste	kg	9,23E-5	1,36E-5	1,43E-5	1,2E-4	1,39E-6	2,32E-6	0E0	8,01E-7	0E0	0E0	-9,25E-6

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	2,31E-1	2,31E-1	0E0	4,2E-1	0E0	0E0	1,13E0	0E0	0E0
Materials for energy rec	kg	0E0	0E0	2,64E-1	2,64E-1	0E0	2,64E-3	0E0	0E0	1E-1	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content	Unit (expressed per functional unit or per declared unit)
Biogenic carbon content in product	0 kg
Biogenic carbon content in accompanying packaging	-9,75E-04 kg

NOTE 1 kg biogenic carbon is equivalent to 44/12 kg of CO₂.

RUX 200

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e	4,93E0	2,08E-1	8,52E-1	5,99E0	2,23E-2	8,23E-2	0E0	1,3E-2	1,7E-1	0E0	-2,89E0
GWP – fossil	kg CO ₂ e	4,89E0	2,07E-1	4,12E-1	5,51E0	2,24E-2	7,23E-2	0E0	1,29E-2	9,74E-2	0E0	-2,89E0
GWP – biogenic	kg CO ₂ e	3,18E-2	1,51E-4	4,39E-1	4,71E-1	1,63E-5	9,92E-3	0E0	9,41E-6	7,26E-2	0E0	8,64E-3
GWP – LULUC	kg CO ₂ e	3,46E-3	6,24E-5	9,59E-4	4,48E-3	6,76E-6	5,09E-5	0E0	3,9E-6	5,24E-5	0E0	-7,19E-4
Ozone depletion pot.	kg CFC-11e	3,94E-7	4,87E-8	2,49E-8	4,67E-7	5,28E-9	7E-9	0E0	3,04E-9	6,94E-9	0E0	-1,13E-7
Acidification potential	mol H ⁺ e	7,09E-2	8,71E-4	1,47E-3	7,33E-2	9,43E-5	8,12E-4	0E0	5,44E-5	5,81E-4	0E0	-1,59E-2
EP-freshwater ³⁾	kg Pe	2,93E-4	1,69E-6	3,93E-5	3,34E-4	1,83E-7	3,59E-6	0E0	1,05E-7	3,19E-6	0E0	-1,67E-4
EP-marine	kg Ne	6,78E-3	2,62E-4	6,92E-4	7,73E-3	2,84E-5	1,05E-4	0E0	1,64E-5	1,35E-4	0E0	-3,26E-3
EP-terrestrial	mol Ne	2,54E-1	2,9E-3	3,59E-3	2,6E-1	3,14E-4	2,89E-3	0E0	1,81E-4	1,55E-3	0E0	-3,74E-2
POCP (“smog”)	kg NMVOCe	2,45E-2	9,32E-4	8,95E-4	2,63E-2	1,01E-4	3,61E-4	0E0	5,82E-5	4,19E-4	0E0	-1,61E-2
ADP-minerals & metals	kg Sbe	6,89E-3	3,54E-6	2,7E-6	6,9E-3	3,83E-7	6,94E-5	0E0	2,21E-7	2,55E-6	0E0	-5,07E-5
ADP-fossil resources	MJ	6,31E1	3,23E0	4,17E0	7,05E1	3,49E-1	8,92E-1	0E0	2,01E-1	6,61E-1	0E0	-2,46E1
Water use ²⁾	m ³ e	2,85E0	1,2E-2	1,42E-1	3E0	1,3E-3	3,18E-2	0E0	7,49E-4	1,59E-2	0E0	-1,3E0

1)GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO₄e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	1,1E1	4,06E-2	7,51E-1	1,18E1	4,39E-3	1,24E-1	0E0	2,54E-3	9,98E-2	0E0	-2,31E0
Renew. PER as material	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	1,1E1	4,06E-2	7,51E-1	1,18E1	4,39E-3	1,24E-1	0E0	2,54E-3	9,98E-2	0E0	-2,31E0
Non-re. PER as energy	MJ	5,83E1	3,23E0	3,54E0	6,51E1	3,49E-1	8,38E-1	0E0	2,01E-1	6,61E-1	0E0	-2,46E1
Non-re. PER as material	MJ	4,74E0	0E0	2,39E-1	4,98E0	0E0	4,98E-2	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	6,31E1	3,23E0	3,78E0	7,01E1	3,49E-1	8,88E-1	0E0	2,01E-1	6,61E-1	0E0	-2,46E1
Secondary materials	kg	5,32E-1	0E0	8,06E-5	5,32E-1	0E0	5,32E-3	0E0	0E0	0E0	0E0	1,09E0
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m ³	2,83E0	6,72E-4	2,28E-2	2,85E0	7,27E-5	2,86E-2	0E0	4,19E-5	4,18E-4	0E0	-2,14E-2

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	1,44E0	3,13E-3	2,28E-2	1,46E0	3,39E-4	1,53E-2	0E0	1,96E-4	0E0	0E0	-1,06E0
Non-hazardous waste	kg	1,63E1	3,47E-1	9,14E-1	1,76E1	3,75E-2	1,98E-1	0E0	2,17E-2	0E0	0E0	-9,06E0
Radioactive waste	kg	1,49E-4	2,21E-5	1,52E-5	1,86E-4	2,4E-6	2,99E-6	0E0	1,38E-6	0E0	0E0	-1,51E-5

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	3,78E-1	3,78E-1	0E0	4,22E-1	0E0	0E0	1,84E0	0E0	0E0
Materials for energy rec	kg	0E0	0E0	4,29E-1	4,29E-1	0E0	4,29E-3	0E0	0E0	1E-1	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content	Unit (expressed per functional unit or per declared unit)
Biogenic carbon content in product	0 kg
Biogenic carbon content in accompanying packaging	-9,75E-04 kg

NOTE 1 kg biogenic carbon is equivalent to 44/12 kg of CO₂.

RUX 250

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e	7,36E0	3,11E-1	1,17E0	8,84E0	3,4E-2	1,11E-1	0E0	1,98E-2	1,92E-1	0E0	-4,31E0
GWP – fossil	kg CO ₂ e	7,3E0	3,11E-1	5,21E-1	8,14E0	3,43E-2	9,87E-2	0E0	1,98E-2	1,2E-1	0E0	-4,33E0
GWP – biogenic	kg CO ₂ e	4,79E-2	2,26E-4	6,49E-1	6,97E-1	2,49E-5	1,22E-2	0E0	1,44E-5	7,13E-2	0E0	1,3E-2
GWP – LULUC	kg CO ₂ e	5,2E-3	9,35E-5	9,76E-4	6,27E-3	1,03E-5	6,89E-5	0E0	5,95E-6	7,84E-5	0E0	-1,08E-3
Ozone depletion pot.	kg CFC ₁₁ e	5,68E-7	7,31E-8	2,74E-8	6,68E-7	8,06E-9	9,04E-9	0E0	4,65E-9	1,02E-8	0E0	-1,69E-7
Acidification potential	mol H ⁺ e	1,05E-1	1,31E-3	1,67E-3	1,08E-1	1,44E-4	1,16E-3	0E0	8,3E-5	8,59E-4	0E0	-2,38E-2
EP-freshwater ³⁾	kg Pe	4,38E-4	2,53E-6	4,88E-5	4,9E-4	2,79E-7	5,16E-6	0E0	1,61E-7	4,77E-6	0E0	-2,5E-4
EP-marine	kg Ne	1,01E-2	3,93E-4	9,36E-4	1,14E-2	4,34E-5	1,42E-4	0E0	2,5E-5	1,96E-4	0E0	-4,89E-3
EP-terrestrial	mol Ne	3,73E-1	4,34E-3	4,22E-3	3,82E-1	4,79E-4	4,11E-3	0E0	2,76E-4	2,26E-3	0E0	-5,6E-2
POCP ("smog")	kg NMVOCe	3,66E-2	1,4E-3	1,04E-3	3,9E-2	1,54E-4	4,88E-4	0E0	8,88E-5	6,13E-4	0E0	-2,41E-2
ADP-minerals & metals	kg Sbe	1,01E-2	5,3E-6	3,22E-6	1,01E-2	5,85E-7	1,01E-4	0E0	3,37E-7	3,82E-6	0E0	-7,61E-5
ADP-fossil resources	MJ	9,19E1	4,83E0	4,43E0	1,01E2	5,33E-1	1,2E0	0E0	3,07E-1	9,79E-1	0E0	-3,67E1
Water use ²⁾	m ³ e	4,24E0	1,8E-2	1,72E-1	4,43E0	1,98E-3	4,61E-2	0E0	1,14E-3	2,04E-2	0E0	-1,95E0

1)GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO₄e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	1,67E1	6,09E-2	7,77E-1	1,75E1	6,71E-3	1,82E-1	0E0	3,87E-3	1,5E-1	0E0	-3,46E0
Renew. PER as material	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	1,67E1	6,09E-2	7,77E-1	1,75E1	6,71E-3	1,82E-1	0E0	3,87E-3	1,5E-1	0E0	-3,46E0
Non-re. PER as energy	MJ	8,72E1	4,83E0	3,8E0	9,58E1	5,33E-1	1,15E0	0E0	3,07E-1	9,79E-1	0E0	-3,67E1
Non-re. PER as material	MJ	4,74E0	0E0	2,39E-1	4,98E0	0E0	4,98E-2	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	9,19E1	4,83E0	4,03E0	1,01E2	5,33E-1	1,2E0	0E0	3,07E-1	9,79E-1	0E0	-3,67E1
Secondary materials	kg	7,99E-1	0E0	8,06E-5	7,99E-1	0E0	7,99E-3	0E0	0E0	0E0	0E0	1,64E0
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m ³	2,86E0	1,01E-3	3,3E-2	2,9E0	1,11E-4	2,9E-2	0E0	6,4E-5	5,48E-4	0E0	-3,21E-2

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	2,16E0	4,7E-3	3,09E-2	2,2E0	5,18E-4	2,27E-2	0E0	2,99E-4	0E0	0E0	-1,6E0
Non-hazardous waste	kg	2,45E1	5,2E-1	1,19E0	2,62E1	5,73E-2	2,84E-1	0E0	3,31E-2	0E0	0E0	-1,36E1
Radioactive waste	kg	2,25E-4	3,32E-5	1,65E-5	2,75E-4	3,66E-6	3,89E-6	0E0	2,11E-6	0E0	0E0	-2,26E-5

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	5,67E-1	5,67E-1	0E0	4,24E-1	0E0	0E0	2,77E0	0E0	0E0
Materials for energy rec	kg	0E0	0E0	6,6E-1	6,6E-1	0E0	6,6E-3	0E0	0E0	1E-1	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content	Unit (expressed per functional unit or per declared unit)
Biogenic carbon content in product	0 kg
Biogenic carbon content in accompanying packaging	-9,75E-04 kg

NOTE 1 kg biogenic carbon is equivalent to 44/12 kg of CO₂.

RUX 315

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e	8,56E0	3,56E-1	1,31E0	1,02E1	3,98E-2	1,25E-1	0E0	2,32E-2	3,28E-1	0E0	-4,98E0
GWP – fossil	kg CO ₂ e	8,5E0	3,55E-1	5,68E-1	9,43E0	4,02E-2	1,12E-1	0E0	2,32E-2	1,83E-1	0E0	-4,99E0
GWP – biogenic	kg CO ₂ e	5,52E-2	2,58E-4	7,39E-1	7,95E-1	2,92E-5	1,32E-2	0E0	1,68E-5	1,46E-1	0E0	1,49E-2
GWP – LULUC	kg CO ₂ e	5,98E-3	1,07E-4	9,84E-4	7,07E-3	1,21E-5	7,68E-5	0E0	6,97E-6	9,07E-5	0E0	-1,24E-3
Ozone depletion	kg CFC	6,98E-7	8,36E-8	2,85E-8	8,1E-7	9,44E-9	1,05E-8	0E0	5,45E-9	1,21E-8	0E0	-1,96E-7
Acidification potential	mol H ⁺ e	1,21E-1	1,49E-3	1,76E-3	1,25E-1	1,69E-4	1,33E-3	0E0	9,73E-5	1,01E-3	0E0	-2,74E-2
EP-freshwater ³⁾	kg Pe	5,06E-4	2,89E-6	5,29E-5	5,62E-4	3,27E-7	5,88E-6	0E0	1,89E-7	5,53E-6	0E0	-2,87E-4
EP-marine	kg Ne	1,17E-2	4,5E-4	1,04E-3	1,32E-2	5,08E-5	1,59E-4	0E0	2,93E-5	2,37E-4	0E0	-5,62E-3
EP-terrestrial	mol Ne	4,32E-1	4,97E-3	4,5E-3	4,41E-1	5,62E-4	4,71E-3	0E0	3,24E-4	2,71E-3	0E0	-6,44E-2
POCP (“smog”)	kg NMVOCe	4,23E-2	1,6E-3	1,11E-3	4,51E-2	1,81E-4	5,49E-4	0E0	1,04E-4	7,33E-4	0E0	-2,77E-2
ADP-minerals & metals	kg Sbe	1,17E-2	6,07E-6	3,46E-6	1,17E-2	6,85E-7	1,17E-4	0E0	3,95E-7	4,41E-6	0E0	-8,74E-5
ADP-fossil resources	MJ	1,11E2	5,53E0	4,54E0	1,21E2	6,25E-1	1,4E0	0E0	3,6E-1	1,15E0	0E0	-4,24E1
Water use ²⁾	m ³ e	4,97E0	2,06E-2	1,85E-1	5,17E0	2,32E-3	5,35E-2	0E0	1,34E-3	2,93E-2	0E0	-2,24E0

1)GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO₄e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	1,92E1	6,96E-2	7,88E-1	2,01E1	7,86E-3	2,08E-1	0E0	4,54E-3	1,73E-1	0E0	-3,97E0
Renew. PER as material	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	1,92E1	6,96E-2	7,88E-1	2,01E1	7,86E-3	2,08E-1	0E0	4,54E-3	1,73E-1	0E0	-3,97E0
Non-re. PER as energy	MJ	1,02E2	5,53E0	3,91E0	1,11E2	6,25E-1	1,3E0	0E0	3,6E-1	1,15E0	0E0	-4,24E1
Non-re. PER as material	MJ	9,48E0	0E0	2,39E-1	9,72E0	0E0	9,72E-2	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	1,11E2	5,53E0	4,15E0	1,21E2	6,25E-1	1,4E0	0E0	3,6E-1	1,15E0	0E0	-4,24E1
Secondary materials	kg	9,16E-1	0E0	8,06E-5	9,16E-1	0E0	9,16E-3	0E0	0E0	0E0	0E0	1,88E0
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m ³	5,64E0	1,15E-3	3,74E-2	5,68E0	1,3E-4	5,68E-2	0E0	7,51E-5	7,66E-4	0E0	-3,68E-2

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	2,47E0	5,37E-3	3,43E-2	2,51E0	6,07E-4	2,58E-2	0E0	3,5E-4	0E0	0E0	-1,83E0
Non-hazardous waste	kg	2,81E1	5,94E-1	1,3E0	3E1	6,72E-2	3,22E-1	0E0	3,87E-2	0E0	0E0	-1,56E1
Radioactive waste	kg	2,58E-4	3,8E-5	1,7E-5	3,13E-4	4,29E-6	4,28E-6	0E0	2,47E-6	0E0	0E0	-2,6E-5

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
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Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	6,51E-1	6,51E-1	0E0	4,25E-1	0E0	0E0	3,18E0	0E0	0E0
Materials for energy rec	kg	0E0	0E0	7,59E-1	7,59E-1	0E0	7,59E-3	0E0	0E0	2E-1	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content	Unit (expressed per functional unit or per declared unit)
Biogenic carbon content in product	0 kg
Biogenic carbon content in accompanying packaging	-9,75E-04 kg

NOTE 1 kg biogenic carbon is equivalent to 44/12 kg of CO₂.

RUX 400

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e	1,34E1	5,6E-1	2,04E0	1,6E1	6,09E-2	1,83E-1	0E0	3,55E-2	4,96E-1	0E0	-7,7E0
GWP – fossil	kg CO ₂ e	1,33E1	5,6E-1	8,15E-1	1,47E1	6,14E-2	1,64E-1	0E0	3,54E-2	2,77E-1	0E0	-7,73E0
GWP – biogenic	kg CO ₂ e	9,02E-2	4,06E-4	1,22E0	1,31E0	4,46E-5	1,83E-2	0E0	2,57E-5	2,19E-1	0E0	2,3E-2
GWP – LULUC	kg CO ₂ e	9,3E-3	1,68E-4	1,02E-3	1,05E-2	1,85E-5	1,11E-4	0E0	1,07E-5	1,4E-4	0E0	-1,92E-3
Ozone depletion pot.	kg CFC ₁₁ e	1,08E-6	1,32E-7	3,4E-8	1,24E-6	1,44E-8	1,49E-8	0E0	8,33E-9	1,87E-8	0E0	-3,03E-7
Acidification potential	mol H ⁺ e	1,88E-1	2,35E-3	2,19E-3	1,93E-1	2,58E-4	2,01E-3	0E0	1,49E-4	1,56E-3	0E0	-4,24E-2
EP-freshwater ³⁾	kg Pe	7,93E-4	4,55E-6	7,46E-5	8,73E-4	5E-7	8,99E-6	0E0	2,88E-7	8,53E-6	0E0	-4,45E-4
EP-marine	kg Ne	1,83E-2	7,08E-4	1,59E-3	2,06E-2	7,78E-5	2,34E-4	0E0	4,49E-5	3,64E-4	0E0	-8,71E-3
EP-terrestrial	mol Ne	6,7E-1	7,82E-3	5,89E-3	6,84E-1	8,59E-4	7,13E-3	0E0	4,95E-4	4,17E-3	0E0	-9,97E-2
POCP ("smog")	kg NMVOC _e	6,65E-2	2,52E-3	1,43E-3	7,04E-2	2,76E-4	8,04E-4	0E0	1,59E-4	1,13E-3	0E0	-4,29E-2
ADP-minerals & metals	kg Sbe	1,8E-2	9,55E-6	4,56E-6	1,8E-2	1,05E-6	1,81E-4	0E0	6,05E-7	6,81E-6	0E0	-1,35E-4
ADP-fossil resources	MJ	1,73E2	8,71E0	5,1E0	1,87E2	9,56E-1	2,06E0	0E0	5,51E-1	1,78E0	0E0	-6,56E1
Water use ²⁾	m ³ e _{des}	7,73E0	3,24E-2	2,53E-1	8,02E0	3,55E-3	8,2E-2	0E0	2,05E-3	4,47E-2	0E0	-3,47E0

1)GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO₄e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	3,13E1	1,1E-1	8,43E-1	3,23E1	1,2E-2	3,29E-1	0E0	6,94E-3	2,67E-1	0E0	-6,15E0

Renew. PER as material	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	3,13E1	1,1E-1	8,43E-1	3,23E1	1,2E-2	3,29E-1	0E0	6,94E-3	2,67E-1	0E0	-6,15E0
Non-re. PER as energy	MJ	1,58E2	8,71E0	4,47E0	1,72E2	9,56E-1	1,91E0	0E0	5,51E-1	1,78E0	0E0	-6,56E1
Non-re. PER as material	MJ	1,42E1	0E0	2,39E-1	1,45E1	0E0	1,45E-1	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	1,73E2	8,71E0	4,71E0	1,86E2	9,56E-1	2,05E0	0E0	5,51E-1	1,78E0	0E0	-6,56E1
Secondary materials	kg	1,43E0	0E0	8,06E-5	1,43E0	0E0	1,43E-2	0E0	0E0	0E0	0E0	2,91E0
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m ³	8,46E0	1,81E-3	6,08E-2	8,53E0	1,99E-4	8,53E-2	0E0	1,15E-4	1,17E-3	0E0	-5,7E-2

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	3,9E0	8,46E-3	5,27E-2	3,96E0	9,29E-4	4,03E-2	0E0	5,36E-4	0E0	0E0	-2,84E0
Non-hazardous waste	kg	4,4E1	9,36E-1	1,92E0	4,68E1	1,03E-1	4,91E-1	0E0	5,93E-2	0E0	0E0	-2,41E1
Radioactive waste	kg	4,01E-4	5,98E-5	1,98E-5	4,81E-4	6,56E-6	5,98E-6	0E0	3,78E-6	0E0	0E0	-4,03E-5

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	1,01E0	1,01E0	0E0	4,28E-1	0E0	0E0	4,91E0	0E0	0E0
Materials for energy rec	kg	0E0	0E0	1,29E0	1,29E0	0E0	1,29E-2	0E0	0E0	3E-1	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content	Unit (expressed per functional unit or per declared unit)
Biogenic carbon content in product	0 kg
Biogenic carbon content in accompanying packaging	-9,75E-04 kg

NOTE 1 kg biogenic carbon is equivalent to 44/12 kg of CO₂.

ROX 160

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e	1,6E1	6,98E-1	2,06E0	1,88E1	7,38E-2	2,24E-1	0E0	4,3E-2	3,96E-1	0E0	-9,74E0
GWP – fossil	kg CO ₂ e	1,59E1	6,97E-1	7,54E-1	1,74E1	7,44E-2	2,08E-1	0E0	4,29E-2	2,55E-1	0E0	-9,77E0
GWP – biogenic	kg CO ₂ e	1,05E-1	5,06E-4	1,31E0	1,41E0	5,41E-5	1,56E-2	0E0	3,12E-5	1,42E-1	0E0	2,93E-2
GWP – LULUC	kg CO ₂ e	1,13E-2	2,1E-4	3,94E-4	1,19E-2	2,24E-5	1,37E-4	0E0	1,29E-5	1,73E-4	0E0	-2,44E-3

Ozone depletion	kg CFC-	1,21E-6	1,64E-7	2,26E-8	1,4E-6	1,75E-8	1,7E-8	0E0	1,01E-8	2,25E-8	0E0	-3,81E-7
Acidification	mol H ⁺ e	2,29E-1	2,93E-3	1,66E-3	2,34E-1	3,13E-4	2,45E-3	0E0	1,8E-4	1,89E-3	0E0	-5,38E-2
EP-freshwater ³⁾	kg Pe	9,59E-4	5,67E-6	6,83E-5	1,03E-3	6,06E-7	1,09E-5	0E0	3,49E-7	1,05E-5	0E0	-5,65E-4
EP-marine	kg Ne	2,21E-2	8,82E-4	1,59E-3	2,46E-2	9,42E-5	2,79E-4	0E0	5,44E-5	4,29E-4	0E0	-1,1E-2
EP-terrestrial	mol Ne	8,23E-1	9,75E-3	4,87E-3	8,38E-1	1,04E-3	8,73E-3	0E0	6E-4	4,95E-3	0E0	-1,26E-1
POCP ("smog")	kg NMVOCe	8,03E-2	3,13E-3	1,18E-3	8,46E-2	3,35E-4	9,61E-4	0E0	1,93E-4	1,34E-3	0E0	-5,45E-2
ADP-minerals &	kg Sbe	2,23E-2	1,19E-5	4E-6	2,23E-2	1,27E-6	2,23E-4	0E0	7,33E-7	8,4E-6	0E0	-1,72E-4
ADP-fossil resources	MJ	1,97E2	1,08E1	3,2E0	2,11E2	1,16E0	2,47E0	0E0	6,68E-1	2,15E0	0E0	-8,27E1
Water use ²⁾	m ³ e	9,19E0	4,03E-2	2,18E-1	9,45E0	4,31E-3	1,01E-1	0E0	2,48E-3	4,35E-2	0E0	-4,41E0

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential.
2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO₄e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	3,6E1	1,36E-1	3,88E-1	3,65E1	1,46E-2	3,81E-1	0E0	8,41E-3	3,29E-1	0E0	-7,82E0
Renew. PER as material	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	3,6E1	1,36E-1	3,88E-1	3,65E1	1,46E-2	3,81E-1	0E0	8,41E-3	3,29E-1	0E0	-7,82E0
Non-re. PER as energy	MJ	1,88E2	1,08E1	2,67E0	2,01E2	1,16E0	2,37E0	0E0	6,68E-1	2,15E0	0E0	-8,27E1
Non-re. PER as material	MJ	9,48E0	0E0	2,39E-1	9,72E0	0E0	9,72E-2	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	1,97E2	1,08E1	2,91E0	2,11E2	1,16E0	2,47E0	0E0	6,68E-1	2,15E0	0E0	-8,27E1
Secondary materials	kg	1,78E0	0E0	8,06E-5	1,78E0	0E0	1,78E-2	0E0	0E0	0E0	0E0	3,7E0
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m ³	5,75E0	2,26E-3	6,41E-2	5,81E0	2,41E-4	5,82E-2	0E0	1,39E-4	1,17E-3	0E0	-7,25E-2

6) PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	4,79E0	1,05E-2	5,28E-2	4,85E0	1,13E-3	5,03E-2	0E0	6,49E-4	0E0	0E0	-3,61E0
Non-hazardous waste	kg	5,38E1	1,17E0	1,82E0	5,68E1	1,24E-1	6,15E-1	0E0	7,18E-2	0E0	0E0	-3,07E1
Radioactive waste	kg	4,84E-4	7,44E-5	1,22E-5	5,71E-4	7,95E-6	7,23E-6	0E0	4,59E-6	0E0	0E0	-5,1E-5

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	1,26E0	1,26E0	0E0	2,93E-1	0E0	0E0	6,1E0	0E0	0E0
Materials for energy rec	kg	0E0	0E0	1,42E0	1,42E0	0E0	1,42E-2	0E0	0E0	2E-1	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content	Unit (expressed per functional unit or per declared unit)
Biogenic carbon content in product	0 kg
Biogenic carbon content in accompanying packaging	-2,93E-04 kg

NOTE 1 kg biogenic carbon is equivalent to 44/12 kg of CO₂.

ROX S 160

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e	1,81E1	6,08E-1	2,06E0	2,07E1	7,26E-2	2,44E-1	0E0	4,23E-2	1,14E0	0E0	-8,8E0
GWP – fossil	kg CO ₂ e	1,79E1	6,07E-1	7,49E-1	1,92E1	7,32E-2	2,27E-1	0E0	4,23E-2	5,5E-1	0E0	-8,82E0
GWP – biogenic	kg CO ₂ e	2,03E-1	4,41E-4	1,31E0	1,51E0	5,32E-5	1,65E-2	0E0	3,07E-5	5,94E-1	0E0	2,59E-2
GWP – LULUC	kg CO ₂ e	1,26E-2	1,83E-4	3,89E-4	1,31E-2	2,2E-5	1,5E-4	0E0	1,27E-5	1,58E-4	0E0	-2,16E-3
Ozone depletion	kg CFC	1,02E-6	1,43E-7	2,19E-8	1,19E-6	1,72E-8	1,49E-8	0E0	9,94E-9	2,25E-8	0E0	-3,54E-7
Acidification	mol H ⁺ e	2,19E-1	2,55E-3	1,61E-3	2,23E-1	3,08E-4	2,34E-3	0E0	1,77E-4	1,86E-3	0E0	-4,79E-2
EP-freshwater ³⁾	kg Pe	1,3E-3	4,94E-6	6,8E-5	1,38E-3	5,96E-7	1,43E-5	0E0	3,44E-7	9,64E-6	0E0	-5,01E-4
EP-marine	kg Ne	2,56E-2	7,69E-4	1,58E-3	2,8E-2	9,27E-5	3,12E-4	0E0	5,35E-5	4,63E-4	0E0	-9,86E-3
EP-terrestrial	mol Ne	7,45E-1	8,49E-3	4,74E-3	7,58E-1	1,02E-3	7,93E-3	0E0	5,91E-4	5,23E-3	0E0	-1,13E-1
POCP ("smog")	kg NMVOCe	8,22E-2	2,73E-3	1,14E-3	8,61E-2	3,29E-4	9,76E-4	0E0	1,9E-4	1,4E-3	0E0	-4,85E-2
ADP-minerals &	kg Sbe	1,91E-2	1,04E-5	3,76E-6	1,91E-2	1,25E-6	1,92E-4	0E0	7,21E-7	7,64E-6	0E0	-1,52E-4
ADP-fossil resources	MJ	2,43E2	9,44E0	3,14E0	2,56E2	1,14E0	2,91E0	0E0	6,57E-1	2,11E0	0E0	-7,56E1
Water use ²⁾	m ³ e	1,12E1	3,51E-2	2,17E-1	1,15E1	4,24E-3	1,22E-1	0E0	2,45E-3	8,19E-2	0E0	-3,9E0

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO₄e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	3,72E1	1,19E-1	3,79E-1	3,77E1	1,43E-2	3,93E-1	0E0	8,27E-3	2,98E-1	0E0	-6,93E0
Renew. PER as material	MJ	3,48E-2	0E0	0E0	3,48E-2	0E0	3,48E-4	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	3,72E1	1,19E-1	3,79E-1	3,77E1	1,43E-2	3,93E-1	0E0	8,27E-3	2,98E-1	0E0	-6,93E0
Non-re. PER as energy	MJ	2,19E2	9,44E0	2,61E0	2,31E2	1,14E0	2,66E0	0E0	6,57E-1	2,11E0	0E0	-7,56E1
Non-re. PER as material	MJ	2,73E1	0E0	2,39E-1	2,75E1	0E0	2,75E-1	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	2,46E2	9,44E0	2,85E0	2,58E2	1,14E0	2,94E0	0E0	6,57E-1	2,11E0	0E0	-7,56E1
Secondary materials	kg	1,7E0	0E0	8,06E-5	1,7E0	0E0	1,7E-2	0E0	0E0	0E0	0E0	3,28E0
Renew. secondary materials	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary materials	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m ³	4,46E-1	1,97E-3	6,41E-2	5,12E-1	2,37E-4	5,22E-3	0E0	1,37E-4	2,04E-3	0E0	-6,42E-2

6) PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	4,29E0	9,18E-3	5,24E-2	4,36E0	1,11E-3	4,53E-2	0E0	6,39E-4	0E0	0E0	-3,19E0
Non-hazardous waste	kg	4,78E1	1,02E0	1,8E0	5,06E1	1,22E-1	5,53E-1	0E0	7,07E-2	0E0	0E0	-2,72E1
Radioactive waste	kg	4,58E-4	6,48E-5	1,18E-5	5,34E-4	7,82E-6	6,86E-6	0E0	4,51E-6	0E0	0E0	-4,57E-5

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	4,9E-2	0E0	1,09E0	1,14E0	0E0	2,91E-1	0E0	0E0	5,4E0	0E0	0E0
Materials for energy rec	kg	1,03E-3	0E0	1,42E0	1,42E0	0E0	1,42E-2	0E0	0E0	8E-1	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content	Unit (expressed per functional unit or per declared unit)
Biogenic carbon content in product	0 kg
Biogenic carbon content in accompanying packaging	2,93E-04 kg, C

NOTE 1 kg biogenic carbon is equivalent to 44/12 kg of CO₂.

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Energy type	Object	QWP value	Data quality
Electricity	Electricity data quality and CO2 emission kg CO2 eq. / kWh	0,0615 kg CO2e / kWh	Electricity production, wind, 1-3mw turbine, onshore EN15804+A1, EN15804+A2, EcoInvent 3.6
			Heat production, light fuel oil, at industrial furnace 1mw EN15804+A1, EN15804+A2, EcoInvent 3.6
District Heat	District heating data quality and CO2 emissions kg CO2 eq. / kWh	0,009721 kg CO2e / kWh	Heat production, softwood chips from forest, at furnace 5000kw, generic Global, EN15804+A1, EN15804+A2, EcoInvent 3.6
			Heat production, at hard coal industrial furnace 1-10mw, Finland, EN15804+A1, EN15804+A2, EcoInvent 3.6

Transportation scenario

Parameter	Value
Fuel type and consumption of vehicle used for transport	Truck: diesel, maximum load capacity 34 t. Specific transport emissions 0,064 kg CO ₂ equiv. / tn x km
Distance (km)	Average transport distance 130 km
Capacity utilization (%)	100 % for truck
Bulk density of transported products (kg/m³)	Bulk density varies depending on product type and thickness
Volume capacity utilization factor	1

Installation of the product in the building

The masses of the packaging materials of products are shown on page 5.

Parameter	Unit
Ancillary materials for installation (specified by material)	Rivet, disposable gloves (not included in the analysis because of their insignificant usage amount)
Water use	0 m3
Other resource use	0 kWh (energy use is insignificant)
Quantitative description of energy type (regional mix) and consumption during the installation process	-
Waste materials generated by product installation	Packaging materials: Cardboard LLDE-Polyethylene Polyethylene (PE)

End-of-life scenario; NOT and RUX

		NOT		RUX	
		Material			
Process flow	Size (mm)		125 / 160 / 200 / 250 / 315		160 / 200 / 250 / 315 / 400
Collection process specified by type	kg collected separately	-	5,0 / 6,9 / 9,9 / 13 / 15,4		1,2 / 1,9 / 2,9 / 3,4 / 5,2
	kg collected with mixed construction waste	-	-		-
Recovery system specified by type	kg for reuse	-	-		-
	kg for recycling	Steel, Powder coating	4,6 / 6,2 / 9,0 / 11,8 / 14,1		1,13 / 1,84 / 2,77 / 3,18 / 4,91
	kg for energy recovery	Plastic	0,42 / 0,72 / 1,02 / 1,22 / 1,32		0,1 / 0,1 / 0,1 / 0,2 / 0,3
Disposal specified by type	kg material for final deposition	-	-		-
Assumptions for scenario development	units as appropriate	Waste materials are transported 150 km by truck to recycling facility with a truck capacity utilization of 45%			

End-of-life scenario; ROX and ROXS

		ROX		ROXS	
		Material			
Process flow	Size (mm)		160 / 200 / 250 / 315 / 400 / 500		160 / 200 / 250 / 315
Collection process specified by type	kg collected separately	-	6,3 / 7,3 / 8,7 / 10,6 / 13,5 / 16,0		6,2 / 8,0 / 9,9 / 12,5
	kg collected with mixed construction waste	-	-		-
Recovery system specified by type	kg for reuse	-	-		-
	kg for recycling	Steel, Powder coating	6,1 / 7,1 / 8,3 / 9,6 / 12,3 / 14,5		5,4 / 7,2 / 8,8 / 11,2
	kg for energy recovery	Plastic	0,2 / 0,2 / 0,4 / 1,0 / 1,2 / 1,5		0,8 / 0,8 / 1,1 / 1,3
Disposal specified by type	kg material for final deposition	-	-		-
Assumptions for scenario development	units as appropriate	Waste materials are transported 75 km by truck to recycling facility with a truck capacity utilization of 45%			

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- 4 Ecoinvent database v3.6 (2019)
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- 6 Supply and exhaust air diffusers EPD Background Report
- 7 Emissions database for construction, Finnish Environmental Institute, 2021. Available at: <https://co2data.fi/>
- 8 Helsinki Region Environmental Services HSY, Announcement, received 5/2022.
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ANNEX 1: RESULTS OF ENVIRONMENTAL INFORMATION REPORTED PER KILOGRAM

NOT 125

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e/kg	2,56E+00	1,01E-01	4,02E-01	3,06E+00	1,17E-02	3,74E-02	0,00E+00	6,82E-03	1,28E-01	0,00E+00	1,49E+00
ADP-minerals & metals	kg Sbe/kg	3,28E-03	1,73E-06	1,28E-06	3,30E-03	2,02E-07	3,30E-05	0,00E+00	1,16E-07	1,28E-06	0,00E+00	-2,60E-05
ADP-fossil resources	MJ/kg	3,50E+01	1,57E+00	2,52E+00	3,92E+01	1,84E-01	4,56E-01	0,00E+00	1,06E-01	3,42E-01	0,00E+00	1,27E+01
Water use ²⁾	m ³ e depr./kg	1,39E+00	5,86E-03	8,48E-02	1,48E+00	6,84E-04	1,59E-02	0,00E+00	3,94E-04	1,03E-02	0,00E+00	-6,68E-01
Biogenic carbon content in product	kg CO/kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Secondary materials	kg/kg	3,00E-01	0,00E+00	3,54E-04	3,00E-01	0,00E+00	3,00E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,62E-01

RUX 160

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e/kg	2,73E+00	1,07E-01	5,20E-01	3,36E+00	1,08E-02	5,22E-02	0,00E+00	6,26E-03	1,28E-01	0,00E+00	1,48E+00
ADP-minerals & metals	kg Sbe/kg	3,40E-03	1,82E-06	1,92E-06	3,41E-03	1,85E-07	3,44E-05	0,00E+00	1,07E-07	1,32E-06	0,00E+00	-2,58E-05
ADP-fossil resources	MJ/kg	4,08E+01	1,65E+00	3,32E+00	4,58E+01	1,68E-01	6,13E-01	0,00E+00	9,75E-02	3,49E-01	0,00E+00	1,27E+01
Water use ²⁾	m ³ e depr./kg	1,62E+00	6,15E-03	1,01E-01	1,73E+00	6,27E-04	1,88E-02	0,00E+00	3,62E-04	1,03E-02	0,00E+00	-6,62E-01
Biogenic carbon content in product	kg CO/kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Secondary materials	kg/kg	2,72E-01	0,00E+00	6,72E-05	2,72E-01	0,00E+00	2,72E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,57E-01

RUX 200

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e/kg	2,59E+00	1,09E-01	4,48E-01	3,15E+00	1,17E-02	4,33E-02	0,00E+00	6,84E-03	8,95E-02	0,00E+00	1,52E+00
ADP-minerals & metals	kg Sbe/kg	3,63E-03	1,86E-06	1,42E-06	3,63E-03	2,02E-07	3,65E-05	0,00E+00	1,16E-07	1,34E-06	0,00E+00	-2,67E-05
ADP-fossil resources	MJ/kg	3,32E+01	1,70E+00	2,19E+00	3,71E+01	1,84E-01	4,69E-01	0,00E+00	1,06E-01	3,48E-01	0,00E+00	1,29E+01

Water use ²⁾	m ³ e depr./kg	1,50E+00	6,32E-03	7,47E-02	1,58E+00	6,84E-04	1,67E-02	0,00E+00	3,94E-04	8,37E-03	0,00E+00	-6,84E-01
Biogenic carbon content in product	kg CO/kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Secondary materials	kg/kg	2,80E-01	0,00E+00	4,24E-05	2,80E-01	0,00E+00	2,80E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,74E-01

RUX 250

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e/kg	2,54E+00	1,07E-01	4,03E-01	3,05E+00	1,17E-02	3,83E-02	0,00E+00	6,83E-03	6,62E-02	0,00E+00	1,49E+00
ADP-minerals & metals	kg Sbe/kg	3,48E-03	1,83E-06	1,11E-06	3,48E-03	2,02E-07	3,48E-05	0,00E+00	1,16E-07	1,32E-06	0,00E+00	-2,62E-05
ADP-fossil resources	MJ/kg	3,17E+01	1,67E+00	1,53E+00	3,48E+01	1,84E-01	4,14E-01	0,00E+00	1,06E-01	3,38E-01	0,00E+00	1,27E+01
Water use ²⁾	m ³ e depr./kg	1,46E+00	6,21E-03	5,93E-02	1,53E+00	6,83E-04	1,59E-02	0,00E+00	3,93E-04	7,03E-03	0,00E+00	-6,72E-01
Biogenic carbon content in product	kg CO/kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Secondary materials	kg/kg	2,76E-01	0,00E+00	2,78E-05	2,76E-01	0,00E+00	2,76E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,66E-01

RUX 315

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e/kg	2,52E+00	1,05E-01	3,85E-01	3,00E+00	1,17E-02	3,68E-02	0,00E+00	6,82E-03	9,65E-02	0,00E+00	1,46E+00
ADP-minerals & metals	kg Sbe/kg	3,44E-03	1,79E-06	1,02E-06	3,44E-03	2,01E-07	3,44E-05	0,00E+00	1,16E-07	1,30E-06	0,00E+00	-2,57E-05
ADP-fossil resources	MJ/kg	3,26E+01	1,63E+00	1,34E+00	3,56E+01	1,84E-01	4,12E-01	0,00E+00	1,06E-01	3,38E-01	0,00E+00	1,25E+01
Water use ²⁾	m ³ e depr./kg	1,46E+00	6,06E-03	5,44E-02	1,52E+00	6,82E-04	1,57E-02	0,00E+00	3,94E-04	8,62E-03	0,00E+00	-6,59E-01
Biogenic carbon content in product	kg CO/kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Secondary materials	kg/kg	2,69E-01	0,00E+00	2,37E-05	2,69E-01	0,00E+00	2,69E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,53E-01

RUX 400

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e/kg	2,58E+00	1,08E-01	3,92E-01	3,08E+00	1,17E-02	3,52E-02	0,00E+00	6,83E-03	9,54E-02	0,00E+00	1,48E+00
ADP-minerals & metals	kg Sbe/kg	3,46E-03	1,84E-06	8,77E-07	3,46E-03	2,02E-07	3,48E-05	0,00E+00	1,16E-07	1,31E-06	0,00E+00	-2,60E-05
ADP-fossil resources	MJ/kg	3,33E+01	1,68E+00	9,81E-01	3,60E+01	1,84E-01	3,96E-01	0,00E+00	1,06E-01	3,42E-01	0,00E+00	1,26E+01
Water use ²⁾	m ³ e depr./kg	1,49E+00	6,23E-03	4,87E-02	1,54E+00	6,83E-04	1,58E-02	0,00E+00	3,94E-04	8,60E-03	0,00E+00	-6,67E-01
Biogenic carbon content in product	kg CO/kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Secondary materials	kg/kg	2,75E-01	0,00E+00	1,55E-05	2,75E-01	0,00E+00	2,75E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,60E-01

ROX 160

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e/kg	2,54E+00	1,11E-01	3,27E-01	2,98E+00	1,17E-02	3,56E-02	0,00E+00	6,83E-03	6,29E-02	0,00E+00	1,55E+00
ADP-minerals & metals	kg Sbe/kg	3,54E-03	1,89E-06	6,35E-07	3,54E-03	2,02E-07	3,54E-05	0,00E+00	1,16E-07	1,33E-06	0,00E+00	-2,73E-05
ADP-fossil resources	MJ/kg	3,13E+01	1,71E+00	5,08E-01	3,35E+01	1,84E-01	3,92E-01	0,00E+00	1,06E-01	3,41E-01	0,00E+00	1,31E+01
Water use ²⁾	m ³ e depr./kg	1,46E+00	6,40E-03	3,46E-02	1,50E+00	6,84E-04	1,60E-02	0,00E+00	3,94E-04	6,90E-03	0,00E+00	-7,00E-01
Biogenic carbon content in product	kg CO/kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Secondary materials	kg/kg	2,83E-01	0,00E+00	1,28E-05	2,83E-01	0,00E+00	2,83E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,87E-01

ROXS 160

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e/kg	2,92E+00	9,81E-02	3,32E-01	3,34E+00	1,17E-02	3,94E-02	0,00E+00	6,82E-03	1,84E-01	0,00E+00	1,42E+00
ADP-minerals & metals	kg Sbe/kg	3,08E-03	1,68E-06	6,06E-07	3,08E-03	2,02E-07	3,10E-05	0,00E+00	1,16E-07	1,23E-06	0,00E+00	-2,45E-05
ADP-fossil resources	MJ/kg	3,92E+01	1,52E+00	5,06E-01	4,13E+01	1,84E-01	4,69E-01	0,00E+00	1,06E-01	3,40E-01	0,00E+00	1,22E+01
Water use ²⁾	m ³ e depr./kg	1,81E+00	5,66E-03	3,50E-02	1,85E+00	6,84E-04	1,97E-02	0,00E+00	3,95E-04	1,32E-02	0,00E+00	-6,29E-01

Biogenic carbon content in product	kg CO/kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Secondary materials	kg/kg	2,74E-01	0,00E+00	1,30E-05	2,74E-01	0,00E+00	2,74E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,29E-01